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OFFICIAL GAZETTE
UNITED STATES
PATENT OFFICE

VOL. 963
OCTOBER
1977

MICRO PHOTO DIVISION

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

October 4, 1977

Volume 963

Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of August 1977

Affirmed	208
Affirmed in Part	25
Reversed	79
Total	312

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,900,240. B. C. Grieb, CONSTRUCTION OF INCUBATORS FOR INFANTS; 2,648,327, S. Y. GIBON, INFANT INCUBATOR EQUIPMENT; 2,778,617, same, COMPARTMENT HUMIDIFIER; 3,335,712, Grosholz and Wallace, INFANT INCUBATOR; 3,338,233, Grosholz and Andreasen, INCUBATOR TEMPERATURE CONTROL SYSTEM AND METHOD OF OPERATION, filed Oct. 13, 1967, D.C., N.D. Ill. (Chicago) Doc. 67c1767, *Air-Shields and Children's Hospital of Philadelphia v. Ohio Chemical & Surgical Co., Division of Air Reduction Company, Inc.* Judgment, U.S.D.C. on defendant's motion for judgment granted, Mar. 30, 1971; judgment affirmed, Mar. 23, 1973.

2,648,327. (See 2,600,240.)
2,778,617. (See 2,600,240.)
2,848,914, S. Gottfried, WIRE STRIPPING DEVICE; 2,921,511, C. Vinten, CONTROL OF THE IRIS APERTURE SIZE IN PHOTOGRAPHIC CAMERAS; 2,931,284, same, CURTAIN SHUTTER FOR CAMERAS, filed Feb. 9, 1976, United States Court of Claims (District of Columbia) Doc. 36-76, *W. Vinten Limited v. The United States and Mitchell Camera Corp.* Order, the third party defendant's motion for summary judgment be granted and the plaintiff's petition is dismissed. The third party defendant's counterclaim is disallowed and dismissed, Apr. 26, 1977.

2,921,511. (See 2,848,914.)
2,931,284. (See 2,848,914.)
3,077,724, Stoddard and Seem, APPARATUS FOR PROCESSING YARNS; 3,091,912, same, METHOD OF PROCESSING STRETCH YARN AND YARNS PRODUCED THEREBY; 3,472,011, E. P. R. Scragg, TREATMENT OF ARTIFICIAL YARNS AND THREADS, filed Nov. 30, 1976, D.C., S.D. Fla. (Miami) Doc. FL-76-6514-C-JLK, *Collins & Aikman Corporation v. Lee Tex Ltd., Inc.*

3,091,912. (See 3,077,724.)
3,140,342, Ehrreich and Avery, ELECTRICAL SHIELDING AND SEALING GASKET; 3,583,930, same, PLASTICS MADE CONDUCTIVE WITH COARSE METAL FILLERS, filed Jan. 14, 1977, D.C. Del. (Wilmington) Doc. 77-21, *Metex Corporation v. Chomerics, Inc.*

3,204,495, J. J. Matthews, INSULATION REMOVING TOOL; 3,572,189, same, INSULATION JACKET SHAVING TOOL, filed Mar. 8, 1977, D.C. Conn. (Hartford) Doc. H77-119, *Utility Tool Corp. v. Ideal Industries Inc. and Hartford Electric Supply Co.*

3,217,546, Cordell and Gustafson, AUTOMATIC GRAIN SAMPLING DEVICE; 3,217,549, same, AUTOMATIC SAMPLING DEVICE; 3,383,924, R. R. Cordell, RETRACTABLE DEVICE FOR PRESSURIZED CONVEYORS, filed June 4, 1976, D.C., S.D. Iowa (Des Moines), Doc. 76-192-L, *Gustafson, Inc. v. Corn States Hybrid Service, Inc.* Judgment for plaintiff and against defendant for infringement of patents and except as to extent permitted by terms of written agreement of Feb. 16, 1977, where plaintiff granted defendant a license under said patents. Defendants are permanently enjoined against infringing or contributing to infringement of any claim of said patent during unexpired term, Mar. 28, 1977.

3,217,549. (See 3,217,546.)
3,219,261, N. Laing, CROSS-FLOW FAN ROTOR SUPPORT MEANS; 3,284,611, same, PORTABLE HAIR DRYERS; 3,293,750, same, CROSS FLOW MACHINE; 3,305,665, same, FORCED CIRCULATION ELECTRIC HEATER EMPLOYING CROSS-FLOW TYPE FAN; 3,308,268, same, PORTABLE HAIR DRYERS; 3,310,228, same, FLOW MACHINES; 3,313,342, same, BLOWERS; 3,319,877, Eck and Laing, MACHINES OF THE CROSS-FLOW TYPE FOR INDUCING MOVEMENT OF FLUID; 3,322,332, N. Laing, CROSS FLOW MACHINE; 3,322,932, same, PORTABLE ELECTRIC FAN HEATER; 3,348,020, B. Cooper, HAND-HELD ELECTRIC HAIR DRYER, filed Oct. 23, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c3048, *Schick Incorporated v. Firth Cleveland Ltd. et al.* Enter stipulation of dismissal under FRCP Rule 41(a) (1) (ii), Apr. 15, 1976.

3,275,316, G. V. Cleary, Jr., INSERT FOR NEWSPAPERS, filed Apr. 30, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c1653, *Free Standing Stuffer, Inc. v. LaSalle Extensions University.* Same, filed Apr. 28, 1972, D.C., N.D. Ill. (Chicago) Doc. 72c1070, *Free Standing Stuffer, Inc. v. Holly Development Co.* Defendant is permanently enjoined and restricted from directly or indirectly infringing said patent. Final order was appealed and appeal was dismissed, Sept. 24, 1976.

3,284,611. (See 3,219,261.)
3,291,004, Stevens and Ostgaard, PNEUMATIC BRAKE SETTING MEANS WITH EMERGENCY MECHANICAL ACTUATOR THEREOF; 3,359,869, W. C. Avrea, FLUID OPERATED BRAKE, filed June 21, 1974, D.C., N.D. Ill. (Chicago) Doc. 74c1704, *Royal Industries, Inc. v. Acme Parts & Supply Corp.* Entered final judgment by consent, Oct. 28, 1975.

3,295,750. (See 3,219,261.)
3,303,615, L. O'Neal, INFLATABLE DOCK SEAL; 3,391,502, same, DOCK SEAL, filed Apr. 23, 1976 (United States Court of Claims) Doc. 159-76, *Larry O'Neal and O'Neal Tarpaulin & Avcing Company v. The United States of America.*

3,305,665. (See 3,219,261.)
3,308,268. (See 3,219,261.)
3,310,228. (See 3,219,261.)
3,313,342. (See 3,219,261.)
3,319,877. (See 3,219,261.)

3,321,202, M. D. Martin, AUTOMATIC SHEET STACKERS; 3,658,322, same, METHOD AND APPARATUS FOR HANDLING SHEETS; 3,880,420, same, CONVEYOR SYSTEM FOR CONVEYING SHEETS; 3,912,258, same, filed Dec. 13, 1976, D.C.N.J. (Newark) Doc. 76-2360, *Molins Machine Company, Inc. v. Merrill D. Martin and Geo. M. Martin Company.*

3,322,332. (See 3,219,261.)
3,322,932. (See 3,219,261.)
3,335,713. (See 2,600,240.)
3,338,233. (See 2,600,240.)
3,348,020. (See 3,219,261.)
3,359,869. (See 3,291,004.)
3,383,924. (See 3,217,546.)
3,391,502. (See 3,305,615.)
3,472,011. (See 3,077,724.)
3,572,189. (See 3,204,495.)
3,583,930. (See 3,140,342.)
3,658,322. (See 3,321,202.)

3,717,963, J. T. Sauriol, METER HOUSING; Re. 28,640, same, filed Sept. 29, 1975, D.C., N.D. Tex. (Dallas) Doc. CA3-75-1195, *Roby Industries, Inc. v. Bass & Hayes Foundry, Inc. and Polyfoam, Inc.* Final judgment on consent, defendant enjoined and restrained from infringing upon said patent and reissue patent. Defendant's counterclaim herein is dismissed with prejudice, May 8, 1977.

3,725,704, Buchanan, Tecotzky and Wickersheim, RARE EARTH PHOSPHORS FOR X-RAY CONVERSION SCREENS; 3,829,700, same, filed May 16, 1977, D.C., N.D. Calif. (San Francisco) Doc. C77-1020, *Lockheed Missiles & Space Company, Inc. v. Eastman Kodak Co. and Professional Electric X-Ray Co.*

3,739,994, A. R. McFarland, APPARATUS FOR PRODUCING DE-BONED MEAT PRODUCTS; 3,741,772, same, PROCESS FOR PRODUCING DE-BONED MEAT PRODUCTS; 3,906,118, same, PROCESS FOR DE-BONING MEAT OR FISH, filed Apr. 6, 1977, D.C. Utah (Salt Lake City) Doc. C-77-0109, *Beehive Machinery, Inc. v. Meat Separator Corporation, A. H. Lang and Lang & Assoc., Inc.*

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3,741,772. (See 3,739,994.)

3,749,003, Wilkes and Jones, SEED COTTON HANDLING APPARATUS, filed May 20, 1977, D.C., E.D. Calif. (Fresno) Doc. F-77-94, *Cotton Incorporated v. Taylor Machinery Corp. and Clyde L. Taylor.*

3,753,364, Runyan and Groover, HEAT PIPE AND METHOD AND APPARATUS FOR FABRICATING SAME; 3,788,388, H. G. Barkmann, HEAT EXCHANGE SYSTEM; 3,865,184, G. M. Grover, HEAT PIPE AND METHOD AND APPARATUS FOR FABRICATING SAME, filed Nov. 24, 1976, D.C., N.D. Tex. (Dallas) Doc. CA3-76-1527-D, *Q-Dot Corp. v. American Air Conditioning Corp.*

3,757,049, Bonsky and Curtis, TELEPHONE ANSWERING INSTRUMENT AND SYSTEM; 3,865,986, J. R. Darwood, VOICE OPERATED ELECTRIC CIRCUIT; 3,903,369, same, TELEPHONE ANSWERING SYSTEM WITH REMOTE PLAYBACK; 3,968,329, same, TELEPHONE ANSWERING APPARATUS; 3,991,274, same, TELEPHONE ANSWERING SYSTEM WITH ONE RESPONSIVE CIRCUIT FOR REMOTE PLAYBACK, filed Jan. 11, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-107-Lew, *Phone-Mate Inc. v. T. A. D. Avanti, Inc.*

3,762,648, Denles, Trenary, Smith and Hickman, SPRAY NOZZLE; 3,801,019, Trenary and Smith, same, filed Mar. 10, 1977, D.C., W.D. Okla. (Oklahoma City) Doc. 77-0233-E, *Teledyne Industries, Inc., doing business as Teledyne Water Pik v. Dillard Department Stores, Inc.*

3,788,388. (See 3,753,364.)
3,799,379, Grether and Kelton, FORK LIFT, filed Apr. 27, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1473, *Tobias Grether and William J. Kelton v. Foxcroft Meadows, Inc.*

3,801,019. (See 3,762,648.)
3,803,731, R. H. Zumbro, SHOES, filed July 10, 1975, D.C., S.D.N.Y., Doc. 75-3388, *Uniroyal, Inc. v. CITC Industries, Inc.* Consent judgment, above Letter's Patent is invalid for want of invention over the prior art pursuant to Title 35 U.S.C. 103, May 19, 1977.

3,808,943, L. Kelly, GUN-LEVELING DEVICE; Reg. No. 1,024,887 (MAG-NA-PORT), Mag-Na-Port Arms, Inc., filed Mar. 29, 1977, D.C., S.D. Fla. (Fort Lauderdale) Doc. 77-1023-C-NCR, *Mag-Na-Port Arms, Inc. v. Universal Sporting Goods, Inc.*

3,826,068, Ballas and Geist, ROTARY CUTTING ASSEMBLY; 3,859,776, same, filed May 26, 1977, D.C., W.D. Wis. (Madison) Doc. 77-C-204, *Weed Eater, Inc. v. The Toro Company and Toro Sales Company, Inc.*

3,829,700. (See 3,725,704.)
3,859,776. (See 3,826,068.)
3,865,184. (See 3,753,364.)
3,865,986. (See 3,757,049.)
3,880,420. (See 3,321,202.)
3,903,369. (See 3,757,049.)
3,906,118. (See 3,739,994.)
3,912,258. (See 3,321,202.)

3,948,680, Mao and Sabatino, LEAD-ACID STORAGE BATTERY CAPABLE OF ACTIVATION BY THE ADDITION OF ELECTROLYTE; 3,988,165, same, METHOD OF MAKING A LEAD-ACID STORAGE BATTERY, AND CELL CAPABLE OF ACTIVATION BY THE ADDITION OF ELECTROLYTE, filed Mar. 1, 1977, D.C. Del. (Wilmington) Doc. 77-73, *Gould Inc. v. Northwest Industries, Inc. and General Battery Corp.*

3,968,329. (See 3,757,049.)
3,988,165. (See 3,948,680.)
3,991,274. (See 3,757,049.)
3,994,240, Berg, Luger and Olsen, COIL CAR COVER, filed May 10, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1640, *Pro-form, Inc. v. Choo-Choo Products Ltd.*

Re. 28,640. (See 3,717,963.)
D. 245,110, R. V. Friesen, DOLL HOUSE, filed Apr. 6, 1977, D.C. Utah (Salt Lake City), Doc. C-77-0110, *Roy V. Friesen v. M. Joseph Long and Nancy H. Long, doing business as The Woodhouse.*

Reg. No. 1,024,887. (See 3,808,943.)

Public Hearing on Relocation of Offices

During the past eighteen months, the Patent and Trademark Office has been attempting to acquire additional office space. The PTO's Public Search Room for Patents currently lacks file expansion capability and its Patent Documentation staff has been seriously overcrowded for some time with some of the staff being located at an adjacent office complex.

Past efforts to locate space in the Crystal City area have not been successful and it appears unlikely that space will become available in this area within the foreseeable future. The General Services Administration recently offered the PTO approximately 36,000 square feet of space in the top four floors of a modern office building which is located at 1000 N. Glebe Road in Arlington, at the intersection of Glebe Road and Fairfax Drive and between Wilson Boulevard and Washington Boulevard. This site, which is approximately five miles from the PTO's Crystal Plaza location, is readily accessible by public transportation. In view of the PTO's urgent need for space, and after careful consideration of all possible alternatives, it has been decided to accept this offer of additional space.

Affected employees and members of the public will have an opportunity to comment before a decision is made on the units to move to the Glebe Road building. Two options are currently being considered and in each instance the number of employees involved is approximately 170. The first consists of shifting most trademark-related functions and the Board of Patent Interferences. The other option would include the Board of Appeals, the Office of Publications and the Board of Patent Interferences.

A public hearing on this subject will be held on October 7, 1977 in the Jefferson Room of the Hospitality House Motor Inn, 2000 Jefferson Davis Highway, Arlington, Virginia. The meeting will commence at 10:00 A.M. and terminate not later than 3:00 P.M. Individuals who wish to participate in this meeting should contact Bradford R. Huther (703) 557-2290 by noon, October 6, 1977.

Sept. 22, 1977. LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,453,054, Re. S.N. 821,611, Filed Aug. 3, 1977, Cl. 356/237, SYSTEM FOR DETECTING SMALL OPENINGS IN HOLLOW BODIES, Bryce W. Phillips, Owner of Record: *Reynolds Metals Company, Richmond, Va.*, Attorney or Agent: John F. C. Glenn, et al., Ex. Gp.: 257

3,609,788, Re. S.N. 818,985, Filed July 25, 1977, Cl. 15/104.3, PLUMBERS' TOOL, Mark F. Mier, Owner of Record: *Inventor*, Attorney or Agent: James E. Brunton, Ex. Gp.: 242

3,833,363, Re. S.N. 812,881, Filed July 5, 1977, Cl. 75/175.5, TITANIUM-BASE ALLOY AND METHOD OF IMPROVING CREEP PROPERTIES, Howard B. Bomberger, Jr., et al., Owner of Record: *RMI Company, Niles, Ohio*, Attorney or Agent: Forest C. Sexton, Ex. Gp.: 111

3,899,136, Re. S.N. 822,082, Filed Aug. 5, 1977, Cl. 239/534, EMITTER FOR IRRIGATION SYSTEMS, Richard C. Harmony, Owner of Record: *Harmony Emitter Company, Inc., Tucson, Ariz.*, Attorney or Agent: C. Robert Von Helens, et al., Ex. Gp.: 313

3,914,864, Re. S.N. 822,835, Filed Aug. 8, 1977, Cl. 30/90.6, JACKETED WIRE LAYER REMOVING TOOL, Jack Henry Prince, Owner of Record: *Inventor*, Attorney or Agent: James B. Kinzer, et al., Ex. Gp.: 323

3,928,245, Re. S.N. 822,623, Filed Aug. 8, 1977, Cl. 252/521, METAL OXIDE VOLTAGE-VARIABLE RESISTOR COMPOSITION, Herbert Fishman, et al., Owner of Record: General Electric Company, Pittsfield, Mass., Attorney or Agent: Francis X. Doyle, et al., Ex. Gp.: 223

3,986,752, Re. S.N. 821,317, Filed Aug. 2, 1977, Cl. 308/137, RESILIENT CENTER BEARING ASSEMBLY, William Henry Bogar, et al., Owner of Record: E. I. Du Pont de Nemours and Company, Wilmington, Del., Attorney or Agent: Robert E. Patridge, Ex. Gp.: 316

3,990,822, Re. S.N. 806,451, Filed June 14, 1977, Cl. 425/25, MECHANISM FOR MAINTAINING ALIGNMENT BETWEEN TWO RELATIVELY MOVABLE MEMBERS, Kenneth T. MacMillan, Owner of Record: Inventor, Attorney or Agent: Charles E. Brown, et al., Ex. Gp.: 322

3,997,458, Re. S.N. 821,963, Filed Aug. 4, 1977, Cl. 252/89 R, METHOD OF CLEANSING CONTAMINATED WOUNDS AND SURGICAL SCRUB SOLUTIONS FOR SAME SCRUB, Leonard D. Kurtz, Owner of Record: Deknatel, Incorporated, Long Island, N.Y., Attorney or Agent: Roberts B. Larson, et al., Ex. Gp.: 165

PATENT NOTICES

Certificates of Correction for the Week of Oct. 4, 1977

Re. 28,419	4,013,354	4,027,720	4,031,995
Re. 29,282	4,013,514	4,027,837	4,032,011
3,647,531	4,013,930	4,027,932	4,032,168
3,699,070	4,014,358	4,028,130	4,032,209
3,790,535	4,014,715	4,028,138	4,032,213
3,851,829	4,014,773	4,028,160	4,032,235
3,871,656	4,014,951	4,028,205	4,032,290
3,909,652	4,015,126	4,028,264	4,032,303
3,915,959	4,015,260	4,028,409	4,032,431
3,919,502	4,015,550	4,028,635	4,032,488
3,922,322	4,015,564	4,028,865	4,032,791
3,928,255	4,015,894	4,029,162	4,032,852
3,932,265	4,016,079	4,029,163	4,032,927
3,933,180	4,016,096	4,029,287	4,032,946
3,945,852	4,016,448	4,029,314	4,033,005
3,946,202	4,016,475	4,029,520	4,033,025
3,948,497	4,017,108	4,029,528	4,033,215
3,952,643	4,017,527	4,029,531	4,033,355
3,953,103	4,018,607	4,029,573	4,033,400
3,957,691	4,019,106	4,029,576	4,033,444
3,957,844	4,019,291	4,029,592	4,033,487
3,960,754	4,019,490	4,029,702	4,033,490
3,962,140	4,019,546	4,029,709	4,033,562
3,964,934	4,020,711	4,029,829	4,033,577
3,965,072	4,021,946	4,029,925	4,033,689
3,967,072	4,022,566	4,030,207	4,033,777
3,973,189	4,022,601	4,030,208	4,033,858
3,973,199	4,022,765	4,030,209	4,033,900
3,981,453	4,022,779	4,030,402	4,033,910
3,981,913	4,023,673	4,030,428	4,034,017
3,985,316	4,023,780	4,030,581	4,034,207
3,986,915	4,023,856	4,030,604	4,034,232
3,989,905	4,023,869	4,030,610	4,034,473
3,990,204	4,023,998	4,030,619	4,034,490
3,990,576	4,024,533	4,030,625	4,034,498
3,991,869	4,024,705	4,030,628	4,034,561
3,992,148	4,024,851	4,030,653	4,034,738
3,996,308	4,024,852	4,030,719	4,034,741
4,000,142	4,024,875	4,030,722	4,034,792
4,001,073	4,024,883	4,030,806	4,034,947
4,002,420	4,024,930	4,030,885	4,035,044
4,003,764	4,025,292	4,030,908	4,035,244
4,004,573	4,025,399	4,030,917	4,035,338
4,007,247	4,025,454	4,030,921	4,035,566
4,008,035	4,025,759	4,031,002	4,035,655
4,008,801	4,025,928	4,031,050	4,035,679
4,008,994	4,026,041	4,031,051	4,035,719
4,009,058	4,026,096	4,031,147	4,035,827
4,009,111	4,026,197	4,031,244	4,035,905
4,009,904	4,026,259	4,031,340	4,036,576
4,010,148	4,026,704	4,031,523	4,036,769
4,010,382	4,026,891	4,031,604	4,036,919
4,010,798	4,026,996	4,031,614	4,037,029
4,011,060	4,027,017	4,031,634	4,037,196
4,011,238	4,027,519	4,031,825	4,037,202
4,011,351	4,027,525	4,031,902	
4,012,880	4,027,531	4,031,914	
4,013,158	4,027,599	4,031,954	

Disclaimers

3,292,341.—James D. Frost, Porterville, Calif. ORIENTING AND PACKING APPARATUS. Patent dated Dec. 20, 1966. Disclaimer filed Jan. 10, 1977, by the inventor.

Hereby enters this disclaimer to all claims of said patent.

3,500,063.—Charles William Renon, Haddonfield, N.J., and Richard James Tarzanski, Philadelphia, Pa. SCANNING LASER OBSTRUCTION DETECTION SYSTEM UTILIZING RETROREFLECTIVE STRIP. Patent dated Mar. 10, 1970. Disclaimer filed Aug. 8, 1977, by the assignee, RCA Corporation.

Hereby enters this disclaimer to the remaining term of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 27, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-30-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-17-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-21-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-6-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	7-26-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-7-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director..... Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-17-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-8-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-25-76
DESIGNS, GROUP 260—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	1-15-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Apparatuses; Brakes; Railways and Railway Equipment.	10-5-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding; Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-24-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	9-2-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-16-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-3-77

Expiration of patents: The patents within the range of numbers indicated below expire during August 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,947,001 to 2,951,248, inclusive
Plant Patents..... Numbers 1,963 to 1,969, inclusive

963 OG 6

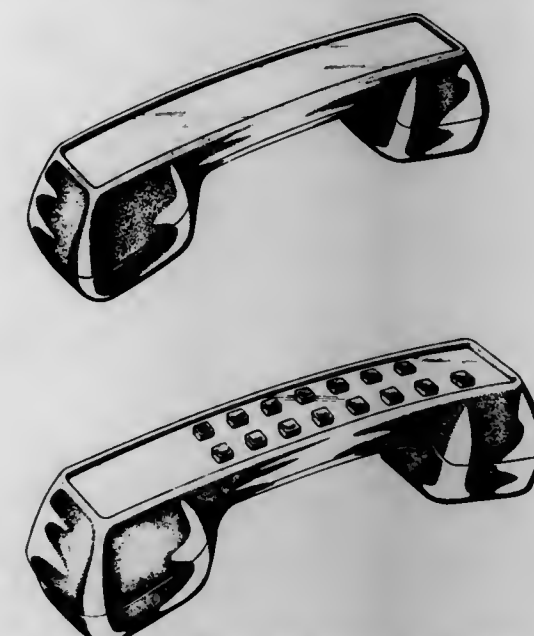
DEFENSIVE PUBLICATIONS

PUBLISHED OCTOBER 4, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T963,001
TELEPHONE HANDSET
Joseph Robert Everhart, Holmdel; Donald Michael Genaro, Haworth; Rembert Ryan Stokes, Middletown, all of N.J.; Gordon Elliot Sylvester, Jamaica, N.Y., and Alvin Richard Tilley, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 30, 1976, Ser. No. 718,853
Int. Cl. D14 03
U.S. Cl. 14—63
3 Sheets Drawing. 1 Pages Specification



The design relates to a telephone handset substantially as shown.

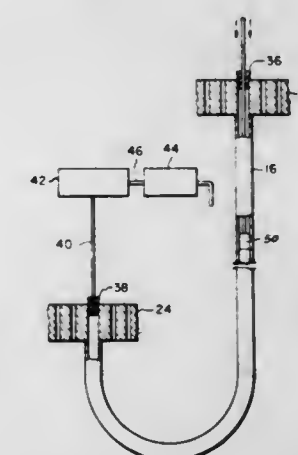
T963,002
COATING OF FIBER WAVEGUIDES
Robert Vincent Albarino, Summit, and Arthur Clifford Hart, Jr., Chester, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 30, 1976, Ser. No. 701,302
Int. Cl. C03B 37/02
U.S. Cl. 65—3 R
2 Sheets Drawing. 2 Pages Specification



The specification describes coating techniques for glass fiber waveguides that avoid physical contact of the fiber by any-

thing other than the coating solution. The techniques depend on the use of very flexible easily deformable materials for the exit die of flooded die applicators.

T963,003
METHOD AND APPARATUS FOR LOCATING A DEFECTIVE TUBE OF A LIQUID METAL-TO-WATER TUBE TYPE HEAT EXCHANGER
Steven L. Schrock, and James D. Mangus, both of Greensburg, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Apr. 12, 1976, Ser. No. 676,179
Int. Cl. G01M 3/20
U.S. Cl. 73—40.7
3 Sheets Drawing. 23 Pages Specification



A method and apparatus for detecting a specific leaking tube or tubes and for detecting the position of a defect within a tube in a liquid metal-to-water tube type heat exchanger, generally used in a sodium cooled nuclear reactor. Subsequent to draining of the heat exchanger a solid reaction product of the liquid metal and water forms at a leak location. Introducing an inert gas to the exterior of the tubes, creating a pressure differential across the tube wherein the interior pressure is less than the exterior pressure, and heating the tube, provide dissociation and isolation of the reaction product, which, when analyzed for chemical content, indicates which tube or tubes is defective. A heat probe apparatus which traverses the interior of the tubes may be used in the heating step, which, as a result of the speed of the dissociation process at high temperatures provides a means for detecting the specific leak location within the tube. A heat apparatus which traverses the exterior of bayonet type tubes may be used in another embodiment.

T963,004

RUN-FLAT SYSTEM FOR A VEHICLE WHEEL

Warren A. Van Wicklin, Jr., Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 670,476, March 25, 1976. This application Feb. 28, 1977, Ser. No. 772,401

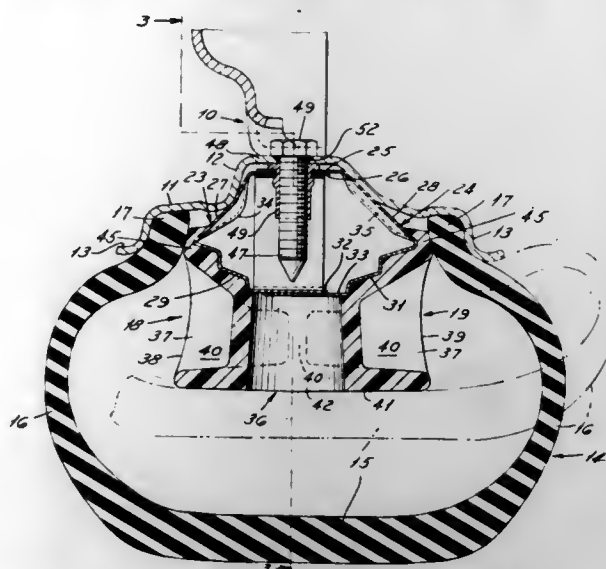
Int. Cl.² B60C 17/00

U.S. Cl. 152—158

2 Sheets Drawing. 10 Pages Specification

A run-flat system comprising, in combination, a vehicle wheel having a tubeless tire mounted thereon and a run-flat support structure within the tire comprising a plurality of arcuate segments interposed between the rim of the wheel and the tread section of the tire. The segments are fastened to the rim and in normal inflated condition of the tire are radially spaced from the tire tread section. The improvement comprises each arcuate segment having an elongated hollow base section seated in the drop center channel of the wheel rim, side walls extending outwardly from the base wall toward the tubeless tire retention beads, and a compression resistant wall spanning the segment base section side walls. An energy absorbent elastomeric arcuate liner externally covers the upper section of

the segment base section, the liner extending over the side edges of the segment base section in abutting relation to the



retention beads to compress the latter against the retention flanges of the rim.

REISSUES

OCTOBER 4, 1977

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,422

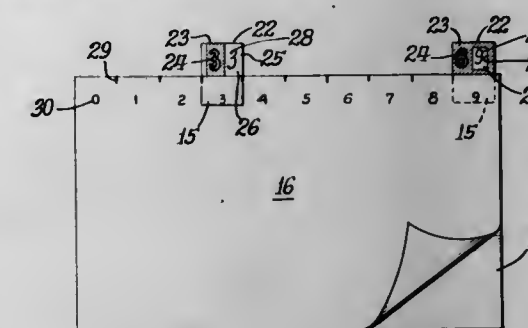
INDEX TABS

Walter F. Cunningham, Des Plaines, Ill., assignor to Superior Tabbles, Incorporated, Elk Grove Village, Ill.

Original No. 3,805,426, dated Apr. 23, 1974, Ser. No. 339,984, Mar. 12, 1973. Application for reissue Apr. 12, 1976, Ser. No. 675,817

Int. Cl.² A44C 3/00

U.S. Cl. 40—2 R



1. A strip of 10 two-digit color coded numerical indexing tabs, comprising a backing strip of release paper, an overlying strip of transparent film having a coating of pressure-sensitive adhesive on its under surface mounted on said backing strip and cut transversely to define ten individually separable tabs, said tabs being color coded by reverse printing the same first digit on each with ink of the same color and leaving a blank space on each tab directly adjacent said first digit, and said overlying strip having a write-on upper surface coterminous with said blank spaces to enable selective application in each said blank space during use of any desired digit for display with the adjacent said first digit.

Re. 29,423

TIME CORRECTION DEVICE FOR DIGITAL WATCHES

Kinji Fujita, Shimosuwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

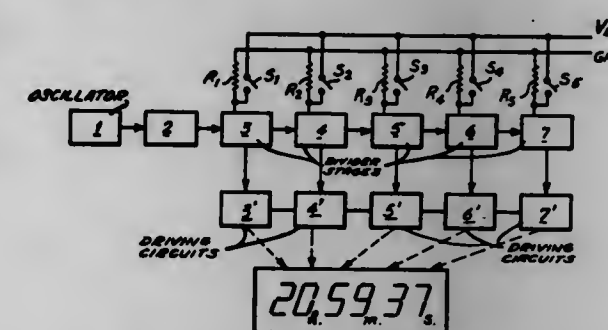
Original No. 3,717,990, dated Feb. 27, 1973, Ser. No. 208,311, Dec. 15, 1971. Application for reissue Feb. 26, 1975, Ser. No. 553,347

Claims priority, application Japan, Dec. 17, 1970, 45-112397

Int. Cl.² G04B 19/30; G04C 3/00; G04B 27/00

U.S. Cl. 58—50 R

12 Claims



1. A time correction device for electronic watches including time standard oscillator means for producing a high frequency signal, and multi-stage divider circuit means coupled to said oscillator means for dividing said high frequency signal into low frequency timing signals, each of said divider means stages producing an output signal for application to the input of the next stage, comprising a gate means connected to the input of each divider means stage to be corrected for selectively applying to said input either the output signal of the prior divider means stage or the inverse thereof; and manually operated switch means operatively coupled to said gate means for the selection of which of said prior divider means stage output

signal or the inverse thereof is passed by said gate means to the input of the divider means stage to be corrected.

Re. 29,424

TANK CONSTRUCTION FOR LIQUIFIED AND/OR COMPRESSED GAS

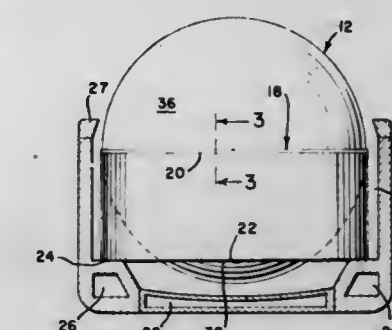
Ragnar Bognæs, Jeløy, and Olav Solberg, Oslo, both of Norway, assignors to Kvaerner Brug AS, Oslo, Norway

Original No. 3,677,021, dated July 18, 1972, Ser. No. 81,102, Oct. 15, 1970. Application for reissue Dec. 21, 1976, Ser. No. 752,896

Int. Cl.² F17C 13/08

U.S. Cl. 62—55

17 Claims



1. In a cargo tank having at least one curvilinear peripheral surface and being adapted to contain liquified gas [and which is], said tank being mounted by a supporting structure extending tangentially to the tank in a marine vessel for transportation thereby or for storage, means for connecting said tank to said supporting structure, comprising, a one piece peripheral support member integral with and forming an annular portion of said tank [and] at said curvilinear peripheral surface, said support member having [a] an inner surface which forms a portion of the inner surface of the tank and an extension portion extending beyond said tank for operative connection with said supporting structure tangentially of the tank; said supporting structure comprising an integral skirt having opposed ends respectively rigidly secured to said extension portion of the support member and to the hull structure of the vessel; thereby eliminating the need for the secondary barrier normally used with LNG cargo tanks.

Re. 29,425

TRASH COMPACTOR AND BAG SYSTEM

Einar O. Engebretsen, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Original No. 3,756,144, dated Sept. 4, 1973, Ser. No. 214,804, Jan. 3, 1972. Continuation-in-part of Ser. No. 184,038, Sept. 27, 1971, Pat. No. 3,807,299. Application for reissue Jan. 7, 1976, Ser. No. 647,162

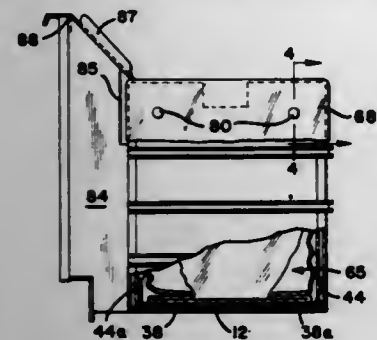
Int. Cl.² B30B 15/30

U.S. Cl. 100—215

5 Claims

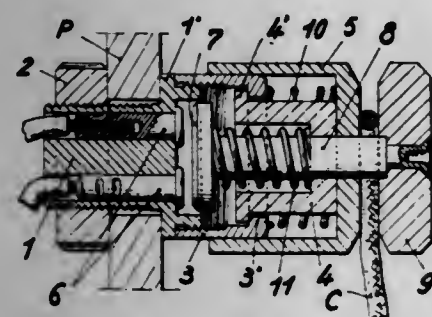
1. [For use in] In a trash compactor having a housing, a ram mounted in said housing and including a reciprocating drive therefor, and a container having rigid walls positionable in said housing beneath said ram to receive items of trash for compaction in said container by movement of the ram into said container, said container having outwardly projecting buttons on the exterior of opposite sides thereof; a disposable trash receiving bag [fittable] fitted within said container and including an upper cuff portion of sufficient length and width [to be] reverse folded over and around the upper edge of said container, and said bag having holes in said cuff portion [providing a

means of engagement] engaging over the buttons on said container [to hold] and holding the bag in position on said container against forces tending to draw said cuff



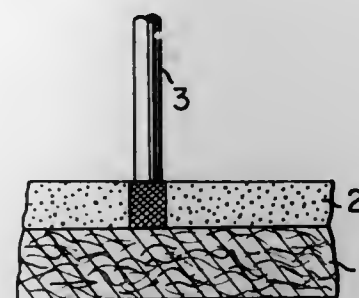
portion thereof into the container as trash is compacted within the bag and against the restraint of the container walls.

Re. 29,426
SAFETY STOPPING DEVICE FOR MARINE ENGINES
Alicie Louise Rosalie Lariviere, widow Giroux, 55 rue de Turbigo, Paris, France
Original No. 3,726,264, dated Apr. 10, 1973, Ser. No. 127,526, Mar. 24, 1971. Application for reissue Dec. 2, 1975, Ser. No. 697,049
Claims priority, application France, Apr. 10, 1970, 70.13076
Int. Cl.² B60L 3/02; F02P 11/06
U.S. Cl. 123-148 S 7 Claims



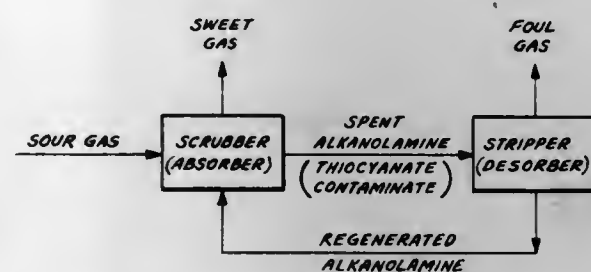
1. A safety device for marine engines comprising an insulating member attachable to a support, a pair of contact terminals mounted in said member and connectable to the engine ignition circuit, a push button slideably connected to said member, a conducting head positioned for connecting said terminals, a stem connected to said head and slideably extending through said push button, a retaining head on said stem positioned adjacent said push button, resilient means between said conducting head and said push button tending to retain said conducting head connecting said terminals, a cord attachably to the pilot of a boat containing said engine and detachably mountable between said push button and said retaining head for withdrawing said conducting head from said terminals whereby when said pilot pulls said cord it is withdrawn from said retaining head and push button allowing said conducting head to connect said terminals and means operable by said pushbutton for moving said conducting head to said terminals when said cord is mounted between said push button and said retaining head.

Re. 29,427
ELECTRORECORDING PAPER
Yoichi Sekine, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Original No. 3,875,023, dated Apr. 1, 1975, Ser. No. 320,820, Jan. 3, 1973. Application for reissue Aug. 30, 1976, Ser. No. 718,989
Claims priority, application Japan, Apr. 5, 1972, 47-34762; May 31, 1972, 47-54666; Sept. 14, 1972, 47-92644
Int. Cl.² B41M 5/20; G01D 15/34
U.S. Cl. 204-2 15 Claims



1. An electrorecording paper having a color-developing layer containing a component capable of changing color in response to applied heat, said color-developing layer comprising a heat coloring component and an electroconductive substance, both of which are dispersed in the form of fine particles in a binder; said electroconductive substance being substantially light reflective, electron conductive and having a specific resistance not greater than $10^4 \Omega \text{ cm}$ and selected from the group consisting of cuprous iodide, tin dioxide [I.] and silver-iodide [I. and antimony]; and said color-developing layer having a [surface] surface resistivity of not greater than $10^7 \Omega \text{ [cm.]}$ at a temperature of 20° C. and at a relative humidity of 65%; said layer being capable of recording by changing color in response to heat applied by means of an applied electric current.

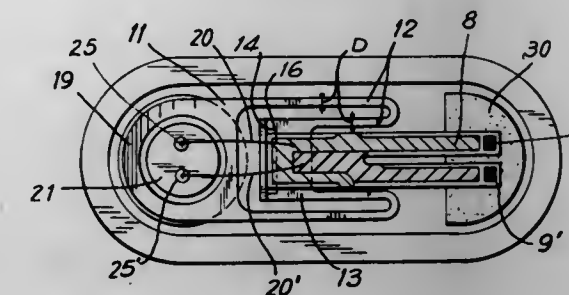
Re. 29,428
REGENERATION OF ALKANOLAMINE ABSORBING SOLUTION IN GAS SWEETENING PROCESSES
Otto A. Homberg, Easton; Charles W. Sheldrake, Bethlehem, and Alan H. Singleton, Baden, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.
Original No. 3,864,449, dated Feb. 4, 1975, Ser. No. 361,389, May 17, 1973. Application for reissue Nov. 10, 1975, Ser. No. 630,566
Int. Cl.² B01D 53/34
U.S. Cl. 423-228 20 Claims



1. In combination with an aqueous alkanolamine absorption/desorption process wherein industrial gases are sweetened by removal of acid gases including hydrogen cyanide and sulfide gases, a process for preventing irreversible deterioration of the alkanolamine solution comprising: maintaining sufficient ammonium ions in the alkanolamine solution during absorption to insure a continued presence of said ammonium ions in the alkanolamine solution during the absorption process, said ammonium acting as a deterrent with respect to the [formation] accumulation

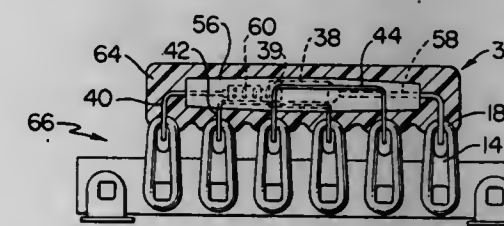
of thiocyanates whereby irreversible deterioration of said alkanolamine solution by said thiocyanates is suppressed.

Re. 29,429
OSCILLATOR FOR A TIMEPIECE
Masanori Kawai, Tatsuno; Haruo Takada, Suwa, and Shinkichi Kobayashi, Chino, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan
Original No. 3,909,639, dated Sept. 30, 1975, Ser. No. 460,231, Apr. 11, 1974. Application for reissue Oct. 20, 1976, Ser. No. 734,056
Claims priority, application Japan, June 14, 1973, 48-67132
Int. Cl.² H01L 41/04
U.S. Cl. 310-348 12 Claims



11. A hermetically sealed quartz crystal tuning fork vibrator assembly particularly for use as a time standard in an oscillator circuit comprising in combination a flexural mode tuning fork quartz crystal vibrator having two substantially opposed planar surfaces and being adapted to vibrate in a first vibratory direction substantially parallel to said surfaces, and a mounting plate having a first portion including a substantially flat surface, the flat surface being secured to one of said opposed surfaces at a non-vibratory portion of said tuning fork vibrator, said mounting plate including a second portion mounted to a reference member, said mounting plate having a resilient portion intermediate said first and second portions, said resilient portion being formed of two substantially U-shaped spring-like elements, a first leg of each element being connected to said second portion and the other leg of each U-shaped spring-like element being adapted to vibrate in said first vibratory direction and to further vibrate in a second vibratory direction at an angle of about 90° with respect to said first vibratory direction.

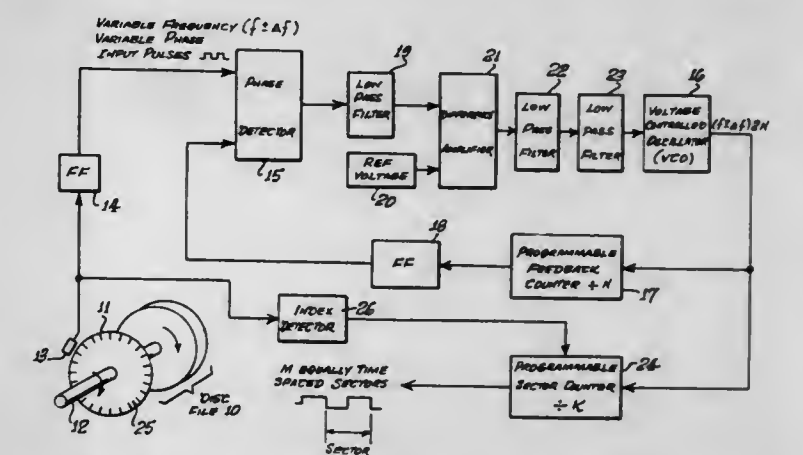
Re. 29,430
THERMAL LIMITER FOR ONE OR MORE ELECTRICAL CIRCUITS AND METHOD OF MAKING THE SAME
Emil Robert Plasko, Dayton, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.
Original No. 3,649,942, dated Mar. 14, 1972, Ser. No. 101,848, Dec. 28, 1970. Continuation-in-part of Ser. No. 62,369, Aug. 10, 1970, abandoned. Application for reissue Apr. 4, 1975, Ser. No. 565,217
Int. Cl.² H01H 85/02
U.S. Cl. 337-163 9 Claims



21. A thermal limiter for at least one electrical circuit comprising a thermally responsive fuse of generally cylindrical configuration; lead means operatively interconnected to said fuse for coupling said fuse in said circuit; an electrical circuit heater means

disposed in a selected position adjacent said fuse in substantially parallel relation therewith and comprising a coiled heater wire having its opposed ends respectively electrically interconnected and securely attached to two lead means comprising blade-like leads positioned in line with the axis of said coil and wrapped at least partially around the ends thereof; a housing means receiving said heater means and said fuse therein in said selected position; and an insulating coating mass disposed in and cooperating with said housing to cover and secure said heater means and said fuse in said selected positioning with all of said lead means having at least portions thereof exposed from said mass; whereby said mass and said selected positioning provides a controlled delay in the time between activating of said heater means and the blowing of said fuse to open said one electrical circuit.

Re. 29,431
PHASE-LOCKED LOOP FOR AN ELECTRONIC SECTORING SCHEME FOR ROTATING MAGNETIC MEMORY
Ashok K. Desai, Chatsworth, Calif., assignor to Pertec Computer Corporation, Los Angeles, Calif.
Original No. 3,898,690, dated Aug. 5, 1975, Ser. No. 503,728, Sept. 6, 1974. Application for reissue July 12, 1976, Ser. No. 704,434
Int. Cl.² G11B 5/09
U.S. Cl. 360-51 2 Claims



8. Apparatus for electronically dividing a rotating memory into a whole number of equally time spaced sectors comprising: means mechanically connected to rotate in unison with said memory, said means being divided into a number of evenly spaced sectors by sector marks, means for detecting said sector marks and generating a train of sector pulses at a frequency $f = \Delta f$, where Δf represents the magnitude of fluctuations in frequency of the sector pulses due to fluctuations in the speed of revolution of said memory, a phase-locked loop having an oscillator controlled by a correction signal for producing an output signal at a frequency significantly greater than said train of sector pulses by a known factor, said correction signal being so produced as to stabilize the loop in phase by continual phase comparison of said sector pulses with feedback pulses, said feedback pulses being produced by continually dividing cycles of said oscillator output signal by said known factor, said correction signal being proportional to the difference between a reference DC signal and a phase error signal produced by second order filtering of a signal derived from phase comparison of said sector pulses with feedback pulses, means for third and fourth order filtering of said correction signal, and digital means for continually dividing said output signal by a predetermined integer to produce a timing signal having a number of cycles equal to said whole number of equally time spaced sectors.

PLANT PATENTS

GRANTED OCTOBER 4, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,117

RUBBER PLANT (*FICUS ELASTICA*)

Tokuyasu Ito, 56 Kamiari-cho, 6-chome, and Hideo Ikuta, 13-5, Aza Funae, Oaza Fushimi Okugaishinden, both of Hekinan, Aichi, Japan

Filed Aug. 12, 1976, Ser. No. 713,998

Claims priority, application Japan, Aug. 19, 1975, 50-99796

Int. Cl.² A01H 5/12

U.S. Cl. Plt.—88

1 Claim

1. A new and distinct variety of *Ficus elastica* Roxb. var. *decora* tricolor hort., substantially as herein shown and described, characterized over the known rubber plant having variegated foliage, *Ficus elastica* Roxb. var. *decora* tricolor hort., in that proportions of light-yellow areas of the variegated leaves are small as a whole, said light-yellow areas appearing relatively narrow in size and are distinctly located on the edges of the leaves to form a so-called "thread-like border variegation"; leaves before development, namely buds and young leaves are reddish in color; grown leaves are larger in size than leaves of the known *Ficus elastica* Roxb. var. *decora* tricolor hort. and have an oblong shape with a thick coriaceous texture; and the new variety can be easily propagated by stem-cutting.

4,118

PISTACHIO TREE

Elmer C. Ruehle, 8599 Road 264, Terra Bella, Calif. 93270

Filed Sept. 24, 1976, Ser. No. 726,261

Int. Cl.² A01H 5/03

U.S. Cl. Plt.—30

1 Claim

1. A new and distinct variety of pistachio tree of the *Pistachia vera* species substantially as illustrated and described which is generally similar in appearance to the Kerman pistachio tree and which produces fruit of uniformly large size characterized by having relatively thin shells with a higher percentage of natural shell splitting than the Kerman pistachio with the splitting occurring about the apex ends of the shells, which contain nut meat having a high meat to shell ratio by size and weight and characterized by a brilliant green exterior coloration extending in lighter shades throughout the meat and which ripen earlier than the Kerman, Red Aleppo and Trabonella pistachios and at about the same time as the Bronte pistachio.

4,119

VINE — *CAMPISIS RADICANS*

William Flemer, III, Princeton, N.J., assignor to Treesearch

Filed Oct. 14, 1976, Ser. No. 732,492

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—54

1 Claim

1. A new and distinct variety of *Campsis radicans*, substantially as herein shown and described, characterized particularly as to novelty by the dark, rich red color of the flowers in contrast to the normal orange color of *Campsis radicans* flowers, and the glossy upper surface of the leaves in contrast to the normal dull upper surface of usual *Campsis radicans* leaves.

4,120

CHRYSANTHEMUM PLANT NAMED PINK CONCORD

Leonard H. Shoesmith, Westfield-Woking, England, assignor to

Pan-American Plant Company, West Chicago, Ill.

Filed Oct. 15, 1976, Ser. No. 733,472

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct cultivar of chrysanthemum substantially as herein shown and described, characterized by its single flower form with several rows of pink ray florets and minimal pollen production, its upright pot habit and good breaking ability, and its abundant production of flowers when grown as a spray pot plant.

4,121

APPLE TREE—ROYAL GALA VARIETY

Hendrik Willem Ten Hove, Matamata, New Zealand, assignor to

Stark Brothers Nurseries & Orchards Company, Louisiana, Mo.

Filed July 28, 1976, Ser. No. 709,506

Int. Cl.² A01H 5/03

U.S. Cl. Plt.—34

1 Claim

1. A new and distinct variety of apple tree which is a mutation of the Gala variety (U.S. Plant Pat. No. 3,637) substantially as shown and described, characterized by an all over bright red color overlaid with obscure darker broad striping.

PATENTS

GRANTED OCTOBER 4, 1977

ERRATA

For CLASS	See PATENT NO.
363-043	4,052,657
363-043	4,052,658
363-057	4,052,659
364-200	4,052,702
364-200	4,052,703
364-900	4,052,704
346-107 R	4,052,712
346-140 A	4,052,713
346-155	4,052,714
346-160	4,052,715
361-103	4,052,744
560-121	4,052,434
560-128	4,052,435
560-052	4,052,436
560-025	4,052,437
560-061	4,052,438
560-129	4,052,439
560-154	4,052,440
560-179	4,052,441
560-243	4,052,442
364-113	4,052,598
364-469	4,052,599
364-554	4,052,600
364-104	4,052,601
364-424	4,052,602
364-120	4,052,603
364-786	4,052,604
364-724	4,052,605
364-825	4,052,606
362-018	4,052,607
362-368	4,052,608
362-071	4,052,609
362-200	4,052,610
318-561	4,052,642
251-004	4,051,578
407-107	4,051,584
364-465	4,051,998
366-341	4,052,037
366-90	4,052,038
431-077	4,052,136
425-392	4,052,145
425-463	4,052,146
051-081 BS	4,052,174
051-096	4,052,175
062-188	4,052,180
134-056 R	4,052,227

ERRATA—continued

204-181	4,052,309
544-022	4,052,387
544-054	4,052,388
544-089	4,052,389
544-118	4,052,390
544-117	4,052,391
544-211	4,052,392
424-250	4,052,395
548-341	4,052,409
548-305	4,052,410
548-342	4,052,411

PATENTS

GRANTED OCTOBER 4, 1977

NOTE—A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,051,552

GOLF GLOVE

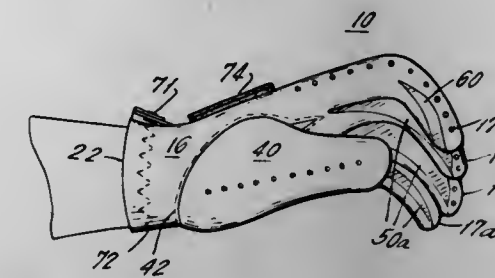
John D. Widdemer, Gloversville, N.Y., assignor to Berkshire Leather Corporation, Gloversville, N.Y.

Filed July 16, 1975, Ser. No. 596,292

Int. Cl.² A41D 19/00

U.S. Cl. 2—161 A

8 Claims



1. A golf glove comprising:

- a rear portion having a wrist edge and having a plurality of rear portion finger portions extending from the edge opposite said rear portion wrist edge to a respective tip; said rear portion finger portions including, in sequence, an index finger portion, a middle finger portion, a ring finger portion and a little finger portion; each said rear portion finger portion being joined at the base thereof to the adjacent said rear portion finger portion at a junction;
- a palm portion having a wrist edge and a thumb opening spaced from said palm portion wrist edge and being defined by a periphery; said palm portion having a corresponding plurality of finger portions extending from the edge opposite said palm portion wrist edge to a respective tip; said palm portion finger portions including, in sequence away from said thumb opening, and index finger portion, a middle finger portion, a ring finger portion and a little finger portion; each said rear portion palm portion being joined at the base thereof to the adjacent said rear portion palm portion at a junction each said rear portion finger portion and the respective said palm portion finger portion being so positioned on their respective said rear and palm portions as to generally be overlaid;
- each of said plurality of palm portion finger portions having a proportionally shorter length from its said tip to its said junction than the length of the corresponding one of said plurality of rear portion finger portions;
- a thumb enclosing portion fastened along said periphery of said thumb opening and shaped to form a generally straight enclosure for the thumb of the wearer;
- a plurality of fourchettes each extending from a said tip of a said finger portion to a said junction; each said fourchette having first and second curved opposite contoured edges which are both curved generally in the same direction; each said fourchette being fastened along one of its said first and second curved edges to one edge of a said palm portion finger portion and being fastened along the opposite said curved edge to the opposed edge of the corresponding said rear portion finger portion each said fourchette extending from the said tip of its said finger portions to said junctions thereof; each said fourchette being prestretched along said contoured edge fastened to its corresponding rear finger portion to reduce the amount of stretch along the length of each finger as the hand is folded to its position fully gripping a golf club handle;
- a first curved end piece having a pair of opposite contoured edges; one of said first end piece opposite edges being fastened to the said palm portion index finger portion nearest to said thumb enclosure and the other of said first

end piece opposite edges being fastened to the corresponding edge of said rear portion index finger portion;

a second curved end piece having a pair of opposite contoured edges, one of said second end piece opposite edges being fastened to the said palm portion little finger portion furthest from said thumb enclosure and the other of said second end piece opposite edges being fastened to the corresponding edge of said rear portion little finger portion;

said palm and rear portions being fastened to each other along a remaining glove edge, said palm and rear portion wrist edges remaining unfastened;

each said fourchette and said first and second end pieces having their said curved edges predeterminedly established and shaped to curl said finger portions upwardly above said palm portion and inwardly along an arc extendable generally towards said palm portion wrist edge and to generally conform said finger portions to the shapes of the wearer's fingers, thereby to avoid bunching of the glove fabric on the fingers and around the finger joints.

4,051,553

HAND PROTECTOR

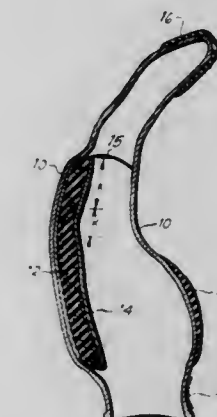
Arthur R. Howard, 4705-29th St., Lubbock, Tex. 79410

Filed Dec. 14, 1976, Ser. No. 750,381

Int. Cl.² A41D 19/00

U.S. Cl. 2—161 A

11 Claims



1. The hand protective device comprising:

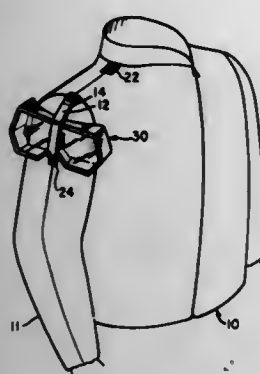
- a. a glove,
- b. a pad of resilient material attached to the back of said glove,
- c. said pad extends over the metacarpo-phalangeal joints of a hand inserted into said glove,
- d. said pad is molded such that it curves downward against the fingers at a point distal of the metacarpo-phalangeal joints of a hand inserted into said glove,
- e. said molded pad providing means for exerting a force on the top of the fingers of a hand inserted into said glove,
- f. said glove is made of cotton net,
- g. said resilient material comprises hard foam rubber,
- h. said pad is covered by cotton net,
- j. friction material is affixed to the palm surfaces of the length of the thumb and index finger, the palm, and the tips of the remaining fingers,
- k. said friction material is latex rubber compound,
- m. said glove is secured by a VELCRO tape fastener affixed to the wrist of the glove.

4,051,554

ACCESSORY HOLDER FOR USE ON ARTICLE OF CLOTHINGRobert A. Kallman, 2030 Haring St., Brooklyn, N.Y. 11229
Filed May 26, 1976, Ser. No. 690,262Int. Cl.² A41D 1/00

U.S. Cl. 2—94

7 Claims



1. An accessory holder for an article of clothing for the upper body portion of the type including a shoulder and an arm portion comprising a flap member, one end of said flap member adapted to be fixedly secured at a point on said article, and cooperating means on said flap and for said article for selectively attaching the other end of said flap to one of two points on said article, the first of said two points being a storage position for the flap on the shoulder of the article and the second of said points being on the arm of said article with the accessory to be held by the said other end of the flap passing around the accessory and being attached to the second point.

4,051,555

PROTECTIVE HEADWEAR

Noel Daly, New Plymouth, New Zealand, assignor to E. D. Bullard Company, Sausalito, Calif.

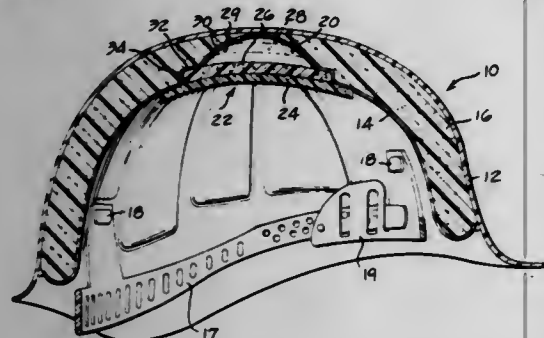
Filed Dec. 10, 1976, Ser. No. 749,247

Claims priority, application New Zealand, Dec. 19, 1975, 179613

Int. Cl.² A42B 3/02

U.S. Cl. 2—412

15 Claims



1. In protective headwear adapted to surround at least a substantial cranial portion of the head of the wearer and comprising a shock absorbing shell including a thin wall outer shell of tough non-brittle material, a thin wall inner shell of tough non-brittle material fitted within said outer shell and spaced therefrom and a relatively thick walled shell of shock absorbing padding filling the space between said inner and outer thin wall shells, the improvement comprising:

a recess at the inner apex of said thin wall inner shell extending substantially through the thickness of said thick wall shell of shock absorbing padding, said recess having an area which is a substantial portion only of the average area of the crown of the human skull; and
an insert member comprising a generally planar member made of comfort padding and a generally planar member made of shock absorbing padding each having one major surface adhered to one major surface of the other, said member of comfort padding having major surfaces of larger area than said recess, said member of shock absorb-

ing padding having major surfaces of smaller area than said area of said major surfaces of said member of comfort padding and centered on said one major surface thereof, and said member of shock absorbing padding being received within said recess with the exposed edges of said one major surface of said member of comfort padding on contact with the interior of said thin wall inner shell and the other major surface thereof exposed to contact by the head of the wearer.

4,051,556

CHIN STRAP FOR PROTECTIVE HEADGEAR

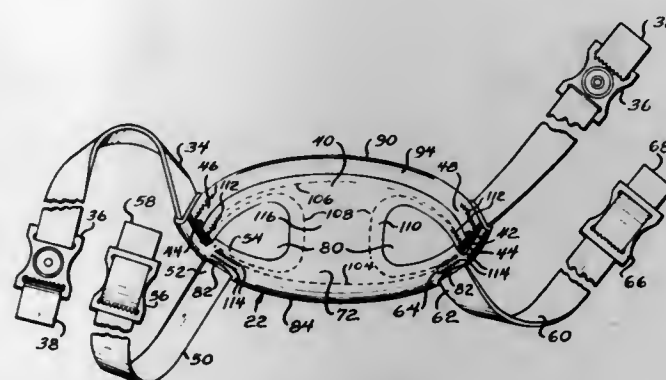
Stanley Davenport, Knoxville, Tenn., and Frank K. Villari, Oak Park, Ill., assignors to The Kendall Company, Boston, Mass.

Filed Oct. 20, 1976, Ser. No. 734,209

Int. Cl.² A42B 7/00

U.S. Cl. 2—421

8 Claims



1. A chin strap for protective headgear, comprising:
an elongated first strap having means for attaching opposed end portions of the first strap to the headgear;
a second strap having opposed ends connected to the first strap at spaced first and second points in a central portion of the first strap, said first and second straps being spaced from each other intermediate the connecting points;
a third strap having one end connected to the first strap at a third point intermediate said first and second connecting points and adjacent said first connecting point, and having means for attaching the other end portion of the third strap to headgear;
a fourth strap having one end connected to the first strap at a fourth point intermediate said first and second connecting points and adjacent said second connecting point, and having means for connecting the other end portion of the fourth strap to the headgear; and
a chin cup extending between the spaced portions of said first and second straps.

4,051,557

EYE PROTECTORS

Torsten R. Bengtson, and Joseph Haslbeck, both of West Vancouver, Canada, assignors to International Servisport Corporation Ltd., Vancouver, Calif.

Filed Aug. 1, 1975, Ser. No. 600,976

Claims priority, application Canada, June 5, 1975, 228781

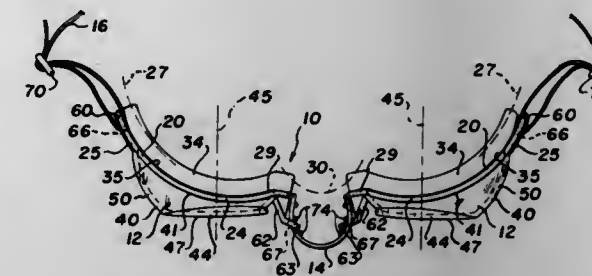
Int. Cl.² A61F 9/02

U.S. Cl. 2—430

9 Claims

1. An eye protector for use in swimming and adapted to provide the minimum reduction in vision of the wearer, to be a close fit around the eye of the wearer and to permit streamline flow over the exterior surface of the protector, the protector comprising a pair of separate eye pieces interconnected at inner ends by a nose piece, each eye piece comprising an integrally formed body of a transparent material, said body comprising a stiff, curved, relatively wide rim dimensioned to fit around an eye socket of the wearer, under the brow and on top of the cheek bone and transversely curved to fit over the temple of a wearer and against the side of the nose of the wearer; an ovaloid opening defined at the inner periphery of

the rim; a generally dome shaped hood, extending outwardly from the inner periphery of the rim and enclosing the eye opening in the rim for permitting straight ahead and peripheral vision therethrough, said hood including at least first and second portions, said first portion comprising a lens portion having a relatively large radius of curvature and being located substantially directly in line with the line of sight of the wearer and said second portion comprising a bulbous dome shaped wall portion which surrounds said lens portion and extends to the inner periphery of said rim, the curvature of the wall portion being substantially greater than that of said lens portion and following generally that of the eyeball of a wearer, said hood further comprising a third portion located between said



first and second portions, at least part of said first portion being spaced from said second portion and said third portion comprising a transition between said first and second portions, a sealing pad formed on the inner side of the rim dimensioned to contact the face of the wearer under the brow, on top of the cheekbone, over the temple and against the side of the nose of the wearer so as to provide an underwater seal around the eye, said pad being soft enough to conform to a wearer's face around the eye socket to seal each eye piece; a connector means on the outer end of the frame and a flexible strap secured to said connector means to extend around the back of the wearer's head to hold the eye piece in position over the eye sockets.

4,051,558

MECHANICAL ENERGY STORAGE DEVICE FOR HIP DISARTICULATION

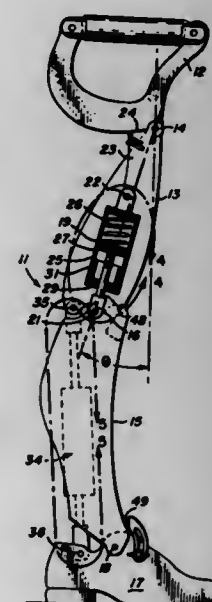
Wilbur C. Vallotton, Los Gatos, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed June 30, 1976, Ser. No. 701,448

Int. Cl.² A61F 1/00, 1/08

U.S. Cl. 3—1.2

8 Claims



1. In an artificial leg:
trunk socket means for receiving and for coupling the trunk of the person using the artificial leg to the artificial leg;
thigh means hingedly coupled to said trunk socket means

and dependent therefrom for simulating a thigh section of a human leg;
leg means hingedly coupled to said thigh means and dependent therefrom for simulating a leg section of a human leg;
a foot means hingedly coupled to said leg means and dependent therefrom for contacting the walking surface; and
energy storage means operatively associated with said thigh means for storage and release of energy during the normal walking stride cycle of the patient for storage of energy during a weight-bearing phase of the normal walking strike when the user's weight is on the artificial leg and for release of energy during an energy release phase of the normal walking cycle when the user's weight is removed from the artificial leg to pivot said thigh means forwardly about the hinged coupling of said thigh means to said trunk socket means.

4,051,559

TOTAL PROSTHESIS OF THE HIP

Marc Laurent Pifferi, Boissy Saint Leger, France, assignor to Mahay & Cie, France

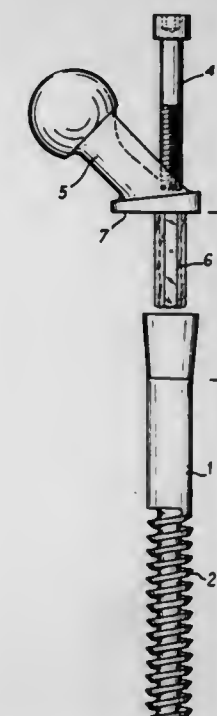
Continuation-in-part of Ser. No. 643,406, Dec. 22, 1975, abandoned. This application Sept. 1, 1976, Ser. No. 719,391

Claims priority, application France, Dec. 27, 1974, 74,42974

Int. Cl.² A61F 1/24

U.S. Cl. 3—1.912

8 Claims



1. In a total prosthesis of the hip, comprising a cotyloid portion adapted to be inserted in the hip bone and a cephalic portion adapted to be inserted in the femur, the improvement in which said cephalic portion comprises a femoral part having a cylindrical externally helically threaded shank portion adapted to be screwed into the medullar canal of the femur and a cephalic part having a base member the underside of which having a flat diaphyseal resting and abutment surface adapted to abut against a bone surface prepared in corresponding manner, an arm on said base member terminating in a ball means for insertion into said cotyloid portion and a sleeve depending perpendicularly from and eccentric with respect to the diaphyseal resting surface, said sleeve fitting in a bore of the same cross section provided in said femoral part, and means for securing said femoral part to said cephalic part.

4,051,560

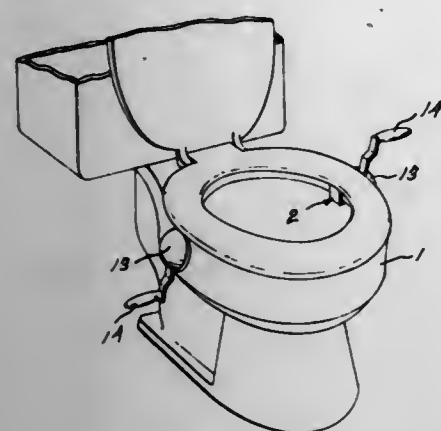
BOWEL MOVEMENT ENERGIZER SYSTEM

Francois Audet, 5010 Fossambault Boulevard, St. Catherine, Portneuf, Canada

Filed Oct. 4, 1976, Ser. No. 728,935
Int. Cl.² A47K 17/00

U.S. Cl. 4-1

12 Claims



1. A bowel movement energiser system adapted for operation by a person sitting on a toilet bowl, this energiser system comprising a pair of exerciser units operatively securable to the opposite sides respectively of the toilet bowl in transverse alignment with the trunk of the person sitting on the toilet bowl, each exerciser unit including a bracket fixedly securable to the upper edge of the toilet bowl and having a base portion outwardly positioned with respect to the toilet bowl, a cyclic movement mechanism mounted on said base portion, and a handle operatively connected to said cyclic movement mechanism and operatively displaceable up and down laterally outward of said toilet bowl for actuation of the corresponding cyclic movement mechanism.

4,051,561

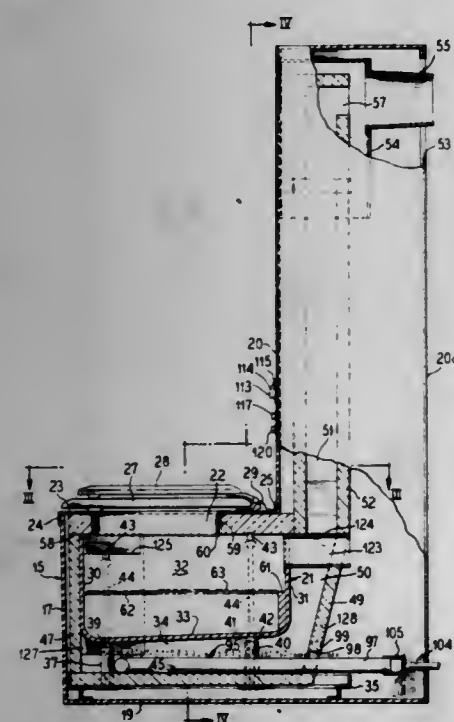
STORE AND BURN INCINERATING TOILET AND METHOD

Donald P. Frankel, Lake Geneva, Wis.; Willard E. Kendall, Elgin, Ill., and John F. Cooper, Williams Bay, Wis., assignors to Lake Geneva A & C Corporation, Lake Geneva, Wis.

Filed Oct. 31, 1975, Ser. No. 627,756
Int. Cl.² A47K 11/02

U.S. Cl. 4-131

32 Claims



1. A store and burn incinerating toilet, comprising:
a housing;
a heat permeable upwardly opening receptacle of substantial capacity within the housing;
said receptacle being of a size adapting it to receive and

accumulate and store waste from a plurality of successive uses of the toilet;
means within the housing defining a combustion chamber in heat transfer relation under said receptacle;
a deck on said housing having a receiving opening over the top of said receptacle and aligned with the upward opening into the receptacle and through which receiving opening waste is adapted to be deposited in said receptacle;
said deck providing a toilet seat support;
a selectively operable heat producing device disposed in said combustion chamber under said receptacle and adapted to heat said receptacle in substantially the manner of heating a cooking pot, but being inoperative while said receiving opening is open to receive waste therethrough for deposit in said receptacle;
a removable closure for said receiving opening to be applied in closing relation to said receiving opening when said heat producing device is to operate;
said heat producing device being operable after the closure has been placed in closing relation to said receiving opening to heat said receptacle and effect substantial boiling and incineration of the stored waste by means of heat permeating from said combustion chamber through at least the bottom of the receptacle from the combustion chamber;
means providing an air passage in preheating relation to said combustion chamber and leading into said receptacle;
an afterburner flue leading from the combustion chamber; and
means compelling vapor and products of combustion generated in said receptacle to pass into said combustion chamber and to travel toward the flue and thereby causing the vapor and products of combustion to pass through the heat produced by the heat producing device in the combustion chamber.

4,051,562

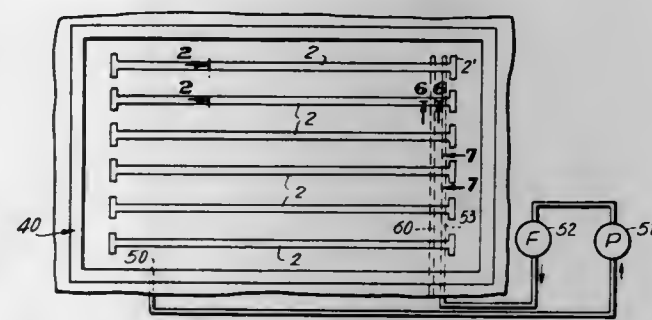
TILE CONSTRUCTION FOR A SWIMMING POOL

Henry Jakowicki, 123 Malts Ave., West Islip, N.Y. 11795

Filed Oct. 20, 1976, Ser. No. 734,328
Int. Cl.² E04H 3/16, 3/18; F16L 22/02

U.S. Cl. 4-172

27 Claims



1. Tile construction for a swimming pool comprising an elongated member having a longitudinal channel therein, said member being provided with a plurality of orifices extending into said channel and opening externally of the member to provide communication between the channel and the exterior of the member to provide a flow path for a fluid, said member having an outer surface adapted for constituting part of the surface of the pool, said orifices being open in the vicinity of said outer surface.

4,051,563

CUSHIONED LINER FOR A BATH TUB

Joseph A. Clarke, Jr., 75 Loomis St., Bedford, Mass. 01730

Filed May 16, 1975, Ser. No. 577,987
Int. Cl.² A47K 3/00, 3/12

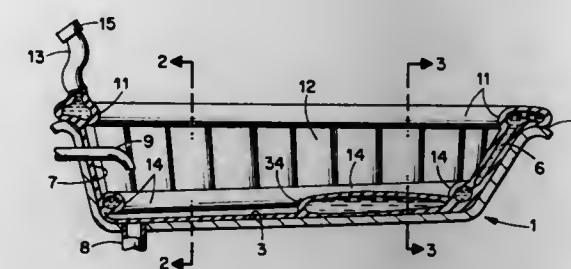
U.S. Cl. 4-173 R

13 Claims

1. In a cushioning water filled liner for a bath tub that includes a back cushioning portion provided by back flexible

water filled cushions conforming to the back of the bath tub and left and right side cushioning portions provided by left and right side flexible water filled cushions conforming to the left and right sides of the bath tub, means interconnecting said cushions comprising,

an elongated top water filled cushion that conforms to the top rim of the bath tub and connects to the back and left and right side water filled cushions,
water passages between the top cushion and the top most end of the back and left and right side water filled cushions,



a water conducting tube connected at one end to the top cushion and adapted at the other end for connections to the bath tub water spigot by which to fill said cushions with water,
the elongated top cushion and the back, left and the right side cushions are fixedly connected together defining an open ended elongated liner and
connecting means are provided at the ends of said elongated liner for connecting and disconnecting said ends together so that the liner defines a closed ring fitting the bath tub when said ends are connected and
means by which to empty said cushions of water.

4,051,564

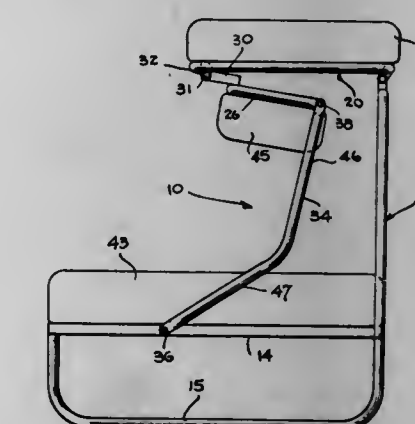
PORTABLE CONVERTIBLE SOFA-BUNK BEDS

Anthony Gudish, 2822 Dalemead St., Torrance, Calif. 90505

Filed Oct. 26, 1976, Ser. No. 735,585
Int. Cl.² A47C 17/16

U.S. Cl. 5-9 R

15 Claims



1. A portable sofa adapted to be converted into a lower and upper tiered bed, which comprises:
a seat structure having a front, rear and opposite end portions adapted to be made into a lower bed,
an upright structure having an upper and lower side, the lower side being mounted on the rear portion of the seat structure,
a first forwardly inclining backrest structure disposed in backrest position on said seat structure and having a lower side and an upper side pivotally connected to the upper side of the upright structure,
first hinge means adapted to rotate the first backrest structure about the upper side of said upright structure,
a second forwardly inclining backrest structure having a lower side, an upper side and opposite ends disposed behind and along side of said first backrest structure, the

lower side being pivotally connected to the lower side of said first backrest structure,
second hinge means adapted to rotate the second backrest structure about the lower side of said first backrest structure,
a pair of spaced apart elongate arms having a lower pivotal connection to the opposite ends of said seat structure at approximately two-thirds of the distance from the rear to the front portion of said seat structure and an upper pivotal connection to the opposite ends adjacent the upper side of said second backrest structure, and
linkage means, in combination with the elongate arms and said first and second backrest structures, adapted to raise and support said structures to an upper side to side, coplanar bed position.

4,051,565

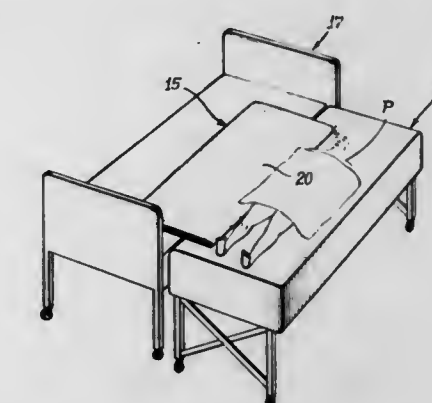
MAT CONVEYOR

Trygve Berge, 2 Adams, Apt. 1109, Denver, Colo. 80206

Filed July 26, 1976, Ser. No. 708,605
Int. Cl.² A47B 83/04; A47C 23/00

U.S. Cl. 5-81 B

1 Claim



1. A lightweight, portable conveyor for moving objects over an undersupporting surface, consisting of an open ended, flexible walled, radially collapsible, seamless tubular member dimensioned to at least coextend with the underside dimensions of an object to be moved, said member being made up of two concentrically laminated cylindrical layers of dissimilar flexible materials; the outer one of said layers being relatively thick spongy material selected from the group of foam rubber and expanded foam plastic and having an exterior surface of relatively high frictional quality for frictionally coupling the tubular member to the underside of said object and an undersupporting surface; and the inner one of said layers being relatively thin plastic material having the general anti-friction characteristics of polytetrafluoroethylene resin whereby opposed surface portions of said inner layer are interengaged in the radially collapsed state of said member and are slidably movable over one another with little frictional resistance under the weight of the object to facilitate moving the latter in directions transversely of said member's tubular axis.

4,051,566

MATTRESS WITH MODIFIABLE CAVITY FOR PREGNANT WOMEN

Lucy C. Esquivel, 509 E. Pershing, Gallup, N. Mex. 87301

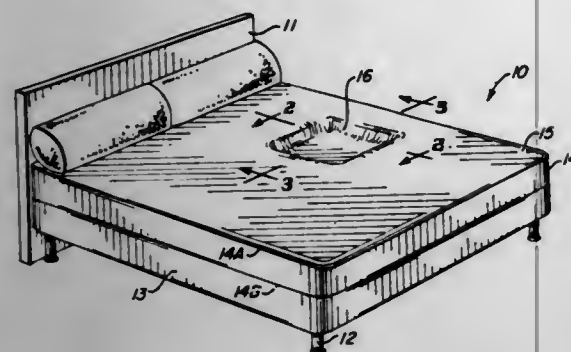
Filed Sept. 20, 1976, Ser. No. 724,931
Int. Cl.² A61G 7/04

U.S. Cl. 5-91

4 Claims

1. A mattress structure useable by pregnant women comprising:
a resilient body comprising a mattress having upper and lower surfaces and a cavity extending downwardly from said upper surface and through said lower surface to accommodate the expanding abdomen of a woman in full term pregnancy,
an insert for said cavity comprising a part of said mattress

and substantially the same shape as said cavity but slightly smaller for movement longitudinally in said cavity, a cover for the top of said mattress, the walls of said cavity and the top of said insert forming a support for the abdomen of a pregnant woman resting on the upper surface of said body, and means mounted on the structure for selectively moving said insert longitudinally of said cavity and maintaining it in a given location,



said cover adjacent said insert deforming to follow it upon movement in said cavity and outlining said cavity at any position of said insert, whereby a woman may selectively fill the cavity to form a complete upper surface of said body or enlarge or decrease the size of said cavity according to the size of her abdomen.

4,051,567

MATTRESS OR CUSHION SPRING ASSEMBLY

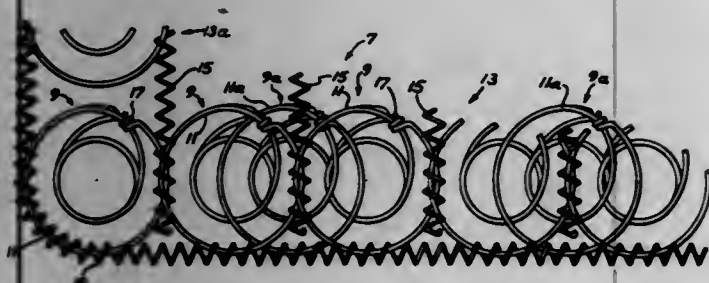
Ronald G. Hutchinson, Naperville, Ill., assignor to Simmons Company, Atlanta, Ga.

Filed Oct. 16, 1975, Ser. No. 622,886

Int. Cl.² A47C 23/04

U.S. Cl. 5-260

5 Claims



1. A spring assembly for a mattress or cushion or the like having at least a peripheral row of vertical open-coil helical wire springs and top and bottom border wires to which said springs are connected, said springs in at least selected zones of only said peripheral row along each side of said assembly being interleaved with their top and bottom convolutions in overlapping engagement to reinforce the side edges of the assembly.

4,051,568

LIFE SAVING GARMENT

William Josef George Strolenberg, 11, Bartholomew Lane, Sudbury, Suffolk, England

Filed July 21, 1976, Ser. No. 707,406

Claims priority, application United Kingdom, July 23, 1975, 30842/75

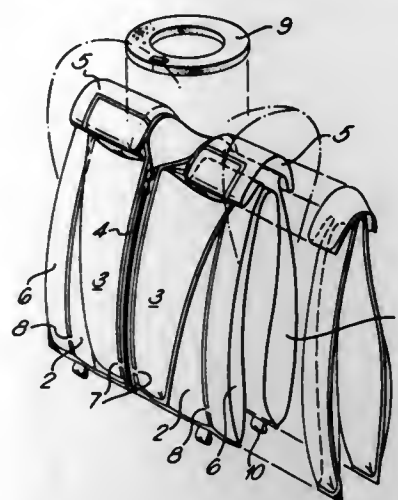
Int. Cl.² B63C 9/12

U.S. Cl. 9-340

9 Claims

1. A life saving garment comprising a double skinned, totally sealed flexible liner and a buoyant neck ring, said liner enclosing a predetermined quantity of air and having at least a back portion, a front portion and a collar portion, the quantity of air in the liner mainly occupying the back portion during normal working conditions to enable freedom of movement, said liner and said quantity of air being such that the air is forced into the

upper part of said back and front portions and into said collar portion when the wearer is substantially submerged in the



water, said collar portion, when inflated, raising said neck ring for maintaining the wearer's head above the water.

4,051,569

FOLDING AND SEALING APPARATUS AND METHOD

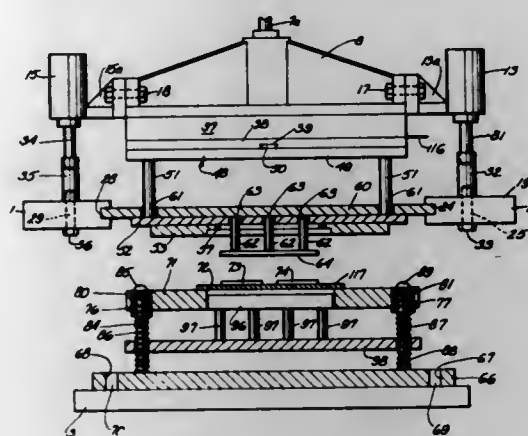
David Bruce Freeman, Cincinnati; Michael C. Patton, Fairfield, and Carl F. Dragan, Harrison, all of Ohio, assignors to Louis G. Freeman Company, Cincinnati, Ohio

Filed Oct. 22, 1976, Ser. No. 735,009

Int. Cl.² A43D 11/00; C14B 00/00; B65H 45/22

U.S. Cl. 12-146 CK

30 Claims



1. An apparatus for folding and sealing edges of a non-rigid work piece, said apparatus comprising cooperating lower and upper die assemblies, said lower die assembly comprising a horizontally oriented plate having a female cavity extending therethrough of a shape corresponding to that of the folded work piece, said female cavity plate being shiftable between upper and lower positions and means to resiliently bias said female cavity plate to its upper position, a male plug receivable within said female cavity with close tolerance, said male plug being shiftable between an upper position within said female cavity with its upper surface slightly below the upper surface of said female cavity plate when said female cavity plate is in its upper position and a lower position wherein said male plug is withdrawn from said female cavity when said female cavity plate is in its lower position and wherein the top surface of said plug is substantially coplanar with said top surface of said female cavity plate when said female cavity plate is in its lower position, means to bias said male plug to its upper position, said upper die assembly comprising a horizontally oriented folding cavity plate, said folding cavity plate having a shallow folding cavity therein corresponding in shape to said female cavity, said folding cavity having curved edge portions corresponding to the edges of the work piece to be folded, said folding cavity plate having at least one electrode mounted therein so as to overlie the edges of the work piece when folded, said folding cavity plate having a central depression, a stripper comprising a horizontal plate independently shiftable between an extended position below said folding cavity, and a retracted position within said central depression of said folding cavity, locating said work piece on said female cavity plate over said female cavity, maintaining said stripper in its extended position, lowering said upper die assembly until said stripper forces said work piece into said female cavity depressing said male plug to its lower position and initiating a fold in said edges of said work piece, maintaining the positions of said stripper, said work piece and said male plug, continuing lower of said folding cavity plate resulting in abutment of and lowering of said female cavity plate to its lower position wherein said male plug has reentered said female cavity shoving said work piece into said folding cavity to complete folding of said work piece edges and to cause them to abut said electrode, connecting said electrode to a source of high frequency electrical current to seal said folded edges, permitting said sealed edges to cool until a seal is assured and raising said upper die assembly to shift said folding cavity plate and said stripper out of contact with said lower die assembly and said work piece.

position below said folding cavity and a retracted position within said central depression of said folding cavity and means to connect said electrode to a source of high frequency electricity whereby when a work piece is properly aligned on said female cavity plate and said stripper is in its extended position, the folding cavity plate and the stripper may be lowered until said stripper forces said work piece into said female cavity and said male plug to its lower position initiating folding of said work piece edges, continued downward movement of said folding cavity plate shifts said female cavity plate to its lower position resulting in relative upward movement of said male plug and said stripper to cause said partially folded work piece edges to be completely folded by said inwardly curved edge portions of said folding cavity and to lie in abutment with said at least one electrode, to be sealed thereby when connection is made to said source of high frequency electricity.

15. A process of folding and sealing edges of a non-rigid, heat sealable work piece comprising the steps of providing a lower die assembly comprising a horizontally oriented plate with a female cavity extending therethrough of a shape corresponding to that of the folded work piece, said female cavity plate being shiftable between upper and lower positions and resiliently biased to said upper position and a male plug receivable within said female cavity with close tolerance, said male plug being shiftable between an upper position with the female cavity with its upper surface slightly below the upper surface of said female cavity plate when said female cavity plate is in its upper position and a lower position wherein said male plug is withdrawn from said female cavity when said female cavity plate is in its upper position and wherein the top surface of said plug is substantially coplanar with said top surface of said female cavity plate when said female cavity plate is in its lower position, means to bias said male plug to its upper position, providing an upper die assembly comprising a horizontally oriented folding cavity plate, said folding cavity plate having a shallow folding cavity therein corresponding in shape to said female cavity, said folding cavity having curved edge portions corresponding to the edges of the work piece to be folded, said folding cavity plate having at least one electrode mounted therein so as to overlie the edges of the work piece when folded, said folding cavity plate having a central depression, a stripper comprising a horizontal plate independently shiftable between an extended position below said folding cavity, and a retracted position within said central depression of said folding cavity, locating said work piece on said female cavity plate over said female cavity, maintaining said stripper in its extended position, lowering said upper die assembly until said stripper forces said work piece into said female cavity depressing said male plug to its lower position and initiating a fold in said edges of said work piece, maintaining the positions of said stripper, said work piece and said male plug, continuing lower of said folding cavity plate resulting in abutment of and lowering of said female cavity plate to its lower position wherein said male plug has reentered said female cavity shoving said work piece into said folding cavity to complete folding of said work piece edges and to cause them to abut said electrode, connecting said electrode to a source of high frequency electrical current to seal said folded edges, permitting said sealed edges to cool until a seal is assured and raising said upper die assembly to shift said folding cavity plate and said stripper out of contact with said lower die assembly and said work piece.

4,051,570

ROAD BRIDGE CONSTRUCTION WITH PRECAST CONCRETE MODULES

William K. Hilfiker, Eureka, Calif., assignor to Hilfiker Pipe Co., Eureka, Calif.

Filed Dec. 27, 1976, Ser. No. 754,496

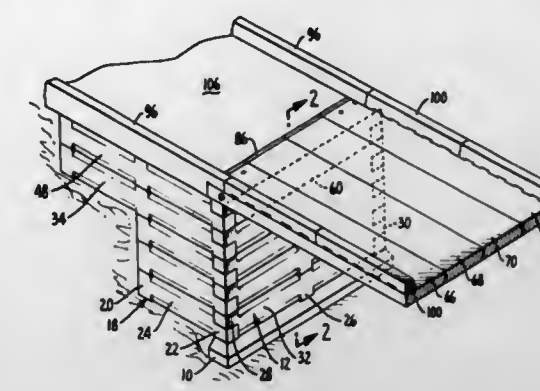
Int. Cl.² E01D 19/02

U.S. Cl. 14-26

11 Claims

1. A road bridge including an abutment therefor formed of readily transportable precast construction modules, said bridge comprising: a footing placed below road grade; generally vertical extending tie rods connected to said footing and ex-

tending upwardly therefrom, at least one of said rods being positioned adjacent each end of said footing; at least one abutment stretcher positioned above and parallel to said footing, said stretcher having an elongated retaining body interconnecting support heads at either end of the stretcher, said heads having top and bottom stacking surfaces and each having a vertical hole therethrough, said holes being so spaced from one



another that said holes will receive said vertical tie rods; an abutment beam overlying the topmost of said abutment stretchers, said beam having holes spaced to receive said vertical tie rods; means securing the beam to the tie rods to stress the rod and capture the stretchers beneath the beam between the beam and the footing; and, a bridge roadbed placed with one end overlying and supported by said abutment beam.

4,051,571

TOOTHBRUSH

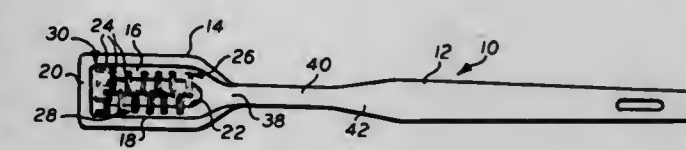
Herbert D. Ayers, 38 Mineola Ave., Roslyn, N.Y. 11576

Filed June 1, 1976, Ser. No. 691,471

Int. Cl.² A46B 9/04

U.S. Cl. 15-167 R

5 Claims



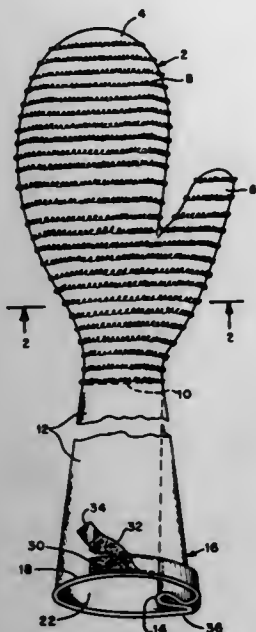
1. A toothbrush comprising an elongated handle, a base member connected to said handle, and a plurality of tufts of bristles connected to and extending outwardly from said base member, said tufts being formed in three distinct rows of adjacent tufts, a first row of tufts spaced along said base member substantially parallel to the longitudinal axis of said toothbrush, the tufts in said first row extending angularly from said base member, a second row of tufts spaced along said base member substantially parallel to said first row of tufts and extending angularly from said base member and toward said first row, the tufts of said first row intersecting opposite tufts in said second row in a single plane along the central portion of said toothbrush thereby to form a single, substantially linear continuous row of bristles, the bristles of said first row being at least partially intermeshed with the bristles of said second row at substantially the outermost portion thereof, and a third row of spaced tufts positioned near the end of said base member farthest from said handle, said tufts being aligned substantially perpendicularly to said first and second rows and extending angularly toward the tufts of said first and second row, said third row having central tufts at least partially contacting the tufts of said first and second row and peripheral tufts extending parallel to said central tufts but not contacting said tufts of said first and second row, the tips of the bristles in said third row and the plane of intersection of said first and second rows forming a T-shaped pattern when viewed from above said toothbrush, said first, second and third rows of tufts being the only rows of tufts on said toothbrush effective to cleanse when contacting teeth.

4,051,572 SCOURING MITTEN

Helen Greenwood, 64 Fanning Ave., Hampton Bays, N.Y. 11946
Filed Aug. 19, 1976, Ser. No. 715,878
Int. Cl.² A47K 7/02

U.S. Cl. 15-227

5 Claims



1. A waterproof stretchable scouring mitten comprising: hand covering means having a first pouch for enveloping a thumb and a second pouch for enveloping the remainder of the hand having a generally planar configuration and extending along an axis and a wrist opening to provide means for insertion and removal of a hand, said first pouch opening into and extending radially from said axis in substantial planar alignment with said axis, said hand covering means being composed of a waterproof stretchable first layer and a second layer of scouring material intimately bonded to and covering the outer surface of said first layer;
- tubular shaped stretchable waterproof cuff means extending from and connected with the said wrist opening, said cuff means having waterproof gusset means along the linear axis of the cuff means located normal to the plane of the said first pouch means to facilitate ingress and egress of a hand into the mitten through the cuff;
- closure means affixed to said gusset means to bring at least a circumferential portion of said cuff means to a snug fitting relationship with a portion of the forearm of a wearer of the mitten;
- and, liquid flow diversion means circumferentially mounted on said cuff means to direct the flow of liquids towards said hand covering means.

4,051,573 POULTRY LEG RETAINER

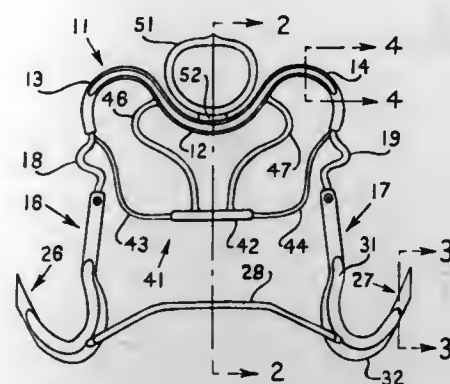
Anthony J. Volk, 173 E. Syracuse St., Turlock, Calif. 95380
Continuation-in-part of Ser. No. 476,297, June 4, 1974, Pat. No. 3,895,415. This application Apr. 14, 1975, Ser. No. 567,761
Int. Cl.² A22C 21/00

U.S. Cl. 17-11

6 Claims

1. A poultry leg retainer comprising a crosspiece having a downwardly bowed center, a pair of legs depending one from each end of said crosspiece and each having a substantially rigid hook portion extending laterally outward and upwardly from the bottom of the leg, a central resiliently extensible bar extending between said

legs below said crosspiece for engaging the underside of poultry hocks, and



a pair of resiliently extensible straps extending between said crosspiece and said central bar in position for fitting in the knuckle creases of poultry hocks.

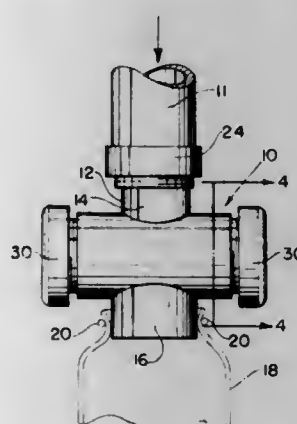
4,051,574 SAUSAGE STUFFING DEVICE

Tobias A. Gaspar, South Dartmouth, Mass., assignor to Gaspar's Linguica Company, Inc., South Dartmouth, Mass.

Filed Oct. 26, 1976, Ser. No. 735,805
Int. Cl.² A22C 11/02

U.S. Cl. 17-35

9 Claims



1. A device for removing hard particles from sausage mix and the like comprising, a longitudinally orientated first tubular conduit forming a flow passage for said sausage mix under pressure therethrough, a laterally orientated second tubular conduit intersecting and disposed generally normal to said first conduit so that at least portions of said second conduit are laterally offset from said flow passage, a member positioned within said second conduit and extending entirely across said flow passage, said member including a plurality of continuous slotted openings having a cross-sectional configuration narrowing in the flow direction of said mix disposed therethrough, at least portions of said openings extending at least partially across and generally normal to said flow passage and extending laterally outwardly of said flow passage at least partially into said offset portions of said second conduit and means operatively associated with said second conduit to gain access to said member for removal therefrom.

4,051,575

PROCESS OF PRODUCING SLIVERS FOR OPEN-END SPINNING

William Frank Hutcheson, Lookout Mountain, Tenn., assignor to Rossville Yarn Processing Company, Rossville, Ga.

Filed May 26, 1976, Ser. No. 690,297
Int. Cl.² D01G 15/46

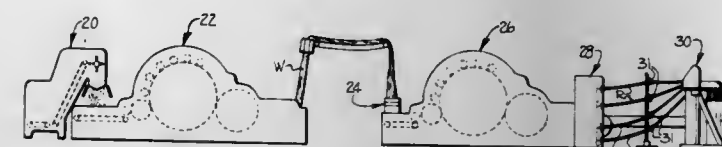
U.S. Cl. 19-151

4 Claims

1. A process of producing slivers of textile fibers for spinning yarns with open-end spinning machines and being characterized by uniform fiber distribution and weight along the length

of the sliver without the necessity of repeated doublings and draftings heretofore required to produce such slivers, said process comprising the steps of:

- forming a first carded web by carding textile fibrous material in a textile card;
- cross-lapping the first carded web to reorient and improve the fiber distribution;
- forming a second carded web by carding the cross-lapped carded web in a textile card;



- dividing the second carded web into relatively narrow rovings and forming a plurality of groups containing a plurality of the rovings with each group containing rovings from different areas across the width of the second carded web for evening the fiber distribution and weight in each such group of rovings; and
- combining all of the rovings of each group with each other and forming a sliver of such rovings for use in spinning yarn in an open-end spinning machine without the necessity of subsequent doublings and draftings.

4,051,576

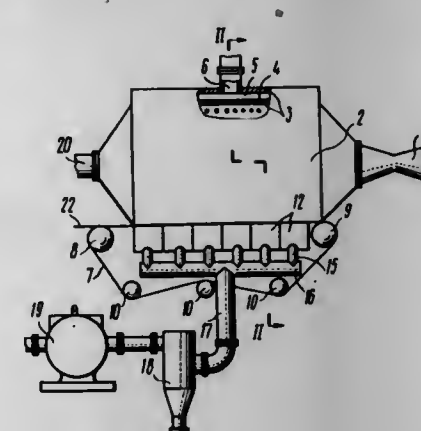
APPARATUS FOR AERODYNAMICALLY FORMING A FIBROUS SHEET MATERIAL

Sergei Vyacheslavovich Baburin, poselok Pravdinsky, ulitsa Zhdanova, 19, kv. 26, Moskovskaya oblast, Pushkinsky raion; Vasily Ivanovich Akimov, "Serebryanka", 9, kv. 69, Pushkino Moskovskoi oblasti, mikroraion; Vladimir Alexandrovich Gorbushin, Turisticheskaya ulitsa 13, kv. 19, Khotkovo Moskovskoi oblasti; Alexandr Petrovich Muraviev; Valery Nikolaevich Nepein, both of poselok Pravdinsky, Institutsky proezd, 1, Moskovskaya oblast, Pushkinsky raion; Mikhail Vladimirovich Frolov, Varshavskoe shosse, 16, kv. 235, Moscow; Sergei Arnoldovich Aizenberg, ulitsa Dmitrova, 11/67, kv. 136, Leningrad; Evgeny Mikhailovich Golovko, Krasnopolitovskaya ulitsa 28/29, kv. 58, Leningrad; Alexandr Fedorovich Kamenev, Bukharestskaya ulitsa 7, kv. 232, Leningrad, and Igor Alexandrovich Sergeev, prospekt Stachek, 27, kv. 8, Leningrad, all of U.S.S.R.

Filed Dec. 18, 1975, Ser. No. 642,120
Int. Cl.² D04H 1/00

U.S. Cl. 19-156

3 Claims



1. An apparatus for making sheets of fibrous material comprising: a forming chamber having perforated inner walls on top and on two opposite sides and solid outer walls spaced from said inner walls and defining a space therebetween for receiving a gas under pressure, means for supplying said gas under pressure into said space for entry into said chamber through the perforations in the inner walls to maintain the fibers from contacting said inner walls of said chamber during operation, a bottom wall of said forming chamber comprising an endless air-permeable travelling conveyor extending along the entire

length thereof, means for feeding an air stream mixture with fibers into the interior of said forming chamber and flowed between said two opposite sides, means for applying an air suction through said conveyor to settle fibers thereon in the form of a sheet material, and a means for removing fibers from said chamber that have not settled on said conveyor.

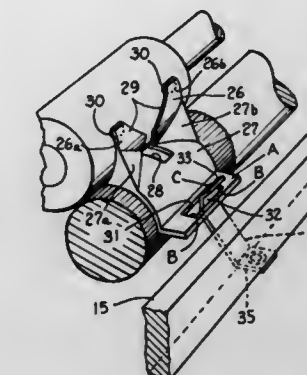
4,051,577 FIBER CONDENSER

Kenneth P. Swanson, Fort Lauderdale, Fla., assignor to Progressive Equipment, Inc., Simpsonville, S.C.

Filed Feb. 27, 1976, Ser. No. 662,022
Int. Cl.² D01H 5/72

U.S. Cl. 19-291

5 Claims



1. A fiber condenser for feeding a fiber strand forwardly into the nip formed by a pair of superposed rolls comprising: upper and lower arcuate covering members having surfaces conforming generally with and positionable in superposed relation to respective nip forming roll surfaces; a strand guiding delivery opening defined by said upper and lower members; a flange connected to said lower arcuate converging member extending rearward therefrom; transversely spaced abutment means carried by said flange for limiting transverse movement of said condenser in either direction; said abutment means being defined by a slot; and a bracket carried adjacent the rolls having a free end extending into said slot for limiting transverse movement of said condenser; whereby upon said fiber strand coming down the tendency for said condenser to move transversely out of engagement with the rolls, as is normally restrained by the fiber strand, may be overcome by the limitation in movement of the condenser afforded by the spaced abutment means.

4,051,578

COMBINATION HANGER AND CLAMP MEMBER FOR BEDSIDE DRAINAGE BAG

James G. Manschot, Mukwonago; Byron L. Mather, Milwaukee, and Thomas W. Balistreri, Hales Corners, all of Wis., assignors to Plastronics, Inc., Milwaukee, Wis.

Filed Dec. 29, 1975, Ser. No. 644,534
Int. Cl.² F16G 11/00

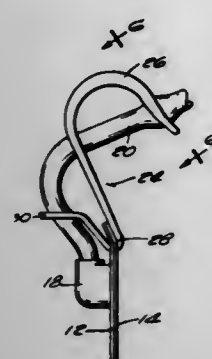
U.S. Cl. 251-4

4 Claims

1. A combination hanger and clamp member for a drainage bag having an inlet tube connected to the top portion of the bag comprising:

- a bag retaining portion adapted to engage and support the drainage bag in a substantially vertical hanging position; and
- a hanger clamp portion including an inverted U-shaped body portion adapted for hanging engagement with a support member, said inverted U-shaped body portion comprised of a pair of leg portions with one of said leg portions being integral with said bag retaining portion and the other of said leg portions terminating at a tip portion,

said body portion having an elongated slot therein extending from one leg thereof to the other leg thereof, said slot being wide enough to freely accommodate said inlet tube therein and said slot tapering inwardly at one end thereof to a narrow clamping slot in which said tube can be forced and when so positioned will clamp the tube to a restricted position and thereby effectively prevent flow there-



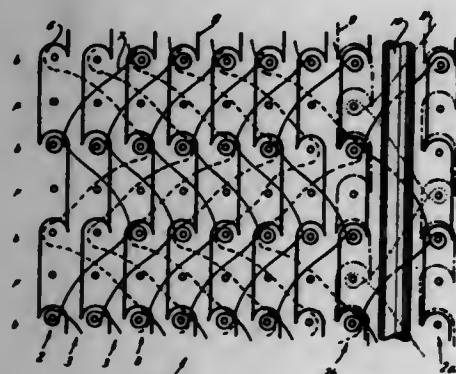
through, said clamping slot located in said other leg portion of said U-shaped body portion and terminating at said tip portion of said other leg portion, said tube when in the clamped position extending across the U-shaped body portion of the hanger member to thereby effectively prevent the bag from being inadvertently placed in its operable hanging position while the tube is still clamped shut.

4,051,579

SLIDE FASTENER SUPPORT AND METHOD OF WARP-KNITTING SAME

Helmut Heimberger, Locarno, Switzerland, assignor to Optilon W. Erich Hellmann GmbH, Cham, Switzerland
Filed Sept. 30, 1976, Ser. No. 728,132
Claims priority, application Germany, June 15, 1976, 2626664
Int. Cl.² D04B 21/00; A44B 19/00
U.S. Cl. 24—205.16 R

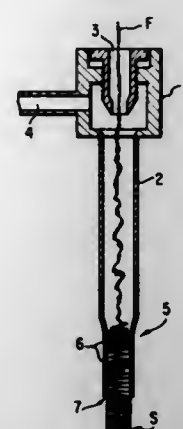
13 Claims



1. A slide-fastener support tape comprising:
 - a relatively thin first warp yarn forming a longitudinally extending double wale and having a succession of loops defining courses;
 - a plurality of relatively thin second warp yarn forming an array of longitudinally extending and transversely spaced single wales adjacent said double wale and each having a succession of loops at every other of said courses;
 - a blind-lapped relatively thick warp yarn extending longitudinally between said double wale and the adjacent single wale at the edge of said array of single wales;
 - a plurality of first weft yarns each laid into a plurality of said single wales;
 - a second weft yarn lapped into said double wale and said adjacent single wale, and lying to one side of said thick warp yarn; and
 - a third weft yarn lapped into said double wale and said adjacent single wale and lying to the other side of said thick warp yarn.

4,051,580
METHOD AND APPARATUS FOR STUFFING YARNS
Pierre Curtillat, Lyon, France, assignor to Rhone-Poulenc-Textile, Lyon Cedex, France
Filed Dec. 30, 1975, Ser. No. 645,389
Claims priority, application France, Dec. 31, 1974, 74.43588
Int. Cl.² D02G 1/20, 1/16; D02C 1/12
U.S. Cl. 28—255

8 Claims

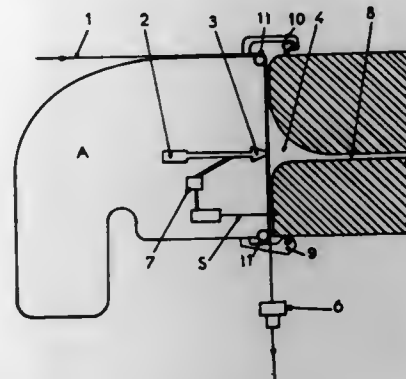


1. The Method of stuffing yarn comprising the steps of:
 - a. injecting yarn into an elongated zone by means of a compressed fluid driving and agitating the yarn,
 - b. confining the yarn and the fluid for travel longitudinally in said elongated zone,
 - c. compacting the yarn into an accumulating stuffing,
 - d. venting the fluid laterally from the elongated zone immediately upstream of the stuffing as the stuffing accumulates,
 - e. blocking venting of the fluid progressively as the stuffing accumulates,
 - f. expelling the accumulated stuffing abruptly as fluid pressure builds behind the stuffing to release the accumulated stuffing from the elongated zone so that the stuffing emerges peristaltically from the elongated zone and venting of the fluid is increased, and
 - g. repeating steps (a) through (g) continuously to form an elongated package of stuffed yarn.

4,051,581

DEVICE FOR INTRODUCING A YARN INTO A PNEUMATIC YARN TEXTURIZING MEANS
Bernard Blot, Craonne, and Charles Blanc, Couzon-au-Mont-D'Or, both of France, assignors to Rhone-Poulenc-Textile, Paris, France
Division of Ser. No. 692,766, June 4, 1976. This application Aug. 30, 1976, Ser. No. 718,771
Claims priority, application France, June 6, 1975, 75.17993; June 6, 1975, 75.17994
Int. Cl.² D02G 1/16
U.S. Cl. 28—272

4 Claims



1. An apparatus for introducing at least one yarn into a pneumatic yarn texturizing means, said apparatus comprising:
 - a orifice for introducing yarn into the texturizing means;
 - a fluid nozzle fixed in spaced relation opposite said orifice;
 - means for positioning the yarn to extend across and between the orifice and fluid nozzle;

means for supplying liquid under high pressure to said fluid nozzle whereby said liquid pushes said yarn into said orifice after the liquid escapes the nozzle;
yarn cutting means for cutting the yarn, said yarn cutting means being located downstream of the orifice in the direction of yarn extent across the orifice;
means for synchronizing the operation of the liquid supply means with the yarn cutting means; and
means for mounting the fluid nozzle and cutting device so as to be moved from juxtaposition with the orifice after the yarn is introduced through the orifice and into the texturizing device so as to allow texturizing to take place under usual conditions.

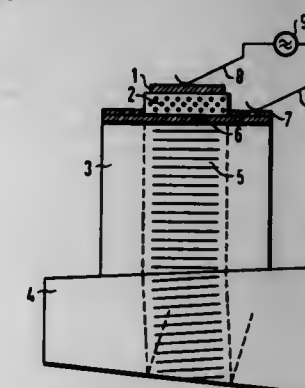
4,051,582

TECHNIQUES FOR PRODUCING AN ACOUSTO-OPTICAL COMPONENT OR A WIDE-BAND ULTRASONIC COMPONENT

Hans Eschler, and Rudolf Oberbacher, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 16, 1975, Ser. No. 641,382
Claims priority, application Germany, Dec. 19, 1974, 2460207
Int. Cl.² H01L 41/22
U.S. Cl. 29—25.35

18 Claims



1. A process for producing an ultrasonic component which comprises a piezoelectric transducer and a sound medium, comprising the steps of:
 - smoothing a surface of the sound medium and a surface of the piezoelectric material to a degree of smoothness which is well below that of a Newton ring;
 - cleaning the smoothed surfaces;
 - applying a first metal layer having a thickness in the range of 0.5–2 nm to each of the cleansed surfaces;
 - applying a second metal layer having a thickness in the range of 5–20 nm to each of the first metal layers;
 - bonding the second metal layers together by molecular adhesion with a portion of the metal layers of the sound medium remaining exposed;
 - applying a third metal layer having a thickness in the range of 0.3–0.6 μm to the exposed portion of the metal layers of the sound medium and to the piezoelectric material; and
 - adjusting the resonant frequency of the transducer to a desired frequency.

4,051,583

MACHINE TOOL WITH A TURRET HEAD FOR TOOL SPINDLES

Shiro Kato, Kariya, and Yasuhiro Hattori, Nagoya, both of Japan, assignors to Toyota-Koki Kabushiki-Kaisha, Japan
Filed Mar. 22, 1976, Ser. No. 668,862
Claims priority, application Japan, Apr. 28, 1975, 50-51687
Int. Cl.² B23B 39/20

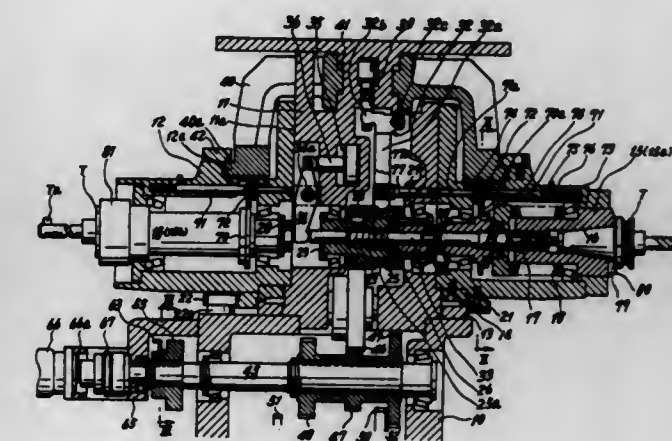
U.S. Cl. 29—40

7 Claims

1. A machine tool having a frame, a turret head rotatably mounted upon the frame, a plurality of tool spindles rotatably supported within the turret head, index means for indexing the turret head to selectively position the tool spindles to an operative position, first coupling means provided upon each of the

tool spindles, second coupling means slidably and rotatably provided upon the frame for rotating any one of the tool spindles positioned at the operative position when engaged with the first coupling means of the said any one of the tool spindles, and orienting means for positioning the second coupling means to a predetermined angular position, the improvement comprising:

first engaging means provided upon at least a particular one of the tool spindles,
second engaging means slidably mounted within the turret head and engageable with the first engaging means when the said one of the tool spindles is positioned to the predetermined angular position for maintaining the same thereat,



means for moving the second engaging means into engagement with the first engaging means,
release means operably disposed within the frame for moving the second engaging means out of engagement with the first engaging means against the last mentioned means when brought into abutting engagement with the second engaging means,
a lever member operably supported and connected with the second coupling means and the release means for simultaneously moving the second coupling means and the release means respectively into engagement with the first coupling means and the second engaging means, and
an actuator connected with the lever member for operating the same.

4,051,584

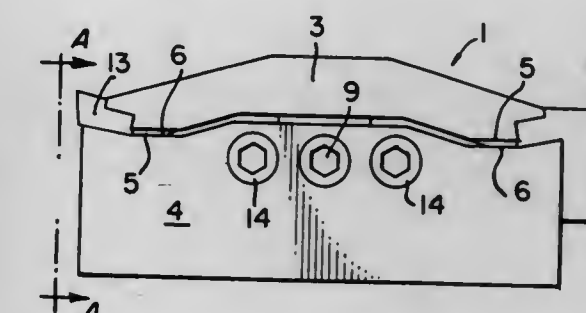
CUTTING TOOL ASSEMBLY

Josef Paul Huser, Meggen, Switzerland, assignor to Firma Uttilis Mullheim A.G., Switzerland
Filed Oct. 24, 1975, Ser. No. 625,712
Claims priority, application Switzerland, Oct. 24, 1975, 014284/75

Int. Cl.² B26D 1/00

U.S. Cl. 407—107

24 Claims



1. A cutting assembly comprising: a cutting tool means, a tool holder means, a support means for supporting said cutting tool means, clamping means for clamping said cutting tool means on said support means, said support means and said clamping means being provided with two opposed longitudi-

nally extending surfaces, means provided on the opposed surfaces of said support means and said clamping means for receiving and accurately guiding said cutting tool means, guide means projecting outwardly from one of the opposed surfaces of said clamping means and said support means for laterally aligning said clamping means relative to said support means, groove means provided on the other of the opposed surfaces of said clamping means and said support means for receiving said guide means, means provided on one of the opposed surfaces of said support means and said clamping means for vertically aligning said clamping means relative to said support means, said guide means, said groove means and said means for vertically aligning said clamping means being arranged on said opposed surfaces substantially along a vertically extending center plane of said clamping means and said support means, and means for mounting said support means and said clamping means on said tool holder means.

4,051,585

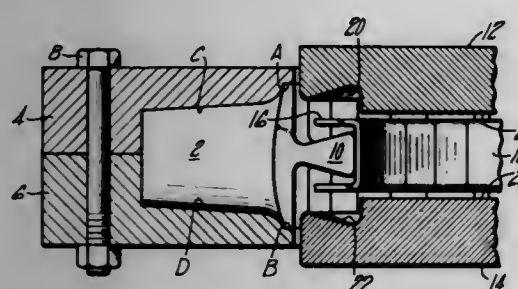
METHOD OF FORMING A TURBINE ROTOR

Bryant H. Walker, Stuart; William D. Carruthers, West Palm Beach, and Donald G. MacNitt, Jr., Riviera Beach, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed July 26, 1976, Ser. No. 708,672
Int. Cl.² B23P 15/04

U.S. Cl. 29—156.8 R

4 Claims



1. Method of forming a turbine rotor having a superalloy disk with ceramic blades, including the steps of:
 1. forming ceramic blade members having a root section with an enlargement thereon,
 2. holding said ceramic blades together with the root sections projecting radially inward,
 3. placing a compliant layer around said root sections,
 4. forming two disk halves of a wrought superalloy having a fine grain size microstructure which can be placed in a superplastic condition,
 5. contouring the outer circumference of each disk half to accommodate the ceramic blade root and compliant layer,
 6. aligning said disk halves so that the contoured circumferences will contact the compliant layer,
 7. placing said disk halves in a superplastic condition,
 8. pressing said disk halves together while they are in said superplastic condition to place the contoured circumference, compliant layer and blade roots in surface-to-surface contact placing the blade roots in compression.

4,051,586

METHOD AND APPARATUS FOR MANUFACTURING A HELICALLY FINNED HEAT EXCHANGER

Robert E. Hicks, Crestwood, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 529,445, Dec. 4, 1974, Pat. No. 3,909,898, which is a continuation-in-part of Ser. No. 579,889, May 22, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,833

Int. Cl.² B21D 53/02; B23P 15/26

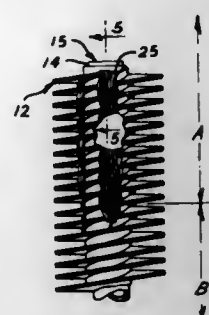
U.S. Cl. 29—157.3 AH

1 Claim

1. Method of manufacturing a continuous spine fin heat

exchanger tube including a helically wound spine fin material supported on a base tube member which comprises:

- a. helically winding said spine fin material in intimate contact with adjacent wraps and the outer wall of said tube;
- b. moving spine fins from adjacent wraps of said spine fin material into interlocking engagement in preselected portions at spaced intervals on said spine fin heat exchanger so as to prevent movement thereof relative to said base tube member;



severing said heat exchanger in said preselected portion to form predetermined lengths of said heat exchanger with the interlocked spine fin material in said preselected portions forming end portions effectively held against movement relative to said base tube member so that the other portion of said helically wound spine fin material intermediate said preselected portion is maintained in its initial helically wound position.

4,051,587

PILE HANDLING APPARATUS AND METHODS

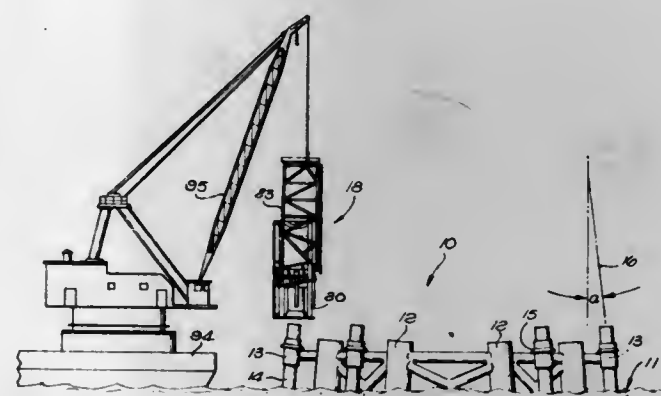
George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Filed Aug. 2, 1976, Ser. No. 710,450

Int. Cl.² B23P 19/04

U.S. Cl. 29—240

20 Claims



1. A pile handling tool comprising:
 - a. a portable support structure adapted to be moved to a location at which a pile is to be lowered or raised;
 - b. power actuated jacking mechanism carried by said support structure and constructed to jack a pile section longitudinally relative to the support structure;
 - c. a mast structure carried by said support structure and projecting upwardly beyond said jacking mechanism; and
 - d. pile aligning means carried by said mast structure and adapted to engage the pile section in aligning relation at a location above the jacking mechanism.

4,051,588

MACHINE FOR DISASSEMBLING WOOD PALLETS

Neil E. Conkle, 1000 Clarendon, Columbus, Ohio 43223

Filed Dec. 2, 1975, Ser. No. 636,932

Int. Cl.² B23P 19/04

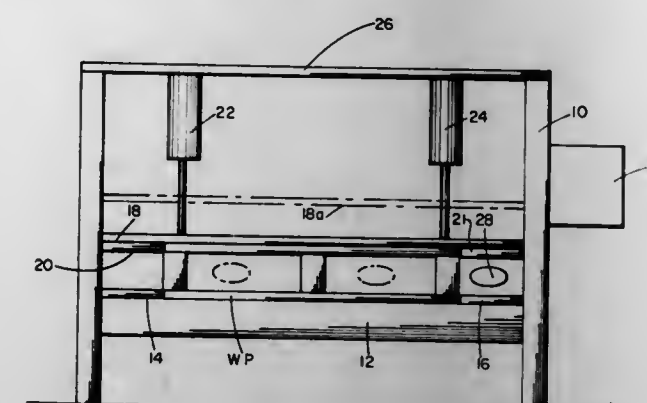
U.S. Cl. 29—252

6 Claims

1. A machine for disassembling wood pallets of the type

having deck and base boards and stringers comprising a structure including:

- a platform for placing said pallet thereon;
- an engaging arm and means for positioning said arm above said platform at a height of said stringers;
- a shaft having said arm movably positioned thereon for movement of said arm laterally from one side of said structure to the other side;



drive means for moving said arm to engage said stringers; a stop on said platform to restrict said pallet placed on said platform from lateral movement; a plate movable vertically to contact the upper deck to restrict said pallet from vertical movement when said arm is in engagement with said stringers.

4,051,589

PROCESS AND APPARATUS FOR THE ASSEMBLY OF SLIDING GATE VALVE UNITS FOR CASTING LADLES

Bernhard Tinnes, Zollikon, Switzerland, assignor to Metac AG, Zurich, Switzerland

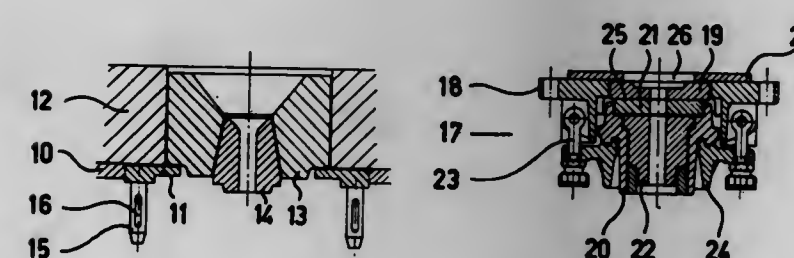
Filed May 16, 1975, Ser. No. 578,315

Claims priority, application Switzerland, May 24, 1974, 7108/74

Int. Cl.² B23P 17/00

U.S. Cl. 29—405

3 Claims



1. A process for assembling a sliding gate valve unit including a valve housing and slide part for a casting ladle, comprising:
 - a. with the unit separated from the ladle and in a substantially disassembled condition,
 - b. heating the valve housing and slide part to an elevated temperature approximately corresponding to the mean temperature of the unit when in use on a casting ladle, the heating step including applying radiant heat to the valve housing;
 - c. mounting the slide part to the valve housing with a fastening means and
 - d. tightening the fastening means to the extent needed to provide a predetermined degree of tightness between the slide part and the valve housing, all while these parts remain heated;
- the unit, when assembled, including a bed plate set in mortar, in the valve housing the process further including:
 - a. applying mortar to the bed plate;
 - b. setting the bed plate in the valve housing while the valve

housing remains heated, before performing step (b) and permitting the mortar to set at elevated temperature; mounting the valve housing on edge so that it faces sideways for the performance of steps (a), (b) and (c), the mounting step further including: mounting the valve housing on a frame having an oven enclosure, with the ladle side of the valve housing facing into the oven and with the opposite side thereof accessible from exteriorly of the oven.

4,051,590

METHOD FOR HOT FORGING FINISHED ARTICLES FROM POWDER METAL PREFORMS

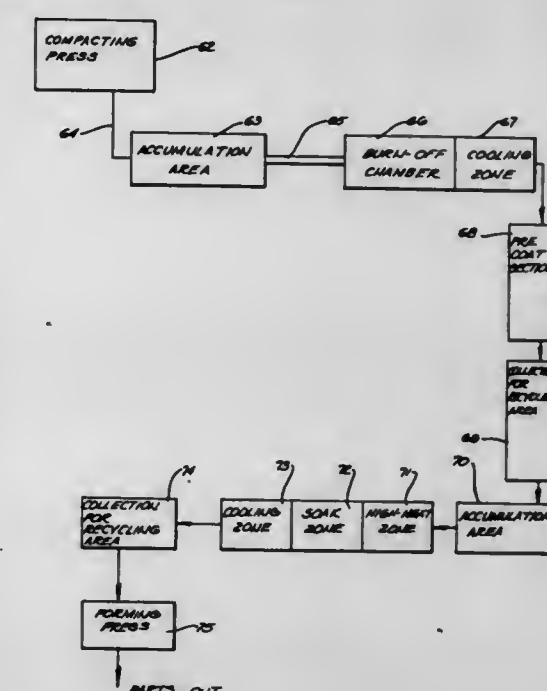
Richard F. Halter, and Richard L. DeWeese, both of Cincinnati, Ohio, assignors to Cincinnati Incorporated, Cincinnati, Ohio

Continuation of Ser. No. 298,832, Oct. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 91,419, Nov. 20, 1970, abandoned. This application May 8, 1974, Ser. No. 468,002

Int. Cl.² B22F 3/24

U.S. Cl. 29—420.5

16 Claims



1. A fully automated, continuous process of producing finished parts from compacted powder metal preforms at a high production rate which comprises the steps of introducing the preforms into a vertically oriented tube-like feeding station, depositing the preforms from said feeding station to a conveying means one-by-one by gravity, conveying said preforms to a vertically oriented induction heating station, advancing said preforms through said heating station and heating them to at least a forging temperature, transferring a heated preform from the upper end of said heating station to a forging station and simultaneously removing a finished part from said forging station, and forging each of said preforms at said forging station.

4,051,591

METHOD OF ASSEMBLING FLOTATION UNITS

Thomas L. Thompson, 2231 Pomona Ave., Costa Mesa, Calif. 92627

Filed Dec. 20, 1976, Ser. No. 752,824

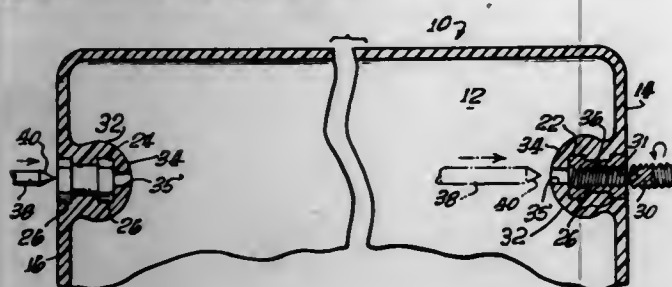
Int. Cl.² B23P 19/04

U.S. Cl. 29—433

9 Claims

1. A method of assembling a monolithic, hollow structure comprising the steps of:
 - a. forming a monolithic unit having a sealed chamber defined thereby;
 - b. arranging a plurality of threaded bushing inserts in at least two oppositely disposed walls of said unit, wherein a pair of oppositely disposed bushing inserts are axially aligned with each other;

passing a guide rod through said bushings from one side of said unit to the other, whereby said guide rod extends outwardly from one side wall thereof; engaging a continuously threaded, support bar to said extended end of said guide rod;

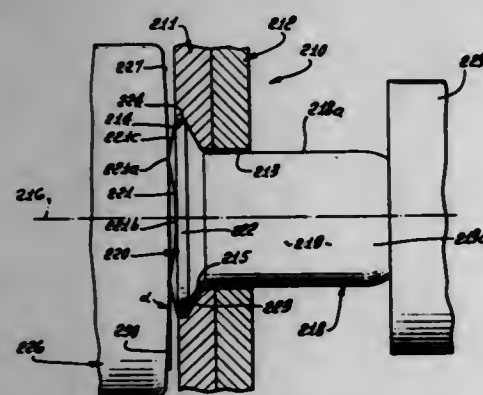


rotating said threaded, support bar so as to cause it to be threaded through said oppositely disposed, bushing inserts during continuous engagement with said guide rod; and adjusting said support rod to provide outwardly projecting ends, said ends being adjusted equidistant from said side walls thereof.

4,051,592

EXPANDING HEAD RIVETING METHOD

Franklin S. Briles, 1301 Dolphin, Corona del Mar, Calif. 92625
Continuation-in-part of Ser. No. 645,242, Dec. 29, 1975, Pat. No. 4,000,680. This application Oct. 15, 1976, Ser. No. 732,869
Int. Cl.² B21D 39/00; B23P 11/00
U.S. Cl. 29—509



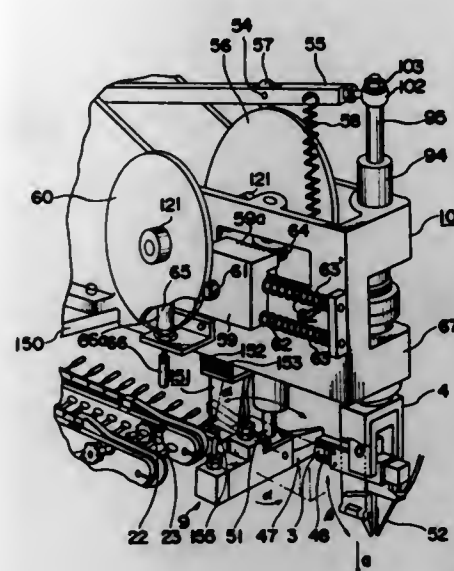
1. In the method of securing a metallic rivet to work containing a through bore, and first and second counterbores; said second counterbore being frusto-conical and tapering forwardly between the first counterbore and the bore, the rivet having a head at one side of the work, and an axially extending shank extending through the bore, the shank having a terminal protruding at the opposite side of the work, the rivet head having an end face defining a ring-shaped dome extending about the rivet axis and in substantial alignment with the outer surface of the shank, the steps that include

- seating the rivet head against the work second counterbore while maintaining only slight annular clearance between the work first counterbore and the rivet head, and with the shank then extending through the bore,
- expanding the rivet head radially outwardly to tightly engage the work first counterbore, said expansion of the rivet head being effected by applying force to said ring-shaped dome to flatten said dome and
- maintaining the head substantially confined within the first and second counterbores during said radial expansion.

4,051,593
COMPONENT MOUNTING APPARATUS
Kazuhiro Mori, and Yoshihiko Misawa, both of Katano, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 2, 1976, Ser. No. 672,958
Claims priority, application Japan, Apr. 7, 1975, 50-42650; Apr. 7, 1975, 50-42651; Jan. 30, 1976, 51-9858; Jan. 30, 1976, 51-9859; Jan. 30, 1976, 51-9860; Jan. 30, 1976, 51-9865
Int. Cl.² H05K 3/32
U.S. Cl. 29—564.6

14 Claims

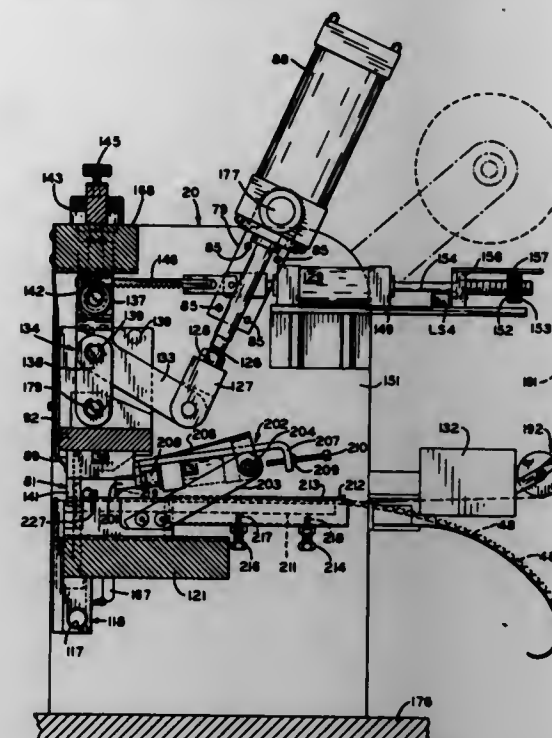


1. Component mounting apparatus comprising

- a plurality of stands for accommodating a plurality of component substrates in ribbon-like form and carrying different components having leads attached to and extending therefrom, end portions of the leads of said components being attached to said component substrates;
- a plurality of transport units provided in alignment with said stands, and having attached thereto leading ends of said component substrates and including means for individually advancing said component substrates and bringing successive components carried by said component substrates into leading positions on said component substrates and to a cut-off line;
- a component selection block laterally movable for bringing a selected component substrate carrying a component required to be mounted into line with a cut-off station;
- a cutter and transfer unit at said cut-off station, for cutting said leads of said leading component of said selected component substrate, thereby detaching said component from said component substrate, and for transporting said detached component to a transfer station and subsequently releasing said component;
- printed circuit board positioning means for supporting a printed circuit board and moving said printed circuit board for bringing successive portions of said printed circuit board requiring successive said components to be mounted thereon to an insertion station;
- an insertion unit for receiving and holding a component brought to said transfer station by said cutter and transfer unit, said cutter and transfer unit releasing said component when said component is held by said insertion unit, and for moving said received component toward and guiding said leads of said component into a printed circuit board portion at said insertion station.

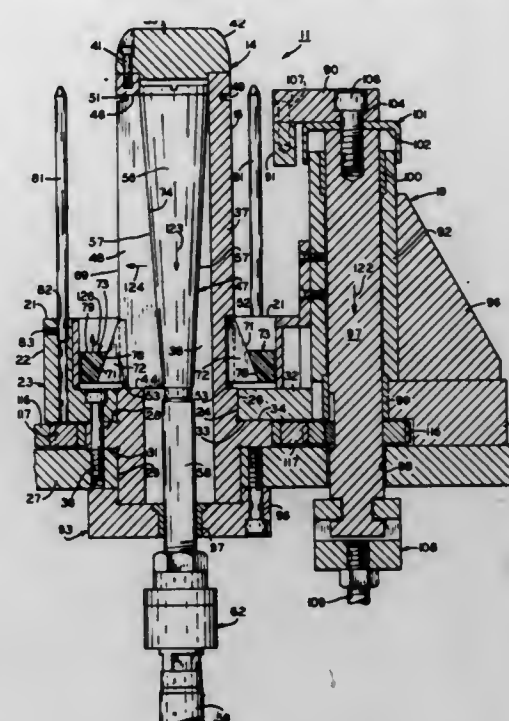
4,051,594
METHODS AND APPARATUS FOR USE IN MAKING ELECTRICAL INTERCONNECTIONS
Alan L. Kindig, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.
Continuation-in-part of Ser. No. 671,618, March 29, 1976, which is a continuation-in-part of Ser. No. 590,707, June 26, 1975, Pat. No. 3,962,780. This application June 23, 1976, Ser. No. 698,922
Int. Cl.² H02K 15/00; H01R 43/04
U.S. Cl. 29—596

10 Claims



1. Apparatus for making an electrical interconnection with at least one magnet wire segment extending from a winding supported on the core of a dynamoelectric machine, wherein the interconnection comprises a crimped splice connector folded upon the at least one magnet wire segment at least one filler wire segment, and at least one other wire segment and wherein the at least one magnet wire segment, the at least one other wire segment, and an uncrimped splice connector are positioned at a crimping station; the apparatus including means for advancing uncrimped splice connectors to the crimping station; means for advancing a filler wire segment comprising a first portion and a remainder toward and into the crimping station a total predetermined distance along a confined pathway and for positioning the lead end of the filler wire segment in overlying relationship relative to the at least one magnet wire segment; means for crimping the splice connector about the first portion of the filler wire segment, the at least one magnet wire segment, and the at least one other wire segment, and for severing the first portion of the filler wire segment from the remainder of the filler wire segment thereby to establish a new filler wire segment end; and control means for causing retraction of the remainder of the filler wire segment along the confined pathway a distance less than the predetermined distance and thereby ensuring that the remainder of the filler wire segment is devoid of major bends therealong.

relative to an axially extending slot of a stator core; and substantially simultaneously therewith changing the shape of at least part of the end portions of a plurality of winding turns supported on the core by moving means for shaping end portions of winding turns while the means for shaping is in pressing engagement with such at least part of the end portions, the method comprising: positioning the stator assembly in predetermined relation to radially movable wedge setting means including the elongate surface at a first station; holding the stator assembly in fixed relation to the wedge setting means and, while so holding the stator assembly, generally concur-



rently setting the at least one wedge and shaping the at least a portion of the plurality of winding turns by moving the wedge setting means radially relative to the stator assembly while the wedge setting means is in camming and driving engagement with the means for shaping end portions and while the elongate surface is in engagement with the wedge, whereby radially moving the wedge setting means causes axial movement of the means for shaping end portions and associated shaping of winding turn end portions engaged thereby and also causes radial movement of the elongate surface and setting of a wedge engaged thereby; and thereafter moving the stator assembly away from the wedge setting means.

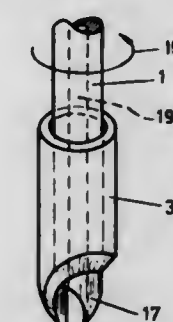
4,051,596

WIRE CUTTER, PARTICULARLY FOR CUTTING ELECTRICAL CONNECTION WIRES

Heinrich Hofmann, Biebertal, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 2, 1976, Ser. No. 719,987
Claims priority, application Germany, Sept. 10, 1975, 2540299
Int. Cl.² B23D 29/02

U.S. Cl. 30—133

3 Claims



4,051,595
METHODS FOR SETTING INSULATORS AND PRESSING END TURNS
Richard W. Bale, Fennville, Mich., assignor to General Electric Company, Fort Wayne, Ind.
Division of Ser. No. 593,491, July 7, 1975, Pat. No. 4,003,116.
This application Nov. 11, 1976, Ser. No. 740,830
Int. Cl.² H02K 15/06

U.S. Cl. 29—596

1 Claim

1. A method of setting at least one insulating wedge in a stator assembly by moving wedge setting means, including an elongate surface, radially relative to the stator assembly while the elongate surface is in engagement with the wedge, and thereby moving at least part of the wedge in a radial direction

1. A wire cutter especially adapted for cutting stranded wires comprising a circular cylindrical outer sleeve having an

end face and a cutting edge extending parallel to the sleeve axis beyond the end face, a distal tip of the cutting edge being connected to the end face by a surface extending generally helically away from the cutting edge; and a hollow cutting shaft arranged coaxially within said sleeve for rotation relative thereto and having a cutting edge extending to a distal tip at an axial location corresponding to said sleeve tip, said cutting edge extending parallel to the shaft axis at a region adjacent the shaft tip, said shaft cutting edge extending away from said tip and said region along an arch, adjacent said cutting edge said shaft having an end face so shaped that a wire portion to be cut is held inside a space between the shaft and sleeve, whereby rotation of the shaft relative to the sleeve for operative cutting engagement of said cutting surfaces against stranded wire cuts all strands of the wire, while application of suction through said hollow shaft will remove cut wire ends.

4,051,597

SAW GUIDE DEVICE

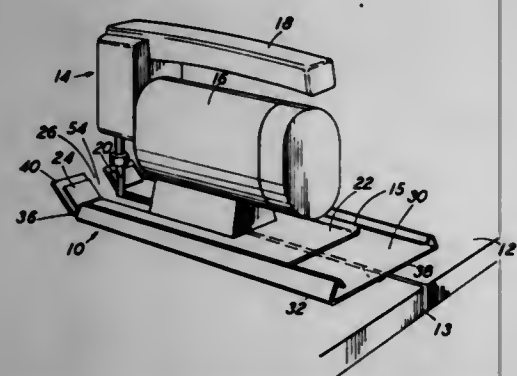
Louis Cardoza, P.O. Box 488, Brookings, Ore. 97415

Filed Aug. 24, 1976, Ser. No. 717,033

Int. Cl.² B27B 11/02

U.S. Cl. 30—373

3 Claims



1. A saw guide used for producing a straight line kerf cut in a board with a saw having a saw blade, a motor housing, a handle, and a shoe, said shoe having upwardly extending side flanges and an upwardly bent forward end, which comprises:
 - a. a rectangularly shaped planar element having a pair of sides, a forward end, and rear end, said planar element adapted to receive said shoe thereon;
 - b. means for retaining said shoe on said planar element, said retaining means including an L-shaped member affixed to each said side of said planar member, each said L-shaped member tilted inwardly over said planar element, each said L-shaped member adapted to slidably receive a corresponding said side flange provided by each side of said shoe for retaining said planar member upon said shoe;
 - c. means for extending said saw blade through said forward end of said planar element; and
 - d. a block element affixed perpendicularly to a bottom rear center surface of said planar element, said block element adapted to be received in said kerf cut rearwardly of said saw blade.

4,051,598

DENTAL IMPLANTS

Meor Saeer, 24 Baslei Melacha St., Tel-Aviv, Israel

Filed Apr. 22, 1975, Ser. No. 570,380

Claims priority, application Israel, Apr. 23, 1974, 44697

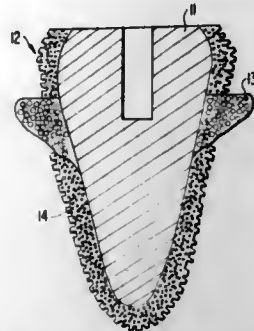
Int. Cl.² A61C 13/00

U.S. Cl. 32—10 A

1 Claim

1. An endosseous dental implant comprising a lower part, adapted to be inserted into the jaw bone, and having a surface layer 100 to 400 μ thick and of open structure comprising pores or interconnected channels of size of about 50 to about 250 μ , said surface layer being formed predominantly of a mixture of physiologically acceptable plastic and an osteogenesis enhancing catalyst selected from the group consisting of calcium carbonate, tricalcium phosphate, calcium fluoride, tribasic

calcium phosphate, monobasic calcium phosphate, calcium glycerophosphate, calcium lacticum, sodium fluoride, total bone substance, magnesium silicate, aluminum silicate, ascor-



bic acid, vitamin D, vitamin A, animal dentin, dibasic calcium phosphate, calcium glucosicum, calcium hexaphosphate, caoline, zinc oxide and mixtures thereof.

4,051,599

BEAM COMPASS

Andrej Sinkovec, Stuttgart, Germany, assignor to Friedrich Frech, Stuttgart, Germany

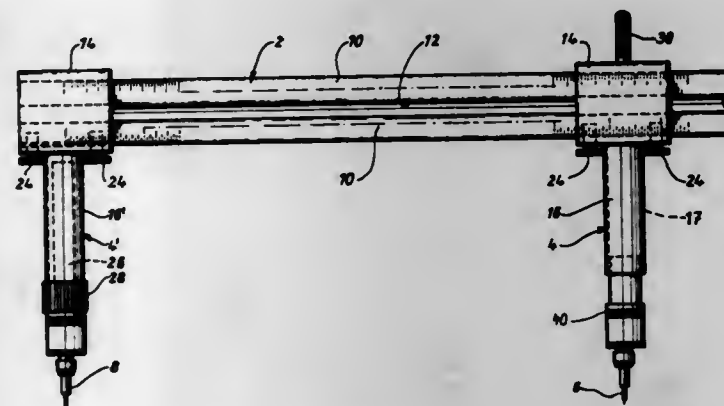
Filed Apr. 8, 1976, Ser. No. 674,895

Claims priority, application Germany, Apr. 11, 1975, 2515923

Int. Cl.² B43L 9/04

U.S. Cl. 33—27 C

11 Claims



1. A beam compass comprising:
 - a. a trammel head including
 1. a hollow slide body having an outer face and three, approximately equiangularly offset inner faces bounding a passage extending in a predetermined direction through said slide body,
 2. a guide rail projecting from each of said inner faces into said passage, each guide rail being elongated in said direction,
 3. an arm mounted on said slide body and projecting from said outer face perpendicularly to said direction, said arm having a free end remote from said slide, and
 4. attaching means for attaching a compass point to said free end;
 - b. an elongated scale of triangular cross section having three longitudinal faces formed with respective longitudinal grooves,
 1. said scale being received in said passage,
 2. said rails respectively engaging said scale in said grooves,
 3. each of said longitudinal faces being separated from a respective one of said inner faces by a clearance; and
 - c. clamping means on said trammel head spaced from said rails for securing said slide body to said scale.

4,051,600

GARLAND MARKER FOR FANCY CAKES

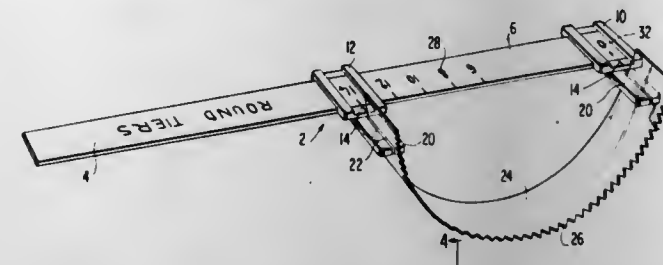
Ray Haapala, Rte. 3, Box 76, Dassel, Minn. 55325

Filed Sept. 22, 1976, Ser. No. 725,646

Int. Cl.² G01B 5/20

U.S. Cl. 33—174 T

1 Claim



1. A device for inscribing garlands on the sides of cakes, comprising
 - a rod having flat opposite sides
 - a pair of slides each having
 - a portion which embraces the rod
 - and a flat tongue having a free end portion which extends outwardly from the rod-engaging portion, each said tongue having flat opposite sides disposed in planes parallel to the flat sides of the rod having a slot which extends therethrough from one flat side thereof to the other inwardly from the free end portion thereof, an elongate bowed flat resilient strip slidably engaged at spaced locations along the length thereof in the slots in said tongue,
 - said strip having serrations along an edge thereof,
 - a series of graduated numbers on the one side of said rod representing an even number of garlands inscribable on the side of a round cake tier of a given diameter, and
 - a series of graduated numbers on the other side of said rod representing an even number of garlands inscribable on a side of a given length of a rectangular cake tier.

4,051,601

FEELER FOR CONTOUR READING APPARATUS

Jean Marie Godot, Brunoy, France, assignor to Essilor International, Cie Generale d'Optique, France

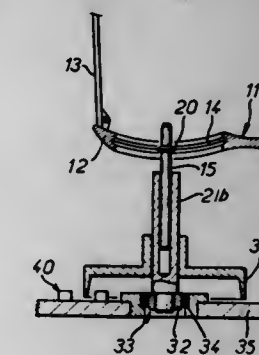
Filed Jan. 6, 1976, Ser. No. 647,313

Claims priority, application France, Jan. 10, 1975, 75.00635

Int. Cl.² G01B 7/28; B24B 9/14

U.S. Cl. 33—174 P

15 Claims



12. A feeler assembly comprising a tracing head for following the contour of a groove in the rim of spectacle frame, a support member, said support member including an end portion remote from said tracing head; means mounting said tracing head on said support member, a base member, ball joint means mounting said support member on said base member, said ball joint means being disposed at said end portion of said support member remote from said tracing head between said support member and said base member, a skirt member mounted on said support member intermediate said tracing head and said ball joint means and facing said base member, and detecting means for detecting the position of said skirt member with respect to said base member in response to dis-

963 O.G.—2

placements of said tracing head in the groove of a spectacle frame rim.

4,051,602

KILN FOR THE THERMAL TREATMENT OF SLURRY TYPE MATERIALS SUCH AS MAGNESITE

Vladimir Suprunov, Alfred Kryczun, and Theodor Manshausen, all of Cologne, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

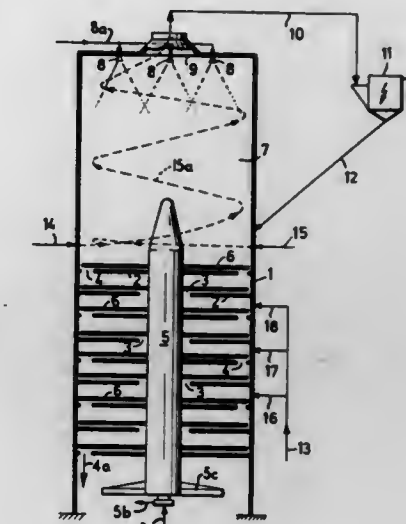
Filed Feb. 2, 1976, Ser. No. 654,643

Claims priority, application Germany, July 4, 1975, 2529847

Int. Cl.² F26B 3/08, 17/00

U.S. Cl. 34—10

10 Claims



7. The method of thermally treating a slurry of material such as a magnesite hydrate including the steps:
 - spraying the material into the upper end of a kiln chamber at the roof;
 - introducing heated gases in a distributed pattern at a first location tangentially at the lower end of an upper portion to flow upwardly countercurrent to the downward movement of the sprayed slurry of material and drying over the entire area of the chamber;
 - drawing off evaporated moisture at the top of the chamber; and
 - removing the heat treated material from the lower end of the chamber.

4,051,603

FLUIDIZED BED APPARATUS

Hobart Malcolm Kern, Jr., Warren, Pa., assignor to Struthers Scientific and International Corporation, New York, N.Y.

Continuation of Ser. No. 375,949, July 2, 1973, abandoned,

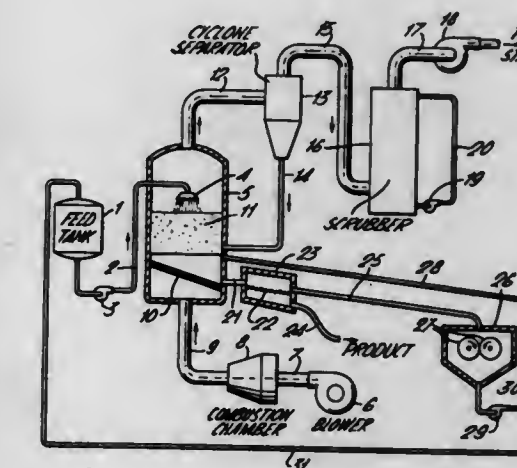
which is a continuation of Ser. No. 260,148, June 6, 1972,

abandoned. This application July 15, 1974, Ser. No. 488,637

Int. Cl.² F26B 17/10

U.S. Cl. 34—57 A

2 Claims



1. Apparatus for providing product particles of a desired size

in a fluidized bed dryer from an aqueous feed solution comprising:

- a chamber to contain a fluidized bed;
- a perforated plate beneath said bed positioned at an incline;
- means for passing heated air upward in said chamber through said plate;
- means for spraying an aqueous solution of feed into the chamber forming a fluidized bed therein in which drying particles aggregate and grow as they are coated and/or stick together;
- means for separating out fines from the exhaust air from said chamber and returning said fines directly to said bed and means for subsequently scrubbing said exhaust air and removing the scrubbed exhaust air from the apparatus;
- means at the lower edge of said plate for withdrawing aggregated particles falling from the fluidized bed;
- means for separating large particles above a desired size range leaving product particles with the desired size range;
- means for withdrawing product particles with the desired size range from said apparatus;
- means for pulverizing all of the large particles; and
- means for returning the pulverized particles to the fluidized bed including means introducing pulverized particles to a tank which contains the aqueous feed solution.

4,051,604

COUPLING FOR THE SUPPLY AND DISCHARGE OF HEATING MEDIUM, FOR EXAMPLE IN TENTERING UNITS

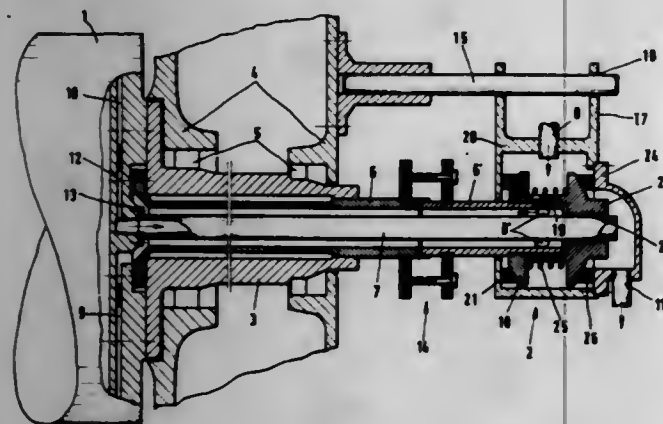
Hans Fleissner, Frankfurt am Main, Germany, assignor to Vepa AG, Switzerland

Filed July 2, 1975, Ser. No. 592,767

Claims priority, application Germany, July 2, 1974, 2431806
Int. Cl.² F26B 11/02

U.S. Cl. 34—124

15 Claims



the clinging area and the nonclinging area, characterized by being formed, except for its cover sheet means, essentially from a single sheet of cardboard folded and including a back portion, a flap folded forwardly therefrom and down thereover and including on the forward face thereof a printed background with a pressure-tacky surface; and including a second flap folded forwardly from the same back portion and adhered down thereover, with face-printing on its forward face and having an edge overlying the first flap to provide a protected area thereof; the cover sheet means being adhered to said cardboard under the said second flap.

4,051,610 SANDAL

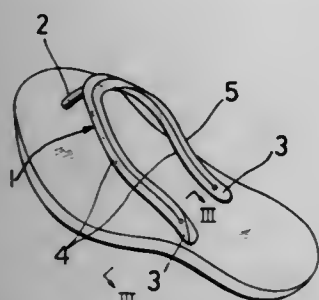
Yoshihiro Shigeji, 5-7-7 Okamotocho, Higashinadaku, Kobe, Japan

Filed May 4, 1976, Ser. No. 683,217

Int. Cl.² A43B 3/12

U.S. Cl. 36—11.5

1 Claim



1. A sandal comprising:
 - a sole member means for supporting and protecting the sandal wearer's foot; and
 - a strap member means removably attached to said sole member means for fitting over the wearer's instep and for selectively fitting over the wearer's instep and around the wearer's heel, said strap member means being comprised of:
 - a foot strap removably connected to said sole member means having a longitudinal slit therein forming two complementary adjacent straps integrally connected at their ends, one of said straps being selectively removable from the other and fittable around the wearer's heel.

4,051,611 BOOT BUCKLE

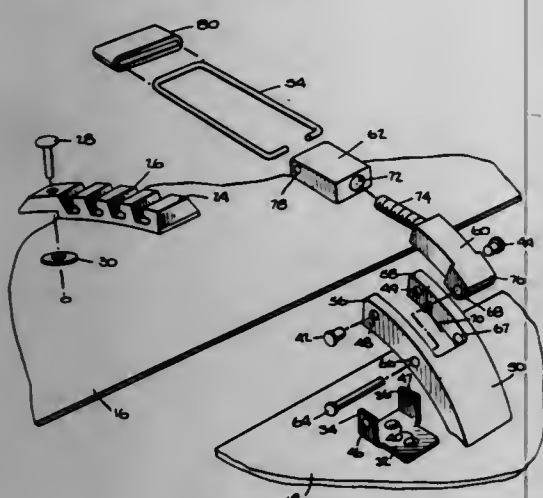
Edward L. Chalmers, Boulder, Colo., assignor to The Garcia Corporation, Tenneek, N.J.

Filed Jan. 24, 1977, Ser. No. 762,195

Int. Cl.² A43B 11/00

U.S. Cl. 36—50

6 Claims



1. A buckle for closing a pair of opposed closure flaps of an athletic boot comprising:
 - an elongated catch adapted to be mounted to one of said

closure flaps, said catch having a plurality of longitudinally spaced transverse notches formed therein; a support adapted to be mounted opposite to said catch on the other of said closure flaps; an elongated latch having a pair of parallel legs pivotally mounted to said support for rotation towards and away from said catch; a substantially U-shaped wireform dimensioned to engage one of said notches; means mounting said wireform to said latch for rotation towards and away from said closure flaps, said mounting means including a member having a threaded shaft pivotally mounted between the arms of said latch, and a wireform holder threaded on said shaft, the free ends of said U-shaped wireform being mounted to said wireform holder for rotation towards and away from said flaps; and biasing means arranged between said member and said latch for urging said shaft and wireform holder towards said closure flaps.

4,051,612 SAFETY TOE SHIELD

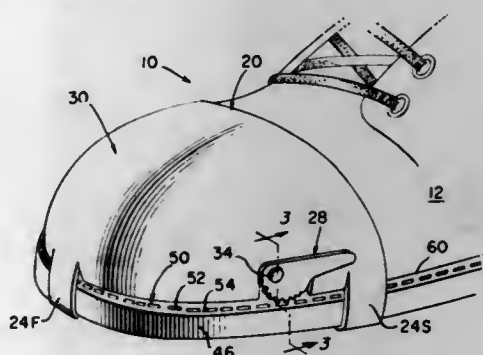
Wilbur T. Damron, 4502 Lela Ave., NE., Roanoke, Va. 24019

Filed Dec. 17, 1976, Ser. No. 751,752

Int. Cl.² A43B 13/22

U.S. Cl. 36—72 R

15 Claims



1. A safety toe shield for use on a shoe comprising:
 - a body having a lower marginal edge and adapted to be placed over and over the toe of a shoe;
 - a plurality of jaws depending from said body and each having a shoulder thereon which will engage the bottom of the sole of the shoe;
 - a plurality of quick-catches pivotally mounted on the body to engage the top of the shoe sole and force said shoulders into engagement with the shoe sole bottom; and
 - means on said quick-catches for locking said quick latches against the shoe sole to thereby lock said body onto said shoe without marring the shoe.

4,051,613 MARTIAL ARTS BOOT

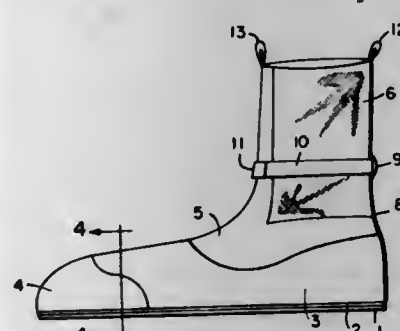
Ronald Eugene Collins, 6001 Rustan St., Berwyn Heights, Md. 20740

Filed Dec. 23, 1975, Ser. No. 643,912

Int. Cl.² A43B 5/00, 19/00

U.S. Cl. 36—114

1 Claim



1. A martial arts boot comprising inner and outer soft rubber soles, a vamp being attached to said soles, a padding totally

covering the inner surface of said vamp, a boot upper being attached to said vamp, said padding extending upwardly from said vamp over the inner front and side portions of said upper, a cap padding covering only the sides and front of the toe portion of said vamp and said upper having an elastic rear side portion.

4,051,614

HIGH CAPACITY LOADER BLADE

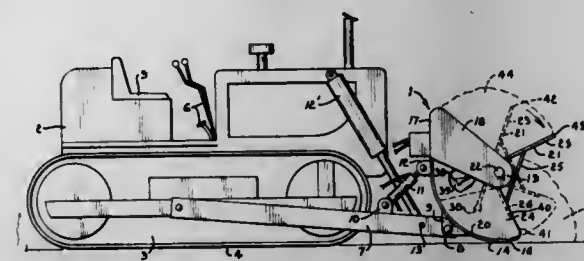
Richard E. Diggs, P.O. Box 776, S. 12A Road, Carthage, Mo. 64836

Filed Oct. 28, 1975, Ser. No. 626,448

Int. Cl.² E02F 3/82, 3/70

U.S. Cl. 37—117.5

6 Claims



1. A boom mounted loader arrangement for excavator, said arrangement comprising:
 - a. a blade having a generally cylindrically shaped inner surface and a cutting edge; said inner surface having a central axis and being disposed at a radius therefrom; said blade being adapted for pivotal connection with said excavator;
 - b. a loading assembly rotatably connected with and supported by said blade for rotation about said central axis; said assembly including a generally flat plate disposed transversely within said blade, having first and second free edges extending generally 180° radially apart from said central axis, said first free edge being positioned outwardly of said central axis at a radius slightly less than the radius of said inner surface, whereby upon rotation of said plate relative to said blade, said first free edge sweeps said inner surface;
 - c. power means selectively pivoting said loading assembly with respect to said blade;
 - d. said second free edge being positioned outwardly of said central axis at a radius shorter than the radius of said first free edge; said second free edge being oriented toward and spaced apart from said inner surface during a ground scraping position, and defining a material receiving throat therebetween; and
 - e. said first free edge of said plate being disposed forwardly of said throat in said ground scraping position whereby ground engagement with said blade cutting edge loosens terrain material and urges the same through said throat and upon an upper surface of said plate, said plate at least partially supporting a load of said material thereon while additional loose material is supported on the inner surface of said blade.

4,051,615

DISPLAY DEVICE AND ARRANGEMENT FOR NEWSPAPERS AND ANALOGOUS ARTICLES

Clarence Gosanko, 4551 51st Place, SW., Seattle, Wash. 98116, and Robert Weinberg, 6955 SW. Merry Lane, Beaverton, Oreg. 97005

Filed Feb. 13, 1976, Ser. No. 657,833

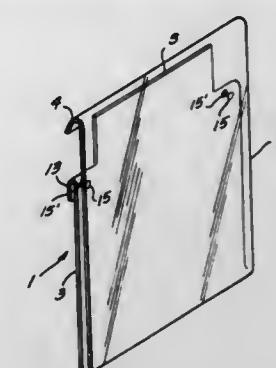
Int. Cl.² G09F 1/10

U.S. Cl. 40—10 D

1 Claim

1. A display device for displaying newspapers and analogous articles on a display rack, comprising an elongated folded element of resilient synthetic plastic material and having a generally rectangular transparent front panel, and a transparent rear panel having a generally rectangular central portion and side portions at opposite sides of the central portion, each

side portion having an aperture, said panels being juxtaposed such that respective free portions of the panels form an open upper end at an upper region of the element for receiving an article to be displayed, and said panels being joined along a common unitary edge at a lower region of the element so as to form a closed lower end for holding the article intermediate said panels; means for closing the open upper end of the element, including a resilient, transversely-extending bent lip extending along a common unitary edge with said front panel so as to form therewith a groove for receiving free edge portions of said central portion of said rear panel with snap action to thereby press the article substantially flat for fixing the position of the article intermediate the panels and for imparting prominence to the article; and means on said rear panel in the



vicinity of said open upper end for mounting said element in upright position on a rack, including a pair of transversely-extending bent lugs each extending along a common unitary edge with a respective one of said side portions so as to form therewith an open-ended channel for receiving portions of the rack on which the element is to be supported, each bent lug having an aperture which is in alignment with a respective aperture of said side portions, and a pair of retaining inserts each having a threaded member and cooperating mating member which extend through the respective apertures which are in mutual alignment with each other, each of said members having an abutting portion at opposite sides of a respective channel and each extending transversely across the open end of said channel for retaining the element on the rack.

4,051,616

ROD WITH STRIKE SIGNALLING APPARATUS

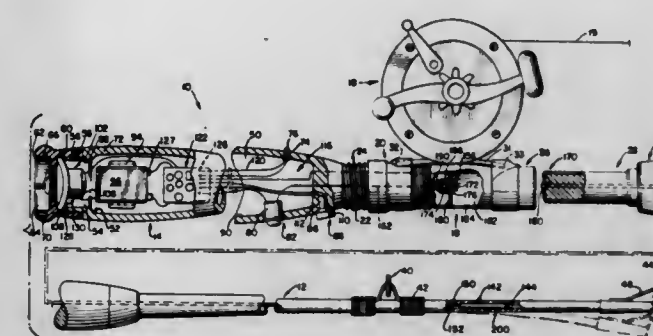
William R. Mathauser, Box 1333, Sun Valley, Idaho 83353

Filed May 11, 1976, Ser. No. 685,157

Int. Cl.² A01K 97/12

U.S. Cl. 43—17

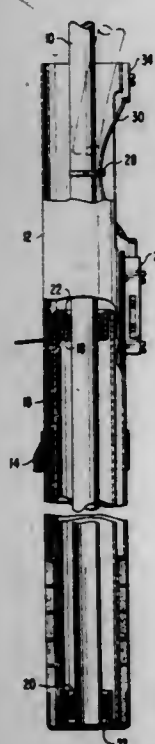
22 Claims



1. A strike signalling means for use in fishing comprising:
 - a fishing rod having a fishing line and which flexes when a fish strikes a hook on said fishing line;
 - an electronic circuit mounted within said fishing rod to be protected from damage;
 - strike signalling means connected to said electronic circuit and controlled by said circuit to signal when a fish strikes said hook, said signalling means including a strain gage;
 - rod flexure sensing means attached to said rod and to said electronic circuit to complete said circuit so that said

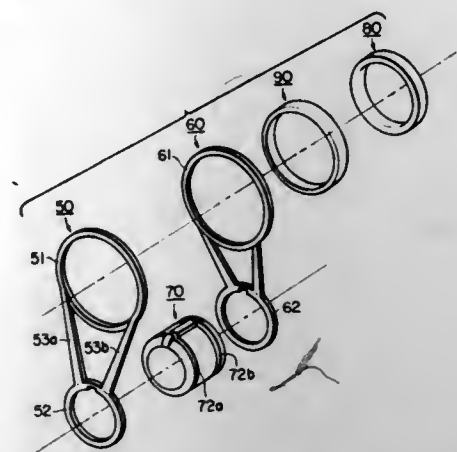
strike signalling means is connected by said electronic circuit to a power source to be activated to signal a strike when said rod undergoes a predetermined amount of flexure due to said strike, said rod flexure sensing means being protected from environmental conditions which may cause said sensing means to inconsistently sense said rod flexure.

4,051,617
AUTOMATIC LINE RELEASE FOR SPIN FISHING EQUIPMENT
Thor Dorph, San Francisco, Calif., assignor to Bjorn Lie and Ginn Lie, both of Oslo, Norway, part interest to each
Filed Sept. 16, 1976, Ser. No. 723,930
Int. Cl.² A01K 87/00
U.S. Cl. 43—18 R



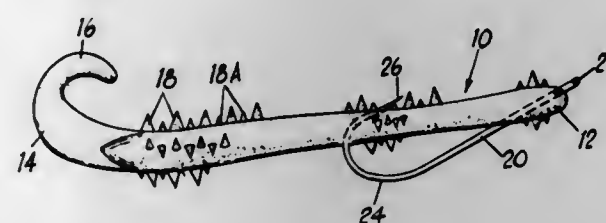
1. An automatic line release apparatus for casting with a spinning rod and reel comprising in combination:
a spinning rod of resilient material;
a hollow handle of substantially larger inside diameter than the diameter of the butt portion of said rod;
means mounting said rod concentrically in said handle to permit flexure of said rod within said handle when casting;
means for mounting a spinning reel on the exterior of said handle;
housing firmly attached to said handle on the opposite side of and forwardly of said reel;
trigger mounted in said housing to pivot from a first position extending outwardly of said housing to a second position within said housing and having a line receiving notch in that side of said trigger which is toward the butt of said rod when in said first position; so that line between said reel and the first line guide on the rod may be placed in said notch;
cam means mounted in said housing for holding said trigger in said first position prior to making a cast;
bar member mounted in said housing for sliding movement parallel to the longitudinal axis of said rod, said bar member when moving from its forwardmost to its rear-most position engaging said cam member and moving it out of the path of travel of said trigger from its first to its second position;
saddle member having an opening therethrough and secured to said rod within said handle and spaced forwardly of said housing, said handle having an opening in the peripheral wall opposite said saddle member; and
resilient wire extending through the opening in said saddle member and having opposite ends attached to the forward ends of said handle and bar member.

4,051,618
LINE GUIDE ASSEMBLY FOR FISHING RODS
Ryuichi Ohmura, No. 19-3, Minami-cho, Shizuoka, Shizuoka, Japan
Filed June 24, 1976, Ser. No. 699,232
Int. Cl.² A01K 87/04
U.S. Cl. 42—24



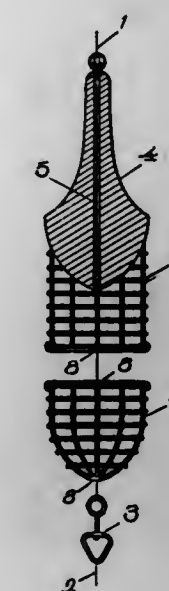
1. An improved line guide assembly for fishing rods comprising, in combination, a seat tube to be inserted over said fishing rods and made of an elastic material and a metallic frame made up of a pair of frame halves coupled to each other at their end surfaces each of which is an integral single body made by stamping of a metallic plate and includes a guide ring part for passing fishing lines therethrough, a seat ring part firmly inserted over said seat tube and an arm part for connecting said two ring parts, said seat tube being provided with a pair of annular grooves in the outer periphery thereof in which said seat ring parts of said frame halves are snugly received.

4,051,619
ARTIFICIAL FISHING LURE
Bingham A. McClellan, Traverse City, Mich., assignor to McClellan Industries, Inc., Traverse City, Mich.
Filed Sept. 27, 1976, Ser. No. 727,027
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.24



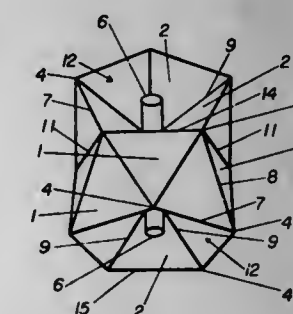
1. An artificial fishing lure comprising, an elongated worm-like body of soft elastic plastic having a head end and a tail end,
a hook having a shank passed into the head end of the body and extending at an angle to the axis of the body to exit the body behind the head end,
the eye of the hook being located adjacent the head end of the body and the rear end of the shank and leading part of the curve of the hook being located exteriorly of the body, the point end of the hook projecting forwardly through the body and projecting from the side thereof with the barb of the hook embedded in the body,
and a multiplicity of thin integral spines on said body and projecting therefrom at least in the area surrounding said point of said hook with a spine in front of said point and projecting therebeyond.

4,051,620
FISHING DEVICE HAVING A FLOAT
Hiromi Yasuda, 3482, Maiokacho, Totsuka, Yokohama, Kanagawa, and Tokuichi Yasuda, 96, Aza-ohirama, Ozanada, Mugimachi, Kaibe, Tokushima, both of Japan
Filed Aug. 6, 1976, Ser. No. 712,341
Int. Cl.² A01K 97/02
U.S. Cl. 43—44.99



1. A fishing device which scatters baits at two distinctively different rates over a fishing site, the device comprising, in combination; a fishing line; a stopper on said line; a swivel element connected to one end of said line; a float positioned about said line and slidable along said line between said stopper and said swivel element; and an apertured basket for containing and scattering baits positioned about said line and slidable along said line, said basket including a lower part and an upper part separable therefrom, said upper part being fixedly connected to said float, being floatable therewith and having a substantially open downwardly facing end when separated from said lower part; whereby upon placing the device into water with baits in the basket, the float and the upper part rise along the fishing line to the surface of the water causing baits in said upper part to be immediately scattered over the fishing site from its substantially open end and the lower part to descend along the fishing line to the swivel element so as to discharge baits therefrom over the fishing site during a period of time.

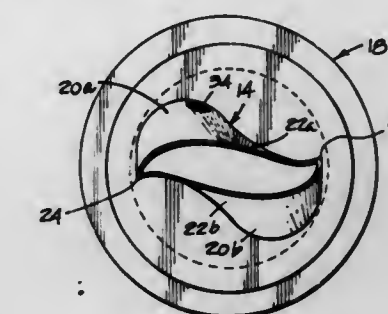
4,051,621
HOMOHEDRAL MODULE GENUS EXTENDER
John Paul Hogan, 600 Elm St., Williamsburg, Iowa 52361
Filed Apr. 8, 1976, Ser. No. 674,935
The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.
Int. Cl.² A63H 33/10
U.S. Cl. 46—26



1. A toy block of convex-concave design in which the convex surface is identical to a surface on two joined, double truncated icosahedra, the truncations being formed by removal of a cluster of five icosahedral faces which form a pentangular pyramid about a vertex, said truncated icosahedra being joined along two truncation surfaces thus formed; and in which the

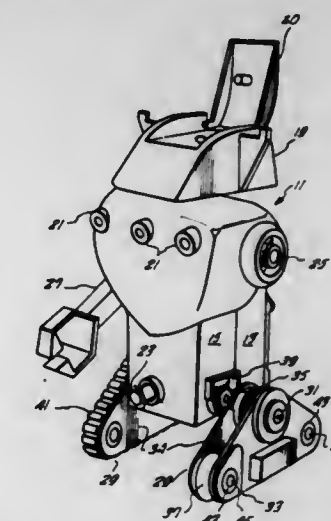
concave surfaces are located at the remaining two truncation surfaces and are of such a degree of concavity that when a wholly convex surface surrounding a vertex on a similar block, an analogous icosahedron block or homohedral module, is fitted within it, a set of pentangular edges on each block are made tangent to one another.

4,051,622
FREE FLYING AERODYNAMIC TOY WITH HIGH STABILITY
Peter A. Sharp, 520 Utah St., San Francisco, Calif. 94110
Filed Apr. 12, 1976, Ser. No. 676,042
Int. Cl.² A63H 27/00
U.S. Cl. 46—74 R



1. An aerodynamic toy comprising in a unitary assembly an elongate air foil having two substantially identical surfaces, each surface having a convex portion and a concave portion extending from the convex portion in a smooth discontinuity-free configuration, the convex portion of each said surface terminating in an edge coterminous with the extremity of the concave portion of the other said surface so that there are two edges diametrically spaced which define a chord therebetween, right and left hand circular stabilizing end plates mounted coaxially to respective ends of said elongate air foil, a rib midway between said end plates rigid with said air foil, said surfaces converging inwardly from respective said end plates to said rib so as to form an angle less than 180° between said surfaces on opposite sides of said rib, said chord is substantially constant throughout the length of said elongated air foil, said plates having equal diameters greater than said chord and defining substantially planar surfaces to avoid turbulence thereover so that said toy flies when thrown so as to spin in a direction wherein the convex portion of one surface rotationally leads the concave portion of the other surface.

4,051,623
MOBILE RECONFIGURABLE ROBOT TOY
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed June 9, 1976, Ser. No. 694,316
Int. Cl.² A63H 11/10
U.S. Cl. 46—103



1. A toy to which a plurality of pressfittable parts may be attached to form various configurations comprising:

a body member having a plurality of openings therein;
a plurality of shafts, each one mounted for rotation in at least one of said plurality of openings;
means within said body member for driving each of said plurality shafts;
means attached to at least one of said shafts for removably press-fit connecting one of said press-fittable parts; and
first and second carriage members pivotally mounted to said body member, each said carriage member bearing means driven by at least one of said plurality of shafts for translating said body member.

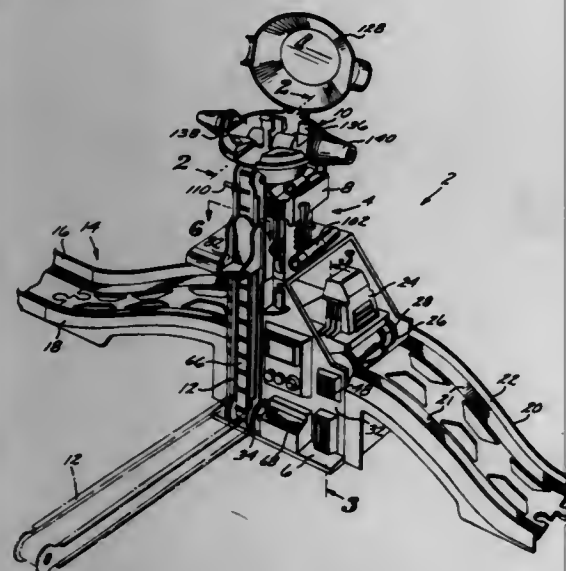
4,051,624

CONTROL TOWER AND TRACK TOY ASSEMBLY
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,139
Int. Cl.² A63H 19/24

U.S. Cl. 46—202

27 Claims



15. A combination toy assembly comprising:
a base member;
a toy vehicle capable of operative movement relative to and on the base member;
power means for energizing the toy vehicle;
means on the base member for restraining the forward locomotion of the vehicle and,
transmission means for coaxing with the energized vehicle as a source of power to provide an energy output from the vehicle while restrained including a first input power connection means having a hollow crown gear for interfacing with the vehicle and a second output power connection means for providing output power including a power shaft movable along its longitudinal axis relative to the crown gear to vary its rotational direction, the power shaft further includes a pinion gear having a smaller width than the inside diameter of the crown gear so that the pinion gear will not be engaged when positioned within the crown gear to thereby provide a neutral position for the power shaft.

4,051,625

PLANT STARTER

George M. Sawyer, 8801 Calico Ave., Garden Grove, Calif. 92641

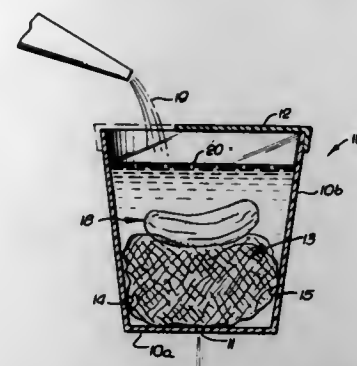
Continuation-in-part of Ser. No. 527,030, Nov. 25, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 657,927
Int. Cl.² A01C 1/00

U.S. Cl. 47—14

2 Claims

1. In apparatus for sprouting a seed and in combination with said seed in the form of peanut in a shell,
a self supporting, preformed container having a lower portion and a water outlet from said lower portion, the container having an upstanding side wall which is transparent, and
a resiliently and flexibly fibrous and water retaining mass of permeable, deformable, and porous yarn material defining interstices, the material removably and loosely placed into and located in the container to extend substantially

completely across the interior thereof, and supporting the seed above said outlet and in intimate contact with said mass, whereby water received in the container will wet said material before slowly draining through said outlet and some of the water will be retained in the interstices of said material to maintain wet the supported surface of the seed whereby roots will penetrate said interstices to be wetted by water retained in said interstices and to be supported by said material, the seed located centrally of said mass of yarn material and centrally of the container, and the seed seated in a depression formed in said material,



c. the container side wall closely surrounding the seed side-wardly thereof and extending above the level of the seed and material, the container formed by light passing transparent material, there being a removable cover on the container, the container having a bottom wall and said outlet being formed in said bottom wall, the transverse width of said bottom wall being approximately the same as the shell overall length, the seed extending lengthwise transversely of the container substantially parallel to the bottom wall.

4,051,626

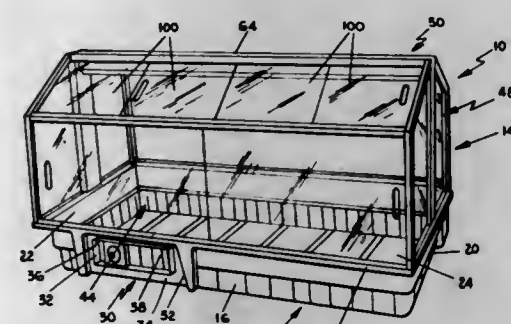
PORTABLE GREENHOUSE

Richard L. Trumley, Charlotte, and Randy W. Linn, Eaton Rapids, both of Mich., assignors to General Aluminum Products, Incorporated, Charlotte, Mich.

Filed May 21, 1976, Ser. No. 688,823
Int. Cl.² A01G 9/14

U.S. Cl. 47—17

16 Claims



1. A portable, self-contained greenhouse comprising:
a base pan adapted to receive a soil mixture;
a transparent enclosure supported on said base pan;
lighting means mounted to said enclosure for artificially stimulating the plant life growing in the soil mixture;
heating means positioned within said base pan and buried within the soil mixture for uniformly heating the soil mixture, said heating means including
a pair of superimposed heat spreading shields adapted to be placed within said base pan and buried within the soil mixture, said shields each having a plurality of spaced apertures arranged in vertically spaced pairs when said plates are superimposed;
a plurality of clips each extending through one of said pairs of vertically spaced apertures being generally U-shaped and including wire retaining tabs extending inwardly between the legs of the clip; and

a resistance type heating wire sandwiched between said shields and retained by said tabs between the legs of each of said clips in a serpentine manner, said wire contacting said heat shields at spaced points.

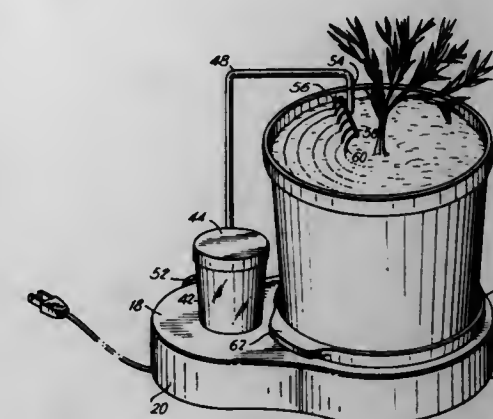
4,051,627

DEVICE FOR ROTATING AND WATERING POTTED PLANTS

Robert G. Schilling, Jr., 36-21 193rd St., Flushing, N.Y. 11358
Filed Feb. 6, 1976, Ser. No. 655,685

Int. Cl.² A47G 7/02; A01G 27/00
U.S. Cl. 47—39

9 Claims



1. In a device for automatically caring for at least one potted plant, rotary support means for supporting a potted plant, moving means operatively connected with said rotary support means for turning the latter, container means for containing liquid to be supplied to the potted plant, said container means having a flexible wall portion, feed-tube means communicating with said container means and extending therefrom to the potted plant for feeding liquid from said container means to the potted plant when liquid is discharged out of said container means, and at least one cam carried by said support means for movement along a predetermined path during rotary movement of said support means, said container means being situated in said path, and said cam cooperating with said container means for compressing the same for discharging liquid out of said container means through said feed-tube means to a potted plant supported by said support means

4,051,628

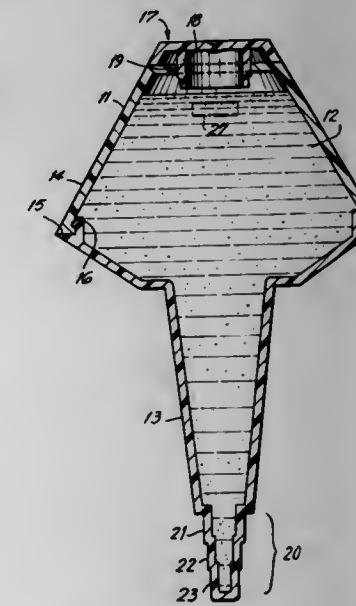
APPARATUS FOR THE IMPROVED DISPENSING OF PLANT NUTRIMENTS

Philip B. Knapp, Lynbrook, N.Y., and Harold Corey, Teaneck, N.J., assignors to Hortigro, Inc., Lynbrook, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,184
Int. Cl.² A01G 29/00

U.S. Cl. 47—48.5

10 Claims



1. Apparatus for transferring plant support reagents to a

watered plant growing medium, such as soil, over a protracted period at an essentially constant rate which is a function essentially solely of the quantity of water added to such medium, comprising a container generally sealed throughout the protracted period and including a reservoir portion and an elongate probe portion adapted to be embedded in said growing medium, said probe portion being in communication with said reservoir portion, means in said probe portion for defining an aperture of a desired size larger than capillary size for communicating the interior of said probe to said growing medium, said probe and reservoir portions containing means for transferring plant support reagents to the watered plant growing medium and comprising an integral diffusion mass of stable, solid, water insoluble but permeable hydrophilic gel essentially saturated with a solution of water soluble plant support reagents wherein the concentration of plant support reagents within all areas of the gel system substantially equalizes between waterings, said aperture providing contact of said diffusion mass and the water of the plant growing medium, said container and said diffusion mass remaining integral during the protracted period whereby essentially constant quantities of plant support reagents are released at each watering.

4,051,629

HYBRID SEED PRODUCTION

Walton C. Gallinat, Wabun, Mass., assignor to Research Corporation, New York, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,372
Int. Cl.² A01H 1/02

U.S. Cl. 47—58

13 Claims

1. A method for masking the expression of an undesirable recessive trait in the production of hybrid corn comprising the steps of:

selecting a corn which is homozygous for said trait;
incorporating into said corn a Tripsacum chromosome which has the dominant allele for said trait and which also has the capability of genetically interacting with said corn to produce, upon selfing, an endosperm phenotype sufficiently recognizable to determine whether said endosperm carries said chromosome; and
selfing said corn to increase said endosperm carrying said chromosome.

4,051,630

SOIL TREATMENT COMPOSITIONS

Richard Timothy Bishop, Durban, Natal, South Africa, assignor to Revertex (South Africa) (Proprietary) Limited, Jacobs, Natal, South Africa

Filed Dec. 5, 1975, Ser. No. 638,166

Claims priority, application South Africa, Dec. 30, 1947, 74/8240; July 4, 1975, 75/4296

Int. Cl.² E02D 3/12

U.S. Cl. 47—58

5 Claims

1. A method of treating sand or soil having a particle size in the range of about 10 microns to about 700 microns, including the step of applying thereto a composition including a water-insoluble copolymer selected from the group consisting of vinylacetate/vinyl ester of versatic acid, vinylacetate/2-ethylhexylacrylate, vinyl acetate/butyl acrylate, methyl methacrylate/2-ethylhexylacrylate, and styrene/2-ethylhexylacrylate in an amount to provide about 0.02 part of copolymer to 100 parts of sand or soil, whereby the individual particles or groups of particles of the sand or soil are rendered non-wetting and the particles retain the non-wetting properties even when they are not aggregated but are free flowing.

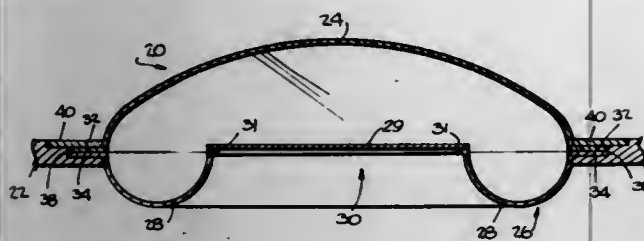
4,051,631

PLANTERS HAVING LIGHT-TRANSMITTING ENCLOSURES

John B. Jones, III, The Willows, Hardscable Road, North Sa-
lem, N.Y. 10560Filed Sept. 15, 1976, Ser. No. 723,585
Int. Cl.² A01G 9/02

U.S. Cl. 47-69

15 Claims



1. A planter comprising a dome-shaped portion which is at least in part light-transmitting a generally trough-shaped planting portion adapted to retain a planting medium therein below said dome-shaped portion, said planting portion having an inner and outer wall, said outer wall joined to said dome-shaped portion and at least a portion of which is substantially coextensive with the perimeter of said dome-shaped portion, there being an access opening defined by said inner wall of said planting portion, permitting access to both said dome-shaped and planting portions, and means for mounting said planter in a substantially horizontal position.

4,051,632

WINDOW GLASS MOUNTING MEANS FOR AUTOMOBILES

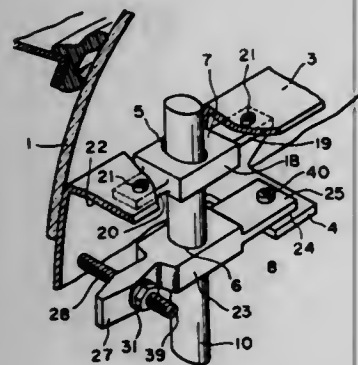
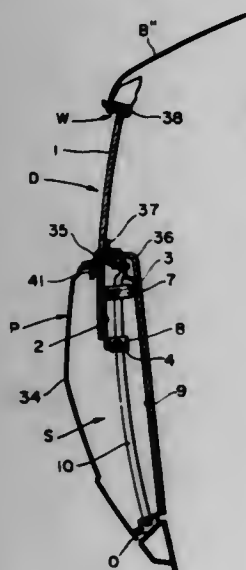
Ryuichi Fukumoto, Nagoya, and Toshiro Igarashi, Hoigan, both
of Japan, assignors to Aisin Seiki Kabushiki Kaisha and
Toyota Shatai Kabushiki Kaisha, both of Kariya, Japan

Filed June 9, 1976, Ser. No. 694,446

Claims priority, application Japan, June 21, 1975, 50-76161
Int. Cl.² E05F 11/38

U.S. Cl. 49-348

8 Claims



1. In an automobile including panel means which has at least

one window opening, a window glass mounted in said panel means for movement substantially in vertical direction between a closed position wherein the window glass closes the window opening and an open position wherein the window opening is fully opened, and window glass actuating means for actuating the window glass to move it between said open and closed positions, the improvement comprising window glass mounting means including window glass support bracket means secured to the window glass, substantially vertically extending guide rail means stationarily disposed in said panel means, guide follower means slidably engaged with the guide rail means, means for connecting said guide follower means with said bracket means, said connecting means including pivot connection means at one point of said guide follower means for allowing a swinging movement of the guide follower means in substantially horizontal plane and adjustable connection means at another point apart from said one point of said guide follower means.

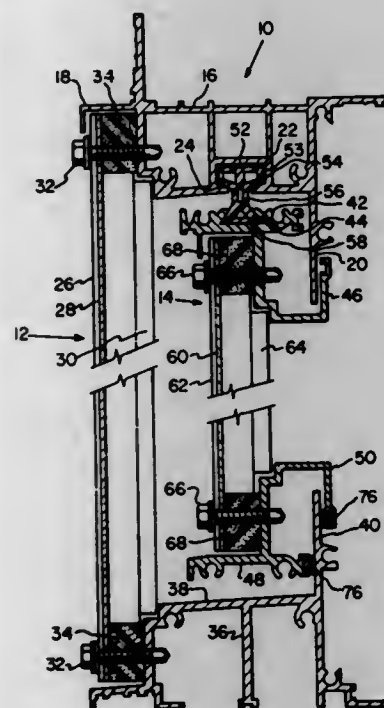
4,051,633

TOP HUNG SLIDING WINDOW ASSEMBLY

William P. Voegelé, Jr., 8308 Post Road, Allison Park, Pa.
15101Filed June 1, 1976, Ser. No. 691,825
Int. Cl.² E05D 13/02

U.S. Cl. 49-411

12 Claims



1. A sliding window assembly comprising:

- a metal frame made up of a head member, a sill member and two side members, said head member including a channel extending therealong on the inside of the frame and defined in part by two downwardly sloping planar bottom surfaces which terminate in spaced apart relationship to define an opening into the channel;
- a stationary panel including a glazing and secured to a first part of the frame;
- a sliding panel including glazing and secured to a slider head; and
- a rigid, plastic key secured at one end to a top of the slider head and positioned at an opposing end in the head member channel, said opposing end defined in part by sloping planar surfaces in mating engagement with the sloping bottom surfaces of the channel so as to permit the sliding panel to slidably move between the first part of the frame and a remaining part thereof.

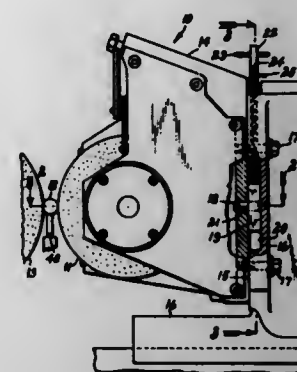
4,051,634

REGULATING WHEEL PIVOT ADJUSTING DEVICE

Robert Clifford Fisher, Milford, Ohio, assignor to Cincinnati
Milacron, Inc., Cincinnati, OhioFiled Feb. 6, 1976, Ser. No. 655,732
Int. Cl.² B24B 5/30

U.S. Cl. 51-103 R

3 Claims



1. In a centerless grinding machine of the type having a base; a grinding wheelhead; a regulating wheelhead adapted to drive and support a workpiece in contact with the grinding wheel, and; a slide supporting one of the grinding and regulating wheelheads and moveable on said base along a feed axis for relative movement of the wheelheads in a grinding operation, wherein said regulating wheelhead is adapted to pivot about a joint so as to pivot said regulating wheelhead in a plane transverse to said feed axis; an improved pivot adjusting device comprising:

means to move said pivot joint along said transverse plane.

4,051,635

APPARATUS FOR FINISHING SHAPED ARTICLES

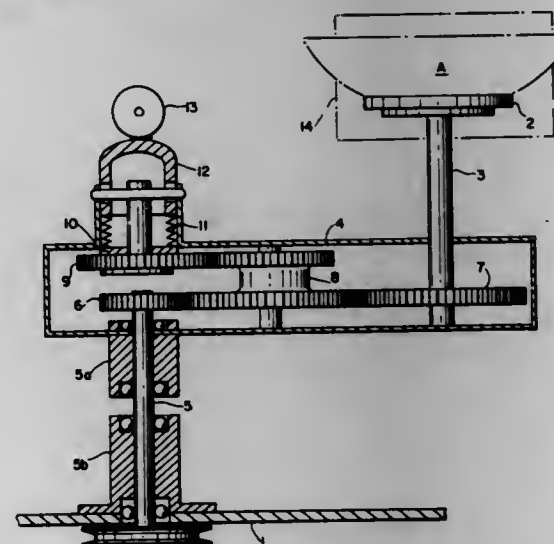
Gosta Arvid Valdemar Ohra, Gemla, Sweden, assignor to AB
Casco, Stockholm, Sweden

Filed June 25, 1976, Ser. No. 699,930

Claims priority, application Sweden, June 25, 1975, 7507292
Int. Cl.² B24B 5/04, 9/00

U.S. Cl. 51-108 R

7 Claims



1. In the known apparatus for finishing shaped articles and the like which includes the combination of a working table, a finishing tool and movable mounting means for shaped articles associated with said table for moving a shaped article toward and away from said finishing tool, the improvement comprising a movable mounting means that includes

- a pivoting arm, having an inner end and an outer end,
- a driving shaft extending from the working table to the inner end of said pivoting arm
- an article holding means supported on a rotary shaft, said rotary shaft extending from the outer end of said pivoting arm,
- means for driving said driving shaft,

- transmission means interconnecting said driving shaft and said rotary shaft,
- braking means attached to the pivoting arm,
- means for periodically moving said braking means into contact with said transmission means so as to induce a reactive force in the pivoting arm which will bring the article into contact with the finishing tool.

4,051,636

METHOD AND APPARATUS FOR GRINDING TURBINE AND COMPRESSOR BLADES TO DIMENSION

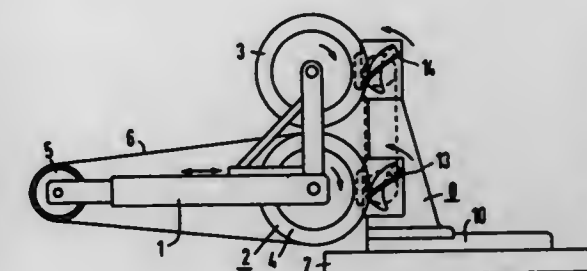
Karlheinz Heine, Wasel, Germany, assignor to Siemens Aktien-
gesellschaft, Munich, Germany

Filed Apr. 19, 1976, Ser. No. 677,968

Claims priority, application Germany, Apr. 30, 1975, 2519190
Int. Cl.² B24B 21/16, 41/00

U.S. Cl. 51-145 R

5 Claims



1. A method for grinding turbine and compressor blades to dimension comprising:

- disposing, on a stationary base, a copier roller and grinding belt of equal diameter one above the other with their axes parallel;
 - supporting a model blade and a work piece blade in a work piece holder one above the other with their axes parallel to each other, said model blade and work piece blade being supported therein for simultaneous rotation about their axes;
 - supporting said work piece holder on an air cushion so that it is freely movable in any direction in the horizontal plane; and
 - bringing said model and work piece in contact with said copier roller and grinding belt.
3. Apparatus for grinding blades for turbines and compressors to dimension comprising:
- A stationary tool holder;
 - a belt grinder rotatably disposed on said stationary tool holder;
 - a copier roller of the same diameter as said belt grinder rotatably disposed on said tool holder so as to be vertically spaced from said belt grinder with its axis parallel to the axis of said belt grinder;
 - a guide plate;
 - a work piece holder having a base plate disposed atop said guide plate, said work piece holder including means for supporting a model blade and a work piece such that they are simultaneously rotatable therein with their longitudinal axes parallel one on top of the other; and
 - means for establishing an air cushion between said guide plate and the base plate of said work piece holder whereby said work piece holder can be easily moved in any direction in the horizontal plane.

4,051,637

CYLINDER INTERNAL GRINDER

Norikazu Takeishi, 453, Nanjo, Nirayama-cho, Tagata, Shizu-
oka, Japan

Filed Mar. 16, 1977, Ser. No. 777,899

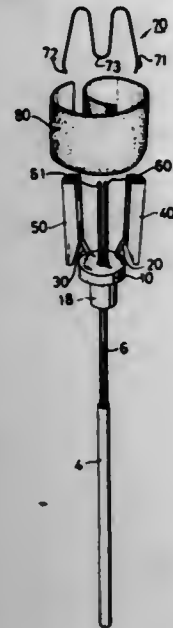
Int. Cl.² B24D 9/02

U.S. Cl. 51-364

5 Claims

1. A cylinder internal grinder comprising a shaft provided

with rotary force at one end thereof, a flexible wire secured to the other end of said shaft, a base secured to said flexible wire, a pair of holding elements erected centrally of said base in opposition to each other, spring means erected at the opposed edges of said base, pressing elements secured to the ends of said spring means and arranged parallel to the axis of said shaft, a



grinding member having its one end secured to said holding elements and arranged to wrap the pressing elements in the direction opposite to the direction of rotation of said shaft, and a substantially M-shaped spring having its pressing portions inserted in the insides of said pressing elements and having its fixing portion fixed to an external edge of said grinding member.

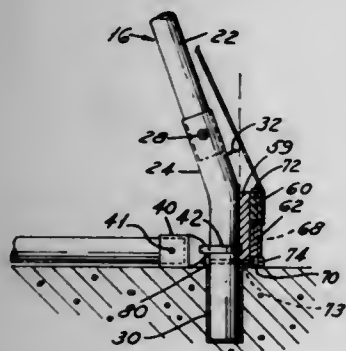
4,051,638

REMOVABLE ENCLOSURE FOR A SWIMMING POOL OR THE LIKE

Robert J. Heintz, 1828 Woodboro, Royal Oak, Mich. 48067
Filed Aug. 5, 1976, Ser. No. 712,022
Int. Cl.² E04B 1/347

U.S. Cl. 52—63

2 Claims



1. An enclosure for a swimming pool or the like, comprising a cover, a frame for supporting said cover, said frame having a plurality of laterally spaced elongated members anchored at their lower end portions to a base along the side of the enclosure, a baseboard extending along the side of the enclosure on the outer side of the lower end portions of said elongated members, and means anchoring said cover at the side of the enclosure comprising upper and lower gripping boards gripping an edge portion of said cover therebetween, said gripper boards being elongated members extending adjacent the outer side of said baseboard and having complementary tongue and groove formations along their adjacent edges gripping said edge portion of said cover, means securing said gripper boards together comprising assembled nuts and bolts, and fasteners passing through one of said gripper boards and passing through said baseboard and connected to the lower end por-

tion of certain of said elongated members to secure the gripper boards and baseboard to said frame.

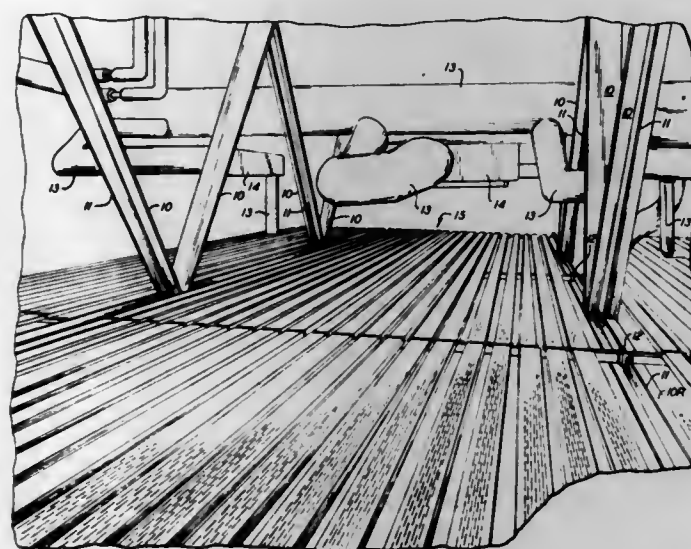
4,051,639

REMOVABLE DECK FOR A BUILDING STRUCTURE INTERSTITIAL SPACE

Jack P. Lombardi, Manlius; Francis T. Lombardi, and Tarky J. Lombardi, Jr., both of Syracuse, all of N.Y., assignors to Syracuse Tank & Manufacturing Co., Inc., Syracuse, N.Y.
Filed Aug. 26, 1976, Ser. No. 718,022
Int. Cl.² E04B 1/343

U.S. Cl. 52—64

3 Claims



1. A removable deck for an interstitial space in a multi-storied building between the ceiling of one story and the floor of the story immediately thereabove, which space contains two spaced and parallel rows of building trusses, each row having at the same level at least one row of horizontally extending truss portions; comprising: a plurality of joist-saddles secured to the horizontal truss portions at spaced intervals therealong, the saddles of one row being transversely precisely opposite to the saddles of the other row of trusses, each saddle having an upwardly open and transversely projecting and opening socket position adapted to contain therein the end portion of a joist member, each joist being equal in length to the space between the horizontal truss portions of the two rows and being generally channel-shaped in cross section, each joist having a flat horizontally-extending upper surface and an upwardly projecting flange therealong, a strip of rubber-like material extending along each joist top surface adjacent the joist flange, and a plurality of generally inverted-channel-shaped deck members of chosen equal lengths extending across a plurality of joists from the center of one joist upper surface to the center of another joist upper surface, each deck member having an upper web surface slitted to provide air circulation therethrough and traction for workers walking thereon, each deck member having vertically extending side flange portions for resting on the joist top surfaces, each deck member having slots in the side flanges thereof extending from the side flange bottoms upward at least a distance equal to the distance that the upwardly projecting flanges of the joists extend above the rubber like strip on the joist top surfaces, whereby the joist ends may be dropped into the sockets of the saddles and lifted therefrom and the deck members placed across a plurality of joists with the slots of the deck side flanges fitted over the joist upwardly projecting flanges and lifted therefrom, while the saddles remain secured to the horizontal truss portions.

4,051,640

COMPOSITE STRUCTURES

Rene F. Vincens, 92a Route de Geneve, 1028 Preverengue, Switzerland

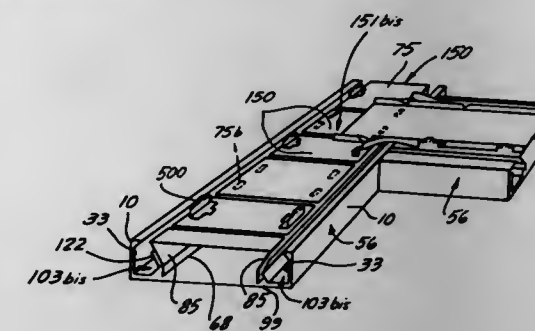
Continuation-in-part of Ser. No. 589,880, June 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 385,804, Aug. 6, 1973, abandoned. This application Jan. 26, 1976, Ser. No. 652,097

Claims priority, application France, Aug. 8, 1972, 72.28635; Jan. 26, 1973, 73.02920

Int. Cl.² E04B 5/48; H02G 3/00

U.S. Cl. 52—220

9 Claims



1. A composite structure, comprising:

- a. an elongate supporting member having a generally U-shaped cross-sectional configuration, the arms of which provide two longitudinal flanks of said member and said U-shaped configuration providing a web between said arms, at least part of at least one of said flanks having at least one longitudinal recess of a generally C-shaped cross-sectional configuration; and
- b. a plurality of bridge members disposed to stiffen the elongate supporting member, each bridge member comprising a rigid deck, at least two rigid piers, one at each end of said deck, and sharp-edged spur means on at least one of said piers engageable with the supporting member, said bridge members being spaced apart along the elongate supporting member, each bridge member having its deck extending between said flanks and spaced from said web; at least one of said members being resilient to enable the bridge members to be clamped transversely in the supporting member with said spur means engaging said flanks, to resist any wrenching and longitudinal displacement of the bridge members.

4,051,641

PANELIZED STRUCTURAL SYSTEM

James I. Elliott, Arcadia Manor, Upperco, Md. 21155
Filed Aug. 9, 1973, Ser. No. 387,044

Int. Cl.² E04B 7/02, 1/30

U.S. Cl. 52—262

1 Claim



1. In a building having a roof, sidewalls including a plurality of pivotally insertable discrete panels, and foundation structure, the improvement comprising: a first plurality of said panels, each having parallel, rectangular-shape exterior and interior faces with a midbody therebetween having first and second lateral planar edge portions parallel-inclined in plan view at an angle to said exterior and interior faces, forming a parallelogram in shape, the exterior faces of all said panels having a lateral extension beyond the midbodies thereof with notch structure vertically along the edge of each lateral extension, the interior faces of all said panels having a lateral extension beyond the midbodies thereof, each of said lateral extensions respectively abutting a next adjacent panel and spacing

apart all said midbodies on assembly, with the notch structure interfitting; means for fastening the first plurality of panels laterally together with the first lateral planar edge portion of one panel in complementary overlap with the second lateral planar edge portion of a panel next adjacent thereto, means for detachably securing each of the first plurality of panels to the building including: a plurality of cornerposts connecting the roof and the foundation, a top plate extending between the cornerposts at each side of the building, the top plate comprising an angle having perpendicular first and second planar legs, the first leg thereof extending outward and the second leg extending downward from the inner edge of the first leg, a floor plate parallel-spaced from the top plate along each side of the building, the floor plate comprising an angle having perpendicular first and second planar legs, the first leg thereof extending outward and the second leg extending upward from the inner edge of the first leg; on assembly, said exterior face of each panel extending upward covering the outer edge of the top plate and downward covering the outer edge of the floor plate, said interior face of each panel extending between the lower edge of the second leg of the top plate and the upper edge of the second leg of the floor plate, said midbody extending between the first leg of the top plate and the first leg of the floor plate; the means for detachably securing the panels to the building further including at least one fixed pin upwardly projecting from the first leg of the floor plate, at least one of said panel midbodies having a slot in the bottom edge thereof extending outwardly through a said lateral planar parallel-inclined edge in position for engaging said fixed pin and guiding said panel and securing the bottom thereof in place during assembly, means for detachably affixing each panel of said first plurality of panels to the top plate, and a second plurality of panels, each of said second plurality of panels having a first lateral edge with a portion substantially square in plan view for abutting a said cornerpost and a second lateral edge having struccomplementary to a lateral edge structure of a panel of the first plurality of panels.

4,051,642

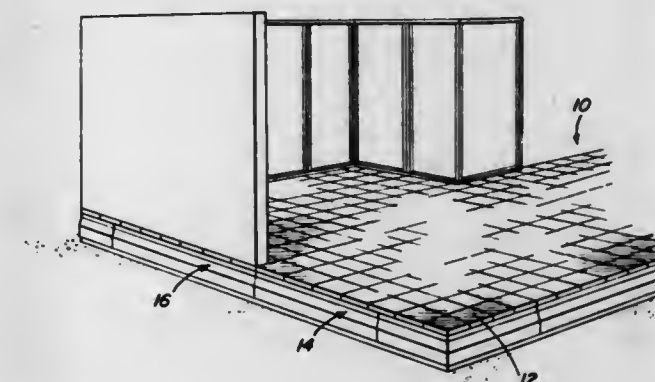
MODULE BUILDING FOUNDATION AND FLOOR SYSTEM

John H. Terry, 505 Park Terrace, Pine Bluff, Ark. 71601
Filed Sept. 30, 1975, Ser. No. 618,552

Int. Cl.² E02D 27/00; E04B 1/02

U.S. Cl. 52—293

13 Claims



1. In a building construction, a foundation assembly comprising a precast ground bearing pad having a peripheral rim portion and upstanding ribs spaced inwardly therefrom, a separate wall section, locking means securing the wall section to said peripheral rim portion, a plurality of floor surface panels locked to the wall section in spaced relation to the ground bearing pad and spacer means engageable with the upstanding ribs of the ground bearing pad for supporting and holding said floor surface panels in abutting relation to each other spaced from the ground bearing pad.

4,051,643

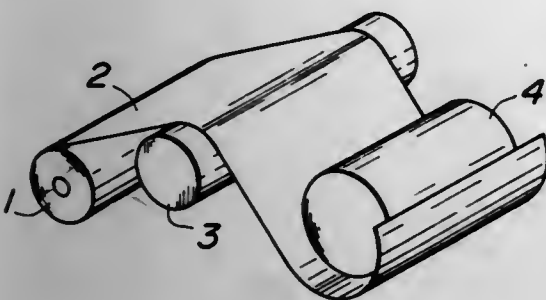
METHOD OF PACKING ARTICLES WITH HEAT SHRINKABLE FILMS

Akio Saito, Tokorozawa, Japan, assignor to Showa Setai Kogyo Kaisha Limited, Japan

Filed Oct. 12, 1976, Ser. No. 731,820

Claims priority, application Japan, Oct. 23, 1975, 50-126912 Int. Cl.² B65B 53/02

U.S. Cl. 53—30 S



1. A method of packing an article with a heat shrinkable film comprising the steps of moving the heat shrinkable film, contacting the film against a heating member heated to a predetermined temperature sufficient to cause the film to shrink, and then immediately wrapping under a predetermined tension the heated film about an article to be packed having a width smaller than that of the heat shrinkable film with the side edges of the film protruded beyond the opposite ends of said article, and causing said film to shrink, thus tightly packing the article not only on the peripheral surface but also on the end surface of the article by the heat shrunk film.

4,051,644

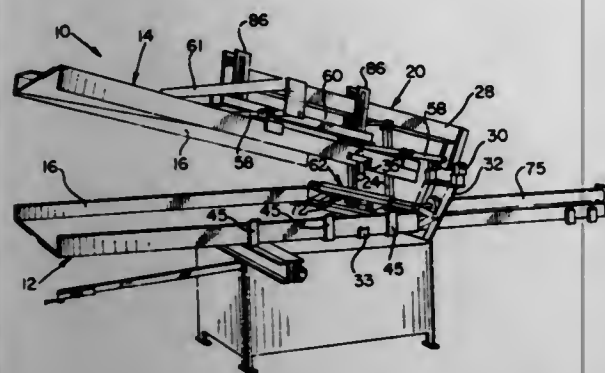
APPARATUS FOR PRODUCING MATTRESSES

Richard H. Elde, Minneapolis, and Gerald A. Golembek, Lake Elmo, both of Minn., assignors to The United States Bedding Company, St. Paul, Minn.

Filed Oct. 4, 1976, Ser. No. 729,386

Int. Cl.² B65B 63/02

U.S. Cl. 53—125



1. In an apparatus for filling a flexible cover with a resilient filler for the formation of mattresses or the like, said apparatus including a hopper defining a filler receiving space and an open end, said cover being dimensioned for attachment to the hopper whereby the interior of the cover communicates with said open end of the hopper, and means for driving said filler into said cover, the improvement comprising adhesive dispensing means positioned on said hopper, at least one surface of the filler being located adjacent said dispensing means when the filler is in the hopper, and means for operating said dispensing means during movement of the filler into the cover whereby adhesive is deposited on the filler surface for contact with an opposed cover surface whereby the cover is adhered to the filler.

4,051,645

COMESTIBLE PACKAGING APPARATUS

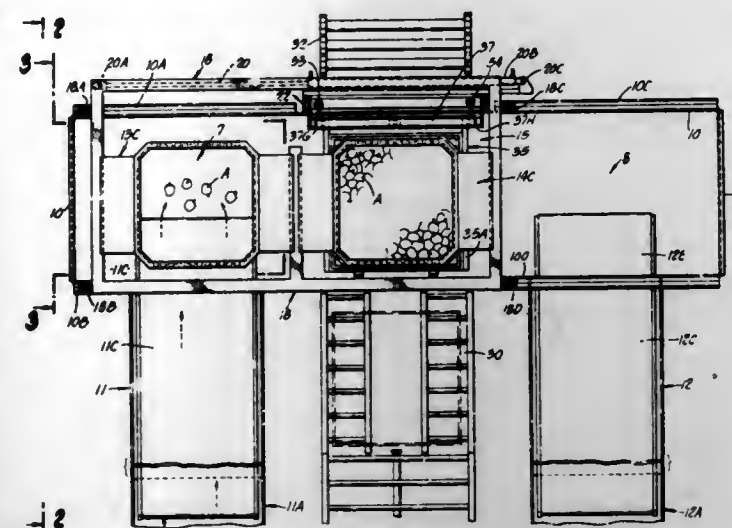
Aaron James Warkentin, 13551 View Drive, Orange Cove, Calif. 93636

Filed Oct. 26, 1976, Ser. No. 735,155

Int. Cl.² B65B 5/06

U.S. Cl. 53—248

4 Claims



1. In a system of the character described for packaging comestibles in a container, the combination comprising a first comestible receiving station, a second comestible receiving station, a comestible loading zone between said receiving stations, a first and a second open-bottom cage, a horizontally movable carrier for shifting one of said cages from one of said stations to said loading zone and the other one of said cages from said loading zone to the other of said stations and vice versa, means at each of said station for loading comestibles into a corresponding one of said cages, said cages being porous and having an open bottom and each of said stations being underwater with said loading means functioning to introduce the comestibles into the water below a corresponding cage such that the comestibles may float upwardly into the cage, means at the loading zone for positioning a container below the expected arrival point of a comestible filled cage, means at said zone for elevating said container and said cage simultaneously out of the water such that the comestibles gravitate into the container, a container feed conveyor and a container discharge conveyor, said elevated means functioning to elevate the comestible filled container to an elevation which is substantially the same as the elevation of said feed and discharge conveyors.

4,051,646

MACHINE FOR SEALING PACKAGES

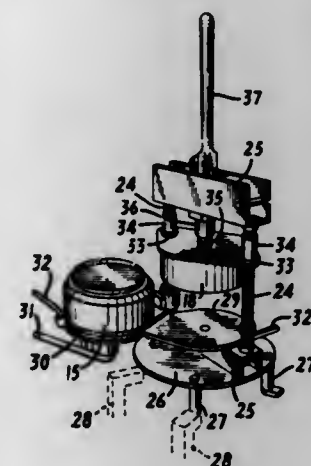
Mario Ursic, Rua Amador Bueno, 142 Sao Paulo, Brazil

Filed Feb. 4, 1976, Ser. No. 655,101

Int. Cl.² B65B 7/28, 67/00

U.S. Cl. 53—366

2 Claims



1. A machine for sealing packages, comprising: a frame comprising a base, a pair of generally parallel columns extending upwardly from the base, and a member

4,051,648

ENGINE SHROUD FOR ROTARY LAWN MOWER

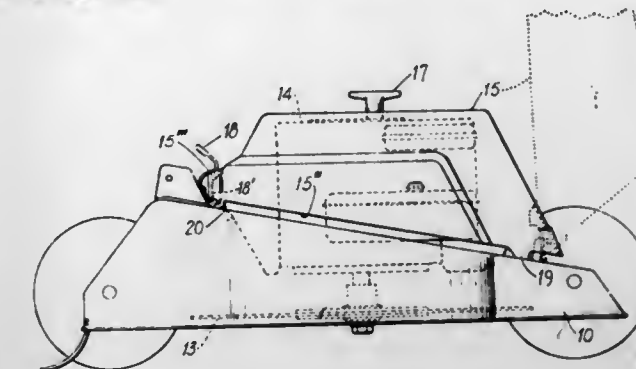
Charles E. Uhlinger, Des Moines, and Clair D. Splittstoesser, Ankeny, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.

Filed May 7, 1976, Ser. No. 684,387

Int. Cl.² A01D 55/18

U.S. Cl. 56—255

1 Claim



spanning between the columns at a position along the columns remote from the base for maintaining the columns generally parallel;
a sealing assembly for sealing a package, said sealing assembly comprising an upper die, means mounting the upper die between said pair of columns for traveling along the length thereof, a hollow lower die having an opening extending therethrough in a direction along the extent of said columns for receiving a package to be sealed, means mounting said lower die to pivot between a position between said pair of columns and underneath said upper die, thereby to permit the upper die to travel down said columns to engage said lower die and seal the package received within the opening extending through said lower die, and a position away from said columns and clear of said upper die, and means operable for displacing said upper die to travel up and down along said columns; and an extractor for extracting a sealed package from said lower die, said extractor comprising a plate-like member normally positioned beneath said lower die when said lower die is at the position away from said columns, said plate-like member being dimensioned to fit through the opening extending through said lower die, and means operable for raising said plate-like member to advance into the opening extending through said lower die thereby to extract a sealed package retained within said lower die.

1. In a rotary mower having a deck, a grass catching blade below the deck, and power means on the deck for driving the blade, noise reduction means for said mower, said noise reduction means comprising a shroud over said power means, said shroud enclosing said power means except for a top air opening in the same and a marginal air opening about the same between the shroud and deck, said shroud being hinged at one end thereof on said deck, and latch means on said deck at the other end of said shroud to latch the same closed with respect to said power means, said power means comprising a gas engine, said top air opening being formed in said shroud opposite the air intake of said engine, said engine having an engine start pull cord handle, said handle being accessible through said top opening, and said engine having a below deck engine exhaust, said engine exhaust comprising an engine exhaust pipe, said pipe extending from said engine to below said deck, and an engine muffler on the outer terminal end of said pipe below said deck.

4,051,647

ROTARY MOWER

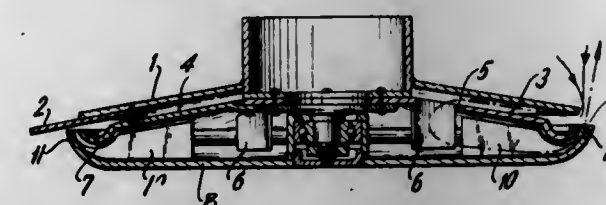
Horst W. Geier, 18 Hawley Terrace, Yonkers, N.Y. 10606

Filed Jan. 21, 1976, Ser. No. 650,843

Int. Cl.² A01D 53/08

U.S. Cl. 56—13.4

4 Claims



1. In a rotary mower, the combination comprising:
a mower body rotatable about a generally vertical axis, including a generally vertical cylinder in the center thereof,
a collar portion fixed to the bottom of said cylinder,
a blower disc mounted underneath the collar section at a predetermined distance therefrom to form an air intake gap and having a selected number of knife blades mounted thereto, said knife blades being rotatable about their mounting upon striking an object and said mountings being protected by the circular configuration of the housing formed between the collar section and the knife supporting blower disc, and,
a freely rotatable protective saucer of a slightly larger diameter than the collar section and blower disc, said saucer being mounted to the mower cylinder at the lower end thereof, the rim of said saucer being substantially at the same level as the blower disc periphery and forming an annular exhaust gap with said disc of a smaller distance than the air intake gap to increase the exhaust air velocity in an upward direction forming a protective air stream about the mower.

4,051,649

FRUIT HARVESTING MACHINE

Roger Clary, Loudun, France, assignor to Howard Machinery Limited, Bury St. Edmunds, England

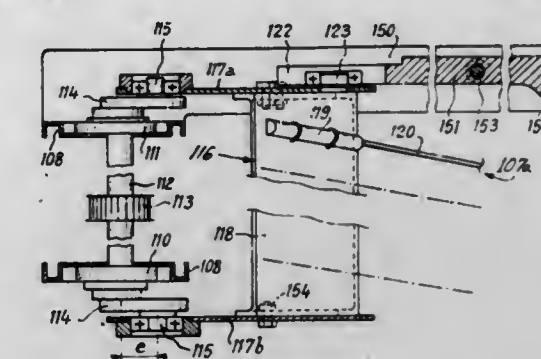
Filed Oct. 7, 1975, Ser. No. 620,414

Claims priority, application France, Oct. 8, 1974, 74.33868; Aug. 25, 1975, 75.26175

Int. Cl.² A01D 46/00

U.S. Cl. 56—330

10 Claims



1. A machine for gathering fruit from plants comprising, in combination:
a wheeled chassis;
a frame on said chassis;
a tunnel defined by the frame and extending longitudinally of the machine;
closure means mounted on the lower part of the frame and closing the base of the tunnel, the closure means being movable away from the longitudinal axis of the machine to allow the plants to pass through the tunnel;

at least one group of flexible beater fingers disposed at each side of the longitudinal axis of the machine; and
 a drive assembly for driving each group of beater fingers in a generally elliptical movement, the drive assembly comprising,
 drive means,
 an eccentric driven by the drive means,
 a connecting rod of which one end is operatively connected to the eccentric,
 a slide block operatively connected to the other end of the connecting rod,
 and carrier means attached to the connecting rod and carrying the beater fingers.

4,051,650

YARN TEXTURIZING MACHINE

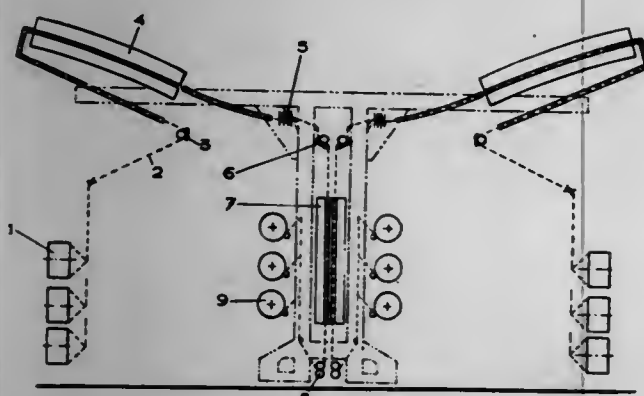
Jean Gleyze, Jean-Claude Dupenble, and Roger Forin, Roanne, all of France, assignors to ASA S.A., Roanne, France
 Filed June 8, 1976, Ser. No. 694,112

Claims priority, application France, June 17, 1975, 75.19497;
 Apr. 6, 1976, 76.10199

Int. Cl.² D02G 1/02

U.S. Cl. 57—34 HS

8 Claims



1. A yarn texturizing machine comprising a plurality of treatment positions, each said position comprising a substantially T-shaped framework, having a vertical portion and a horizontal portion; and, in operational sequence, a yarn supply device, a first yarn feeder, a yarn heating device, a cooling device, a first yarn feeder, a false twist spindle, a second yarn feeder and a wind-up device, the false twist spindle, the second feeder and the wind-up device being mounted on the vertical portion of the T-shaped framework and the first feeder, the heating device and the cooling zone being on the horizontal portion, the yarn supply device being mounted at a location below the free end of the horizontal portion, effective to define with the vertical portion, a zone through which the operator can pass and have easy access to the essential parts of the machine.

4,051,651

METHOD AND APPARATUS FOR WETTING THREAD IN A DOUBLE TWIST TWISTING SPINDLE

Antoine Wahlen, and Klaus-Detlef Otten, both of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Feb. 4, 1976, Ser. No. 655,282

Claims priority, application Germany, Feb. 8, 1975, 2505376;
 Dec. 23, 1975, 2558474

Int. Cl.² D01H 13/30

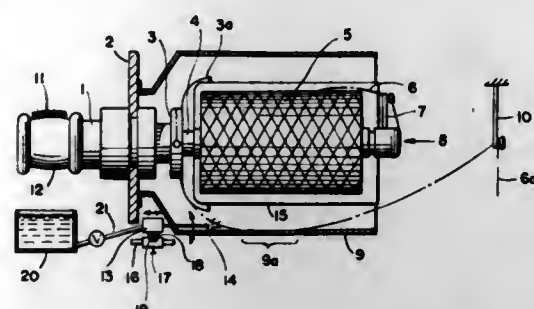
U.S. Cl. 57—35

29 Claims

1. In the double twist twisting of a thread drawn from a delivery bobbin, passed through a hollow twist spindle and then directed outwardly into a balloon pattern, the improved method for wetting said thread with a liquid as a treating agent which comprises:

conducting the thread in contact with a balloon limiting guide surface as a wettable surface from which the liquid

is applied to the thread being conducted in said balloon pattern; and
 supplying said liquid in a discontinuous jet or spray under



regulated pressure impulses for application onto the wettable balloon limiting guide surface contacted by the thread and in a measured amount providing a predetermined liquid takeup by the thread.

4,051,652

METHOD AND APPARATUS FOR PACKAGING YARN PACKAGES DOFFED FROM A YARN PRODUCING MACHINE

Satoru Hirano, Kyoto; Atsushi Kubota, Kobe; Mitsuru Yoshida, Kawanishi; Junzi Mizuno, Sabae, and Nobutaka Miyamoto, Sakai, all of Japan, assignors to Kanebo, Limited, Japan

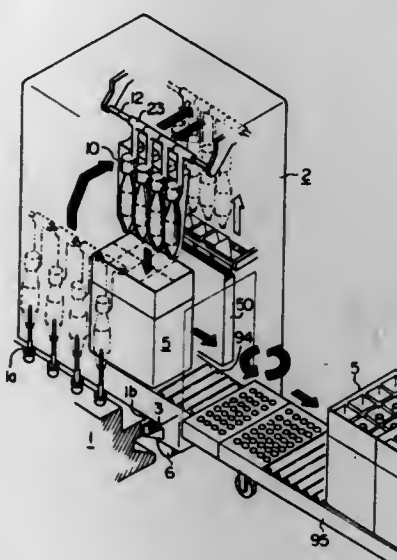
Filed Feb. 7, 1977, Ser. No. 766,146

Claims priority, application Japan, Feb. 9, 1976, 51-13770;
 Feb. 9, 1976, 51-13771; Apr. 27, 1976, 51-48815; Apr. 30, 1976, 51-50159; May 25, 1976, 51-60991

Int. Cl.² D01H 9/00

U.S. Cl. 57—52

16 Claims



1. Method for packaging in a carton full size yarn packages produced by a yarn producing machine provided with a plurality of yarn producing units, each unit provided with a spindle for supporting a bobbin for forming said yarn package, said spindles aligned along a longitudinal direction of said yarn producing machine, comprising in combination of doffing said full size yarn packages by means of a plurality of bobbin chucks:

a first step of positioning said carton at a predetermined position adjacent to a group of said spindles whereon full size yarn packages are supported;

a second step of simultaneously doffing a plurality of said full size yarn packages by said bobbin chucks from respective spindles of said group;

a third step of simultaneously displacing said doffed yarn packages supported by the respective bobbin chucks from the respective positions for carrying out said doffing operation to respective positions removed from said group of spindles;

a fourth step of simultaneously wrapping each of the doffed yarn packages supported by the corresponding bobbin

chuck with a film bag, while positioning said bobbin chucks at said removed positions;
 a fifth step of displacing said bobbin chucks from said removed positions toward the respective releasing positions right above a receiving space in said carton and depositing said wrapped yarn packages into said carton;
 an intermediate step of changing a pitch between two adjacent bobbin chucks of said group of bobbin chucks from a spindle pitch between two adjacent spindles of said spindle alignment to a predetermined distance selected for packaging, just before carrying out said fourth step operation or said fifth step operation;
 a sixth step of releasing the grip of said bobbin chucks and displacing said bobbin chucks from said releasing positions upward to the respective standby positions of said bobbin chucks;
 a seventh step of discharging said carton filled with said wrapped yarn packages from said predetermined position; said operations from said first step to said seventh step are successively carried out until the doffing operation of full sized yarn packages is completely carried out with respect to all spindles of a spindle alignment of said yarn producing machine.

7. Apparatus for packaging in a carton full size yarn packages produced by a yarn producing machine provided with a plurality of yarn producing units, each unit provided with a spindle for supporting a bobbin for forming a yarn package, said spindles aligned along a longitudinal direction of said yarn producing machine, comprising in combination,

means for correctly positioning said apparatus at predetermined working positions for carrying out each doffing operation by said apparatus,

a group of bobbin chucks for doffing full size yarn packages from a group of said spindles facing said group of bobbin chucks respectively,

means for supporting said bobbin chucks in a condition whereat they are capable of changing a pitch between each two adjacent bobbin chucks of said group of bobbin chucks,

means for separately wrapping said full size yarn packages, each supported by a corresponding bobbin chuck, in individual film bags respectively,

means for temporarily positioning said carton at a position for simultaneously receiving wrapped yarn packages,

means for displacing said supporting means from a position for carrying out said doffing operation to several working positions of said apparatus, which involve a position for simultaneously, individually wrapping each said doffed yarn package supported by a corresponding bobbin chuck in said film bag, a position for depositing said wrapped yarn package in a predetermined space in said carton and a position for maintaining said bobbin chucks in a standby condition thereof,

said supporting means provided with means for changing a pitch between each two adjacent bobbin chucks from a spindle pitch of said spindle alignment to a pitch for packaging.

4,051,653

APPARATUS FOR SPINNING TEXTILE FIBERS

Anton Mitteregger, Linz, Austria, assignor to Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G. Textilmaschinenfabrik u. Stahlbau, Linz, Austria

Filed Jan. 7, 1977, Ser. No. 757,588

Claims priority, application Austria, Feb. 2, 1976, 714/76

Int. Cl.² D01H 1/12

U.S. Cl. 57—58.89

3 Claims

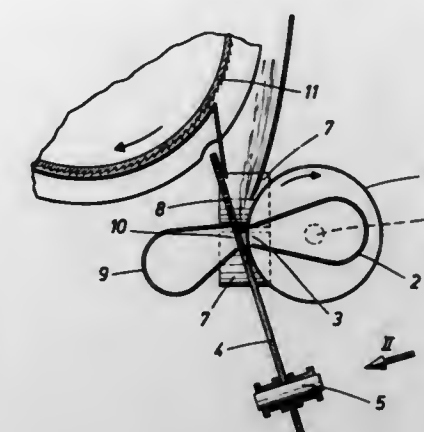
1. Apparatus for spinning textile fibers, which comprises a suction drum having an air-permeable shell and rotatable about a first axis,

a rotary disc which is rotatable about a second axis, which crosses said first axis and is spaced therefrom by a distance which is equal to one to two diameters of said drum, said rotary disc having a generally flat side face that is almost

tangential to said shell and defines a tapering gap therewith,

suction means disposed in said drum and defining on said shell an air-permeable suction zone which adjoins said tapering gap,

means for supplying flying fibers into said gap into contact with said suction zone and said side face,



drive means for rotating said drum and disc in such a manner that fibers in contact with said drum and disc are twisted to form a thread, and

thread-withdrawing means for withdrawing said thread in a direction which is approximately parallel to said first axis while holding said thread against rotation, said drive means being operable to move said disc toward said thread-withdrawing means adjacent to said gap.

4,051,654

OPEN END SPINNING MACHINE

Gerhard Bartling, Burgstetten, Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

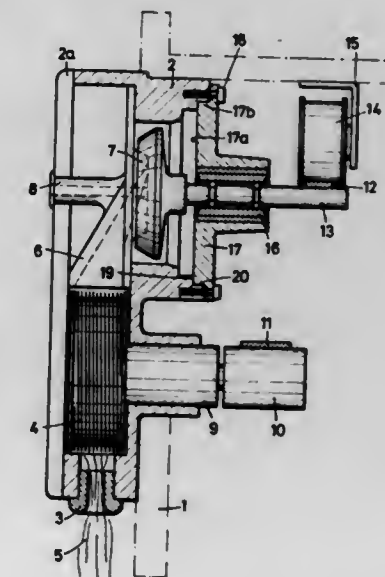
Filed Aug. 27, 1976, Ser. No. 718,373

Claims priority, application Germany, Sept. 3, 1975, 2539088

Int. Cl.² D01H 1/12

U.S. Cl. 57—58.89

9 Claims



1. An open end spinning machine comprising a frame, a plurality of spinning units disposed in side-by-side juxtaposition on said frame, each spinning unit comprising a housing and having at least a spinning rotor mounted at the end of a shaft journaled in a shaft bearing, means for feeding fibers to said rotor, and means for withdrawing the yarn formed in said rotor, said machine having drive means for driving the shaft of each of the rotors in each of said spinning units and the guide means for mounting said drive means on said frame, said housing comprising a first portion accommodating said spinning rotor, and a second portion in which said bearing for said rotor shaft is fixedly mounted, said first and second housing portions being separably secured together and having cooperatively

engaging contact surfaces and counter-contact surfaces respectively permitting exchange of said rotor and rotor shaft and being effective to secure said second portion against axial and radial movement with respect to said first portion, said guide means being adjustable along the axis of said rotor shaft to permit engagement of said drive means and said rotor shaft irrespective of the shaft bearing employed.

4,051,655

FRICTION FALSE TWISTER

Hellmut Lorenz, Remscheid, and Heino Bünger, Radevormwald, both of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Germany

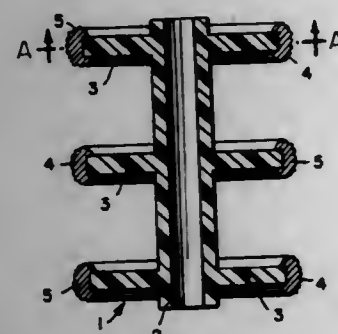
Filed July 28, 1976, Ser. No. 709,319

Claims priority, application Germany, July 30, 1975, 7524158 [U]; Aug. 8, 1975, 7525192 [U]

Int. Cl.² D02G 1/04; D01H 7/92

U.S. Cl. 57—77.4

34 Claims



1. In a friction false twister for the false twist texturizing of a synthetic yarn in combination with yarn supply means and yarn take-up means, said twister including a plurality of parallel shafts, which are positioned on the corners of a polygon and rotatably driven in the same direction and at the same speed, and a plurality of discs with frictional surfaces on their peripheries, said discs being carried on each shaft in axially spaced positions and being so large in diameter that the discs on each of the parallel shafts overlap in the center of said polygon, the yarn path being substantially parallel to said shafts in frictional engagement with said disc surfaces in said center of the polygon, the improvement which comprises a sleeve hub which is adapted to be mounted on each of said rotatable shafts and to extend over substantially the length of said shaft, said hub having a plurality of axially spaced seatings for carrying said discs, each of the discs being fixed to the hub by a shrink fit on said seatings.

4,051,656

DRIVE SYSTEM FOR A SPINDLE FRAME

Helm Burri, and Richard Burri, both of Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

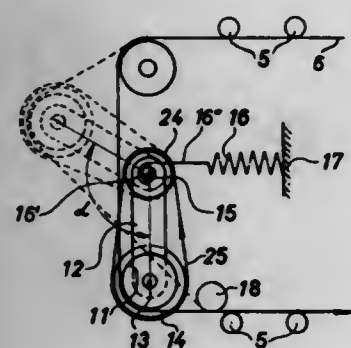
Filed Sept. 10, 1976, Ser. No. 722,094

Claims priority, application Switzerland, Sept. 12, 1975, 11870/75

Int. Cl.² D01H 1/24; F16H 7/10

U.S. Cl. 57—105

12 Claims



1. A drive system for a spindle frame of a spinning machine

having a plurality of spindles arranged in a row, said drive system comprising

a drive roll,
a tensioning roll,
a tangential drive belt tensioned between said drive roll and said tensioning roll for engaging and driving the spindles,
a first axle secured to said tensioning roll for rotation therewith about a first axis,
a second axle rotatably mounted about a fixed second axis,
a lever journaled on said first axle and said second axle, means secured to said lever for biasing said lever to pivot about said second axis in a plane parallel to said tangential drive belt,
drive transmitting means disposed between said first and second axles for rotating said second axle off said first axle, and
a drive means interconnected to said second axle for driving additional working elements of the spinning machine.

4,051,657

SPINNING-RING BEARING AND SUPPORT

Alfons Spies, Munich, Germany, assignor to Dr. Johannes Heidenhain, GmbH, Traunreut, Germany

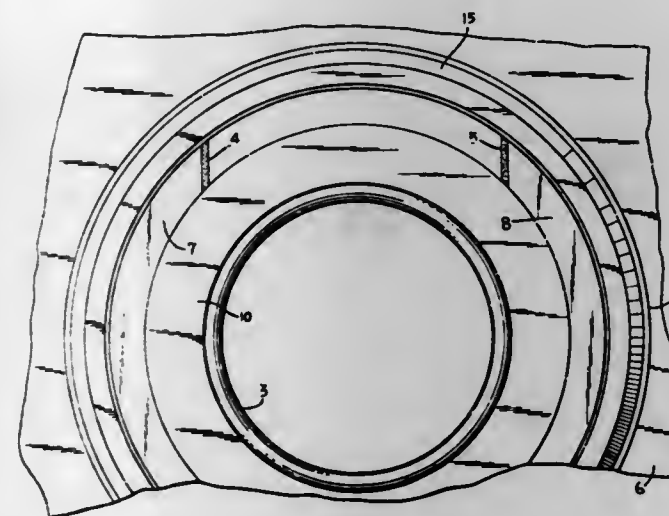
Filed July 24, 1975, Ser. No. 598,791

Claims priority, application Germany, July 25, 1974, 2435770

Int. Cl.² D01H 7/56, 7/64

U.S. Cl. 57—124

6 Claims



6. In an aerodynamic bearing for air cushion supporting of a spinning or twisting ring, both axially and radially, comprising a stator, a rotor supported by and rotatable relative to said stator, the improvement comprising:

said rotor having an annular shape and including upper and lower radially extending projections;
said stator having an annular shape and being disposed concentric to said rotor and including upper and lower radially extending projections, whereby said stator substantially engages said rotor to define a small air gap therebetween for the air cushion;

mounting means for said stator comprising a resilient dampening absorber system including two resiliently flexible ring segments each having inside and outside radial surfaces and being oppositely disposed and substantially concentric relative to said stator, and connecting means operable to connect said stator to said ring segments to be supported thereby; whereby deflections of said stator result in corresponding deflections in said ring segments; and

stopping means disposed in close proximity to the outside radial surface of said ring segments when at rest, said absorber system having a characteristic spring-curve which is linear for radial deflections until there occurs abutment between a portion of the outside radial surface of at least one of said ring segments with said stopping

means and thence rises progressively for larger deflections.

4,051,658

METHOD OF MANUFACTURING TWISTLESS YARN AND YARN MADE BY THIS METHOD

Thomas Henricus Marie Terwee, Enschede, and Jan Nijhuis, Hengelo, both of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Jan. 16, 1976, Ser. No. 649,706

Claims priority, application Netherlands, Feb. 10, 1975, 7501535

Int. Cl.² D02G 3/40, 3/04

U.S. Cl. 57—140 BY

8 Claims

1. Method for the manufacture of twistless or substantially twistless yarn from a sliver or a roving which consists of a fibrous material containing at least two components, at least one component being a potential adhesive, in which method the sliver or roving is subjected to a number of processes, including at least wet-drafting of the sliver or roving to a thinner fibrous sliver, false twisting, the supply of additional moisture and bonding of the fibrous sliver by activation of the potentially adhesive component, and drying of the fibrous sliver, wherein the step of activation of the potentially adhesive component comprises passing the fibrous sliver through a narrow space and heating the sliver therein, so that in said narrow space an equilibrium is reached between the amount of moisture in the fibrous sliver and in the narrow space surrounding the fibrous sliver at a temperature within the dissolving range of the potentially adhesive component, while maintaining a residual moisture content in the fibrous sliver sufficient for good activation.

8. Twistless or substantially twistless yarn manufactured by the application of the method as claimed in claim 1.

4,051,659

PRODUCTION OF CARBON FIBRE

Harold Dennis Blakelock, South Ruislip, England, assignor to Morganite Modmor Limited, London, England

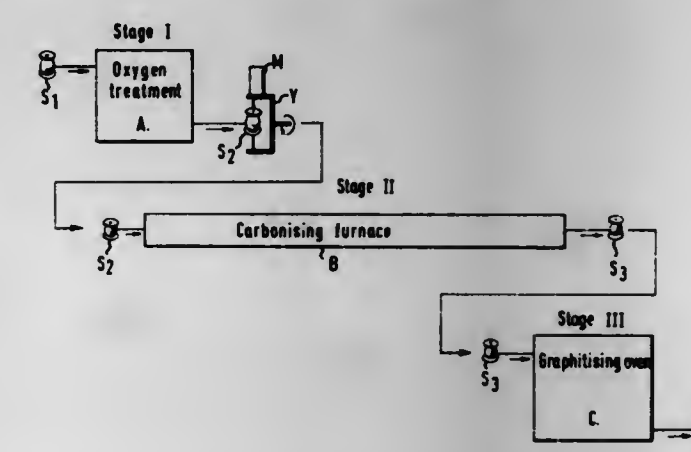
Filed Feb. 17, 1976, Ser. No. 658,368

Claims priority, application United Kingdom, Feb. 17, 1975, 6583/75

Int. Cl.² D01F 9/12, 9/14; D02G 3/02

U.S. Cl. 57—140 R

11 Claims



1. In the production of carbon fibre from a multifilament tow of organic precursor fibre, by heat treatment in an oxygen containing atmosphere and subsequent carbonisation optionally followed by graphitisation, the improvement comprising giving the tow a twist between the oxygen treatment and carbonisation, which twist is made permanent by the carbonisation and maintains the fibres within the tow during the carbonisation and subsequent handling.

6. A tow of carbon fibre, made by the method of claim 1, having a permanent twist maintaining the fibres within the tow.

4,051,660

YARNS AND THEIR METHOD OF MANUFACTURE

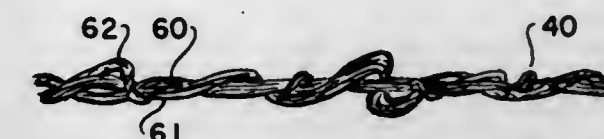
Ernest Griset, Jr., Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 488,878, July 15, 1974, abandoned, and a continuation-in-part of Ser. No. 211,997, Dec. 27, 1971, Pat. No. 3,823,449. This application Aug. 24, 1976, Ser. No. 717,737

Int. Cl.² D01H 1/00, 7/92

U.S. Cl. 57—140 BY

21 Claims



17. A novel yarn comprised of at least two strands of filaments twisted in random "s" and "z" directions in variant degrees of twist along their lengths, including sections of no twist, and having filaments of each strand simultaneously interlaced with filaments of adjacent strands to entrap the random twists in a cohesive, commingled yarn.

4,051,661

WIRE STRAND AND ROPE

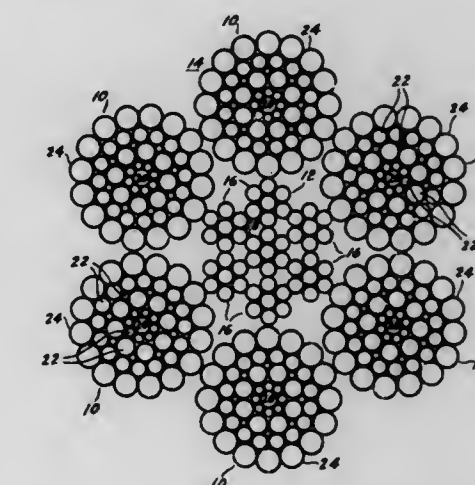
Louis C. Leprohon, Jr., and John C. Overdorf, Jr., both of Williamsport, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Sept. 15, 1976, Ser. No. 723,366

Int. Cl.² D07B 1/06

U.S. Cl. 57—148

20 Claims



1. A steel wire strand comprising a plurality of layers of steel wires helically wound around a steel king wire with all the wires in the layers made from a first steel grade and the king wire made from a second steel grade.

4,051,662

SOLID STATE WATCH WITH INERTIAL SWITCH

Arthur H. O'Connor, and Robert E. McCullough, both of Lancaster, Pa., assignors to Time Computer, Inc., Lancaster, Pa. Division of Ser. No. 504,734, Sept. 10, 1974. This application

Nov. 1, 1976, Ser. No. 737,654

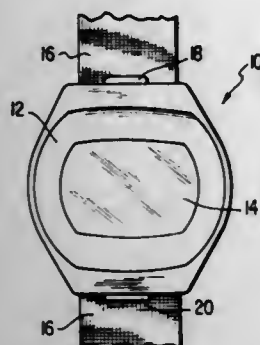
Int. Cl.² G04B 19/24, 19/60

U.S. Cl. 58—4 A

8 Claims

1. A solid state wristwatch comprising an electrooptical time display for displaying time in decimal numbers, an electrical power supply terminal for energizing said time display from a power supply, and an arm responsive inertial switch coupling said power supply terminal to said display whereby said display is energized upon a predetermined movement of a wearer's arm upon which said wristwatch is mounted, said arm responsive switch comprising an envelope, a pair of side-by-side electrical contacts in said envelope, a conductive member movable in said envelope into and out of bridging engagement with said contacts, and a time delay circuit coupled to said

contacts for producing an electrical output only when said member has made a complete cycle of movement between



contacts bridging and non-bridging positions within a predetermined time period.

4,051,663

ELECTRONIC TIMEPIECE

Hiroyuki Chihara, Okaya, and Hitomi Numabe, Suwa, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

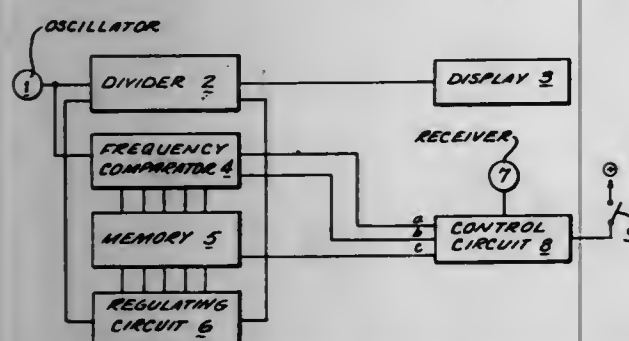
Filed Dec. 5, 1974, Ser. No. 529,881

Claims priority, application Japan, Dec. 5, 1973, 48-135301

Int. Cl.² G04C 13/08

U.S. Cl. 58—26 R

10 Claims



1. In an electronic timepiece having oscillator means for producing a high frequency time standard signal, divider means including a plurality of series-connected divider stages adapted in response to said time standard signal to produce a low frequency timekeeping signal, and display means for displaying time in response to said timekeeping signals, the improvement comprising receiving means adapted to receive an externally applied actual time reference signal for at least a predetermined actual time interval, comparator means coupled to said oscillator means and adapted to compare the period counted from said high frequency time standard signal during the predetermined actual time interval of said reference signal with the actual time interval of said externally applied reference signal received by said receiving means, and in response thereto produce a frequency difference signal representative of the difference between the high frequency time standard frequency required to produce the predetermined actual time interval and the high frequency time standard signal output of said oscillator means, memory means adapted to store said frequency difference signal, and division ratio regulating means coupled to said divider means for regulating the division ratio of said divider means to produce a timekeeping signal having a period representative of actual time in response to said frequency difference signal stored in said memory means being applied thereto.

4,051,664
DRIVE CIRCUIT OF LIGHT EMITTING MEANS FOR LIQUID CRYSTAL ELECTRONIC WATCH

Takehiro Ishikawa, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

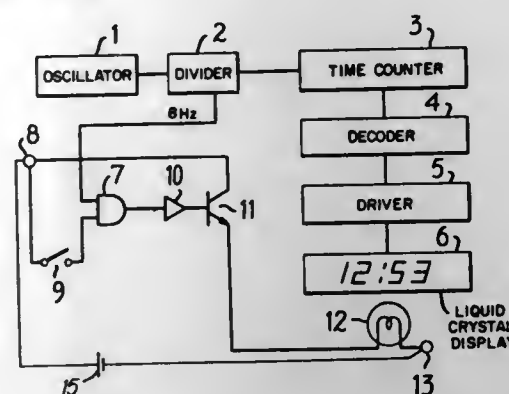
Filed Aug. 31, 1976, Ser. No. 719,102

Claims priority, application Japan, Sept. 9, 1975, 50-109322

Int. Cl.² G04B 19/34

U.S. Cl. 58—50 R

5 Claims



1. In a liquid crystal all electronic watch comprising an oscillating circuit, a frequency dividing circuit for dividing a signal obtained from said oscillating circuit, a time counter for counting an output signal of said frequency dividing circuit, a liquid crystal time display means, a decoder and driver for converting the time signals from said counter and displaying them by said liquid crystal display means, and a battery for supplying power for operating said electronic watch; auxiliary means for illuminating said liquid crystal time display means comprising means for generating an alternating current of selected frequency, light emitting means positioned for illuminating said liquid crystal time display means and control means for temporarily supplying alternating current from said generating means to said light emitting means only when it is desired to illuminate said crystal time display means, said alternating current generating means comprising an AND circuit having two inputs and one output, means for connecting one input of said AND circuit to an output of selected frequency of said frequency dividing circuit, means for connecting the other input of said AND circuit to terminal of said battery, and means for amplifying the current output of said AND circuit and applying the amplified output to said light emitting means.

4,051,665

OPERATING SWITCH AND RETAINER FOR DIGITAL WATCH CASES

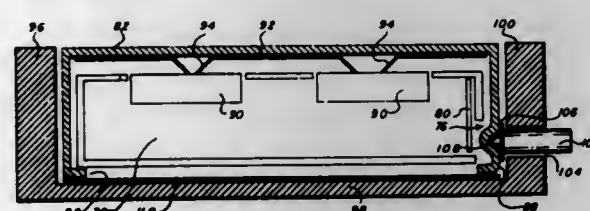
Robert M. Arn, Toronto, Canada, assignor to Hayden/Arn Productions Limited

Filed Jan. 14, 1976, Ser. No. 649,143

Int. Cl.² G04B 19/30

U.S. Cl. 58—50 R

3 Claims



1. For an electronic digital watch having a watch case; at least one battery, an electronic operating and digital display module and an activator switch element associated with said display module contained in said watch case; and at least one activator post extending beyond the periphery of said watch case and into the interior thereof, and adapted to cause a closing action of said activator switch element so as to provide an electrical circuit through said element only when said activator post has at least a pre-determined force exerted axially therealong; the improvement where:

said watch case is substantially electrically non-conductive; and

said watch case further contains an electrically conductive retainer casing having a substantially planar bottom, said retainer casing being a pre-formed shell of elastomeric material, and being adapted to contact and to exert and maintain spring pressure against a first side of at least one battery remote from said digital display module;

said retainer casing having a side upstanding from said bottom and an inwardly turned lip to co-operate with said electronic and digital display module to secure the same therein; and being adapted to retain the inner end of said activator post out of a co-operating position with respect to said activator switch element which would result in said closing action of said switch element, except when at least a pre-determined force is extended axially along said activator post;

so that when at least said pre-determined force is exerted axially along said activator post, the inner end of said activator post is forced to act against the elastic memory of a portion of the side of said retainer casing shell so as to move it into contact with said activator switch element, so that an electrical circuit from said first side of said battery to said switch element is formed and includes said retainer casing shell; and when said axial force is released, the elastic memory of said portion of the side of said retainer casing shell causes said activator post to move away from said activator switch element.

4,051,666

ELECTRONIC TIMEPIECE HAND-ADJUSTMENT MECHANISM

Masahito Yoshino, and Kazuo Kawasumi, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

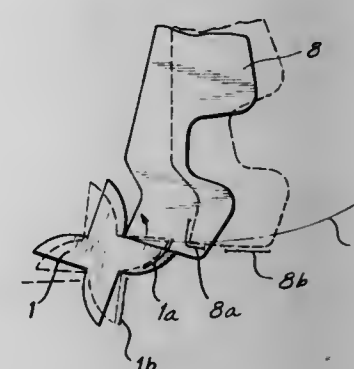
Filed Nov. 20, 1975, Ser. No. 633,735

Claims priority, application Japan, Nov. 21, 1974, 49-140908[U]

Int. Cl.² G04B 27/00; G04C 3/00

U.S. Cl. 58—85.5

10 Claims



1. In a hand display electronic timepiece having a gear mechanically coupled to at least a second hand, the rotational position of the gear determining the time indication position of said hand and electro-mechanical converter means including a rotor mechanically coupled to said gear to rotate said gear, the improvement comprising manually operable adjusting means mechanically coupled to said gear, said adjusting means effecting an advancing of said gear and rotor to predetermined respective positions corresponding to 10n second positions of said second hand, where n=1,2,3, said adjusting means being adapted to effect an advancing of the second hand from substantially all positions of said second hand between said 10n second positions to the next 10n second position.

4,051,667

CHAIN WELDING MACHINE

Gerhard Lange, Reutlingen, Germany, assignor to Wafios, Maschinenfabrik, Wagner, Ficker & Schmid (GmbH & Co. KG), Reutlingen, Germany

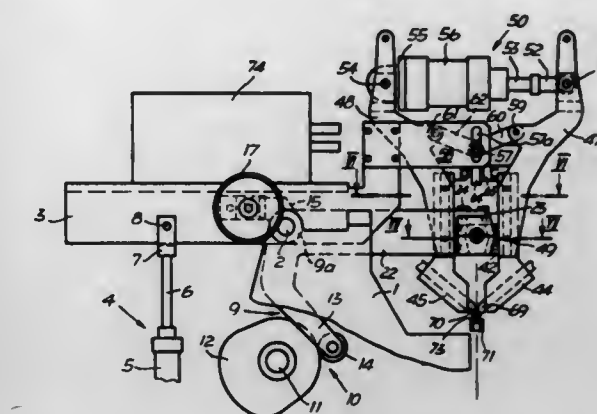
Filed Mar. 11, 1976, Ser. No. 665,804

Claims priority, application Germany, Mar. 11, 1975, 2510420; Sept. 30, 1975, 2543552

Int. Cl.² B21L 3/02

U.S. Cl. 59—31

27 Claims



1. A chain welding machine for the electrical resistance butt-welding of inter-linked chain links bent into approximate C-shape comprising:

a machine frame having a vertical median plane; two bushings mounted to said machine frame along horizontal axes and symmetrically with respect to said median plane; a trunnion disposed in each bushing; means resiliently mounting each trunnion in its respective bushing along the horizontal axis thereof; two pair of double-armed levers arranged symmetrically with respect to said median plane, the levers of each lever pair being rotatably mounted to a respective one of said trunnions for rotation in opposite directions about the axis of said respective trunnion; and an electrode supported by each lever and arranged to grip a respective one of the two ends of the chain link to be welded in a plier-like manner.

4,051,668

LINK CHAIN

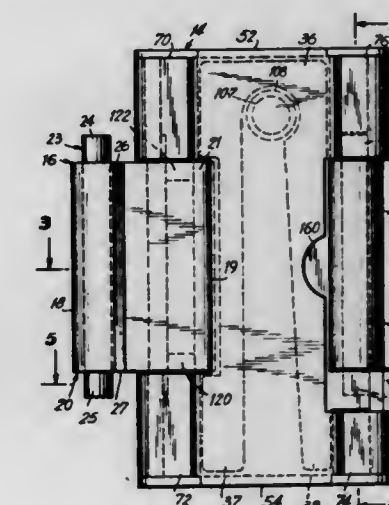
Richard D. Learn, South River, N.J., assignor to Duchess Mfg. Corporation, Hoboken, N.J.

Filed Sept. 30, 1976, Ser. No. 728,141

Int. Cl.² F16G 13/18

U.S. Cl. 59—80

7 Claims



1. A flexible articulated linkage comprising a plurality of link elements pivotably interconnected in a chain, at least, one of said link elements including a journal link-half and a bearing

link-half, said journal link-half having a first and a second transverse edge, said journal link-half having a pintle mounted thereon transverse to the longitudinal axis of said chain and situated adjacent said first transverse edge, said pintle having two ends, said bearing link half having a third and a fourth transverse edge, a permanently closed bearing and a selectively openable bearing aligned therewith and spaced therefrom and situated adjacent said third transverse edge, said permanently closed bearing pivotably receiving endwise one end of the pintle of a next adjacent link element, said selectively openable bearing transversely releasably receiving the other end of said pintle of the next adjacent link element, means biasing said openable bearing to a closed condition and means adjacent said second transverse edge of said journal link-half and said fourth transverse edge of said bearing link-half permanently hingedly connecting said journal link-half to said bearing link-half.

4,051,669

GAS TURBINE POWER PLANT CONTROL APPARATUS HAVING A MULTIPLE BACKUP CONTROL SYSTEM

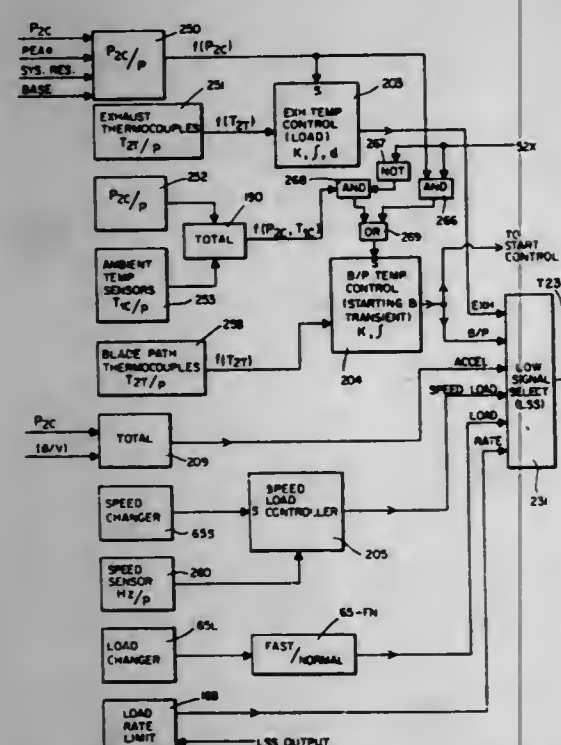
Robert A. Yarnone, Aldan, and James J. Shields, Philadelphia, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 371,625, June 20, 1973, Pat. No. 3,911,285. This application Dec. 3, 1974, Ser. No. 529,204

Int. Cl.² F02C 9/08

U.S. Cl. 60—39.03

40 Claims



37. A method of operating a gas turbine electric power plant, said plant comprising a gas turbine having compressor, combustion and turbine elements, a generator coupled to said gas turbine for drive power, a generator breaker for coupling the generator to a power system, a fuel system for supplying fuel to said gas turbine combustion element, and means for operating said fuel system, said method comprising:

- generating a plurality of control path signals, including at least two temperature backup control signals which are functions of the temperature at respective different portions of said gas turbine;
- generating a first of said backup control signals to represent a relatively fast response of its respective temperature turbine condition, and generating a second of said backup control signals to represent a relatively slower response of its respective turbine temperature condition;
- the step of generating said control path signals including, for each of said backup control signals, generating a setpoint signal, and generating said backup signals independently and as a function of their respective setpoint signals during a first predetermined portion of said turbine operation, and as a function of a common one of said setpoint

signals during a second predetermined portion of said turbine operation; and
d. selecting one of said control signals and operating said fuel system in response thereto.

4,051,670

SUCTION VENT AT RECIRCULATION ZONE OF COMBUSTOR

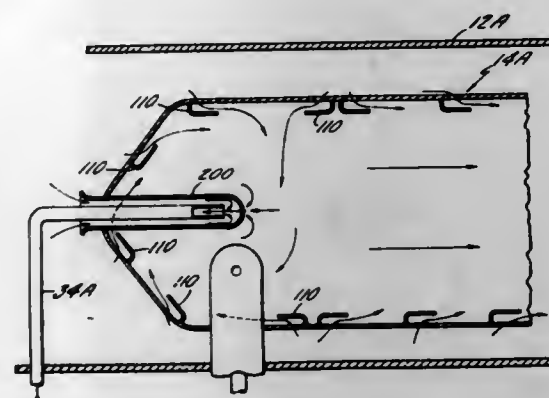
Robert M. Pierce, Tequesta, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 30, 1975, Ser. No. 582,538

Int. Cl.² F02K 3/00, 3/10

U.S. Cl. 60—39.72 R

9 Claims



1. In combination in a gas turbine engine, a combustion section including a burner means, means for forming a region of recirculating fuel/air mixture in said burner means having a flow pattern suitable for combustion, means for reducing the pressure within the recirculating region for strengthening and stabilizing the recirculating flow pattern, said pressure reducing means including a vent conduit means, said vent conduit means having one end located at the recirculating region and the other end connected to a region of lower pressure for removing flow from said recirculating region, said vent conduit including a probe which extends into the recirculating region to withdraw gases therefrom.

4,051,671

JET ENGINE WITH COMPRESSOR DRIVEN BY A RAM AIR TURBINE

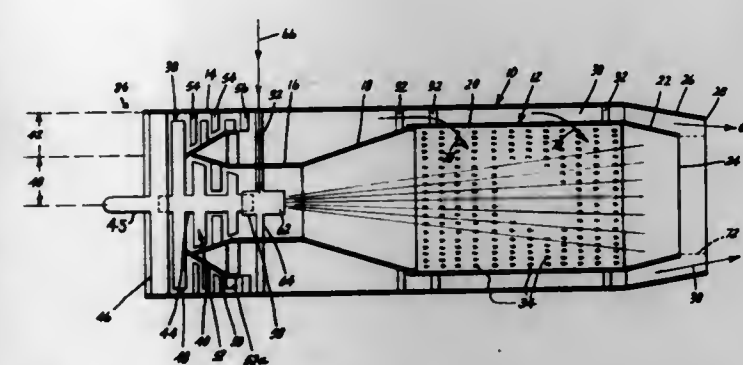
John A. Brewer, 2120 Kensington Blvd., Fort Wayne, Ind. 46805

Continuation-in-part of Ser. No. 519,527, Oct. 31, 1974, abandoned. This application Oct. 8, 1975, Ser. No. 620,846

Int. Cl.² F02K 3/00

U.S. Cl. 60—262

8 Claims



1. In a jet engine comprising:

- an elongated annular outer casing having a central longitudinal axis, a substantially open forward end and a substantially open, rear nozzle end,
- an elongated annular inner casing coaxially disposed within said outer casing and having a substantially open forward end and a substantially, rear nozzle end,
- said inner casing forward end being smaller than said outer casing forward end and forming a first air intake for said inner casing;

c. said outer casing being radially spaced from and defining an elongated annular air passage with said inner casing which extends between said ends thereof,

- said inner casing forward end forming with said outer casing a second, annular air intake for said air passage,
- said outer casing nozzle end being larger than and spaced rearwardly from said inner casing nozzle end whereby combustion gasses exhausted from said inner casing nozzle end cause rearward air flow in said air passage by Venturi action;

d. a fan and compressor assembly rotatable about said axis and having radially inner compressor vanes connected to radially outer motor fan vanes, and rotated thereby,

- at least one group of said fan vanes being disposed in said second air intake whereby said air flow in said air passage causes rotation of said fan and compressor vanes,
- at least one group of said compressor vanes being disposed in said first air intake whereby rotation of said compressor vanes forces air under pressure rearwardly through said inner casing; and

e. means for burning fuel disposed in said inner casing rearwardly of said compressor vanes;

the improvement wherein:

- said inner casing has a first section which converges rearwardly from said first air intake to a rear end smaller than said first air intake;
- said inner casing has a second section with a forward end connected to said first section, said second section extending rearwardly from said first section to a rear end which is no larger than said forward end,

1. said fuel burning means being disposed in said second section;

- said inner casing has a rear section with a forward end connected to said second section, said rear section extending rearwardly from said second section to said nozzle end thereof

iv. said fan and compressor assembly includes an annular wall rotatable therewith and which diverges rearwardly in said annular passage from said second air intake to define a rearwardly converging air intake duct with said outer casing,

- all of said fan vanes being connected to said wall and extending radially outwardly therefrom,
- said one group of compressor vanes having a connection with said wall and extending radially inwardly therefrom.

4,051,672

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Kenji Masaki, and Kenji Okamura, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

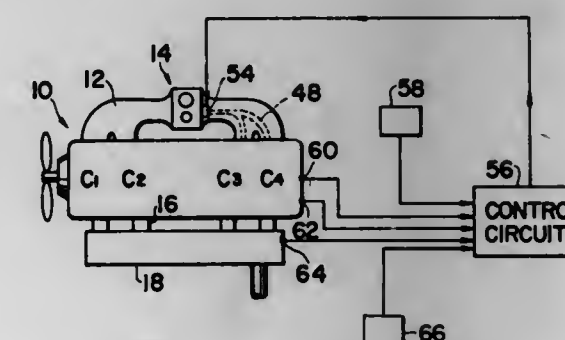
Filed July 22, 1975, Ser. No. 598,075

Claims priority, application Japan, Sept. 20, 1974, 49-109185

Int. Cl.² F02B 75/10; F01N 3/10

U.S. Cl. 60—277

14 Claims



1. A multi-cylinder internal combustion engine having a first group of cylinders and a second group of cylinders, the engine being followed by an after-burner to purifying exhaust gases

discharged from the first and second groups of cylinders, said engine comprising:

- a carburetor for supplying into the first and second groups of cylinders a first air-fuel mixture which is leaner than the stoichiometric air fuel mixture;
- a mixture enriching device arranged to supply supplemental fuel from the fuel chamber of said carburetor into portions upstream of the intake ports of said second group of cylinders to enrich the first air-fuel mixture into a second air-fuel mixture which is richer than the stoichiometric air-fuel mixture; and
- control means to cause said mixture enriching device to stop supply of the supplemental fuel during at least one of high engine speed, high engine load, and excessively high after-burner temperature.

4,051,673

AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

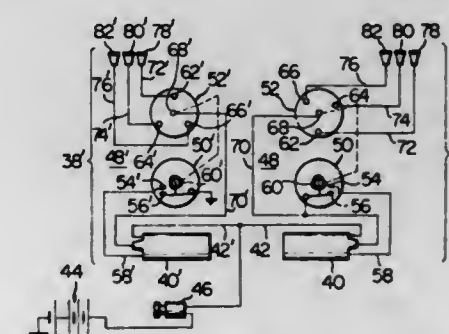
Filed Sept. 4, 1975, Ser. No. 610,390

Claims priority, application Japan, Sept. 19, 1974, 49-108081

Int. Cl.² F02B 75/10

U.S. Cl. 60—282

14 Claims



1. A spark-ignition multiple-cylinder internal combustion engine having a first set of cylinders connected to first mixture induction means operative to supply each of said first set of cylinders with a combustible mixture leaner than a stoichiometric mixture, a second set of cylinders connected to second mixture induction means operative to supply each of said second set of cylinders with a combustible mixture richer than the stoichiometric mixture, an exhaust system including exhaust re-combustion means for re-combusting the mixture of the exhaust gases from the first and second sets of cylinders, and a spark-ignition system comprising first and second ignition units respectively connected with said first and second sets of cylinders, wherein the first ignition unit is arranged to provide spark-advance characteristics enabling each of the first set of cylinders to produce a power output approximating maximum power output of the cylinder and the second ignition unit is arranged to provide spark-advance characteristics producing ignition timing retarded from ignition timing dictated by spark-advance characteristics which will provide maximum power output of each of the second set of cylinders.

4,051,674

MULTICYLINDER INTERNAL COMBUSTION ENGINE

Motoko Suzuki, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Mar. 9, 1976, Ser. No. 665,258

Claims priority, application Japan, Mar. 20, 1975, 50-34768

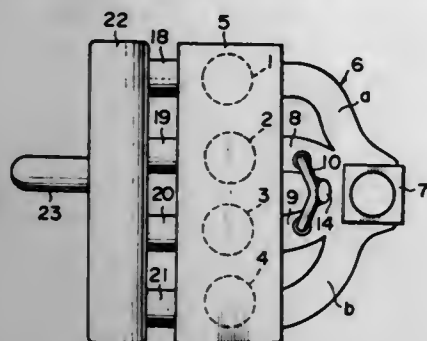
Int. Cl.² F02B 75/10

U.S. Cl. 60—282

14 Claims

1. A multicylinder internal combustion engine comprising: a plurality of cylinders; means for making an air-fuel rich mixture to be supplied to said cylinders; first passages for supplying the rich mixture made by said making means to some of said cylinders; second passages for supplying the rich mixture to the remaining ones of said cylinders; an air-supply passage having one end opening in said second passages and the other

end communicating with the atmosphere; and valve means disposed in said air-supply passage operative to close the passage under high load conditions so that the rich mixture is supplied to all the cylinders under high load conditions, and, under other operating conditions, the rich mixture is supplied only to the cylinders communicating with the first passages



while a lean mixture comprised of air introduced through the air-supply passage mixed with the rich mixture is supplied to the other cylinders communicating with the second passages.

10. A multicylinder internal combustion engine as claimed in claim 1, further including means for decontaminating exhaust emissions from all the cylinders by oxidizing HC and CO contained therein.

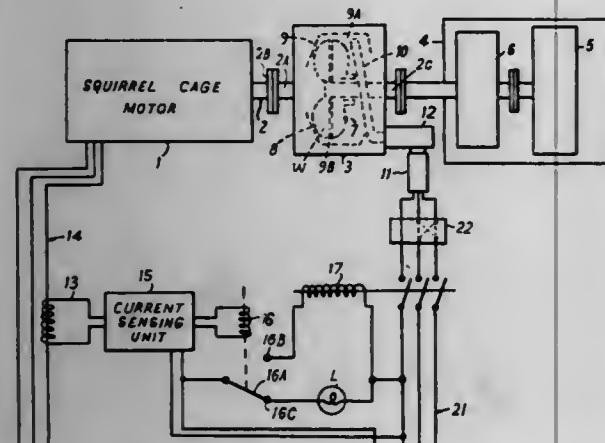
4,051,675

DRIVES INCORPORATING VARIABLE FILLING FLUID COUPLINGS

Walter Hugh Knight James, London, England, assignor to Fluid-drive Engineering Company Limited, Isleworth, England
Continuation-in-part of Ser. No. 495,463, Aug. 7, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,376
Int. Cl.² F16D 33/00

U.S. Cl. 60-330

4 Claims



1. In a fluid coupling assembly comprising a variable filling fluid coupling, adjustable filling control means for controlling the degree of filling of the coupling by removing excess liquid therefrom, said filling control means providing the sole means of escape for liquid from the coupling under running conditions, torque-sensing means for sensing the driving torque of the fluid coupling, and controller means under the control of the torque-sensing means for (1) moving the filling control means to increase the filling of the coupling when the sensed torque falls below a predetermined value and (2) stopping the filling control means when the sensed torque exceeds said predetermined value to hold the degree of filling of said coupling constant until said sensed torque falls below said predetermined value, whereupon said torque sensing means operates said filling control means to allow the degree of filling of said coupling to increase.

4,051,676

HYDRAULIC VALVE ACTUATOR

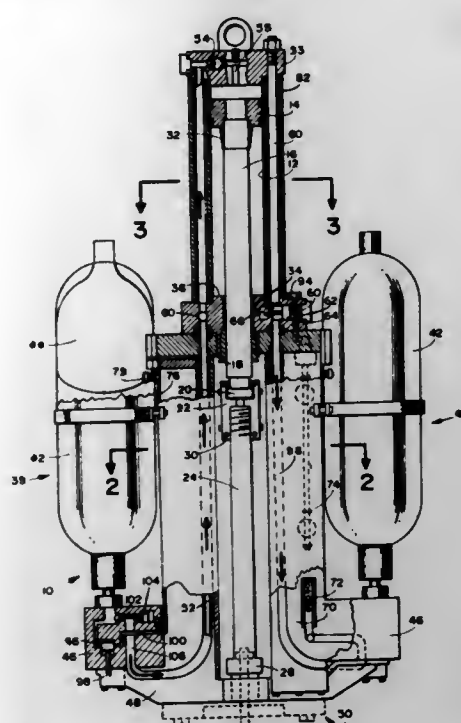
Howard L. Ledeen, Pasadena; Franz Schmon, Granada Hills, and Willem E. Tupker, Sylmar, all of Calif., assignors to Ledeen Flow Control Systems, Inc., Sun Valley, Calif.

Filed Mar. 25, 1976, Ser. No. 670,254

Int. Cl.² F15B 1/02, 20/00

U.S. Cl. 60-404

8 Claims



1. An emergency valve actuator comprising:
a cylinder;
a piston reciprocable in said cylinder;
a pair of pressure fluid sources;
separate pressure ducts connecting said sources to inlet ports in said cylinder on one side of said piston;
separate exhaust ducts connecting outlet ports in said cylinder on the other side of said piston to an evacuation zone;
first check valve means in said inlet ports and pilot-operated check valves in said outlet ports, all blocking outward flow therethrough;
each of said pilot-operated check valves being exposed to fluid in one of said pressure ducts and being operative in response to flow therethrough to move to open position; and
selectively operable valve means connected into each of said pressure ducts.

4,051,677

MULTIPLE-COMPLETION GEOTHERMAL ENERGY PRODUCTION SYSTEMS

Allen T. Van Huisen, 29456 Indian Valley Road, Rolling Hills Estates, Calif. 90274

Division of Ser. No. 375,751, July 2, 1973. This application Oct. 3, 1974, Ser. No. 511,586

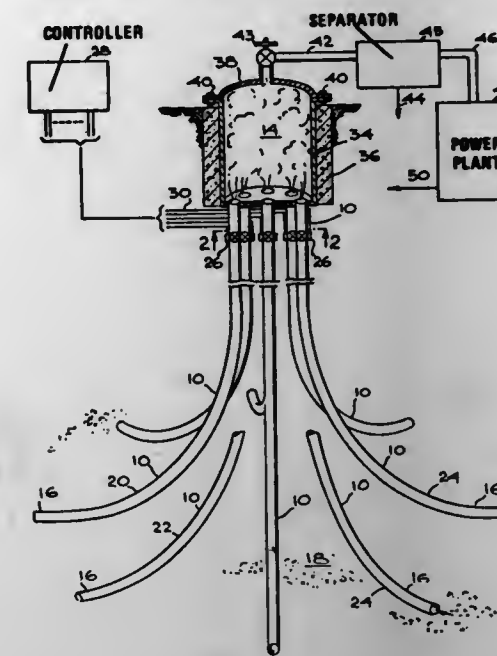
Int. Cl.² F03G 7/00

U.S. Cl. 60-641

17 Claims

1. A system for the recovery of geothermal energy comprising:
a closed, steam vapor collection reservoir vessel having side walls, a top wall and a bottom wall, said side walls and bottom wall being recessed below the surface of the earth, said bottom wall containing a plurality of inlet apertures, and said top wall including at least one outlet aperture;
a plurality of cased geothermal wells, the casing of each having a first end converging toward and sealingly connected to one of the apertures in the bottom wall of said reservoir and each well casing diverging from said reservoir and having a second end disposed within a common, wet geothermal zone having a temperature of at least 300° F;
vapor fluid delivery means within each of said wells to

conduct heated steam vapor fluid from each second end to said reservoir;
separation means for receiving the collected heated steam vapor from the outlet aperture; and



energy conversion means for receiving said separated heated fluid and for converting it into rotary power.

4,051,678

THERMAL PANEL POWERED HEAT ENGINE

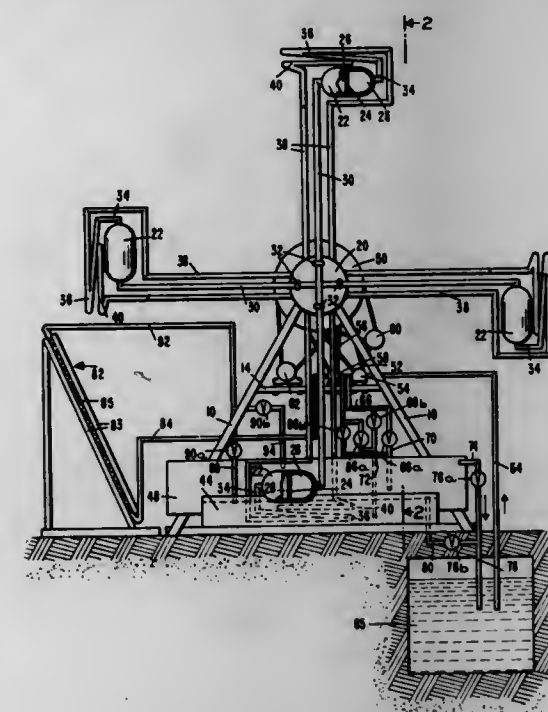
John W. Yates, 6005 Sixth St., Tampa, Fla. 33611

Filed Mar. 12, 1975, Ser. No. 557,512

Int. Cl.² F03G 1/02, 7/06

U.S. Cl. 60-641

12 Claims



1. A heat engine comprising:
a plurality of tanks, each tank having therein a flexible diaphragm dividing the tank interior into first and second chambers;
a rotatable structure;
means connecting said plurality of tanks to said rotatable structure in radially opposed pairs for rotation therewith;
first pipe means connecting the radially opposed tanks for fluid communication between the first chamber of each tank and the first chamber of that tank's radially opposed tank;
a plurality of evaporator coils, each evaporator coil having first and second open ends, one evaporator coil uniquely associated with each tank;
a plurality of condenser coils, each condenser coil having an

open end and a closed end, one condenser coil uniquely associated with each tank;
second pipe means connecting each tank to its associated evaporator coil first open end for fluid communication between the second chamber of the tank and its associated evaporator coil and for rotation of said evaporator coils with said tanks as said rotatable structure rotates;
third pipe means coupling said evaporator coils and said condenser coils to connect the second open end of each evaporator coil to the open end of the condenser coil associated with the tank with which the evaporator coil is associated, for fluid communication between the commonly associated evaporator coil and condenser coil and for rotation of said condenser coils with said tanks as said rotatable structure rotates;
a fluid propellant within the first chambers of said tanks;
a high vapor pressure fluid within the second chambers of said tanks;
a hot water reservoir positioned adjacent the lower extremity of rotation of said evaporator coils for passage in turn therethrough of each evaporator coil as said rotatable structure rotates;
a cold water reservoir positioned for passage in turn therethrough of each condenser coil, as said rotatable structure rotates, with each condenser coil passing through the cold water reservoir as the evaporator coil associated with the tank radially opposed to the tank with which that condenser coil is associated passes through the hot water reservoir; and
output means coupled to said rotatable structure for generating power in response to rotation of said rotatable structure.

4,051,679

MARINE PROPULSION PLANT WITH REVERSIBLE PROPELLER SHAFT CONNECTED THERETO

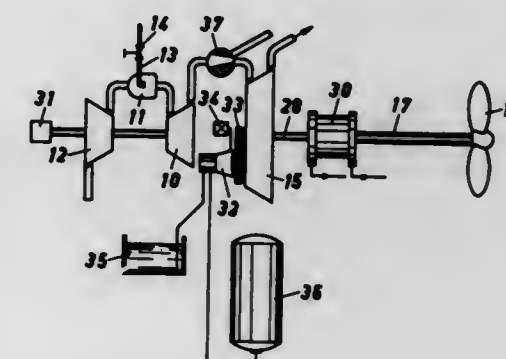
Lars Thorbjorn Collin, Molndal, Sweden, assignor to Lars Collin Consult AB, Vasterbergsgatan, Sweden

Continuation of Ser. No. 595,228, July 11, 1975, abandoned, which is a continuation of Ser. No. 422,845, Dec. 7, 1973, abandoned. This application Mar. 16, 1976, Ser. No. 667,341

Claims priority, application Sweden, Aug. 19, 1972, 7216003
Int. Cl.² B63H 23/08; F01K 13/02

U.S. Cl. 60-656

2 Claims



1. In a propulsion plant including a propulsion shaft, a gas turbine having a rotor and an output shaft, means for supplying motive fluid to the turbine, a reversing gear means for connecting the turbine output shaft to the propulsion shaft, said gears means including a first portion connected to said turbine output shaft and a second part connected to said propulsion shaft, clutch means to engage and, during reversing, disengage said first and second parts, the improvement of a combination pump/motor hydraulic machine operably connected to the turbine rotor, an open reservoir for hydraulic fluid and a closed storage tank for pressure fluid, means for engaging the machine as a pump to the turbine rotor for braking the rotor during reversing by transporting hydraulic fluid from said reservoir to said storage tank, and to act as a motor for subsequently accelerating the rotor, by accepting return flow of hydraulic fluid from said storage tank back to the reservoir.

4,051,680

MODIFIED RANKINE CYCLE ENGINE APPARATUS

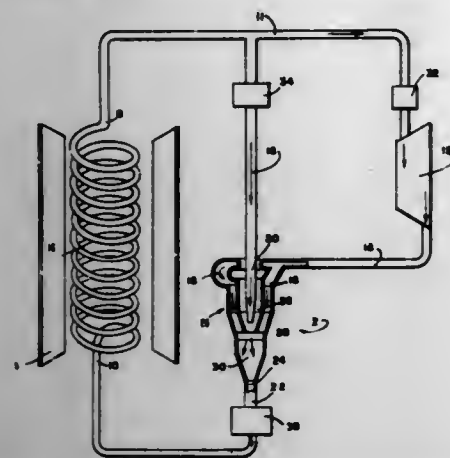
Carroll D. Hall, Rte. 1 Box 5X, Tallahassee, Okla. 74571

Filed Dec. 26, 1973, Ser. No. 428,031

Int. Cl.² F01K 19/00

U.S. Cl. 60-689

10 Claims



1. A modified Rankine cycle engine apparatus comprising
 - a heat reservoir,
 - a working fluid having a gaseous phase
 - a fluid heating vessel, which heating vessel is in thermal contact with the heat reservoir, the heating vessel having an inlet and an outlet, and which heating vessel contains a portion of the gaseous phase of the working fluid, which experiences heating while within the heating vessel,
 - a first conduit having a first end connected to the outlet and having a second end
 - an engine in which heated working fluid undergoes an approximately adiabatic expansion, thereby converting a portion of heat energy of the working fluid into mechanical work,
 - an engine intake conduit having a first end connected to the first conduit and having a second end connected to the engine, thereby connecting the engine to the outlet of the fluid heating vessel, through which conduits the heated working fluid passes to the engine,
 - a jet pump with a suction port, a main flow intake port and a main flow exhaust port,
 - an engine exhaust conduit connecting the engine to the suction port of the jet pump, through which conduit expanded, spent working fluid passes from the engine,
 - a pump intake conduit having a first end connected to the first conduit and having a second end connected to the pump main flow intake port, thereby connecting the outlet of the heating vessel to the main flow intake port of the jet pump, through which heated working fluid passes into the jet pump and into and through a nozzle structure within the pump, and
 - a pump exhaust conduit connecting the main flow exhaust port of the jet pump with the inlet of the heating vessel, through which fluid from the suction port and the main flow intake port passes out of the jet pump and returns to the heating vessel;
- whereby, an adiabatic expansion engine, supplied with a heated, pressurized working fluid is exhausted by a jet pump, and spent working fluid is returned to a heating vessel for reheating.

4,051,681

UNITARY ROOF BOLT ASSEMBLY

Lee William Yaros, 136 Gedney Road, Trenton, N.J. 08638

Filed Oct. 6, 1975, Ser. No. 619,739

Int. Cl.² E21D 20/02

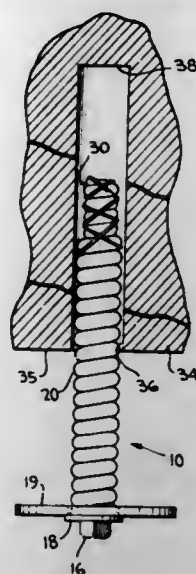
U.S. Cl. 61-45 B

7 Claims

1. A unitary roof bolt assembly mountable within a bore hole of predetermined depth in an excavation roof desired to be strengthened comprising:
 - a bolt having an elongated stem, a head integral with said stem at one end thereof; and said stem having a distal end

opposite said head and a length which is somewhat but not substantially less than the depth of said bore hole which reaches to an innermost wall thereof,

- a rupturable flexible sack means having a first generally uniformly disposed unbroken portion encompassing said stem in extending from said head to said distal end, and which continues to a relatively narrower generally uniformly disposed unbroken portion covering said distal end and extending therebeyond, said sack means containing a



- curable adhesive along said extents of said first and said second portions thereof, and being secured to said stem by means wrapped about said first and said second portions until ruptured,
- whereby an insertion of said bolt within said bore hole which pressure contacts said second portion of said sack means against said innermost bore hole wall provides a substantial force rupturing said sack means so as to fixedly secure said bolt within said bore hole with said adhesive thus released therebetween.

4,051,682

METHOD FOR INSTALLING CEILING PANELS IN A TUNNEL

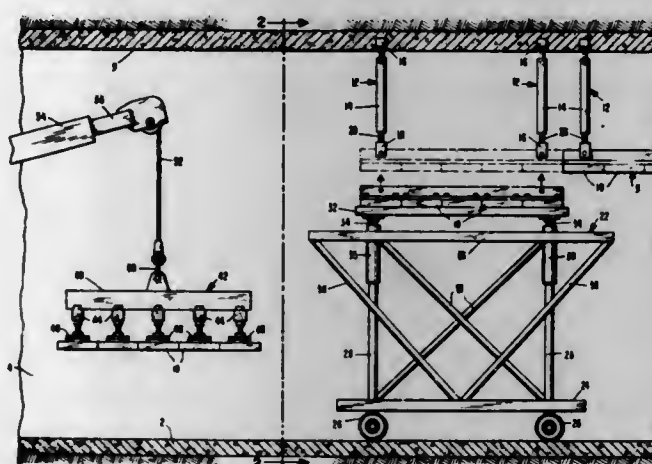
James L. Lockwood, Jr., 10 Tomahawk Road, Hampton, Va. 23669

Filed July 15, 1976, Ser. No. 705,612

Int. Cl.² E21D 11/05; B25J 3/00

U.S. Cl. 61-45 R

8 Claims



1. A method for installing ceiling panels in a tunnel comprising the steps of:
 - a. installing a plurality of depending brackets from the tunnel roof;
 - b. disposing a vertically movable horizontal platform at an intermediate height in the tunnel;
 - c. lifting a plurality of separate ceiling panels to said horizontal platform;
 - d. rigidly linking together said separate panels on said platform to form a single integrated ceiling section for subsequent handling as one unit;
 - e. raising said horizontal platform to a position adjacent said brackets; and
 - f. securing said ceiling section to said brackets.

4,051,683

METHOD AND APPARATUS FOR SUPPORTING A MINE ROOF

Stephen F. Koval, Portage, Pa., assignor to Jeanmar Corporation, Cresson, Pa.

Filed June 28, 1976, Ser. No. 700,600

Int. Cl.² E21D 20/02

U.S. Cl. 61-45 B

19 Claims

1. Apparatus for insertion in a drill hole of a rock formation to support the rock formation comprising,
 - an elongated reinforcing rod positioned in the drill hole, said reinforcing rod having one end portion positioned adjacent the end of the drill hole and an opposite threaded end portion,
 - a resin system mixed and cured in the drill hole and filling the annulus between the rock formation and said reinforcing rod to anchor said reinforcing rod to said rock formation,
 - an elongated bolt member positioned in the drill hole, said bolt member having a threaded end portion positioned oppositely of said reinforcing rod threaded end portion and an opposite end portion extending out of the entrance to the drill hole,
 - a bearing plate retained on said bolt member opposite end portion,
 - a coupling having an internally threaded bore for receiving said reinforcing rod threaded end portion and said bolt member threaded end portion,
 - stop means positioned in said coupling for maintaining said bolt member threaded end portion in a first position within said coupling spaced from said reinforcing rod threaded end portion to permit rotation of said bolt member and said reinforcing rod, and
 - said bolt member operable upon rotation to shear said stop means and advance in said coupling to urge said bearing plate into engagement with the rock formation and apply tension on said bolt member with said reinforcing rod anchored within said drill hole.

4,051,684

SELF-PROPELLED PERCUSSION UNIT FOR DRIVING CEMETERY MARKERS AND METHOD OF USING SAME

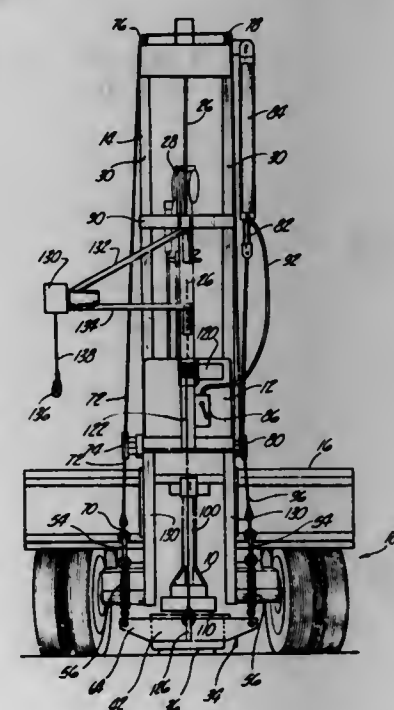
David William Fulkerson, 8360 W. Six Mile Road, Northville, Mich. 48167, and Lawrence William Smith, 26950 Taft Road, Novi, Mich. 48050

Filed Oct. 23, 1975, Ser. No. 625,141

Int. Cl.² E02D 7/08; E04H 13/00

U.S. Cl. 61-53.5

20 Claims



1. The method of reducing maintenance costs at a cemetery having a plurality of grave markers associated with respective burial graves, said markers protruding above the ground sur-

face to an extent sufficient to interfere with the passage of a lawn mower over said markers with the mower blade operating at normal grass cutting heights comprising creating a first downwardly directed impact force distributed over a first area, converting said first force into a second downwardly directed force by a hard first impact against force transmitting means and by distributing said first force over a second area of said force transmitting means, and applying said second force at said force transmitting means directly to a first marker by an impact softer than said first impact and then repeatedly impacting said first marker in the foregoing manner until said marker is driven downwardly into the ground to a level such that it will not interfere with the passage of a lawn mower over said first marker with its mower blade operating at normal cutting heights.

4,051,685

POSITIONING METHOD AND APPARATUS FOR SUBMERSIBLE PILE DRIVING

Joost W. Jansz, The Hague, Netherlands, assignor to Hollandse Beton Groep N.V., Rijswijk, Netherlands

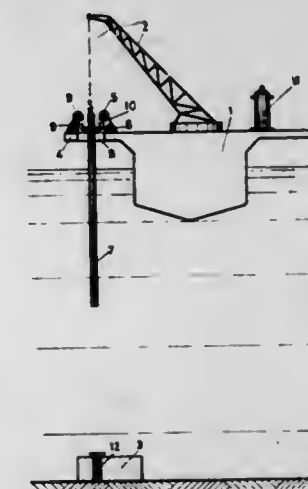
Filed Apr. 30, 1976, Ser. No. 681,937

Claims priority, application Netherlands, Oct. 13, 1975, 7512021

Int. Cl.² E02D 7/10

U.S. Cl. 61-53.5

4 Claims



1. In an apparatus for submarine pile driving, said apparatus comprising a pile to be driven into the bottom of a body of water and a pile driving head which rests on the top of the pile after being lowered along guide cables from the surface of the body of water, said apparatus comprising:
 - crossbar means;
 - attachment means for detachably mounting said crossbar means to the pile near its top;
 - said guide cables terminating at said said crossbar means and said attachment means comprising release means carried by said crossbar means and responsive to contact of said pile driving head therewith for releasing said pile from said crossbar means.

4,051,686

PLATFORMS RESTING UPON THE BED OF A BODY OF WATER

Jacques Edouard Jean Lamy, Fontenay-aux-Roses, France, assignor to C. G. Doris, Paris, France

Continuation-in-part of Ser. No. 521,075, Nov. 5, 1974. This application July 9, 1975, Ser. No. 594,568

Claims priority, application France, July 12, 1974, 74.24310

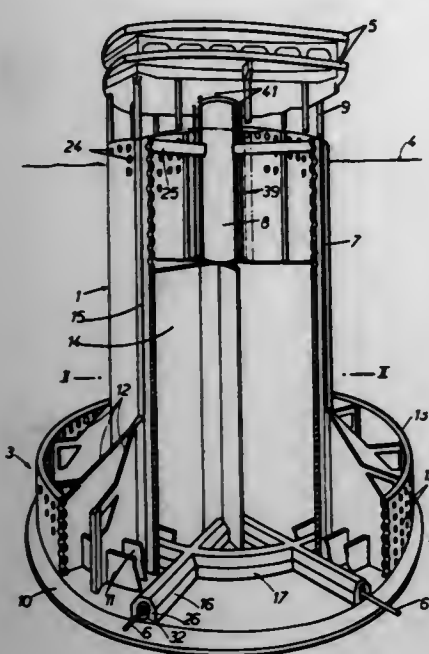
Int. Cl.² E02B 17/00

U.S. Cl. 61-86

7 Claims

1. In combination with an external piping system resting submerged upon a seabed for conveying a useful fluid between at least two spaced, submerged locations on the seabed, an offshore platform comprising a base structure resting upon the

seabed and having means for supporting a bridge structure emergent from the surface of the sea when the base structure is disposed upon the seabed, said base structure including submerged, mutually isolated work chambers located in said base structure and bounded by at least two watertight walls, said work chambers being maintained dry in their undersea environment, an internal piping system housed in said work chambers, means sealed across said watertight walls for intercon-



necting said submerged external piping system with said internal piping system at a point interposed between said two spaced locations, and including fluid handling means for pumping said useful fluid from that portion of said external piping system located between said offshore platform and one of said spaced locations to that portion of said external piping system located between said offshore platform and another of said spaced locations.

4,051,687

PIPELINE LAYING METHOD

John William Ellis, Bexleyheath, England, assignor to The British Petroleum Company Limited, London, England and Saipem S.p.A., Milan, Italy

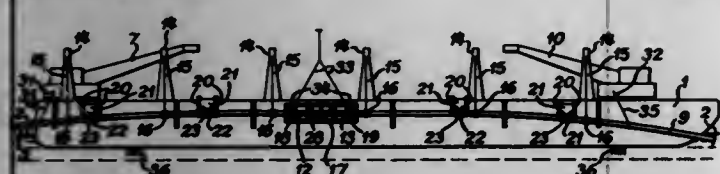
Filed Sept. 17, 1975, Ser. No. 614,238

Claims priority, application United Kingdom, Sept. 27, 1974, 42183/74

Int. Cl.² F16L 1/04

U.S. Cl. 61-110

10 Claims



1. (Twice amended) A method of joining together the ends of two pipelines having an internal diameter of from about 10 to about 60 inches into a continuous length at an offshore location wherein at the commencement of the method at least one of the pipeline ends is submerged in water from about 100 to about 1000 feet in depth, the method comprising:

- dewatering the submerged pipeline or pipelines over the length to be lifted;
- initially lifting the submerged end or ends above the surface of the water with at least one first lifting means;
- positioning buoyancy means along the submerged pipeline or pipelines adjacent the end or ends to be lifted to assist said initial lifting;
- further lifting the pipelines into engagement with a plurality of longitudinally spaced-apart inverted U shaped brackets with a plurality of longitudinally spaced-apart second lifting means, said inverted U shaped brackets being lockably movable along the vertical plane and

pivotal along the horizontal plane and being positioned so that the pipeline ends are presented horizontally end to end in axial alignment for joining;

- gripping the ends of said pipelines to maintain them in axial alignment;
- interposing a spool piece between the horizontal, axially aligned ends of said pipelines and welding said spool piece to said ends to form a continuous fluid tight length; and
- lowering and laterally moving said continuous length of pipeline back to the sea bed to form a loop in a horizontal plane on the sea bed.

4,051,688

OFFSHORE STRUCTURE AND METHOD

John William Ellis, Bexleyheath, and Ian David Parker, Basingstoke, both of England, assignors to The British Petroleum Company Limited, London, England

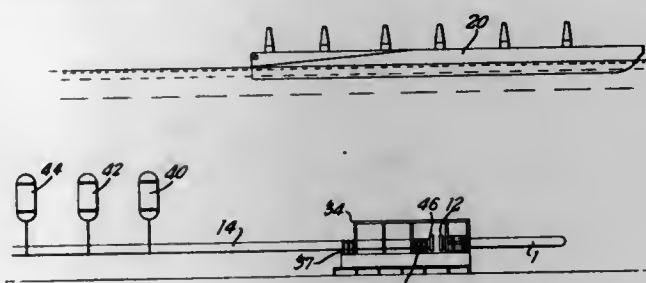
Filed June 4, 1976, Ser. No. 692,772

Claims priority, application United Kingdom, June 13, 1975, 25356/75

Int. Cl.² F16L 1/00

U.S. Cl. 61-110

7 Claims



1. A method of connecting by means of flanges two pipelines lying on the bottom of a body of water which method comprises:

- disposing a first pipeline having a flange at the end thereof so that the end portion of the pipeline is moveable in the direction of its longitudinal axis to provide adjustment for joining the flanges together,
- installing on the water bottom a spool frame, the spool frame having releasable means for holding the end portion of the first pipeline free of the water bottom in a suitable attitude for installing a joining frame, and employing said spool frame to lift the first pipeline at a position a small distance from the end thereof,
- installing on the water bottom a joining frame, said joining frame having means for supporting the first pipeline and means for supporting a second pipeline having a flange at the end thereof in alignment therewith and, using said joining frame, supporting the first pipeline and supporting the second pipeline in alignment therewith, and
- connecting the flanges on the supported pipelines together in fluid tight relationship.

4,051,689

AIR SEPARATING APPARATUS

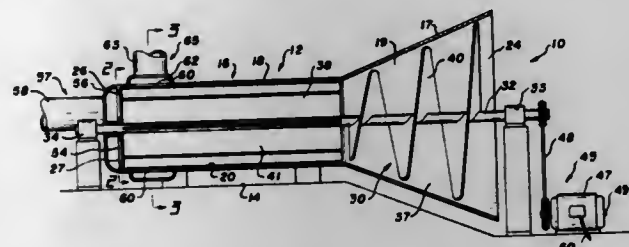
Ronald A. MacDonald, 904-510 W. Hastings, Vancouver, B. C., Canada (V6B 1L8)

Filed June 8, 1976, Ser. No. 693,974

Int. Cl.² F25B 9/02

U.S. Cl. 62-5

1 Claim



1. Apparatus for separating air into relatively warm and cool components comprising a housing having a tapered section and a cylindrical section, said tapered section tapering outwardly

from the cylindrical section and having an open intake end, said cylindrical section having a discharge end remote from the tapered section, an impeller rotatably mounted within the housing and having an axial flow portion and a radial flow portion, said axial flow portion being a feed worm tapered to conform to the tapered section, said radial flow portion having a plurality of radial blades extending into close proximity with an inner periphery of the cylindrical section, said discharge end having first and second port means radially spaced apart with respect to a longitudinal axis of the housing, said first port means being positioned to discharge axially moving air, said second port means being positioned to discharge radially moving air, duct means separately connected to the first and second port means respectively for conducting warm and cool air components away from the housing, and drive means for rotating the impeller.

4,051,690

METHOD AND APPARATUS FOR FREEZING FISH

David John Doust, 276 St. James Street West, Suite 417, Montreal, Quebec, Canada (H2Y 1N3)

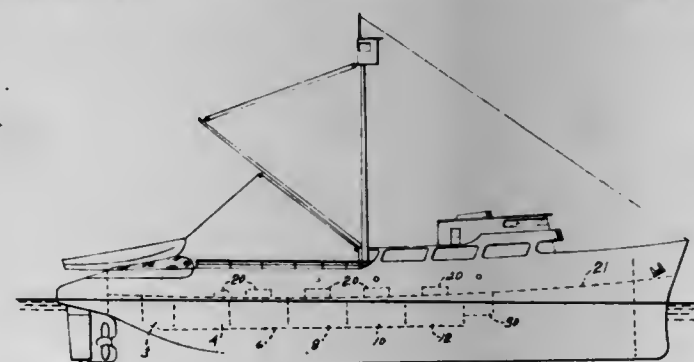
Filed July 21, 1975, Ser. No. 597,587

Claims priority, application United Kingdom, July 22, 1974, 32366/74

Int. Cl.² F25D 17/02

U.S. Cl. 62-64

10 Claims



1. Apparatus for continuous freezing of large fish on board a fishing vessel comprising a fishing vessel, said fishing vessel including a series of in line insulated fish freezing tanks, the said freezing tanks having hatch openings at deck level, and hermetically sealed hatch covers for said hatch openings, means for encapsulating in plastic bags the individual large fish brought on board the fishing vessel and vacuum sealing the bags, and means to feed the encapsulated fish through the hatch openings of the fish freezing tanks, refrigerating apparatus for feeding brine to the series of fish freezing tanks, the said refrigerating apparatus including feeding and return brine headers, pump means for circulating brine through the said header, individual valve controlled feed pipes between said feed brine header and each freezing tank, and individual valve controlled drains from each freezing tank to said return brine header, and brine collecting tanks in which the brine from the freezing tanks is replenished before being recirculated through the refrigerating apparatus.

4,051,691

AIR CONDITIONING APPARATUS

Claude W. Dawkins, 4900 NW. 30 St., Oklahoma City, Okla. 73122

Continuation-in-part of Ser. No. 581,102, May 27, 1975, Pat. No. 3,984,224, which is a continuation-in-part of Ser. No. 423,280, Dec. 10, 1973, Pat. No. 3,885,398. This application Oct. 5, 1976, Ser. No. 729,873

Int. Cl.² F25B 27/00

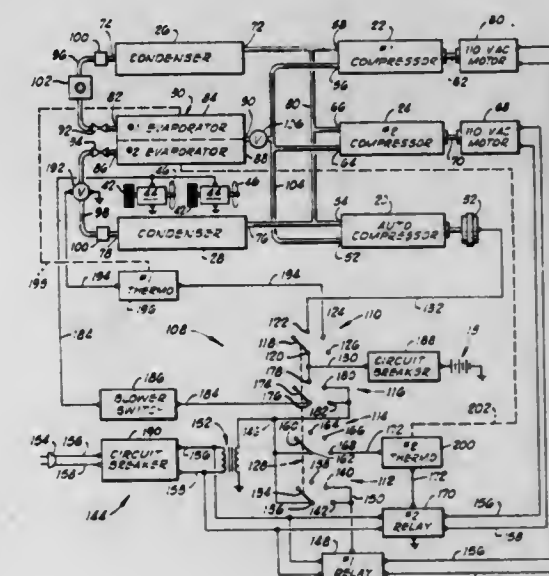
U.S. Cl. 62-236

7 Claims

1. An air conditioning apparatus employing a heat transfer medium for use in a vehicle having a large passenger area and equipped with an engine and a source of DC voltage, the apparatus comprising:

- a first compressor having a suction port and a discharge port;
- clutch means for drivingly connecting the first compressor to the engine of the vehicle;

- a second compressor having a suction port and a discharge port;
- a first electric motor drivingly connected to the second compressor;
- a third compressor having a suction port and a discharge port;
- a second electric motor drivingly connected to the third compressor;
- a first condenser coil having an inlet port and an outlet port;
- a second condenser coil having an inlet port and an outlet port;
- discharge manifold means interconnecting the discharge ports of each of the first, second and third compressors and the inlet ports of each of the first and the second condenser coils, for conducting heat transfer medium from the first, second and third compressors to the first and second condenser coils;
- an evaporator coil having a first inlet port providing access to a first half of the evaporator coil, a second inlet port providing access to a second half of the evaporator coil, and an outlet port providing an exhaust path from each of the first and second halves of the evaporator coil;
- a first expansion valve connected to the first inlet port of the evaporator coil;
- a first liquid conduit interconnecting the outlet port of the first condenser coil and the first expansion valve;
- a second expansion valve connected to the second inlet port of the evaporator coil;



- a second liquid conduit interconnecting the outlet port of the second condenser coil and the second expansion valve;
- suction manifold means interconnecting the outlet port of the evaporator coil and the suction ports of each of the first, second and third compressors, for conducting heat transfer medium from the evaporator coil to the first, second and third compressors; air circulating means having an interior portion connected to the passenger area for moving air from the passenger area over the evaporator coil for return to the passenger area, and an exterior portion for moving air from outside the vehicle over the first and second condenser coils; and
- electrical circuit means comprising:
 - first compressor control circuit means connected to the source of DC voltage and to the clutch means, for connecting the DC voltage to the clutch means in a first position of the electrical circuit means;
 - second compressor control circuit means connected to a source of AC voltage and to the first electric motor, for connecting the AC voltage to the first electric motor in at least a second position of the electrical circuit means; and
 - third compressor control circuit means connected to the source of AC voltage and to the second electric motor, for connecting the AC voltage to the second electric motor in a third position of the electrical circuit means.

4,051,692

COOLING APPARATUS FOR AUTOMOBILE PASSENGER COMPARTMENT

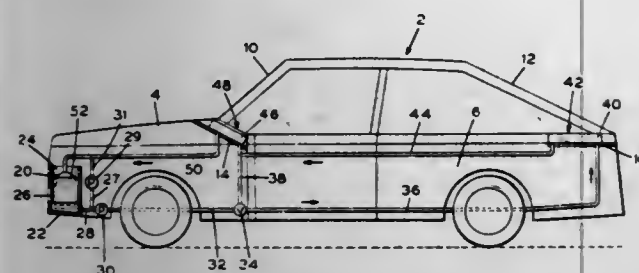
Paul Ku, and Irene Lau Ku, both of 47-50 59th St., Apt. 6E, Woodside, N.Y. 11377

Filed Oct. 12, 1976, Ser. No. 731,659

Int. Cl.² B60H 3/04; F25D 17/04; F28D 5/00

U.S. Cl. 62-244

8 Claims



1. A cooling unit for the passenger compartment of a vehicle for cooling such passenger compartment while said vehicle is driven in a forward direction said cooling unit including a vertical body having an air inlet opening, an air outlet opening and an air passageway for moving air entering said body through said air inlet opening through an upward vertical path and out said outlet opening, means adjacent said outlet opening for spraying an evaporable liquid downwardly through said vertical path through said upwardly moving air, means for catching said liquid sprayed downwardly after said liquid has passed downwardly through said upwardly moving air and pumping means for circulating said liquid from said catching means, through said passenger compartment to said spraying means, said pump circulating means in said passenger compartment including heat exchanger means whereby said liquid passing through said heat exchanger means and cooled by evaporation as said liquid is sprayed downwardly through said upwardly moving air cools the air in the passenger compartment.

4,051,693

SELF-CONTAINED AIR-CONDITIONING UNITS

Frederick Johnston Needham, Auckland, New Zealand, assignor to McAlpine Prestcold Limited, Auckland, New Zealand

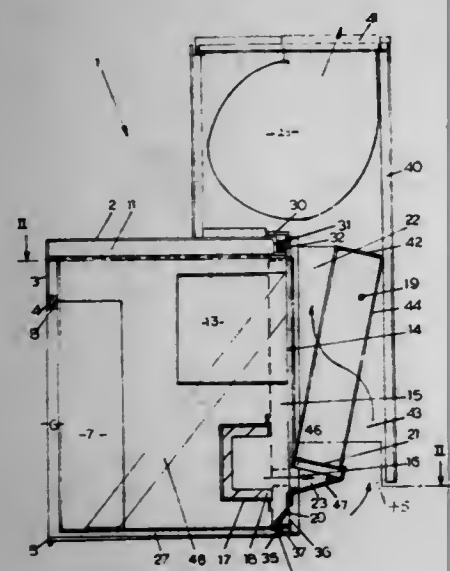
Filed Oct. 9, 1975, Ser. No. 621,211

Claims priority, application New Zealand, Oct. 18, 1974, 1175744

Int. Cl.² F25D 23/13

U.S. Cl. 62-262

9 Claims



1. An air conditioning unit comprising: a housing positionable in an aperture through a partition such as a wall structure of a building; a space dividing member removably positioned adjacent the end of said housing which is innermost within said building; said space dividing member having an inclined first surface

extending downwardly and outwardly from said building toward said housing; said housing having an upwardly extending rim terminating in an inwardly and downwardly second surface; said inclined first surface engaging over said inclined second when said space dividing member is positioned adjacent said innermost end of said housing, said inclined first and second surfaces cooperating to form means, as said space dividing member is inserted toward said housing, for drawing and urging said space dividing member toward said housing to form a seal therebetween and between the exterior and interior of said building; said space dividing member having therein at least one aperture for the passage therethrough of air; and said space dividing member having operatively mounted thereon a compressor, a condenser and an evaporator.

4,051,694

EVAPORATIVE PRECOOLER FOR AN ABSORPTION REFRIGERATING APPARATUS

Lars Sivert Eager, Bandhagen, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

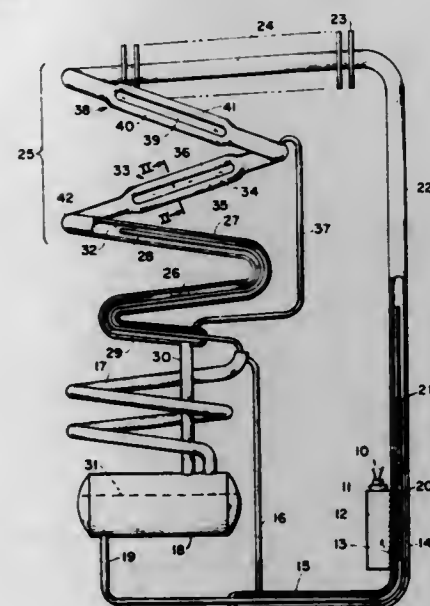
Filed June 24, 1976, Ser. No. 699,219

Claims priority, application Sweden, June 30, 1975, 7507432

Int. Cl.² F25B 15/10

U.S. Cl. 62-490

9 Claims



1. In an absorption refrigerating apparatus operating with a pressure-equalizing inert gas comprising: an evaporative pre-cooler having two parallel flow paths that are separated from each other by means which heat conductively connects said flow paths to one another, one of said flow paths being located below the other and forming a conduit for the condensate accumulating when said apparatus is operative, the other of said flow paths being situated at a higher level forming a conduit for the partial flow of weak gas, and means being provided for raising the condensate to said weak gas conduit and to moisten the inner wall of said weak gas conduit with said condensate, said means being a channel that extends substantially perpendicular to the longitudinal axes of said parallel flow paths.

4,051,695

ROTATING SHAFT COUPLING FOR USE IN VACUUM

Wayne E. Phillips, Boulder, Colo., and Glen R. Schenemann, Hollywood, Calif., assignors to Alreo, Inc., Montvale, N.J.

Filed Apr. 27, 1976, Ser. No. 680,542

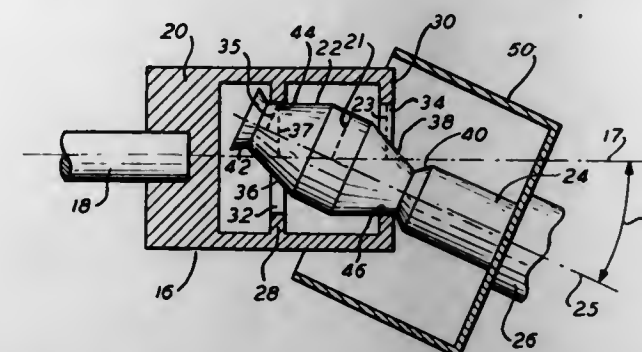
Int. Cl.² F16D 3/02

U.S. Cl. 64-8

13 Claims

1. A coupling between first and second rotatable shafts for use in vacuum vapor coating apparatus comprising: a. a socket affixable to an end of the first shaft, the socket

having an opening and two closed loop, axially spaced, interior bearing surfaces; b. a roller inside the socket and affixable to an end of the second shaft, the roller having two closed loop, axially spaced, exterior bearing surfaces for making rolling contact with the interior bearing surfaces of the socket at two radially opposed and axially spaced locations at



which the radial distance from each exterior bearing surface to the axis of the second shaft is shorter than the radial distance from the contacting interior bearing surface to the axis of the first shaft, whereby the second shaft is disposed at an angle to the first shaft; and c. means for preventing disengagement of the socket and the roller when their bearing surfaces are in rolling contact.

4,051,696

SPLINE MECHANISM FOR DRILL TOOLS

Leonard Mason, and Clifford Anderson, both of Edmonton, Canada, assignors to Lee-Mason Tools Ltd., South Edmonton, Canada

Filed Sept. 12, 1975, Ser. No. 613,005

Claims priority, application Canada, Apr. 1, 1975, 223511

Int. Cl.² F16D 3/06

U.S. Cl. 64-23

11 Claims



1. A spline mechanism for a telescoping tool useful in a drill string which comprises:

a tubular outer part; a tubular inner part arranged to slide longitudinally within the outer part; one of said parts being adapted to connect to the upper driving portion of a drill string and the other part being adapted to connect with the lower driven portion of the drill string; said parts co-operating to form insertable spline-receiving passages; and a composite insertable spline disposed in at least one passage for interconnecting the tubular parts so that they

rotate together in use and may slide longitudinally relative to each other; each said insertable spline comprising a substantially rigid body having a driving face that slides relative to the driven tubular part, said face having a slab or coating of deformable, resilient, abrasion-resistant material associated therewith.

4,051,697

HIGH PILE FABRIC

Herbert York, 30 Church Road, Great Glen, Leicestershire, England

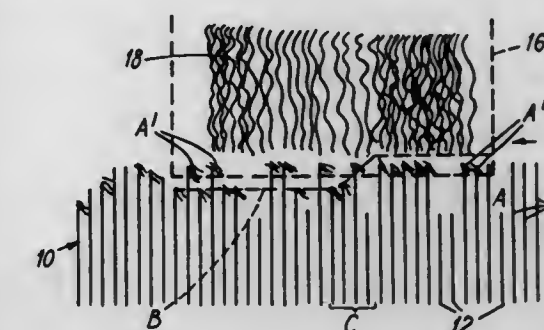
Filed Dec. 23, 1975, Ser. No. 643,774

Claims priority, application United Kingdom, Jan. 3, 1975, 00200/75

Int. Cl.² D04B 9/12

U.S. Cl. 66-9 B

4 Claims



1. A method of producing a high pile fabric simulating an animal pelt or fur on a multi-feed circular weft knitting machine which comprises feeding a plurality of loose fibers in the form of carded slivers to a fiber-collecting station disposed adjacent a needle bed of the multi-feed circular weft knitting machine so that the needles in the bed pass the station during knitting, effecting a needle preselection on the knitting machine to raise selected knitting needles from a first, non-fiber collecting level in which the needles do not collect fibers at said fiber-collecting station to a second, fiber-collecting level in which the selected needles collect fibers from said fiber-collecting station during the passage of said selected needles past said station, permitting said selected needles to collect fiber from said fiber-collecting station, and effecting a needle reselection in predetermined pattern sequence while said preselected needles are collecting fiber from said fiber-collection station so to provide a variation in the needles which collect fiber.

4,051,698

GUIDE BAR ASSEMBLY FOR A WARP KNITTING MACHINE

Herbert Leonhardt, Carboonstraat 15, KerkRade-West, Netherlands

Filed Nov. 5, 1976, Ser. No. 739,191

Claims priority, application Germany, Nov. 13, 1975, 2550921; Nov. 13, 1975, 7536036

Int. Cl.² D04B 23/00, 27/00

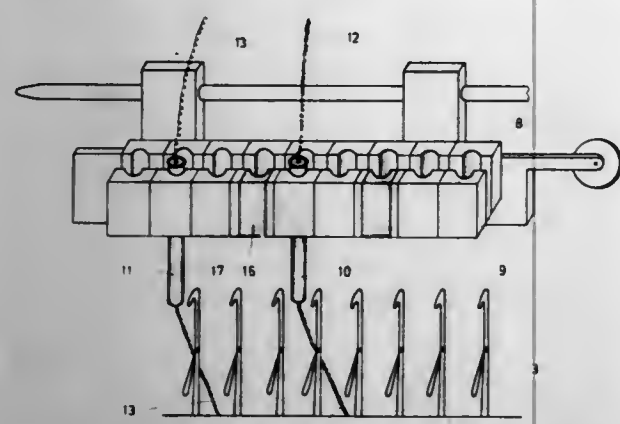
U.S. Cl. 66-205

4 Claims

1. A guide bar assembly for use in a warp knitting machine, comprising:

a guide bar including two guide rails moveable relative to each other; means for mounting said guide bar; a plurality of independently controllable yarn carrier elements extending transversely between said guide rails; means for releasing said yarn carrier elements from said guide rail during the knitting process and shifting said

elements in the longitudinal direction relative to at least one of said guide rails, between predetermined positions



substantially across the full length of said guide bar and means at said positions for receiving a yarn carrier.

4,051,699

LIQUID AMMONIA MERCERIZATION

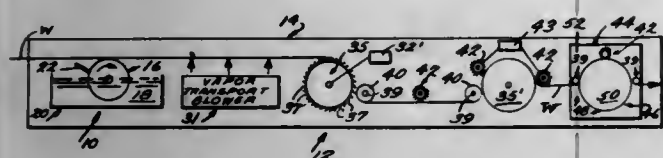
John B. Carpenter, Jr., Greensboro, N.C.; assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Sept. 25, 1975, Ser. No. 616,818

Int. Cl.² D06B 1/14, 5/08, 7/08

U.S. Cl. 68—5 D

8 Claims



1. Apparatus for mercerization of a cellulosic pile or ribbed fabric, the fabric having a pile or ribbed face and a back, said apparatus comprising

means for applying a predetermined amount of liquid ammonia to said fabric less than the amount that would be picked up by said fabric if immersed in liquid ammonia, said means including a metering roller partially disposed in a pan of liquid ammonia and having a surface for engaging the back of said fabric, and means for rotating said metering roller at a predetermined rate, said metering roller having a plurality of deep engravings formed in the surface thereof,

means for tensioning said fabric so that the face thereof is not disturbed after application of liquid ammonia to said fabric, said means including a first cylinder having a plurality of pins associated with the peripheral surface thereof for engaging the back of said fabric,

means for facilitating the removal of ammonia from said fabric by changing the direction of fabric movement without damaging the fabric face and drying said fabric, said means including a plurality of guide rollers for engaging the fabric face and changing the direction of fabric movement, and a second, heated, cylinder for engaging the back of said fabric,

means for brushing the fabric face to substantially restore the original appearance thereof, and means for further treating said fabric as necessary to remove all of the ammonia therefrom.

4,051,700

PROCESSING OF LEATHER

Jiri Dokoupil, Guckingen, Germany, assignor to Maschinenfabrik Turner GmbH, Oberweel, Germany

Filed Dec. 1, 1976, Ser. No. 746,329

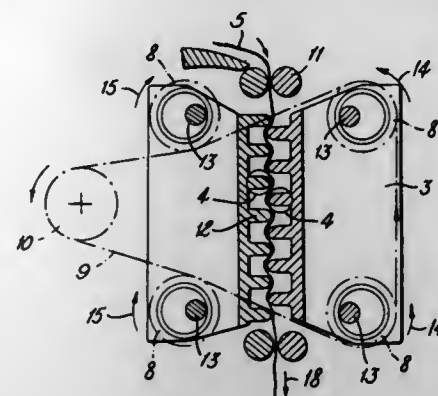
Int. Cl.² C14B 1/40

U.S. Cl. 69—33

2 Claims

1. A machine for the processing of flat, flexible objects, especially for the softening, stretching and glazing of leather;

said machine comprising two opposed interengageably processing elements between which the objects are through-fed for processing, both the opposed processing elements being mounted for movement around closed circular paths and the processing elements being arranged so that their paths overlap, and at least a pair of eccentric mechanisms for moving each of the processing elements correspondingly around their closed circular paths with a periodic motion whereby the distance



apart of the processing elements is periodically increased and decreased so that the object to be processed is processed during the phase of motion in which the paths of the processing elements interengage and overlap and the object is simultaneously transported through the machine by the processing elements, the processing elements having a component of motion in the through-feed direction during the phase of motion in which the paths of the processing elements overlap.

4,051,701

LEATHER SOFTENING MACHINES

Walter Baum, Frankfurt, and Hans Helmut Brendel, Wehrheim, both of Germany, assignors to USM Corporation, Boston, Mass.

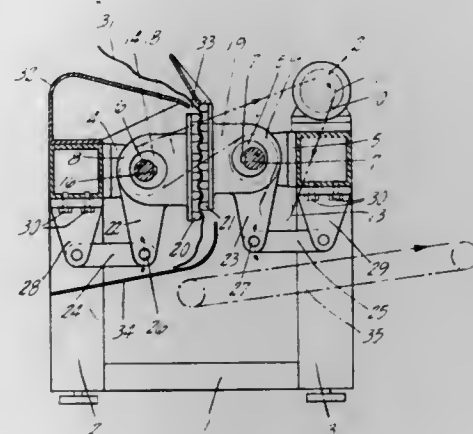
Filed Nov. 22, 1976, Ser. No. 743,753

Claims priority, application Germany, Dec. 2, 1975, 2554175; Dec. 2, 1975, 7538410[U]

Int. Cl.² C14B 1/40

U.S. Cl. 69—33

10 Claims



1. A machine for the processing of flat, flexible workpieces by means of two opposing processing members, between which the workpieces are guided through, and whose distance apart is periodically increased and decreased by a relative movement, whereby the workpieces intended for processing is pressed by an arrangement of projections fitted on at least one processing member into an arrangement of corresponding recesses on the other processing member, wherein both processing members execute a feed movement in the closed position, taking the workpiece with it, and in an opened position, by contrast, the processing members execute a return movement.

4,051,702

MAGNETICALLY OPERATED SWITCH LOCK AND KEY THEREFOR

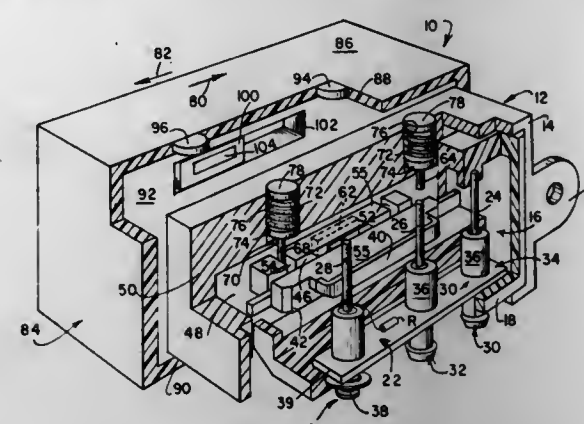
John Phillip Treschitta, South Norwalk, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed July 28, 1975, Ser. No. 599,692

Int. Cl.² E05B 47/00; H01H 27/00

U.S. Cl. 70—276

14 Claims



1. A controllable locking mechanism comprising: an actuating member movable between two positions; switch means connected to and operable by said actuating member to corresponding switch positions; at least two release means operable to lock said actuating member and to release said actuating member and located in a coding arrangement; an external lock housing preventing physical access to said actuating member and said release means with said housing including at least two external surfaces each adjacent a respective one of said release means; key means including first actuating means having a corresponding coding arrangement to said release means and generating a plurality of fields for operating said release means; a key housing mounting said first actuating means and having a configuration corresponding to said external lock housing for embracing said external lock housing and automatically positioning said first actuating means in operative relationship to said release means for operating said release means; and second actuating means carried by said housing for selectively operating said actuating member to said two positions.

4,051,703

BICYCLE LOCK

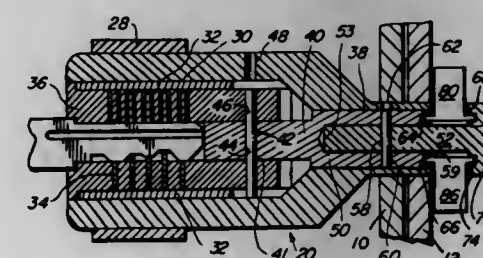
Charles E. Plais, 6834 W. Devon Ave., Chicago, Ill. 60631

Filed Oct. 21, 1976, Ser. No. 734,399

Int. Cl.² E05B 9/04

U.S. Cl. 70—371

2 Claims



1. A lock for bicycles comprising a cylindrical housing having an enlarged rear end and an integrally-formed forward reduced end, said enlarged end having a large axial bore, said reduced end having a smaller axial bore therein communicating with said large bore, a tumbler mechanism inserted in said large bore and secured thereto, said tumbler mechanism having a housing including an axial bore, a connecting rod secured at

one end in said tumbler housing bore and having a face on its opposite end, said connecting rod having an axial bore in said opposite end and said rod partially seated in said bore in said reduced end of said housing, a pin having a shank and a head, said head including an inner face on the side adjacent said shank, a part of said shank anchored in said bore of said connecting rod, a pair of aligned bores in said opposite end face of said head, a pair of aligned bores in the inner face of said head, a pair of latching members, each latching member having laterally-extending prongs at one end, the prongs being rotatively seated in opposed aligned bores in said inner face of said head and said opposite end face of said connecting rod, a pair of angularly-aligned slots in said reduced end of said housing whereby said latch members are each seated in one of said slots and projected outwardly thereof upon rotation of said tumbler housing which simultaneously rotates the connecting rod and pin.

4,051,704

METHOD FOR THE MANUFACTURE OF AN ORNAMENTAL HEAD LUG OF THE SINGLE UNIT TYPE FOR USE IN BICYCLES

Senkichi Kimura, 27-3, Higashi-Mukojima 4-chome, Sumida, Tokyo, Japan

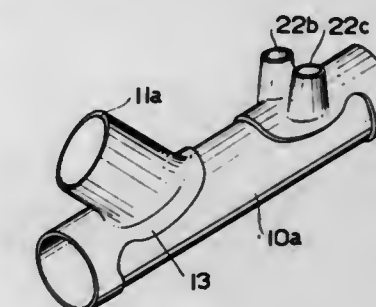
Filed May 28, 1976, Ser. No. 690,930

Claims priority, application Japan, Nov. 19, 1975, 50-138209; May 10, 1976, 51-57656[U]

Int. Cl.² B21D 39/08, 22/10

U.S. Cl. 72—58

9 Claims



1. Method for the manufacture of an ornamental head lug with a cut wave pattern of the single unit type for use in bicycles from a tubular ferrous blank as a starting material by an oil hydraulic bulge forming press machine in which there are provided with a first sectional die, a second sectional die, a third sectional die, a vertically reciprocating hydraulic ram, and two horizontally opposed and reciprocating rams, the bottom half of each of said sectional die is bolted onto the bed of said press machine and the top half thereof is lowered and held in position by said vertically reciprocating ram, all of said rams are driven by the oil hydraulic pressure, the improvement which comprises inserting said tubular ferrous blank into said first sectional die designed to bulge-form a single protuberant component on said blank, subjecting said blank in said first die to the combined load of a vertical compressive load of said vertical ram, an axial compressive load applied to both ends of said blank through pistons by said horizontal rams, and a high pressure oil supplied into the interior of said blank, inserting the thus bulge formed tubular blank with one protuberant component into said second sectional die designed to form two or twin parallel small protuberant components on the exterior surface of said bulge-formed blank, the parallel direction of said twin components being located perpendicularly to the axis of said tubular blank, subjecting said primary semiproduct in said sectional die to said combined bulge forming pressure to obtain a secondary product with one and twin protuberant components on said tubular blank, inserting said secondary product into a third sectional die designed to form an ornamental joggled cut wave pattern on the exterior surface of said secondary product, mechanically forcing a pair of horizontally opposed mandrels into each end of said secondary product in

said third sectional die, and forming said pattern on said surface, the outer diameter of said mandrel being bigger than the bore of said secondary product by the order of 1.5 - 2.5 mm., whereby means for eliminating repulsion resulting from the high pressure oil in said tubular blank in said first and second dies and an oil seal means by the serrated shoulder on said piston are not provided.

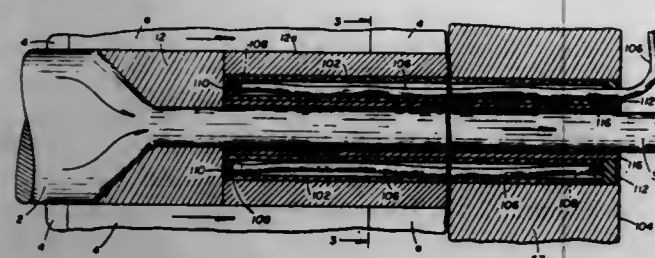
4,051,705 DIE STEM HEATING

Paul W. Andrus, Cambridge, Mass., and Ronald A. Carter, Levittown, Pa., assignors to Western Electric Co., New York, N.Y.

Filed June 24, 1976, Ser. No. 699,395
Int. Cl.² B21D 22/10

U.S. Cl. 72—60

9 Claims



1. A method of extruding an elongated, metallic workpiece through an aperture in a die, which die is supported at an exit end thereof by an apertured die stem, so as to form an elongated, metallic product, the method comprising the steps of:

- continuously advancing a heat-softenable pressure medium toward an entrance end of said die aperture, while applying the advancing medium to the periphery of said elongated, metallic workpiece, such that frictional drag forces transmitted by the advancing medium along said periphery cause the elongated, metallic workpiece to pass through the die aperture and then into said apertured die stem as said elongated, metallic product, surrounded by at least a portion of the medium; while
- applying sufficient heat from a source of electrical energy, circumferentially about the periphery of the apertured die stem, to so regulate the temperature of the medium passing with the elongated, metallic product into the apertured die stem as to maintain the medium within the apertured die stem continuously in a softened state, capable of flowing freely through the apertured die stem with the advancing, elongated, metallic product; and while
- electrically isolating the apertured die stem from said source of electrical energy.

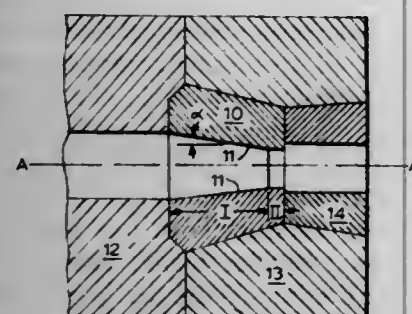
4,051,706 METHOD OF MAKING ANISOTROPIC PERMANENT MAGNETS OF MN-AL-C ALLOYS

Yoichi Sakamoto, Hirakata; Nobuyuki Kato, and Tadao Ohtani, both of Kotano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 1, 1975, Ser. No. 592,314
Claims priority, application Japan, July 11, 1974, 49-79789
Int. Cl.² B21C 23/00; H01F 1/00, 7/02

U.S. Cl. 72—253 R

6 Claims



1. A method of making anisotropic permanent magnet which

comprises the steps of (1) preparing a polycrystalline body of an alloy comprises of the Mn-Al-C system by melting and casting (2) subjecting said alloy to heat treatment, and (3) warm extruding at a temperature of 530° to 830° C in order to make said alloy anisotropic, said warm extruding step being performed by pushing said polycrystalline body through a converging die with lubricant interposed between said polycrystalline body and said converging die.

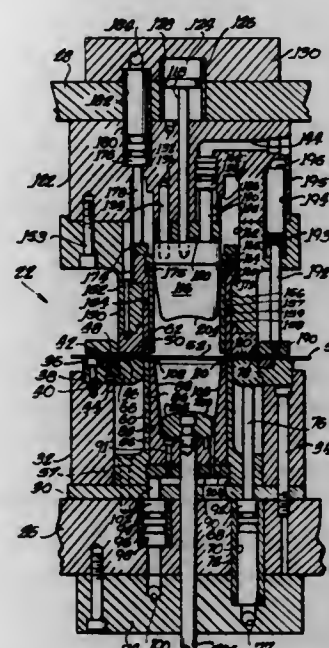
4,051,707 METHOD AND APPARATUS FOR MAKING DRAWN CONTAINERS

John Valek, Cicero; Roland E. Miller, Orangeville, and Joseph A. Scaletta, Mount Prospect, all of Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Feb. 2, 1976, Ser. No. 654,985
Int. Cl.² B21D 22/24

U.S. Cl. 72—348

10 Claims



7. A method of making a container from a blank of metallic material of predetermined diameter, comprising the steps of: drawing said blank over an external cylindrical surface on a forming ring having a first predetermined diameter so as to form a drawn container having a substantially planar portion of said predetermined diameter and a cylindrical annular wall portion, engaging an annular portion of said planar portion between a clamping ring applied exteriorly against said annular portion and an opposed forming die applied interiorly against said annular portion, reverse redrawing said annular wall portion between said clamping ring and forming die to form a reverse redrawn container having a bottom floor and an annular flange formed between said opposed clamping ring and forming die, said reverse redrawing simultaneously forming a redrawn annular wall generally normal to the plane of said annular flange and having a diameter less than said first diameter, said redrawn annular wall having a free edge portion, and curling said free edge portion of said annular wall outwardly and downwardly relative to said bottom floor and then inwardly toward said redrawn annular wall to form a curled rim circumferentially of an upper open end of the container.

4,051,708 FORGING METHOD

David J. Beane, and Ronald M. Kaplan, both of North Palm Beach, Fla., assignors to United Technologies Corporation, Hartford, Conn.

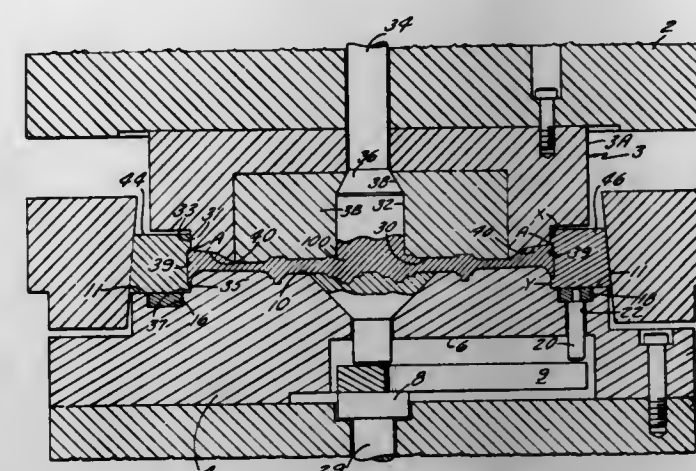
Filed Nov. 25, 1975, Ser. No. 635,181
Int. Cl.² B21D 22/00

U.S. Cl. 72—354

5 Claims

1. A method of forming a disc having integral blades including (1) pressing a billet to a preform shape where the center

part of a disc is formed close to final shape with additional material needed to form the blades being placed at the outer circumference thereof, (2) holding the center formed part of the preform shape of the disc in place while applying a pressing force to press the additional material into blades, the pressing force being distributed between the center formed part of the disc and the additional material at the outer circumference so



that a greater proportion of the pressing force is placed on the additional material, wherein step (2) a first die engages the center formed part of the preformed shape while a second die having a surface of final shape is held against the additional material of the preformed shape, spacing an upper surface on said second die above a lower surface on said first die, pressing said second die, placing deformable means between said upper and lower surfaces to limit the force transmitted therebetween.

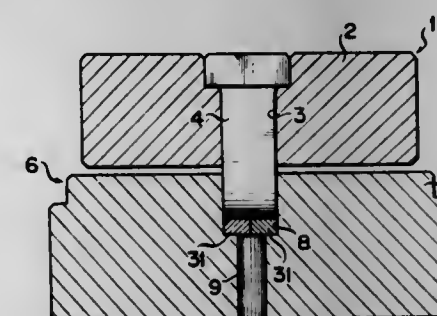
4,051,709 METHOD OF PRODUCING CONNECTOR FITTINGS FOR PIPES

Yoshio Sasahara, Tokyo, Japan, assignor to Kabushiki Kaisha Taishin Seisakusho, Tokyo, Japan

Filed Aug. 16, 1976, Ser. No. 714,905
Int. Cl.² B21D 22/00

U.S. Cl. 72—356

3 Claims



1. A method of producing connector fittings for pipes, comprising attaching a first upper die to an upper die set and a first lower die to a lower die set, respectively, said first upper die having a hole formed in the central part thereof in which a pressure die can be inserted, said first lower die having a cavity formed in the upper surface thereof, placing a pair of blanks in the cavity of said first lower die, pressing said blanks with said pressure die so as to form a semicircular recess in the upper surface of said blanks, attaching a second upper die to said upper die set and a second lower die to said lower die set, respectively, said second upper die having a cavity in its lower surface to receive a second pressure die, said second lower die having a cavity formed in the upper surface thereof, placing said pair of blanks in the cavity of said second lower die, and pressing said blanks with said second pressure die thereby forming a pair of connector fittings, each having a semicircular inner recess for holding flange of a pipe and a pair of surface in which bolt holes are formed.

4,051,710

PULL TAB ATTACHMENT TOOL

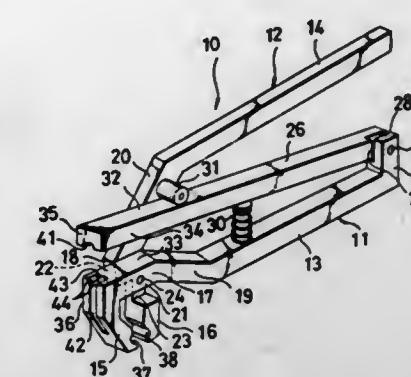
Yasuhiro Kobayashi, Niyuzen, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Dec. 22, 1976, Ser. No. 753,479

Claims priority, application Japan, Dec. 29, 1975, 50-178459
Int. Cl.² B21D 9/08

U.S. Cl. 72—410

3 Claims



1. A pull tab attachment tool comprising:

- a pair of first and second levers having respectively first and second handle portions and opposed first and second jaw portions extending from their one ends in a common direction, said first and second levers being pivotably connected together adjacent to said one ends thereof, said second lever having a roller intermediate the opposite ends thereof, and said first lever having an outwardly opening pull tab-receiving slot at said one end thereof which also opens in a direction away from said first jaw portion and defines a pair of laterally spaced apart seat surfaces at its opening facing away from said first jaw portion;
- a third lever pivotably connected to the other end of said first lever, said third lever having an outwardly-opening punching depression at one end thereof, and said depression facing said pair of seat surfaces;
- an urging means acting between said first and third levers and normally urging said third lever away from said first handle portion whereby said third lever is held in rolling engagement with said roller to spread said first and second handle portions apart with said opposed jaw portions held away from each other; and
- whereby when said first and second handle portions are manually actuated to move toward each other, said opposed jaw portions are brought into engagement with each other to provide a first pressing structure, and said one end of said third lever is brought into engagement with said one end of said first lever through the rolling action of said roller along said third lever, with said punching depression in alignment with said pair of seat surfaces to provide a second pressing structure.

4,051,711

CALIBRATION APPARATUS FOR GAS FLOWMETERS
Alan Thomas Joseph Hayward, East Kilbride, Scotland, assignor to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 8, 1976, Ser. No. 740,019

Claims priority, application United Kingdom, Nov. 12, 1975, 46783/75

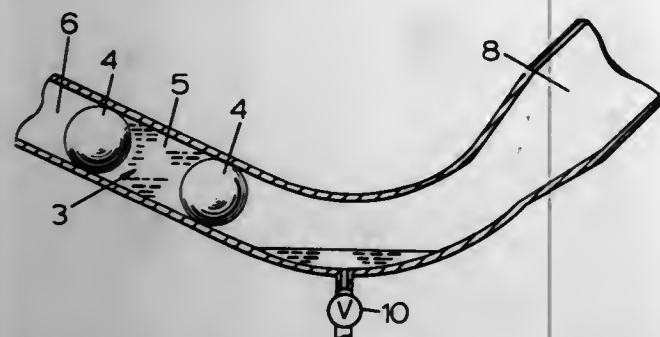
Int. Cl.² G01F 25/00

U.S. Cl. 73—3

12 Claims

1. A mechanical displacement meter prover for gas flowmeters comprising a pipe and a displacer movable along the pipe in response to the flow of gas through the pipe, the pipe having a prover section provided at each end with a detector reactive to the transit of the displacer, and the displacer comprising a

pair of longitudinally spaced, transverse sealing members between which there exists a reservoir of lubricating fluid to



which fluid each of the sealing members is exposed in use of the prover.

4,051,712

PRESSURE TRANSDUCER AUTO REFERENCE

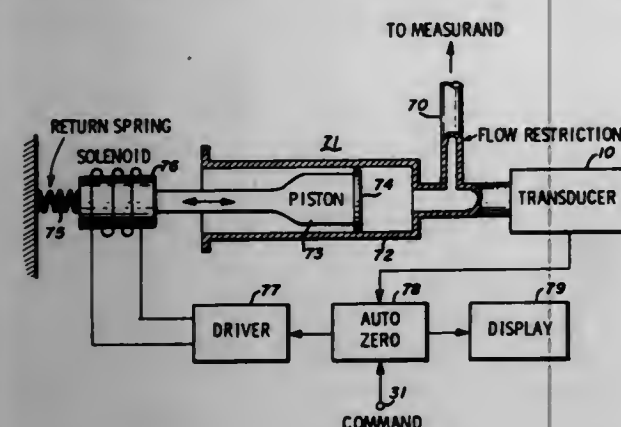
Arthur R. Ziss, Los Altos, and Duane R. Tandeske, Pleasanton, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 20, 1976, Ser. No. 716,316

Int. Cl.² G01L 27/00

U.S. Cl. 73-4 R

10 Claims



1. In an absolute pressure transducer capable of producing an analog potential representative of the absolute value of an applied pressure, means for calibrating said transducer to a standard reference pressure, said calibrating means comprising: means for producing upon command a reference pressure for a controlled period of time at said transducer input, means for generating a variable calibrating potential during said period of time, means responsive to said analog potential and to said calibrating potential to produce an output indication, means for producing a reference potential representative of the desired transducer output for said reference pressure, and means for stopping the variation in said calibrating potential and holding the calibrating potential fixed when said output indication is equal to said reference potential.

4,051,713

FRICTION MEASURING AND TESTING METHOD AND APPARATUS

Frank W. Bao, Clermont, Fla.; James L. Hummendorf, Morningview, and Stephen D. Parker, Erlanger, both of Ky., assignors to Actua, Inc., Florence, Ky.

Filed Mar. 23, 1976, Ser. No. 669,594

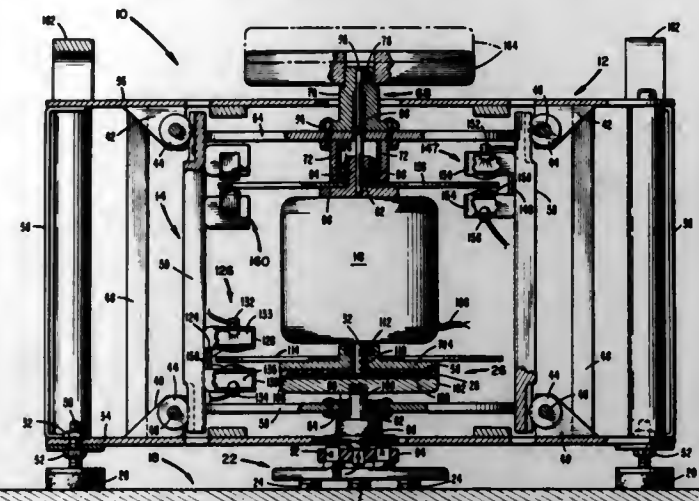
Int. Cl.² G01N 19/02

U.S. Cl. 73-9

14 Claims

1. An apparatus for measuring and testing coefficient of friction characteristics of a surface and the like, the apparatus comprising: an outer frame adapted to be fixed relative to the surface under test; friction pad means mounted rotatably relative to said outer frame and adapted to contact the surface

under test; a motor mounted on said outer frame, having a rotatable shaft; torque means for coupling said rotatable shaft to said friction pad means for developing a torque on said friction pad means urging the same to rotate relative to said frame element and hence the surface under test; said torque means forming a coupling between said rotatable shaft and said



friction pad means which permits rotation of said rotatable shaft to occur without rotation of said friction pad means below torque values representative of static friction torque sensing means for sensing the torque developed by said torque means; and speed sensing means for sensing the rotation of said friction pad means relative to said frame element and hence the surface under test.

4,051,714

SONIC SIGNALLING TRANSDUCER

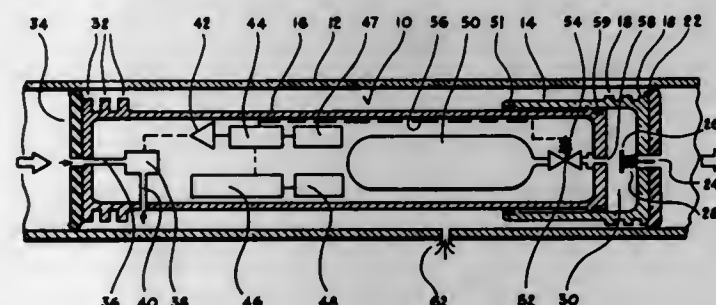
Harry Robert Fechter, 2298 Capistrano, Las Vegas, Nev. 89121, and Peter Hood, 4721 Royce Road, Irvine, Calif. 92715

Filed July 12, 1976, Ser. No. 704,547

Int. Cl.² G01M 3/24

U.S. Cl. 73-40.5 A

7 Claims



1. A method of locating and recording at remote stations the location of a leak in a pipeline through which a stream of pressurized fluid flows, consisting of the steps of

- Inserting a ferret including a cylinder and a piston, each of which is provided with a member substantially obstructing fluid flow therepast, said members being spaced axially of the pipe,
- And employing pressure change in the ferret resulting from fluid flow through a pipeline leak aperture to effect release of pressurized gas and resultant propulsion of the piston within the cylinder for generation of sonic waves through the pipeline fluid in both upstream and downstream directions.

4,051,715

LINEBREAK DETECTION SYSTEM

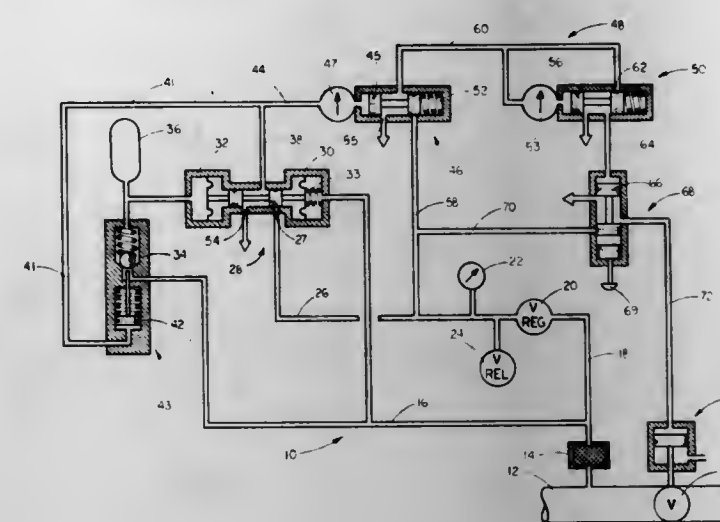
Howard L. Ledeen, Pasadena, and Franz Schmon, Granada Hills, both of Calif., assignors to Ledeen Flow Control Systems, Sun Valley, Calif.

Filed Aug. 30, 1976, Ser. No. 718,757

Int. Cl.² G01M 3/28

U.S. Cl. 73-40.5 R

11 Claims U.S. Cl. 73-46



1. A pipeline pressure drop monitoring system comprising: means for transmitting an actuating signal in response to each decrease in pipeline pressure of a given increment; timing means activated by receipt of an actuating signal to deliver an energizing signal for a predetermined period; and output means conditioned while a said energizing signal is imposed thereon to deliver an action signal after a timed delay longer than said predetermined period; said output means comprising: a pressure fluid system; and an on-delay output valve in said fluid system.

4,051,716

LEAK DETECTOR

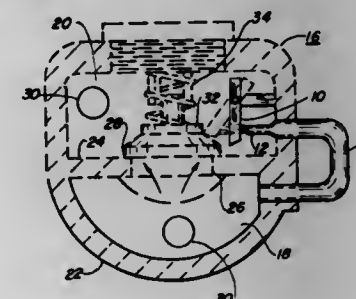
Joseph R. Mooney, 33 Hawk St., New Orleans, La. 70124

Filed Oct. 8, 1976, Ser. No. 730,767

Int. Cl.² G01M 3/04; F17D 3/04

U.S. Cl. 73-40.5 R

5 Claims



1. In a poppet valve for connection in a fluid pressure line to detect any leakage downstream therefrom, said poppet valve defining up and down stream spaces connected by a valve seat, spring biased closed by a valve mounted to seat therein, and by a bypass of said valve seat, a leak detector comprising: a. a nozzle defined on the downstream end of said bypass for directing and accelerating a bypass leakage flow; and b. a blocking lever pivoted in said downstream space with an end opposite said nozzle and adjacent the valve and valve seat, said blocking lever being adapted to be pivoted by said leakage flow from said nozzle to swing an end over the seated valve and limit its displacement from the valve seat and thereby limit a normal pressure fluid flow through the poppet valve to signal the presence of a leak.

4,051,717

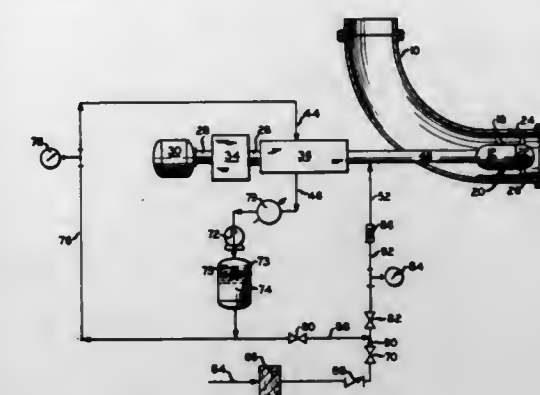
TESTING SHAFT SEALS WITHOUT PRESSURING SYSTEM TO OPERATING PRESSURE

J. B. Miller, Houston, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 21, 1976, Ser. No. 678,857

Int. Cl.² G01M 3/08

13 Claims



1. A seal test procedure comprising: introducing a lubricant which is liquid under test conditions into an annulus between a shaft and a surrounding sleeve, said introduction being at a point downstream of said seal, said introduction being under low pressure; passing said lubricant liquid along said annulus, through a downstream bearing and out to the atmosphere or the at least essentially unpressured interior of a vessel; maintaining a sealant liquid behind said seal under about normal operating pressure; and thereafter operating said shaft at about normal operating speed for a short time, and inspecting for vibration, smoking, or a surge of sealant liquid along said annulus which would indicate seal failure.

4,051,718

APPARATUS FOR MEASURING THE VELOCITY OF LOW FREQUENCY VIBRATIONS

Ferenc Meckl, and Péter Pluk, both of Tatabánya, Hungary, assignors to Banyaszati Kutató Intézet, Budapest, Hungary

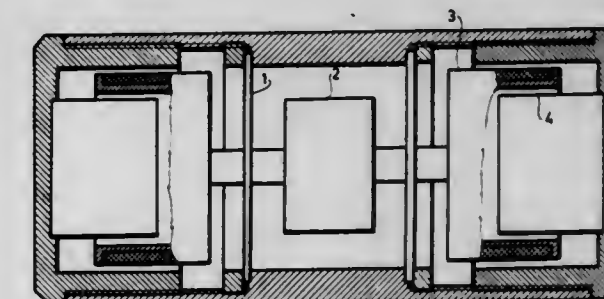
Filed Jan. 9, 1976, Ser. No. 647,807

Claims priority, application Hungary, Jan. 9, 1975, BA 3186

Int. Cl.² G01V 1/28

U.S. Cl. 73-71.2

4 Claims



1. Apparatus for measuring the velocity of low frequency mechanical vibrations, comprising at least one spring means, a vibratable mass secured to said spring means, at least two coils mechanically coupled to said mass, a core for each coil of a permanent magnetic material, said cores being stationary relative to said coils, at least one of said coils serving as a measuring coil, while at least one other coil is a feedback coil, a controllable current generator having a control input and an output, said measuring coil being connected to said control input and said feedback coil being connected to said output, the current fed through said feedback coil by said current generator being of the same direction as the current generated in said feedback coil by the vibration of said mass.

4,051,719

METHOD AND APPARATUS FOR THE MOISTURE MEASUREMENT OF FLAT STRUCTURES, ESPECIALLY TEXTILE WEBS

Ernst Loch, Uster, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland

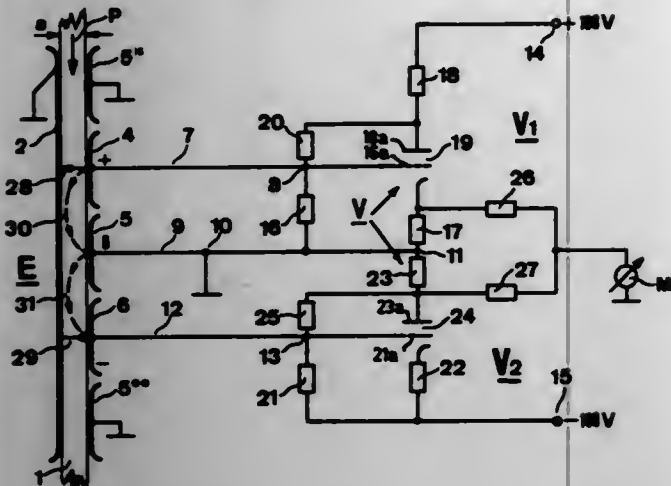
Filed Aug. 16, 1976, Ser. No. 714,858

Claims priority, application Switzerland, Oct. 20, 1975, 18571/75

Int. Cl.² G01N 25/56

U.S. Cl. 73—73

3 Claims



1. A method of measuring the moisture of substantially flat textile structures, especially textile webs, comprising the steps of: feeding the textile structure along a predetermined path of travel towards a measuring location where there is carried out a measuring operation, removing electrical charges from the textile structure prior to initiation of the measuring operation, carrying out the measuring operation, deriving the useful signal components of the same polarity by means of the measuring operation and dependent upon the conductance of the textile structure, deriving disturbance signal components of opposite polarity which depend upon external voltages, additively processing the useful signal components into a measurement value, and adding the disturbance signal components which by virtue of their opposed polarity at least approximately cancel one another.

4,051,720

ENGINE USEFUL LIFE MEASURING DEVICE

Clive Seymour Barrington, Bristol, England, assignor to Rolls-Royce (1971) Limited, Great Britain

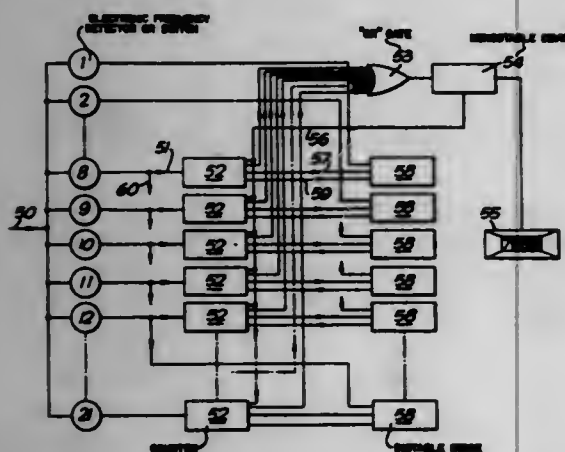
Filed June 3, 1976, Ser. No. 693,870

Claims priority, application United Kingdom, June 18, 1975, 2879/75

Int. Cl.² G01M 15/00

U.S. Cl. 73—116

5 Claims



1. A device for measuring the use of the useful life of a rotating machine, comprising means for generating a signal having a characteristic related to a variable load of the machine; a plurality of detectors each responsive to a different

level of said characteristics of said signal, the said detectors comprising a first set of detectors which respond to lower levels of said characteristic and a second set of detectors which respond to higher levels of said characteristic, the means for generating the count being associated only with the second set of detectors; means for generating a count which means is associated with said detectors and arranged to generate a count when the characteristic of said signal changes between predetermined levels of said characteristic consequent upon a corresponding machine load change; and means for summing successive counts generated by said means thereby to give an indication of the usage of said useful life.

4,051,721

CAPACITIVE FORCE-MEASURING SYSTEM

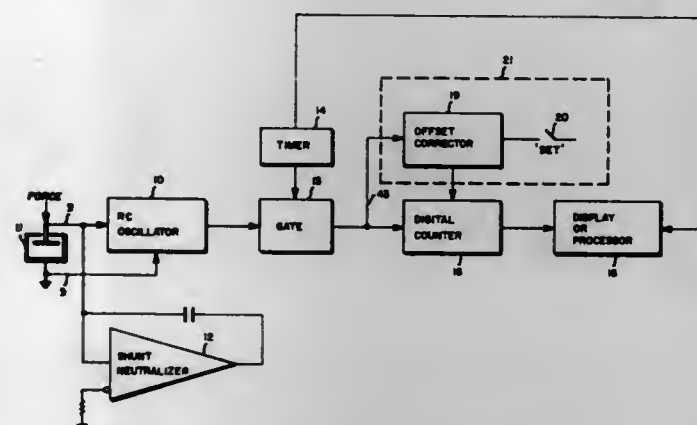
Richard E. Williams, Reston, Va., assignor to Scope Incorporated, Reston, Va.

Filed Jan. 13, 1976, Ser. No. 648,757

Int. Cl.² G01L 1/14

U.S. Cl. 73—141 A

7 Claims



1. A system for measuring force comprising: first means for producing electrical capacitance reciprocally responsive to said force including an electrical phase and amplitude positive feedback device for neutralizing stray capacitance; a resistance-capacitance oscillator responsive to said first means for generating an alternating electrical signal whose frequency is reciprocally responsive to said capacitance; second means responsive to the output of said oscillator for generating a signal indicative of said frequency whereby said signal is also indicative of said force.

4,051,722

METHOD AND APPARATUS FOR MEASURING IRREGULARITIES IN THE CROSS-SECTION OF YARNS, ROVING, BANDS AND THE LIKE

Peter Feller, Benglen, Switzerland, assignor to Zellweger, Ltd., Uster, Switzerland

Filed Feb. 22, 1977, Ser. No. 771,034

Claims priority, application Switzerland, Mar. 22, 1976, 3559/76

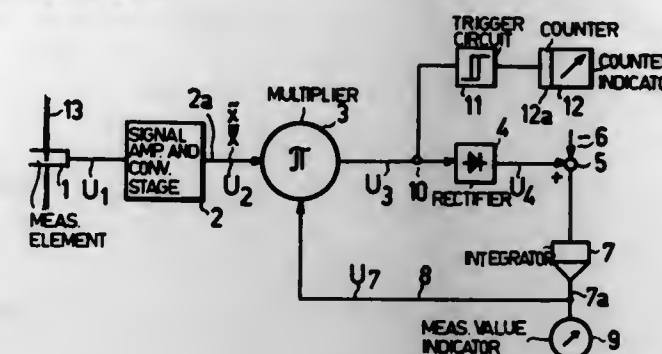
Int. Cl.² G01N 33/36

U.S. Cl. 73—160

23 Claims

1. A method of measuring irregularities in the cross-section of textile materials, especially yarns, rovings, bands and the like, comprising the steps of: testing the textile material for detecting irregularities in its cross-section; deriving a textile material-irregularity signal from the detected irregularities; deriving a measuring signal from the textile material-irregularity signal; checking the measuring signal with respect to the number of times it passes through at least one predetermined refer-

ence value or a hysteresis range to thereby form an indicator value; and



classifying the indicator value for the irregularities as statistically of significance when the number of passes through the reference value or hysteresis range has reached at least a predetermined value.

4,051,723

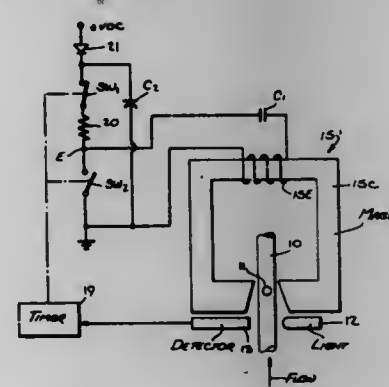
FORCE-TYPE FLOWMETER

Victor P. Head, Hatboro, and Peter J. Herzl, Morrisville, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa. Division of Ser. No. 626,832, Oct. 29, 1975. This application Nov. 19, 1976, Ser. No. 743,471

Int. Cl.² G01F 1/28

U.S. Cl. 73—194 E

9 Claims



1. A flowmeter capable of accurately measuring extremely low flow rates, said flowmeter comprising: A. a flow tube through which the fluid to be metered is conducted in the upward direction; B. a ferromagnetic ball disposed in said flow tube and movable therein, said tube having an upward inclination whereby said ball is subjected to the force of gravity, and in the absence of any other force, tends to fall down said tube; C. a position sensor operatively associated with a detection zone in said tube adjacent the low end thereof to provide a control signal when the ball lies within said zone; D. an electromagnet associated with said tube adjacent the high end thereof to provide, when energized, a magnetic force attracting said ball and seeking to raise it above said detection zone; E. a current controller coupled to said electromagnet to energize same, said controller being governed by the control signal from said position sensor and generating a magnet current to energize said electromagnet, said position sensor producing a control signal which causes said magnet current to pulse and said ball to oscillate at a rate depending on the flow rate of the fluid; and F. means indicating the frequency of said current to provide a reading of flow rate.

4,051,724

FLOW RESPONSIVE COUNTING APPARATUS

Jack S. Segal, Park Forest, Ill., and Harold D. Trapp, Dyer, Ind., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Mar. 2, 1976, Ser. No. 663,176

Int. Cl.² G01F 1/00

U.S. Cl. 73—198

7 Claims

1. In a mechanism adapted to perform specified acts on an

object, at least one of the acts involving "on-off" flow of liquid under pressure to the object an apparatus for counting the number of transactions comprising in combination

a. conduit means having an inlet and an outlet for carrying the liquid to the object;
b. means mechanically responsive to the liquid flow for measuring volumetric flow of water;
c. means mechanically responsive to liquid flow for totalling "on-off" water flow cycles, the total being related in a predetermined manner to the number of transactions;
said conduit means interconnecting in series said means for measuring volume flow and means for totalling on-off water flow cycles.

4,051,725

HAND-HELD ANEMOMETER

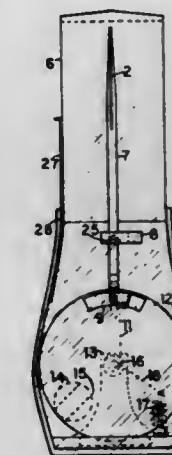
Alden Schloss, P.O. Box 4862, N. Hollywood, Calif. 91607

Filed Apr. 26, 1976, Ser. No. 680,376

Int. Cl.² G01F 1/28

U.S. Cl. 73—228

9 Claims



1. An anemometer, comprising in combination, a vane to be exposed to the wind, said vane being pivotally mounted to a sub-chassis free to rotate in an arc due to force of said wind; connecting means connecting said vane to an upper flexible means, said flexible means extending to, wrapping about and attaching to a first drum section on a drum pivotally mounted on said sub-chassis; rotation of said vane causing a pull on said upper flexible means and causing same to unwrap from said first drum section, causing rotation of said drum; a lower flexible means attached to a second drum section on said drum and extending to and attaching to a spring mounted on said sub-chassis; rotation of said drum causing said lower flexible means to wind on to said second drum section and in so doing causing deflection of said spring; at some sufficient deflection, sufficient tension is applied to said lower flexible means to cause balance of the force applied by said wind; an indicator axially connected to said drum for the purpose of indicating wind speed at any position of said drum.

4,051,726

ELECTRO-OPTICAL LIQUID LEVEL INDICATOR

Albin A. Hastbacka, 3 Singlefoot Road, Chelmsford, Mass. 01824

Filed Apr. 6, 1976, Ser. No. 674,214

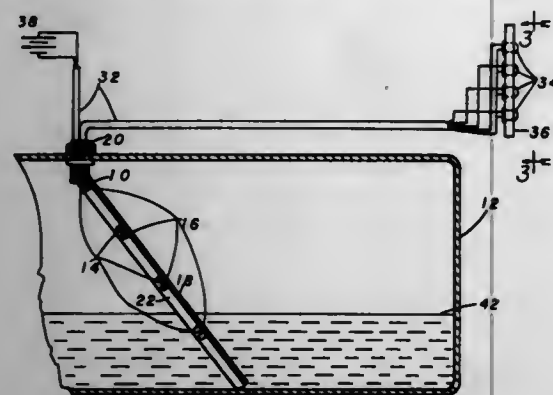
Int. Cl.² G01F 23/00

U.S. Cl. 73—290 R

4 Claims

1. A liquid level indicating device comprising: a transparent rod which is capable of being inserted into a container holding a liquid; a plurality of infrared emitters and photosensors within the transparent rod wherein a photosensor is placed sufficiently distant from the rod surface and an infrared emitter so as to collect a narrow band of infrared rays which are all totally reflected when the emitter-sensor pair is in air and to collect only rays which are not totally reflected

when the emitter-sensor pair is immersed in a liquid; a substrate with conductive paths embedded within the transparent rod which provide for the means to drive the infrared emitters with electric current and provide the



output path for sensing current from the photosensors; and a remote viewing device whereby the level of the liquid in the container is indicated by selective illumination of visible light emitting diodes in a remote viewing device.

4,051,727

LIQUID MIXTURE INDICATOR FOR RUG SHAMPOO APPARATUS

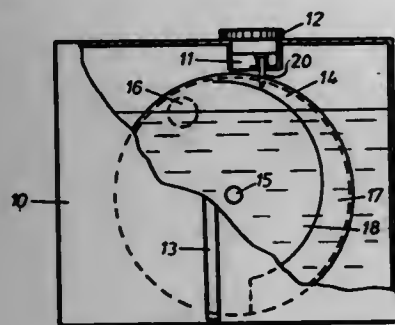
Osten Schwartz, Varmdo, and Milos Vukotic, Bandhagen, both of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed June 1, 1976, Ser. No. 691,521

Claims priority, application Sweden, June 11, 1975, 7506680
Int. Cl.² G01F 23/08

U.S. Cl. 73-306

7 Claims



1. A liquid mixture indicator for a liquid dispensing apparatus in which the correct proportions of the components in a receptacle are continuously determined comprising: a float on the liquid surface in said receptacle, a movable indicator dial rotatably mounted on the receptacle and operatively connected to said float, said indicator dial at any given time showing through a wall of the receptacle the quantity of each component to be added to obtain the correct proportions of said liquid mixture, an operator member engaging said indicator dial before filling of said receptacle to thereby block the movement of said indicator dial whereby accurate proportions of the components to be added may be determined through said wall, and means for releasing said operator member from engagement with said indicator dial after the receptacle has been filled to a given level.

4,051,728

INSTRUMENT FOR MONITORING PHYSICAL PARAMETERS OF TEMPERATURE AND PRESSURE

Walter Metz, Hohenweg 2-6, Moosbrunn, Germany (6936)

Filed Nov. 17, 1975, Ser. No. 632,694

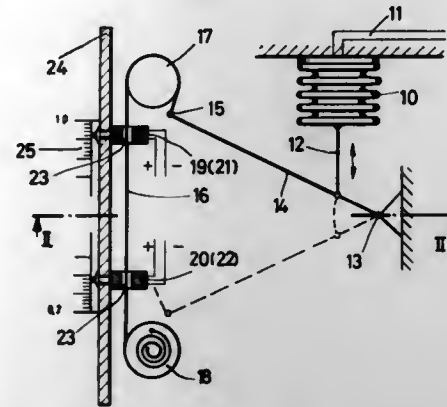
Claims priority, application Germany, Nov. 18, 1974, 2454658
Int. Cl.² G01K 1/02; G01L 19/12

U.S. Cl. 73-343 R

21 Claims

1. An instrument for monitoring a physical parameter consisting of temperature or pressure, comprising an elastic sensor

displaceable as a function of the physical parameter being monitored, a belt extending over at least two spaced rollers and coupled to the elastic sensor in such manner as to be displaced by an amount proportional to the displacement of the elastic sensor, said belt having a characteristic which changes along



the length thereof, and sensing means responsive to said characteristic of said belt for producing an output signal which varies as a predetermined function of the physical parameter being monitored, said belt also having means for indicating the measured value of the physical parameter that is monitored.

4,051,729

AMPLIFIER BEAM TYPE TRANSDUCER

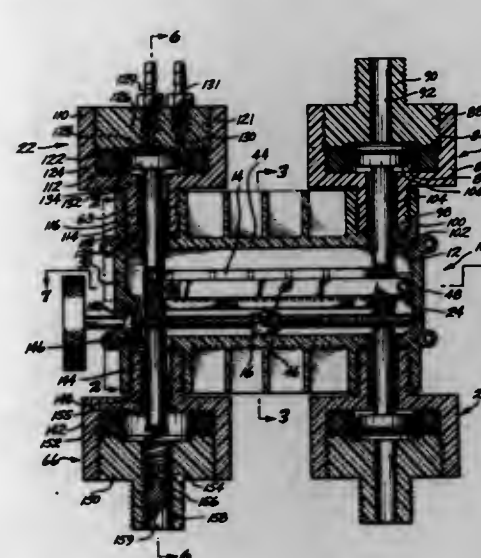
Petur Thordarsson, Seattle, Wash., assignor to Thordarson, Inc., Seattle, Wash.

Filed July 2, 1976, Ser. No. 702,280

Int. Cl.² G01L 13/00

U.S. Cl. 73-407 R

23 Claims



1. A transducer, comprising: housing means forming a beam chamber; an elongated rigid beam within said chamber; a fulcrum positioned within said chamber providing a support edge in contact with said beam about which said beam pivots; adjusting means for moving the fulcrum in said chamber lengthwise along said beam, to in that manner vary the relative lengths of the beam portions on opposite sides of the support edge; means within said housing for both maintaining said beam on said support edge, for pivotal movement therabout, and for restraining said beam against all other movement, comprising: a U-shaped yoke including a pair of elongated side members disposed on opposite sides of the beam and a transverse end member interconnected between corresponding ends of said side members, so that the yoke has both a closed end and an open end; first pivot means near one end of the yoke, connecting said

yoke to said housing for pivotal movement about a first axis which is parallel to the support edge of the fulcrum; and second pivot means near the opposite end of the yoke, connecting said yoke to said beam for pivotal movement about a second axis which is parallel to both the first axis and the support edge of the fulcrum; load input means for exerting a force on one end portion of the beam in a direction tending to pivot the beam about the support edge of said fulcrum; and load output means responsive to displacement of the opposite end portion of said beam, upon such pivotal movement of said beam, to produce an output signal responsive to the input force.

4,051,730

CONDITION RESPONSIVE INDICATING INSTRUMENT

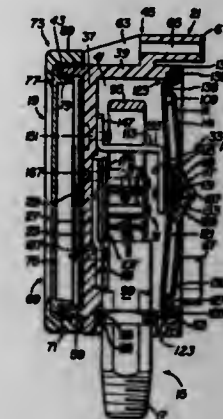
Richard A. Andrews, Dearborn, and Thomas E. Noakes, Birmingham, both of MI, assignors to H. O. Trerice Co., Oak Park, Mich.

Filed May 20, 1976, Ser. No. 688,448

Int. Cl.² G01L 7/04

U.S. Cl. 73-416

30 Claims



1. In a condition responsive indicating instrument for measuring pressure, temperature or the like, said instrument having an inlet means for communicating with a media whose conditions is to be measured, a Bourdon tube coupled to said inlet means and responsive to a predetermined distinct condition of said media for effecting a corresponding predetermined distinct displacement indicative thereof, mechanical linkage means coupled to said Bourdon tube and including a rotatable shaft, said linkage means being responsive to each predetermined distinct condition-indicative displacement for rotating said shaft through a corresponding predetermined distinct angle indicative thereof, cavity-defining means forming a cavity for enclosing said Bourdon tube and said linkage means, said cavity adapted to be filled with a protective liquid, a dial face having a predetermined range of condition-indicating indicia thereon and a pointer secured to said shaft for rotation therewith and disposed in front of said dial face so as to indicate a predetermined distinct condition-indicative indicia on said dial face which corresponds to said predetermined distinct angle of rotation of said shaft, an improved instrument housing comprising a unitary, integrally formed casing having a generally circular front support plate whose front surface is adapted to mount said dial face and whose rear face is adapted to form one end of said cavity-defining means and a cylindrical wall integral with said support plate and extending rearwardly therefrom to form the sides of said cavity-defining means, said improved housing further including back cover means normally engageable with the rearwardly facing portion of said cylindrical wall and forming the opposite end of said cavity-defining means to prevent the escape of the protective liquid from said cavity but responsive to the attainment of a predetermined unsafe pressure condition within said cavity for disengaging said cylindrical wall and relieving the excess pressure out of the back of said instrument without damage thereto, said back cover means comprising a resilient diaphragm normally closing and sealing said opposite end of said cavity defining

means to prevent the escape of the protective liquid from said cavity and a back cover plate normally spaced from said cavity by said diaphragm and engageable with said diaphragm to provide support therefor when said diaphragm is subjected to a safe pressure condition within said cavity, and means for securing said diaphragm and said cover plate in operable position relative to said cavity and to said casing.

4,051,731

FLUID SAMPLING SYSTEM

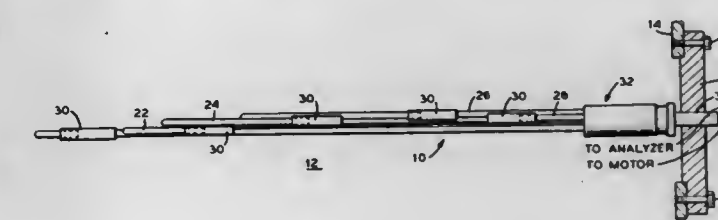
Thomas L. Bohl, Madison, and Leonard J. Vlasos, Lyndhurst, both of Ohio, assignors to Bailey Meter Company, Wickliffe, Ohio

Filed Dec. 30, 1976, Ser. No. 755,720

Int. Cl.² G01N 1/16

U.S. Cl. 73-422 R

9 Claims



1. A fluid sampling system for analyzing fluids in a duct conducting fluid therethrough comprising: valve means connectable to a fluid analyzer; a first sample probe having an inlet located at one point in the duct and an outlet connectable to said valve means and having a single bend of substantially 180° between the inlet and the outlet of said first sample probe; and a second sample probe having an inlet located at another point in the duct and an outlet connectable to said valve means, said second sample probe having a length between inlet and outlet substantially identical to the length between inlet and outlet of said first sample probe and also having a single bend of substantially 180° between the inlet and the outlet of said second sample probe to provide substantially identical transport times to fluids conducted through said first and second sample probes from different points in the duct.

4,051,732

MOLTEN METAL STREAM SAMPLER

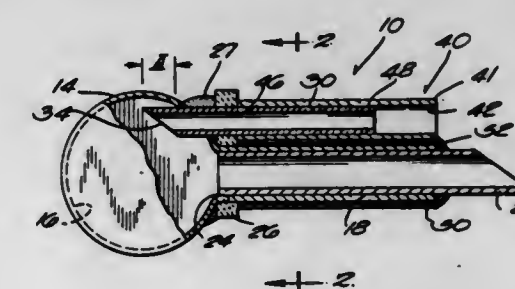
Richard A. Falk, 519 Westminster Drive, Waukegan, Wis. 53186

Filed May 4, 1976, Ser. No. 683,440

Int. Cl.² G01N 1/12

U.S. Cl. 73-425.4 R

7 Claims



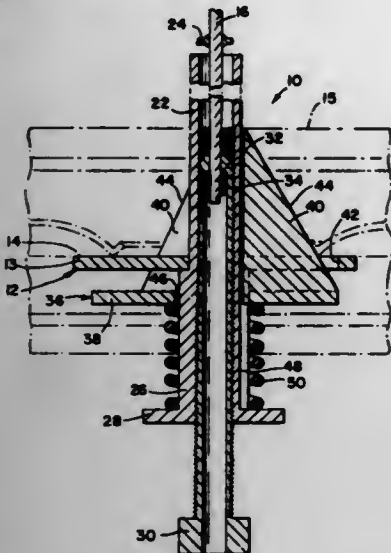
1. A molten metal sampler comprising wall means defining a mold cavity for forming a sample, wall means defining a sample entry passage having an inlet for receiving molten metal and an outlet communicating with said mold cavity, an aperture in said wall means, a pin sample tube extending through said aperture and having an inner end located in said mold cavity remote from the wall means to obtain metal from the interior of said mold cavity to minimize decarburization of the pin sample.

4,051,733 WHEEL BALANCING INSTRUMENT

Sam Tomkin, Box 482 Cantrell Ave., Middletown, N.Y. 10940
Filed Oct. 26, 1976, Ser. No. 735,142
Int. Cl.² G01M 1/12

U.S. Cl. 73-484

2 Claims



1. An instrument for indicating the balance condition of a centrally apertured wheel; said instrument being adapted to be pendently suspended from an elevated support and being adapted to carry said wheel in a generally horizontal orientation; said instrument comprising: wheel support means having a generally circularly symmetric upwardly facing surface for generally concentrically engaging a bottom side of said wheel; the top surface of said wheel support means being formed by a generally planar member having a plurality of radially directed elongated apertures therethrough; and elongated generally tubular member extending upwardly fixedly and concentrically from said surface for passage through the center of said wheel; a flexible line means for passage through said generally tubular member; said line means having an upper end for connection to said elevated support; means carried by the center of said wheel support means for engaging a lower end of said line means; centrally apertured upwardly converging means for engaging the center of said wheel; said wheel center engaging means being carried concentrically by said wheel support means for vertical movement along said tubular member; said wheel center engaging means comprising a plurality of vertically and radially oriented angularly spaced apart triangular blades which are slideable respectively through said plurality of apertures; said wheel support means having a generally circular elongated portion projecting downward fixedly from said generally planar member coaxially with said tubular member; spring means disposed about said portion and acting against said wheel center engaging means for urging said center engaging means upward; said portion having a plurality of longitudinally directed angularly spaced apart slots formed therein respectively in line with said radially elongated apertures; said plurality of blades extending radially inward for sliding movement in said slots; wherein a condition of concentricity between said line means and an upper end of said tubular member indicates a condition of balance of said wheel.

4,051,734 G-METER

Reginald R. Skinner, 2511 Wiggins Ave., Saskatoon, Saskatchewan, Canada

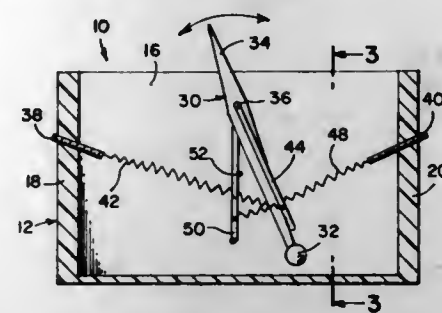
Filed June 4, 1976, Ser. No. 693,211
Int. Cl.² G01P 15/02

U.S. Cl. 73-514

5 Claims

1. A device for measuring the acceleration and deceleration of an object comprising:
a case;
a transparent dome on said case having a "G" scale associated therewith;
a pendulum pivotally mounted in said case having a weight

on one end thereof and a pointer on the other end thereof adjacent said scale; and
means carried by said case for adjusting the rest position of said pendulum relative to a fixed position on said scale, said adjustment means comprising:
screw means on said case; and
spring means between said screw means and pendulum,



said spring means including
an L-shaped bar whose longer leg is pivotally connected to said case and whose shorter leg is adapted to abut said pendulum;
a top in said case limiting movement of said L-shaped bar to a vertical position in said case; and
a spring between said screw means and L-shaped bar.

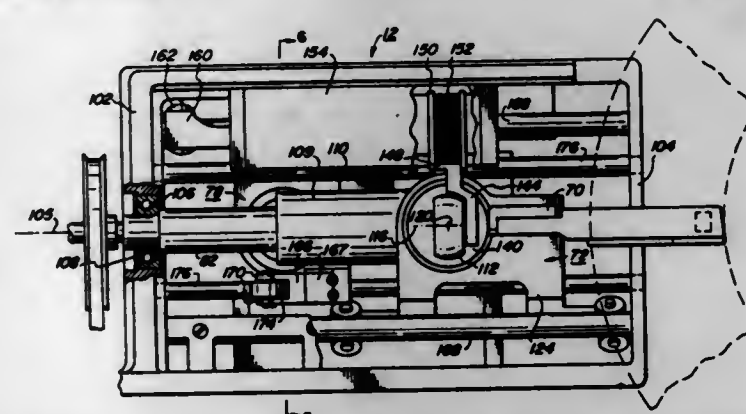
4,051,735 LINEAR ACTUATOR

James L. Johnson, San Jose, and Russell K. Brunner, Santa Clara, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 19, 1975, Ser. No. 633,524
Int. Cl.² F16H 21/16

U.S. Cl. 74-25

2 Claims



1. A linear actuator for selectively moving a carriage relative to a support frame along a predefined linear path, comprising:

a drive shaft having a cylindrical surface fabricated of a hardened, corrosion resistant steel having a Rockwell C hardness of approximately between about 63 and 65;
means for rotatably mounting said drive shaft to said frame for rotation of said drive shaft about the axis of said cylindrical surface;
means coupled to said drive shaft for rotating said drive shaft about said axis;
a roller having a peripheral surface fabricated of a polyimide plastic having a Rockwell E hardness of approximately about 45;
means for mounting said roller to said carriage with said roller being rotatable about a first axis and pivotable about a second axis perpendicular to said first axis;
means for mounting said carriage to said support frame with said carriage being movable relative to said support frame along said predefined linear path and with the peripheral surface of said roller being in frictional engagement with the cylindrical surface of said drive shaft whereby said roller is caused to rotate about said first axis by rotation of said drive shaft when said first axis is parallel to the axis of

the drive shaft and is additionally caused to move along said predefined linear path during rotation of said drive shaft when said first axis is oblique to the axis of said drive shaft; and
means for controllably pivoting said roller about said second axis to control movement of said roller and thus said carriage along said predefined linear path during rotation of said drive shaft.

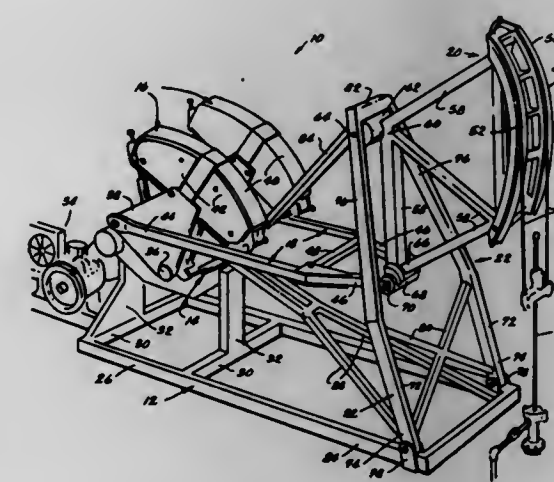
4,051,736 PUMP JACK

Gomer W. Jones, Rose Hill, Kans., assignor to Bird Oil Equipment, Ltd., Calgary, Canada

Filed Jan. 14, 1976, Ser. No. 648,932
Int. Cl.² F16H 21/32

U.S. Cl. 74-41

5 Claims



1. An improved pump jack for raising and lowering a polish rod attached to pump rods and a well pump, the jack comprising:

a horizontal base having a front portion and a rear portion;
a pair of counter weights rotatably mounted on the rear portion of said base;
a speed reduction box mounted on the rear portion of said base and disposed between said counter weights and rotatably attached thereto;
an upwardly extending sampson post, said post including a pair of parallel legs, the bottom portion of the legs attached to each side of the front portion of said base, the top portion of the legs secured together;
a pair of horizontal push rods having a first end portion and a second end portion, the first end portion rotatably attached to said counter weights, the second end portion disposed below the top portion of the legs of said post and therebetween; and
a sector head having trapezoidal bracing, said bracing rotatably attached to the top portion of the legs of said post and to the second end portion of said push rods, said sector head having an annular section attached to said bracing, said annular section attached to the polish rod for raising and lowering the polish rod thereon, the load on the polish rod is distributed proportionately on said annular section and through said bracing to said push rod and said post; said push rods reciprocating in a horizontal plane, said push rods on their forward stroke raising said sector head, said push rods on their return stroke lowering said sector head.

4,051,737 VEHICLE BRAKES

Albert Charles Hill, Birmingham, England, assignor to Girling Limited, Birmingham, England

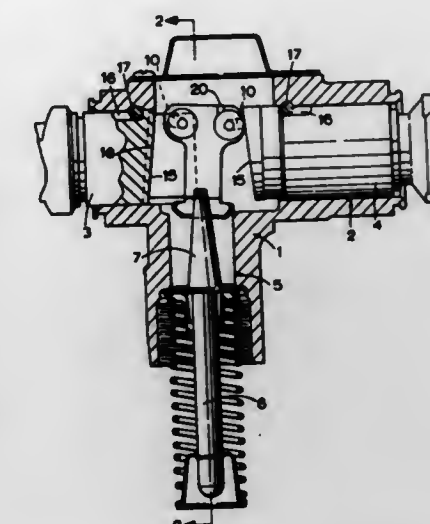
Filed May 19, 1975, Ser. No. 578,930

Claims priority, application United Kingdom, May 24, 1974, 23223/74

Int. Cl.² F16H 21/54; F16D 51/22

U.S. Cl. 74-110

8 Claims



1. A vehicle brake actuator comprising a housing, a wedge member in the housing, follower members in the housing displaceable apart in response to movement of said wedge member and presenting inclined surfaces arranged one on each side of said wedge member, at least one roller interposed between each of said inclined surfaces and the co-operating surface of the wedge member, and a cage in which said rollers are retained, wherein said cage and said rollers constitute an independent cage assembly unattached to said wedge member, said cage assembly and one of said follower members are formed with corresponding abutment means which limit the travel of the cage assembly in the direction of movement of said wedge member, and stop means are provided for limiting movement outwardly of the housing of said one follower member.

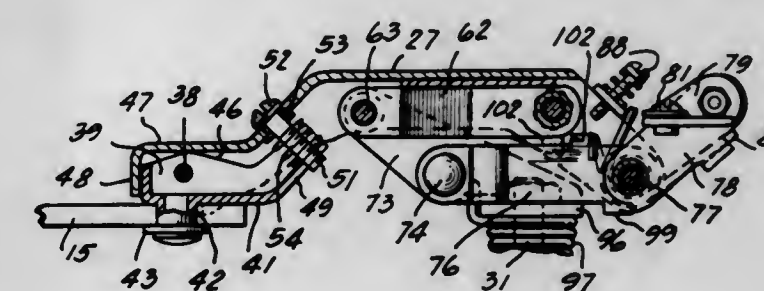
4,051,738 SINGLE POINT RESILIENT AND ADJUSTABLE MOUNT FOR DERAILLER

Walter Dian, Downers Grove, Ill., assignor to Beatrice Foods Co., Elgin, Ill.

Filed July 6, 1976, Ser. No. 702,590
Int. Cl.² F16H 7/22

U.S. Cl. 74-217 B

10 Claims



1. A rear derailleur for a bicycle having a rear wheel attached to its frame, comprising a bracket attached to the frame of the bicycle adjacent the rear wheel, a derailleur member movably attached to said bracket member and flexibly biased away from the plane of the rear wheel, such that upon the application of a force transverse to the plane of the rear wheel acting on said derailleur member, the derailleur member can move about said bracket and toward the rear wheel, so as to prevent damage to the derailleur.

4,051,739

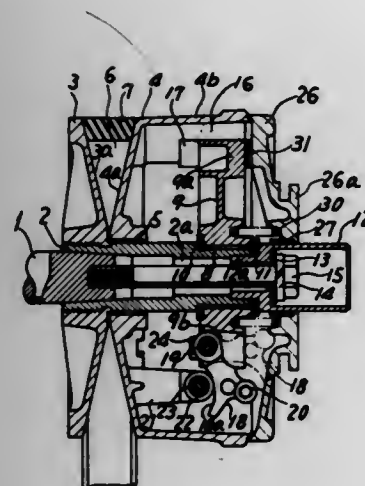
DRIVE CLUTCH FOR THE V-BELT TYPE AUTOMATIC TRANSMISSION

Inami Takagi, and Noboru Yanagiuchi, both of Akashi, Japan, assignors to Kawasaki Heavy Industries, Ltd., Japan
Filed Jan. 13, 1976, Ser. No. 648,808

Claims priority, application Japan, Jan. 14, 1975, 50-7580[U]; Jan. 14, 1975, 50-7584[U];
Int. Cl.² F16H 55/52

U.S. Cl. 74-230.17 E

4 Claims



1. A drive clutch device for the V-belt type automatic transmission comprising:

- a driving shaft;
- a stationary sheave having a sheave surface and fixed to the driving shaft;
- a movable sheave having a sheave surface and a hollow cylindrical portion which extends in the opposite direction from the sheave surface and has the free end thereof open, said movable sheave being rotatably and axially slidably mounted on the driving shaft with the sheave surface thereof opposed the stationary sheave, said sheave surface of the movable sheave and said sheave surface of the stationary sheave defining therebetween a V-shaped groove in which a V-belt is positioned;
- a cover enclosing the open end of the cylindrical portion of the movable sheave and also being slidable along the driving shaft;
- a bracket fixed to said driving shaft for transmitting rotation of the driving shaft to said movable sheave;
- a spring interposed between said bracket and said cover in for biasing the movable sheave in a direction away from the stationary sheave;
- a roller rotatably mounted on said movable sheave around an axis transverse to and spaced from the axis of said driving shaft; and
- a cam weight acting as a centrifugal weight and pivotally supported on said bracket around an axis parallel to said roller as is for swinging movement radially outwardly of said driving shaft and having a concave cam surface in engagement with said roller for urging said movable sheave to slide along said driving shaft against the force of said spring toward said stationary sheave when centrifugal force caused by rotation of said cam weight swings said cam outwardly, thereby varying the pulley diameter, the pivotal axis of said cam weight being radially inwardly of the center of said roller with respect to said driving shaft and in the same direction from the center of the roller as the direction in which the cam weight swings so that said roller is movable along the concave surface of said cam.

4,051,740

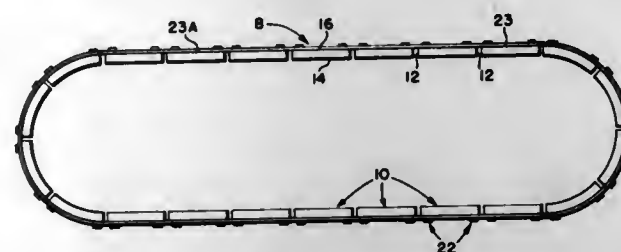
SEGMENTAL V BELT

Rajendra K. Narang, 1525 Bonnie Road, Macedonia, Ohio 44056

Filed May 27, 1976, Ser. No. 690,608
Int. Cl.² F16G 1/00, 51/80

U.S. Cl. 74-231 C

18 Claims



1. A segmental V belt or the like comprising a plurality of body segments, adapted selectively to be joined into an endless belt of any desired length, fastener means partially embedded in said body segments and partially extending radially outwardly therefrom through the radially outer surfaces of said body segments relative to the endless belt formed therefrom, and connection means superimposed on the radially outer surfaces of said body segments to interconnect the adjacent fasteners at the ends of the adjacent segment bodies to form the same into an endless belt.

4,051,741

DRIVE BELT WITH CONNECTOR

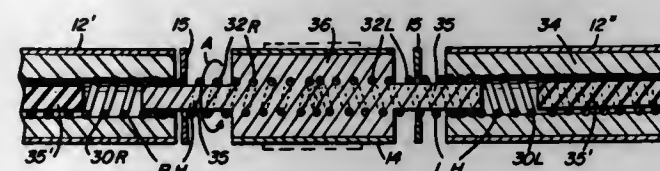
George A. Marczewski, 4109 Chapmans Road, R.D. No. 1 Green Hills, Orefield, Pa. 18069

Filed June 21, 1976, Ser. No. 698,200

Int. Cl.² F16G 1/00

U.S. Cl. 74-231 J

21 Claims



1. A drive belt and connector combination comprising; an elongated member of pulley engaging configuration, central means including an elongated element arranged along the center line of the elongated member and extending from one end to the other thereof, and connector means engageable with the said central means for the purpose of connecting the two ends of the elongated member to form a closed belt, said connector means including structure for complementing the central means within the elongated member in order to form a semi-permanent non-unlocking type connection between the two ends.

4,051,742

ARRANGEMENT FOR TENSIONING AND GUIDING THE BELTS OF A CELLULAR PLASTIC FORMING MACHINE

Jan-Olof Johansson, Hoganas, and Karel Spacek, Morarp, both of Sweden, assignors to Gullfiber AB, Billeholm, Sweden

Filed Sept. 3, 1976, Ser. No. 720,412

Claims priority, application Sweden, Sept. 5, 1975, 7509903

Int. Cl.² F16H 7/18, 7/12, 7/10

U.S. Cl. 74-241

4 Claims

1. In a machine for forming cellular plastic between parallel moving endless belts, an automatic tensioning and guiding system for said belts comprising:

- a pair of end rollers within each of said endless belts;
- hydraulic cylinder means having a piston coupled to each end of at least one end roller of each of said pairs;
- guide means for said at least one end rollers for movably supporting said rollers for displacement longitudinally of

said endless belts in response to displacement of said piston coupled thereto;
a source of hydraulic fluid under pressure;
supply line means connecting said source of hydraulic fluid to said hydraulic cylinder means;
adjustable control valve means for varying the pressure of fluid in said supply line and thus the position of the piston in said hydraulic cylinder means;

bottom walls for pressing the webbing against said walls thereby to lock the webbing in the box.

4,051,744

GEAR MECHANISM FOR PREVENTING REVERSE ROTATION

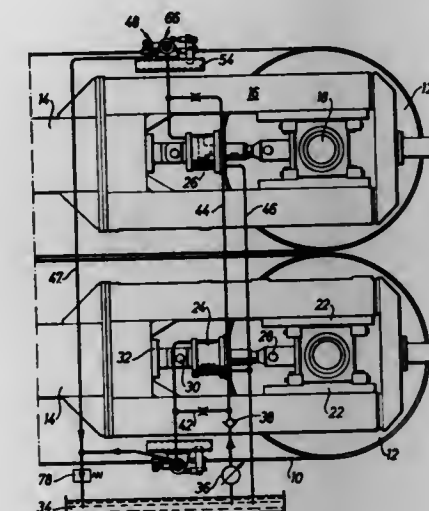
Kenji Oshima, Tokyo, Japan, assignor to Kabushiki Kaisha Seikoha, Japan

Filed Oct. 15, 1976, Ser. No. 732,720

Int. Cl.² F16H 55/04, 55/06

U.S. Cl. 74-437

1 Claim



1. A gear mechanism for preventing reverse rotation comprising:

- a drive pinion having alternately disposed wide teeth and narrow teeth and having larger interdental spaces in front of the wide teeth than at the back thereof,
- and a follower gear wheel having teeth formed with cut-away portions at their front sides.

4,051,743

BOX WEBBING ADJUSTER

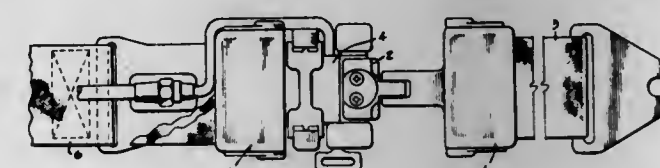
John A. Gaylord, San Diego, Calif., assignor to H. Koch & Sons, Inc., Anaheim, Calif.

Filed June 11, 1976, Ser. No. 695,077

Int. Cl.² F16H 7/08; F16G 11/00; A44B 11/12

U.S. Cl. 74-242.8

6 Claims



1. A box webbing adjuster comprising,
a box having a top wall, a bottom wall, opposite sides between said walls, and an opening at one end between the sides of the box for the passage of the webbing,
a cam extending between said walls across the box parallel with said opening in position for passing the webbing around the cam and out through said opening,
means to journal the cam in said sides of the box,
manipulating means accessible from the outside of the box connected to said cam for manipulating the cam for rotation about an axis substantially parallel with the opening, the cross-sectional shape of said cam being such that said cam has diagonally opposite risers and the distance between the opposite risers of the cam is about the same or longer than the distance between the top and bottom walls of the box, thereby to prevent the cam from assuming a dead center position in the box,
a curved peripheral portion adjacent each riser being of such height as to leave a limited clearance adjacent said top and

4,051,745

MULTIPLE-CONTACT TYPE W-N GEAR

Shoichi Ishikawa, Yokohama, Japan, assignor to Kabushiki Kaisha Hasegawa Haguruma, Tokyo, Japan

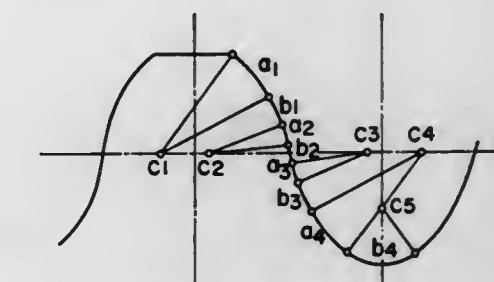
Filed Apr. 15, 1976, Ser. No. 677,216

Claims priority, application Japan, Apr. 16, 1975, 50-45155; Oct. 30, 1975, 50-129907

Int. Cl.² F16H 55/06

U.S. Cl. 74-462

14 Claims



4,051,746

MECHANISM FOR OPENING AND CLOSING A MOVABLE MEMBER

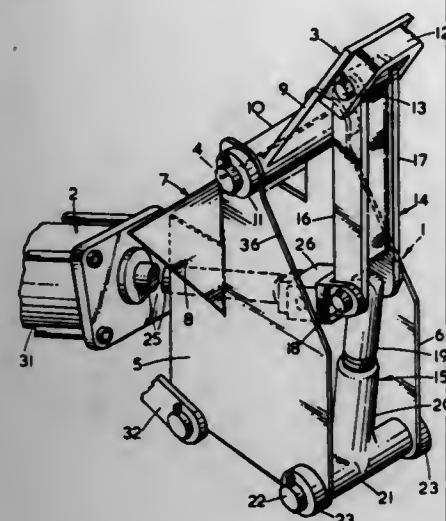
Rolf Sven Gunnar Liljeros, 17 Waltham Avenue, Glazebury, Warrington, England

Filed Feb. 20, 1976, Ser. No. 659,639

Int. Cl.² G05G 1/04; B60P 1/26; E05F 15/04

U.S. Cl. 74—520

11 Claims



1. An apparatus for controlling the movement of a tail-gate of a vehicle body, comprising:
 - a support securable to the vehicle body adjacent and below the tail-gate;
 - a flap adapted to bear against the tail-gate;
 - a collapsible linkage having first and second arms pivotally interconnected on a pivot axis at their one ends to form a toggle, the opposite ends of the arms pivotally connected to the flap and to the support respectively;
 - actuating means operable to swing the flap between first and second positions for both opening and closing the tail-gate respectively; and
 - a bracket operatively connecting the actuating means to the linkage, the bracket including means responsive to said pivot axis being immediately on the side of a line joining the opposite ends of the arms remote from the actuating means for preventing collapse of said toggle.

4,051,747

METHOD FOR MAKING A TOOL ELECTRODE FOR ELECTRICAL DISCHARGE MACHINING

Günther Pödinghaus, Harry Neumann, and Horst Wittenstein, all of Emmetal, Germany, assignors to A.G. für industrielle Elektronik AGIE Loosne b. Locarno, Loosne, Switzerland

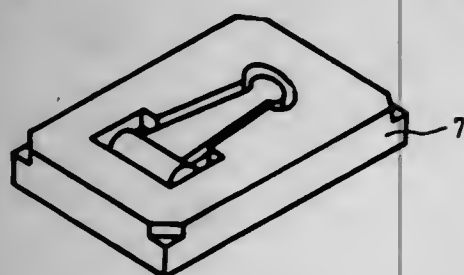
Filed Oct. 7, 1975, Ser. No. 620,304

Claims priority, application Germany, Oct. 8, 1974, 2447842; Switzerland, Sept. 26, 1975, 12483/75

Int. Cl.² B21K 5/20

U.S. Cl. 76—107 R

6 Claims



1. A method of machining a tool electrode for use in electrical discharge machining, the method comprising:
 - a. using a preformed model (1), of a shape which is a positive or negative replica of a shape which is to be machined by the tool electrode (6), to produce a positive casting (3) and a negative casting (2) of said shape one of the castings comprising at least on its surface (31) which defines said

- shape, abrasive material and bonding material which holds the abrasive material in place, and the other comprising a material which is readily machinable and which is stable as regards retaining a shape to which it is machined;
- b. using the said one casting to abrade the other casting by moving the two castings together so that the positive one enters the negative one and, at the same time, applying a relative circulating but non-rotating movement, as defined herein, to the two castings whereby the said other casting assumes dimensions which deviate from what they were before;
- c. making use of said other casting as thus shaped by abrasion for moulding a master mould which, at least on its surface which, allowing for the dimensional deviation, defines said shape, comprises abrasive material and bonding material which holds the abrasive material in place; and
- d. using said master mould (5) to abrade a workpiece from which said tool electrode (6) is to be made, and hence forming the tool electrode, by moving the master mould and the workpiece together so that one enters the other and, at the same time, applying a relative circulating but non-rotating movement, as defined herein, to the master mould and the workpiece, the amplitude of said circulating but non-rotating movement being adjusted to give predetermined dimensions of the tool electrode in relation to those of said model.

4,051,748

KEY CUTTING MACHINE FOR PRODUCING OBLIQUELY ORIENTED BITTING

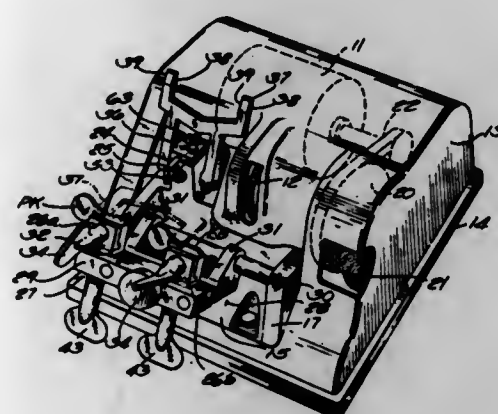
Charles F. Sherman, Westminster, Mass., assignor to Unican Security Systems, Ltd, Montreal, Canada

Filed July 20, 1976, Ser. No. 707,037

Int. Cl.² B23C 1/16; B21K 13/00

U.S. Cl. 76—110

12 Claims



12. A method of duplicating a key in a machine of the type wherein a power driven rotary cutter rotating about a fixed axis cuts V bits in a key blank at locations and to depths determined by engagement between a pattern key and a stylus, wherein the stylus and the rotary cutter occupy fixed locations along the axis of the rotary cutter, and a pair of vises having key blade clamping jaws, one to grip the pattern key and the other to grip the key blank, are mounted on common carrier means, wherein the rotary cutter and stylus, as one entity, and the common carrier means, as another entity, are relatively movable with respect to each other to enable any selected V bit in the pattern key to be brought into alignment with the stylus and also effect locating engagement between the selected V bit in the pattern key and the stylus and cutting engagement between the corresponding but unbitted edge of the key blank and the cutter, to thereby bring about the formation of a V bit in the key blank that is a duplicate in size and location of the one engaged by the stylus, said method being characterized by its capability of enabling the operator to accurately and efficiently duplicate a pattern key in which some at least of the V bits forming

the bitting of the key extend obliquely across its edge, and which to enable that result comprises:

- A. mounting the common carrier means for both hinged movement about an axis in fixed parallel relationship to the axis of the rotary cutter and reciprocating movement along its hinge axis;
- B. providing for rotation of the vises with respect to their common carrier means about parallel axes that are
 1. transverse to said hinge axis and spaced apart the distance between the stylus and the rotary cutter, and
 2. parallel to and lie between the key blade clamping jaws;
- C. constraining the vises to rotate in unison; and
- D. manually imparting such rotation to the vises between defined limits at each of which the key blank occupies a plane angularly disposed with respect to the axis of the rotary cutter so that the V bit formed therein as said common carrier means is swung about its hinged mounting towards the axis of the rotary cutter extends obliquely across the edge of the blank, the direction of the obliqueness depending upon which of said defined limits is dictated by the stylus-sensed V bit being duplicated.

4,051,749

CABLE INSULATION STRIPPING APPARATUS

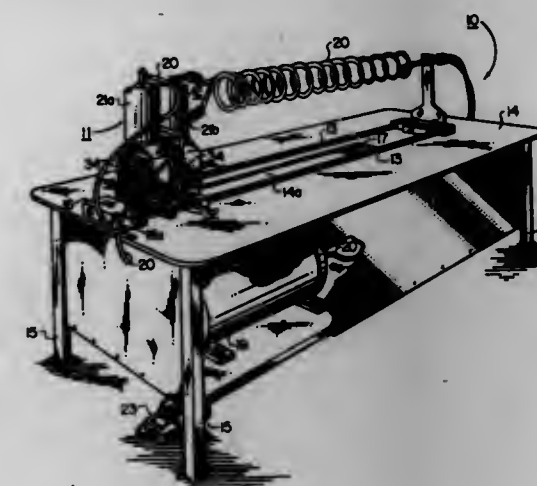
Rex R. Bell, and John W. Sandstrom, both of Dallas, Tex., assignors to Integral Corporation, Dallas, Tex.

Filed Jan. 21, 1976, Ser. No. 650,908

Int. Cl.² H02G 1/12

U.S. Cl. 81—9.51

2 Claims



1. Apparatus for removing a defined portion of the outer insulating casing from an electrical cable, comprising:
 - a. first and second cable clamping assemblies for releasably clamping an end of said electrical cable,
 - b. means for supporting said cable clamping assemblies at a desired height, said first cable clamping assembly being stationary with respect to said support means, said second cable clamping assembly mounted for reciprocal translation from and toward said first cable clamping assembly in the axial direction of the cable clamped within said cable clamping assemblies,
 - c. each of said cable clamping assemblies comprising:
 - i. upper and lower carrier assemblies, one of said carrier assemblies being fixed, the other carrier assembly being mounted for vertical translation toward and away from engagement with said fixed carrier assembly,
 - ii. first and second jaw members respectively removably connected with said upper and lower carrier assemblies and having mutually aligned semi-circular shaped recessed surface portions for clamping retention of said cable end when said other carrier assembly is translated toward engagement with said fixed carrier assembly, and
 - iii. a pair of laterally spaced pin carrier frames carried by said upper and lower carrier assemblies, each of said

frames defined by upper and lower horizontal frame members joined by vertically extending rod means extending through, and slidably mounted with, said upper and lower carrier assemblies, and opposed ejector pins respectively extending from said upper and lower horizontal frame members and aligned with vertically extending channels in said first and second jaw members, whereby the vertical translation of the other carrier assembly away from engagement with said fixed carrier assembly is effective to engage said upper and lower horizontal frame members with said upper and lower carrier assemblies to drive said opposed ejector pins through said channels, thereby to assist in the release of said cable end from clamping retention by said recessed surface portions,

- d. said second cable clamping assembly additionally having blade means for severing a substantial thickness of said outer insulating casing when the carrier assembly of said second cable clamping assembly is vertically translated toward engagement with the fixed carrier assembly of said second cable clamping assembly, and
- e. means for automatically and sequentially actuating the said other carrier assembly of both said first and second cable clamping assemblies initially toward engagement with the fixed carrier assemblies thereof, then translating said second cable clamping assembly in said axial direction away from said first cable clamping assembly, and thereafter actuating said other carrier assemblies away from engagement with said fixed carrier assemblies and translating said second cable clamping assembly in said axial direction toward said first cable clamping assembly.

4,051,750

MACHINE TOOLS

Marcel Berly, Verrieres le Buisson, France, assignor to H. Ernaut-Somus, Vélizy-Villacoublay, France

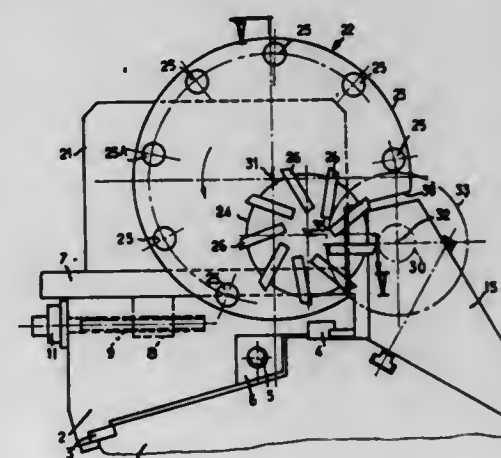
Filed Dec. 28, 1976, Ser. No. 754,994

Claims priority, application France, Jan. 26, 1976, 76.01992

Int. Cl.² B23B 3/00, 29/00, 3/16

U.S. Cl. 82—2 R

5 Claims



1. In a machine tool comprising a machine bed and a workpiece spindle mounted on said machine bed, said spindle being rotatable about its axis to rotate a workpiece to be machined, a tool turret assembly comprising:
 - turret support means mounted on said machine bed, said turret support means and said workpiece spindle being relatively movable on said machine bed in a first direction parallel to the axis of said workpiece spindle and in a second direction at an angle to the axis of said workpiece spindle;
 - a main tool turret for carrying a first plurality of tools, said main tool turret being carried by said turret support means for pivotal movement about an axis parallel to the axis of said workpiece spindle, said main turret having a predetermined inoperative angular position relative to said workpiece spindle; and an auxiliary tool turret for carrying a

second plurality of tools, said auxiliary turret being carried by said main turret for pivotal movement about an axis parallel to the axis of the workpiece spindle, whereby each tool of said second plurality of tools can be selectively brought into an operative angular position relative to said workpiece spindle with said main turret in it predetermined inoperative angular position; in which turret assembly the improvement comprises: said auxiliary turret being located eccentrically with respect to the pivotal axis of said main turret.

4,051,751

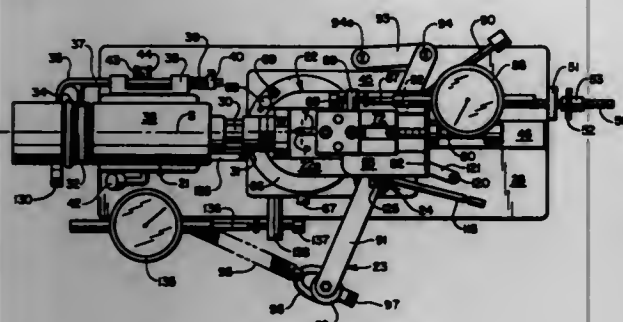
MACHINE FOR GENERATING SURFACES OF VARIOUS CHARACTERISTICS ON WORKPIECES

Otto Estrada, Medellin, Colombia, assignor to Ignacio Acevedo, Columbus, Ohio

Filed Sept. 13, 1976, Ser. No. 722,686
Int. Cl.² B23B 3/28

U.S. Cl. 82-12

53 Claims



1. A machine for generating surfaces on a workpiece member comprising a unit for supporting a workpiece member and a unit for supporting a generating tool member so that the tool member carried thereby will engage the workpiece member carried by the first unit, one of said units being mounted for pivoting movement about a pivot so that the tool member will travel across the workpiece member with a predetermined radius, means for advancing or retracting one of said members relative to the other member during the pivotal movement of the unit to change said radius on the surface of the workpiece, said means including an eccentric unit; said unit which is mounted for pivotal movement including a moveable support which supports its said member for advancing or retracting movement relative to the other unit which includes a relatively fixed support, said eccentric unit being rotatably mounted on said moveable support, means for rotating said eccentric unit in response to pivotal movement of the pivoted unit, and means for biasing said moveable support in one direction to cause yielding contact between said members, said eccentric unit being rotatably mounted on the moveable support in cooperative relationship to a contact portion relative to which said moveable support can move and which is operatively connected to said fixed support, said biasing means also biasing said moveable support to a position where said contact portion is engaged by said eccentric unit.

4,051,752

PROCESS FOR GEL CUTTING

Leo P. Cawley, Wichita, Kans., assignor to Bloware, Inc., Wichita, Kans.

Division of Ser. No. 473,585, May 28, 1974, Pat. No. 3,949,471, which is a continuation-in-part of Ser. No. 294,696, Oct. 3, 1972. This application Oct. 20, 1975, Ser. No. 623,727

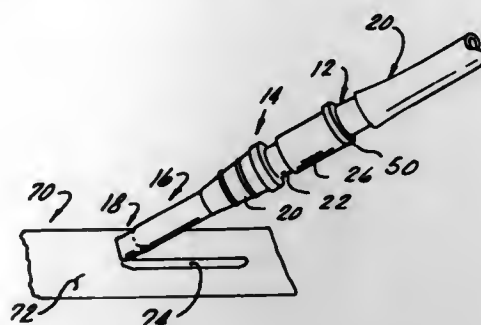
Int. Cl.² B26D 3/06

U.S. Cl. 83-5

6 Claims

1. A process for cutting gel comprising:
a. placing a gel on a surface;
b. situating a flattened end of a gel cutting apparatus on said surface coated with said gel, said gel cutting apparatus including a hollow substantially cylindrical body having an inlet and an outlet to provide fluid communication therethrough, a cutter portion attached to said inlet, a

vacuum pressure source connected to said outlet, said cutter portion including a structure defining an essentially elongated conduit having said flattened end;



c. moving said flattened end over said surface coated with said gel and thereby channeling a groove in said gel; and
d. removing said gel through said cutter portion by said vacuum pressure simultaneous to said moving step (c).

4,051,753

METHOD AND APPARATUS FOR ASSEMBLING ITEMS

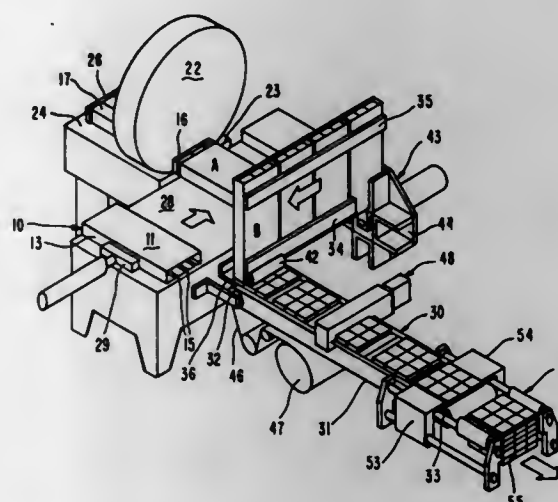
Wayne F. Everman, Cedar Falls, Iowa, and Vincent E. Bernard, Richardson, Tex., assignors to Swift & Company, Chicago, Ill.

Filed Jan. 30, 1976, Ser. No. 653,918

Int. Cl.² B26D 4/46

U.S. Cl. 83-29

17 Claims



13. An improved apparatus for assembling quantities of meat patties, said apparatus comprising: a slicer, said slicer having a horizontal bed for supporting a plurality of meat logs in side-by-side relation for simultaneous slicing by a knife as the logs are forced across an anvil by a pusher; a movable magazine having dimensions sufficient to receive columns of patties sliced from each of said logs; first means for supporting said magazine at a first position horizontally aligned with said meat logs; an endless conveyor trained in a path extending in a given direction; second means for supporting said magazine at a second position disposed vertically above said endless conveyor; shuttle gate reciprocally mounted at said second means to sequentially release and discharge patties simultaneously from said magazine; a supply of web material associated with said endless conveyor, said web being disposed on said conveyor to receive said patties when discharged from said magazine; severing means adjacent said conveyor and spaced in said direction from said second means for cutting said web into uniform sheets; and means to stack said sheets with patties thereon.

4,051,754

HEATED CUTTER FOR PLASTICS MATERIALS

Siegfried Harcuba, Saarbrücken, and Herbert Dits, Schmelz, both of Germany, assignors to Siegfried Harcuba, Saarbrücken, Germany

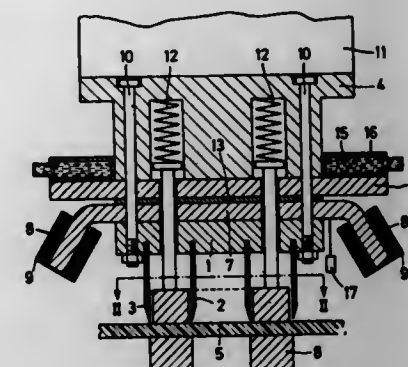
Filed Dec. 31, 1975, Ser. No. 645,636

Claims priority, application Switzerland, Dec. 31, 1974, 17395/74

Int. Cl.² B26F 1/40; B29C 17/10

U.S. Cl. 83-124

4 Claims



1. A cutting apparatus for cutting soft materials such as plastic sheets, said cutting apparatus comprising at least one cutting means, a heated part, and a cooled part, the heated part and the cooled part being separated from each other by a heat insulator, means for continuously operating the cutting means at a predetermined temperature so that the plastic to be cut will be at its transition temperature from solid to liquid, the heated part comprising a heating plate of a high thermal conductivity; and the cooled part comprising a cooling plate of a high thermal conductivity, the heating plate comprising edge portions which extend beyond the cutting means, means disposed adjacent the edge portions of the heating plate for heating the edge portions of the heating plate, the cooling plate comprising edge portions which extend beyond the cutting means and means disposed adjacent the edge portions of the cooling plate for cooling the edge portions of the cooling plate, said heated part being connected to said cutting means by heat conductive means, said cooling part being disposed between said heated part and a ram, adapted to actuate said cutting part, to protect said ram from heat.

4,051,755

ULTRAMICROTOME AND ATTACHMENT THEREFOR

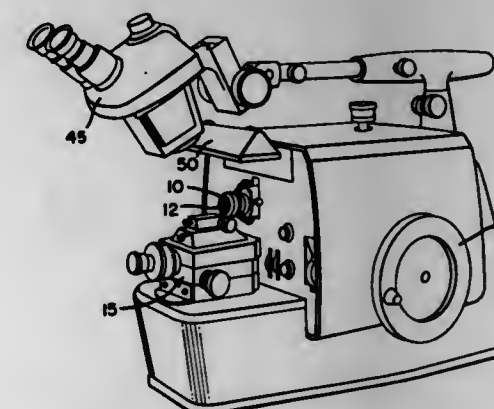
Dan Raveed, Xenia, Ohio, assignor to Charles F. Kettering Foundation, Dayton, Ohio

Filed Oct. 7, 1976, Ser. No. 730,450

Int. Cl.² G01N 1/06

U.S. Cl. 83-167

12 Claims



1. An ultramicrotome for preparing sections for electron microscope analysis, comprising:
chuck means for holding a specimen which is to be sectioned,
stationary knife assembly means for cutting said specimen, said knife assembly means including a knife boat for hold-

ing a quantity of fluid and a knife held by said knife boat, said knife defining one side of said knife boat, means for moving said chuck means, and said specimen held thereby, into contact with said knife such that sections are cut from said specimen and floated onto the surface of the fluid held in said knife boat, and
radioactive means mounted on said ultramicrotome for discharging static electric charge which may have accumulated on said chuck means, the specimen, and said knife assembly means, whereby the static electric attractive force on the fluid held in said knife boat is reduced and the fluid prevented from migrating over said knife as said chuck means approaches said knife.

4,051,756

CUTTING ARRANGEMENT

Istvan Bogner, Zurich, and Peter Brassel, Uster, both of Switzerland, assignors to Zellweger, Ltd., Switzerland

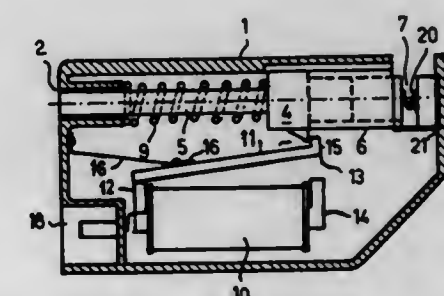
Filed Feb. 20, 1975, Ser. No. 551,105

Claims priority, application Switzerland, Feb. 20, 1974, 2313/74

Int. Cl.² B26D 5/08, 7/02

U.S. Cl. 83-389

35 Claims



1. A cutting arrangement for filament monitoring systems comprising: a slide; means for moving said slide; a filament guide on said slide; gripping means responsive to movement of said slide for gripping said filament arranged on one side of said filament guide; and cutting means responsive to movement of said slide for cutting said filament arranged on another side of said filament guide.

4,051,757

DICING MACHINE

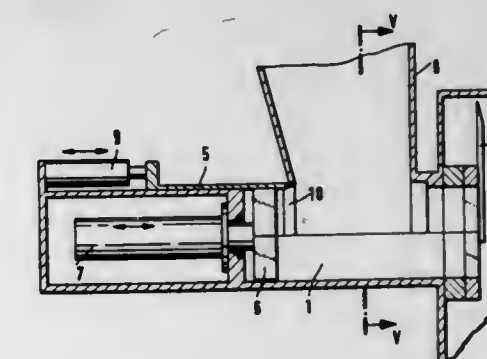
Toni Reifenhäuser, Burglahr, and Helmut Walter Maus, Oberlahr, both of Germany, assignors to Toni Reifenhäuser, Burglahr, Germany

Filed Apr. 26, 1976, Ser. No. 680,477

Claims priority, application Germany, May 6, 1975, 2520068
Int. Cl.² B26D 3/26

U.S. Cl. 83-404.3

11 Claims



1. A dicing machine for foodstuffs, such as meat, bacon and the like having a magazine which is rectangular in cross-section and which receives the foodstuff that is to be cut, said magazine having a filling aperture extending substantially over its length, lattice-work knives arranged at one open end of the

magazine, a piston movable into the magazine to force the foodstuff against said lattice-work knives for extrusion of the foodstuff in strips, one cross-sectional diagonal of the magazine extending horizontally, the length of said diagonal determining the width of the filling aperture and a roof-angle-shaped slider to close said filling aperture, said slider being movable parallel to said piston and having two front cutting edges.

4,051,758

BREAD SLICER USEABLE BY A BLIND PERSON

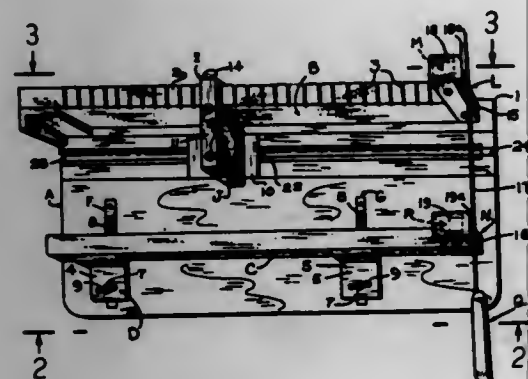
Lester R. Livick, 15106 Beatty St., San Leandro, Calif. 94579

Filed Feb. 17, 1977, Ser. No. 769,840

Int. Cl.² B26D 4/30

U.S. Cl. 83—437

2 Claims



1. A bread slicer comprising:

- a. a base;
- b. an upright wall fixed to said base;
- c. an adjustable upright wall paralleling said fixed wall and being spaced therefrom;
- d. means for guiding said adjustable wall for maintaining it parallel to said fixed wall as it is adjusted toward or away therefrom to accommodate an object to be sliced such as a loaf of bread;
- e. a loaf pusher slidably mounted between said walls and being movable in a direction paralleling the two walls;
- f. a marker carried by said loaf pusher and having a portion overlying the upper edge of said fixed wall, said upper edge having equally spaced apart grooves constituting a scale that can be used by a blind person;
- g. a pair of upright magnetized posts positioned near one end of said base so as not to interfere with the object to be sliced from being moved between said posts; and
- h. said posts adapted to magnetically attract and support the metal blade of a knife and to act as a guide for the slicing operation as the operator keeps the blade in contact with the posts while cutting.

4,051,759

MITER BOX FOR A PORTABLE ELECTRIC SAW

Gerald Oliff, 8530 N. Harding Ave., Skokie, Ill. 60076

Filed Jan. 21, 1977, Ser. No. 761,246

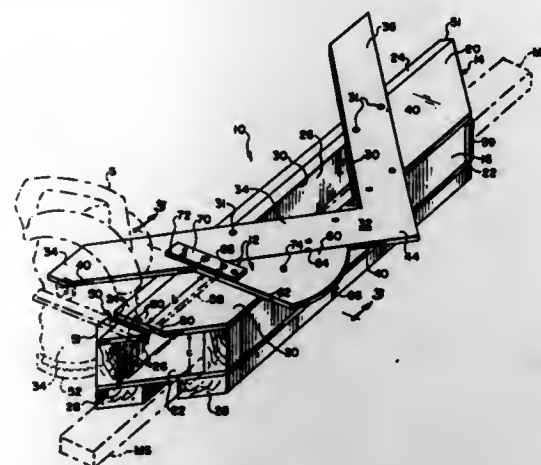
Int. Cl.² B26D 7/26; B27G 5/02

U.S. Cl. 83—471.3

20 Claims

1. A miter box for facilitating 45° cuts in the end portions of a molding strip or the like by means of a portable electric saw of the type that has a slotted slide shoe through which the rotary blade of the saw extends, said miter box comprising an elongated hollow open-ended body having a top wall for sliding reception of the slide shoe of the saw, a strip-supporting bottom wall, and front and rear walls, the opposite ends of said body being bevelled on a 45° bias so that the vertical planes thereof extend at a right angle to each other, and means on said top wall establishing a pair of guide edges for the inside edge

of the slide shoe of the saw, said guide edges extending parallel to said bevelled ends of the miter box body and spaced there-



from a distance substantially equal to the distance between the inside edge of the saw slide shoe and the saw blade.

4,051,760

SHEARING APPARATUS

Michael John Glennan, 8 Congewoi Road, Mosman, Sydney, Australia (2089)

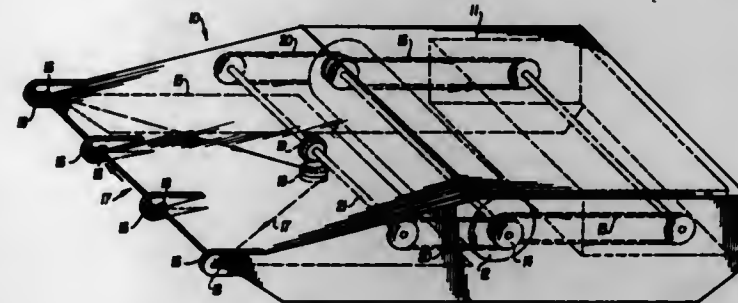
Filed July 2, 1975, Ser. No. 592,800

Claims priority, application Australia, July 4, 1974, 8084/74; July 22, 1974, 8283/74; Apr. 14, 1975, 1229/75; June 5, 1975, 1882/75

Int. Cl.² B26B 19/24

U.S. Cl. 83—801

22 Claims



1. A cutting unit for a shearing apparatus comprising a flexibly curvable comb having teeth on the intended concave surface thereof, the comb cooperating with a cutting means located behind and adjacent to the upper part of the teeth of the comb, and when the toothed surface of the comb is applied in a flexed condition to the body of an animal to be shorn, the comb and the co-operating cutting means conform as required to the contours of the animal's body and when forward propulsion force is applied to the shearing apparatus to propel same over the body of the said animal, this propulsion force simultaneously assists the cutting means to break or sever the fleece from the animal's hide.

4,051,761

METHOD FOR ADJUSTING THE TONE CHARACTERISTIC OF TONE GENERATING ELEMENTS AND A DEVICE THEREFOR

Artur Nylea, 6888 Ward Ave., Charleston Heights, S.C. 29405

Filed June 3, 1975, Ser. No. 583,441

Claims priority, application Sweden, June 11, 1974, 7407717

Int. Cl.² G10H 3/00

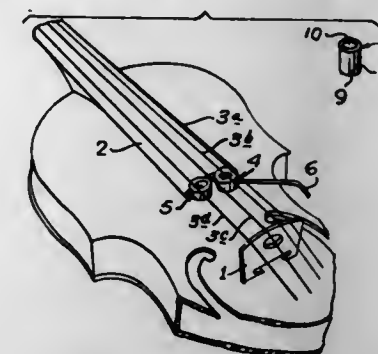
U.S. Cl. 84—1.15

5 Claims

1. A method for adjusting the tone characteristics of tone generating elements such as strings of musical instruments including a bridge for said strings, said tone generating elements at least being partly of a magnetizable material, comprising the steps of permanently arranging a solenoid near to, but

out of contact with said elements and separate from the bridge, electrically connecting said solenoid to an amplifier and moving a magnet along each of said tone generating elements

spaced location from the fortification, said explosive charges including a plurality of charges arranged in a plurality of rows, one behind the other, each of said rows including a supporting



separately towards and away from the part thereof which faces the center of said solenoid and diminishing respectively the loudness of the reproduction and altering the tone characteristics thereof.

4,051,762

LIQUID PROPELLANT WEAPON SYSTEM

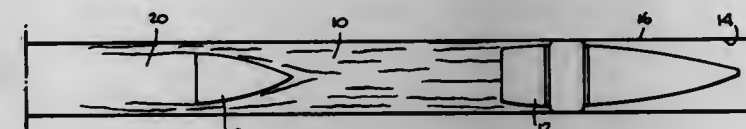
Eugene Ashley, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Division of Ser. No. 575,283, May 7, 1975, Pat. No. 4,011,817, and Ser. No. 707,144, July 20, 1976, which is a division of Ser. No. 469,507, May 13, 1974, abandoned. This application Sept. 30, 1976, Ser. No. 728,355

Int. Cl.² F41F 1/04

U.S. Cl. 89—7

5 Claims



1. A method of propelling a projectile from a bore of a gun comprising:

- providing a series in said bore of said gun a projectile, a charge of liquid propellant aft of said projectile, and a cavity generator aft of said projectile and said charge;
- providing a volume of combustion gas in said bore of said gun aft of said cavity generator to create a combustion cavity; and
- translating said generator forwardly into said charge of liquid propellant to enlarge said combustion cavity and to pass liquid propellant aftwardly into said cavity.

4,051,763

ARMAMENT SYSTEM AND EXPLOSIVE CHARGE CONSTRUCTION THEREFOR

Franz Rudolf Thomanek, Landkreis Schrobenhausen, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschränkter Haftung, Munich, Germany

Filed Dec. 2, 1965, Ser. No. 512,039

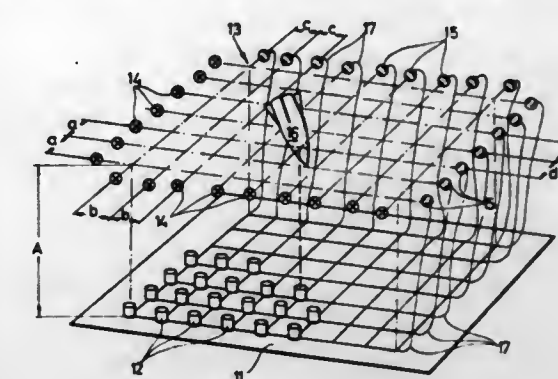
Claims priority, application Germany, Dec. 11, 1964, 978036

Int. Cl.² F41H 11/06

U.S. Cl. 89—36 R

17 Claims

1. A protective system for a fortification such as a bunker, tank, airplane hangar and the like, comprising a plurality of explosive charges, means mounting said explosive charges in a grid pattern adjacent the fortification to be protected and oriented in a direction for firing outwardly away from the fortification along predetermined shooting lines, and sensing means at a location spaced outwardly from said charges in a direction away from the fortification including sensing actuating means in alignment with each charge, each sensing actuating means being connected to each charge with which it is in alignment for firing the associated charge upon sensing an incoming enemy warhead, whereby the explosion of said charge will cause the premature explosion of said warhead at a



plate, the supporting plate between adjacent rows having shooting openings for permitting penetration of the solid matter of an explosive charge in the row therebehind on explosion thereof.

4,051,764

HYDRAULIC ACTUATING SYSTEM

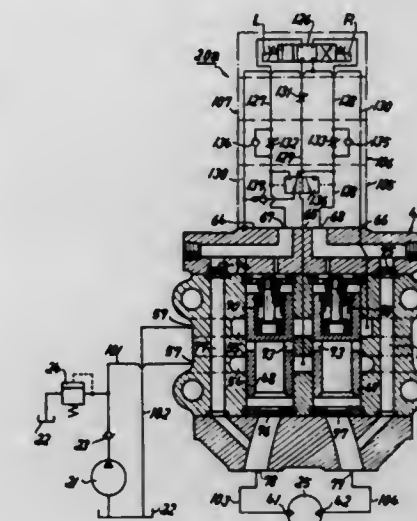
Hikaru Murata, No. 1734, Sakakura, Sakabogi-cho, Kamo, Gifu, Japan

Filed June 5, 1975, Ser. No. 583,874

Int. Cl.² F15B 13/042

U.S. Cl. 91—29

4 Claims



1. A hydraulic actuating system, comprising a hydraulic actuator having a fluid intake port and a fluid discharge port; first means forming a fluid supply line which communicates with said intake port of said hydraulic actuator; second means forming a fluid discharge line which communicates with said discharge port of said hydraulic actuator; a fluid reservoir; pump means for supplying fluid under pressure from said reservoir to said fluid supply line; a closed center control valve interposed in said fluid supply and said fluid discharge lines; an adjustable inflow control valve in said fluid supply line upstream of said intake port for controlling the rate of fluid flow into said intake port; an adjustable outflow control valve in said fluid discharge line downstream of said discharge port for controlling the rate of fluid outflow from said outflow port; two position switching valve means communicating with said fluid lines intermediate said hydraulic actuator and said control valves for detecting a pressure difference between said fluid lines which results from a difference between the fluid requirements of said hydraulic actuator and fluid flow rate permitted by said control valves, and for communicating that one of said fluid lines which has

the lower detected pressure with said reservoir via a low pressure relief valve so as to prevent excessive pressure build-up in the respective lines; and

an amplifier valve assembly intermediate said hydraulic actuator and said control valves and including a housing having two valve chambers each interposed in parallel with one of said fluid lines and having inner circumferential surfaces formed with respective inlet and exhaust annular grooves connected directly to said fluid reservoir and said pump means, port means each communicating with one of said fluid lines and one end of said valve chamber, a pair of hollow inlet and exhaust valve spools each slidable in one of said chambers between positions in which it respectively permits and prevents fluid flow through the other end of the respective chamber to the respective fluid line to join with the fluid flow in the respective fluid line from said closed center control valve, and wherein said control means form differential pressure-detecting pilot-flow circuit means for controlling the extent of movement of said valve spools between said positions thereof in dependence upon the detected pressure difference between said fluid lines.

4,051,765

ELECTRIC-HYDRAULIC PULSE MOTOR HAVING AN IMPROVED ROTARY GUIDE VALVE MEANS

Shoichi Saito, Karatsu, Japan, assignor to Nishin Sangyo Co., Ltd., Tokyo, Japan

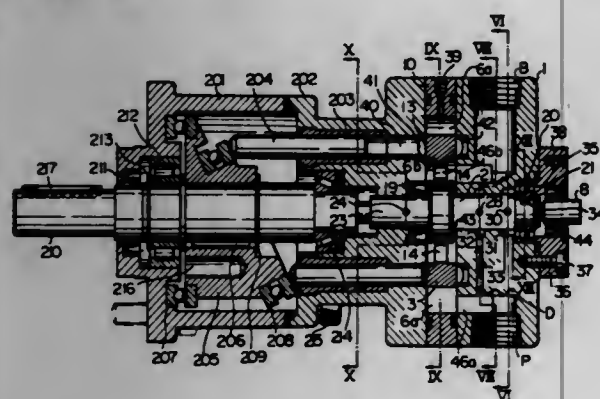
Continuation of Ser. No. 597,816, July 7, 1975, abandoned. This application June 1, 1976, Ser. No. 692,021

Claims priority, application Japan, July 23, 1974, 49-84906

Int. Cl.² F15B 21/02; F01B 3/10

U.S. Cl. 91-35

23 Claims



1. In an electric-hydraulic pulse motor consisting of a hydraulic motor having a housing, a rotor and a plurality of bores formed in said housing and disposed circularly around the axis of rotation of said rotor for being supplied in order with pressurized fluid to actuate said rotor; and rotary guide valve means adapted to be connected to signal input means such as an electric pulse motor for sequentially supplying the pressurized fluid to said bores, the rotary guide valve means comprising: means defining a valve chamber with which said bores in the hydraulic motor communicate;

a valve shaft and a signal input shaft movably supported in said valve chamber defining means in engagement with each other for relative movement relative to each other, at least one of said shafts being rotatable in said means and having a portion thereof extending through said valve chamber;

a valve member in said valve chamber having an annular portion dividing said valve chamber into an outer valve chamber portion and an inner valve chamber portion, said annular portion having an annular closure surface which closes the ends of all the bores of said hydraulic motor when the valve member is in a central position between said inner and outer valve chamber portions, said valve member being provided with an elongated opening at the center thereof through which said portion of the shaft in

the valve chamber extends so as to divide said opening into two sections;

means yieldably biasing said valve member to its central position;

means operatively associated with said valve member and said portion of the shaft in the valve chamber for preventing relative rotation between said valve member and said one of said shafts while allowing the valve member to move transversely relative to said one of the shafts to either of two eccentric positions in which the bores on one side of the annular portion communicate with the outer valve chamber portion and the bores on the opposite side of the annular portion communicate with the inner valve chamber;

means engaging with said valve member for closing both sides of each of said sections of said opening thereby forming two variable size fluid chambers on the opposite sides of said shaft portion in the valve chamber;

passage means for supplying pressurized fluid to each variable size fluid chamber and discharging the fluid therefrom, said passage members each having throttle means at a portion thereof where said valve shaft and said input shaft engage with each other, said throttle means being for varying the fluid pressure in at least one of said variable size fluid chambers according to the relative movement between the two shafts;

conduit means for connecting a source of pressurized fluid to one of said valve chamber portions and connecting the other portion to a discharge port; and

means for interconnecting said rotor of the hydraulic motor to said valve shaft for causing the valve shaft to rotate in the same direction as the rotational direction in which the pressurized fluid should be sequentially supplied to said bores in the hydraulic motor.

4,051,766

ARRANGEMENT FOR STEERING-POWER LIMITATION IN HYDRAULIC SERVO-STEERING SYSTEMS

Günter Strauff, Kaarst, Germany, assignor to Langen Company, Düsseldorf, Germany

Continuation of Ser. No. 316,397, Dec. 18, 1972, abandoned.

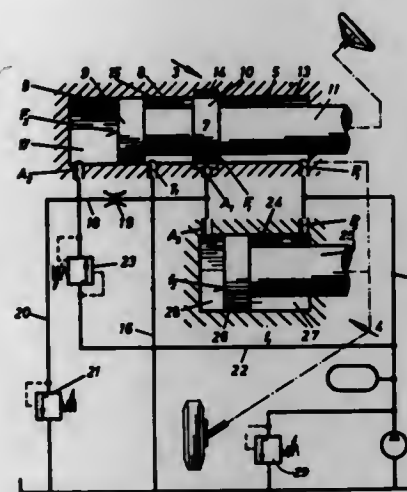
This application Jan. 21, 1975, Ser. No. 542,671

Claims priority, application Germany, Dec. 17, 1972, 2162631

Int. Cl.² F15B 15/17, 11/08, 13/04

U.S. Cl. 91-417 R

5 Claims



1. An arrangement for limiting the steering power in hydraulic servo-steering systems for vehicles having steerable wheels and

a steering wheel,
a servo-motor (4) having
a cylinder (24),
a piston (26) and

a piston rod (25) defining larger (28) and smaller (27) working areas, the smaller working area (27) being continuously connected with a pressure source (1),

the servo-motor (4) being operatively connected with the steerable wheels,

a comparator means (3, 3a) being operatively connected with the steering wheel and provided for the relay of a steering sensation to the steering wheel,

the comparator means (3, 3a) including an activator means (33, 34; 11),

a first reaction chamber (17) of a larger effective reaction area (F_2) and

a second reaction chamber (42) of a smaller effective reaction area (F_1) continuously connected with the pressure source (1) and

a three way, three position control valve portion (7, 31) controlling a pressure medium flow from the pressure source (1) to the larger working area (28) of the servomotor (4) or from said larger working area (28) to a return flow (T_1 , 16),

said larger working area (28) of the servo-motor (4) being connected by a restrictor (19) with the first reaction chamber (17),

the smaller working area (27) of the servo-motor (4) and the pressure source (1) being connected with the first reaction chamber (17) by a pressure release valve (23),

said pressure release valve (23) opening during the reduction of a predetermined lower pressure in the first reaction chamber (17) or during the exceeding of a predetermined pressure difference between the smaller working area (27) and the first reaction chamber (17),

and the first reaction chamber (17) being connected with 51 and exhaust passage via a pressure limitation valve (21), with said pressure limitation valve (21) preventing the exceeding of a predetermined upper pressure of the first reaction chamber (17).

4,051,767

ACTUATOR FOR FLUID PRESSURE-OPERATED POWER DEVICES

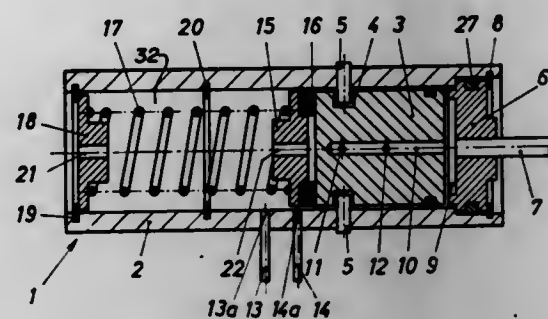
Dieter Landsberg, Riemenschneiderstrasse 17, 4041 Allerheiligen, Germany

Filed July 17, 1975, Ser. No. 596,782

Int. Cl.² F15B 13/042

U.S. Cl. 91-420

2 Claims



1. In a system including a fluid motor means; means for supplying pressurized fluid from a pressure source to energize the fluid motor means; a switch means having a first switching state in which pressurized fluid is introduced from the pressure source to the system and a second switching state in which communication is blocked between the pressure source and the system and the system is depressurized; the improvement comprising

a. a sole first pressure conduit having a first end and a second end; said first end being connected to the pressure source with the interposition of said switch means;

b. an actuator including

1. a cylinder having a cylindrical wall defining a pressure chamber to which said second end of said first pressure conduit is connected and an exhaust chamber;

2. at least two coupling ports provided in said cylindrical wall; said ports being axially spaced from one another;

3. a guide pin secured to said cylindrical wall and projecting into a space bounded by said cylindrical wall;

4. a piston disposed in said cylinder with a close fit and arranged for axial and angular displacement; said piston having a cylindrical lateral surface and a radial end face which bounds said pressure chamber; said piston separating said pressure chamber from said exhaust chamber in a fluidtight manner by a first sealing means carried by said piston; said piston having a first axial position and a second axial position;

5. means defining a passage between the cylindrical wall of said cylinder and the cylindrical lateral surface of said piston;

6. pressing means urging said piston in said first axial position; said piston being moved into said second axial position by the pressurized fluid when admitted into said pressure chamber from said pressure source through said first pressure conduit; said piston being moved into said first position by said pressing means upon depressurization of said pressure chamber;

7. means defining a helically extending groove in the piston surface; said guide pin projecting into said groove for effecting a rotary motion of predetermined angle of said piston during axial movement of said piston from one of its positions into the other;

8. a bore extending into said piston from said radial end face;

9. axially spaced channels provided within said piston; said channels starting at said bore and terminating at said cylindrical lateral surface of said piston; said channels establishing communication between said pressure chamber and a selected one of said ports when said piston is in said second position; the magnitude of the predetermined angle being such that upon each successive arrival of said piston into said second position a different one of said ports communicates with said pressure chamber; in said first axial position of said piston each said coupling port is in communication with said exhaust chamber through said passage and in said second axial position of said piston each said coupling port other than that pressurized from said pressure chamber is in communication with said exhaust chamber through said passage;

10. second sealing means carried by said piston and individually surrounding the mouth of each said channel on said cylindrical lateral surface of said piston; said second sealing means being in engagement with the cylindrical wall of said cylinder for blocking communication, in said second axial position of said piston, between said exhaust chamber and any coupling port pressurized from said pressure chamber; and

c. second pressure conduits equalling the number of said ports; a separate one of said second pressure conduits being connected, at one end, to a separate one of said ports and, at another end, to said fluid motor means.

4,051,768

CONVERSION KIT FOR AN AUTOMOBILE AIR CONDITIONING UNIT

Wayne Bayles, 6006 Craig St., Springfield, Va. 22150

Filed Nov. 2, 1976, Ser. No. 738,241

Int. Cl.² B60H 1/00

U.S. Cl. 98-2

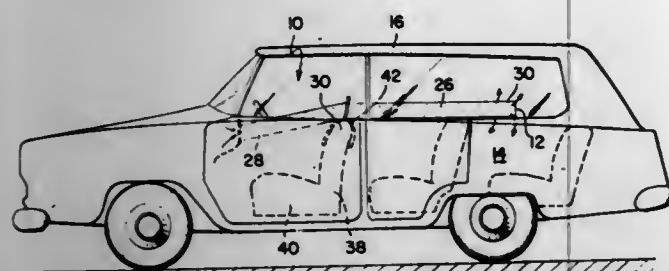
2 Claims

1. A conversion kit for transferring cool air of an automobile air conditioning unit to a rear portion of an interior of an automobile, which comprises:

a. a rectangularly shaped frame formed from a ferrous metal;
b. an adhesive backing disposed on one side of said metal frame, said adhesive backing adapted to be adhesively secured to a dashboard of said automobile around an air register of said air conditioning unit;

c. an elongated flexible thermoplastic tube member having a pair of open ends and a continuous bore therethrough;

d. a rectangularly shaped frame element affixed to one said end of said tube member, another said end of said tube member extending into said rear portion of said interior of said automobile; and



e. a magnetic flexible gasket adhesively secured to said frame element, said gasket magnetically affixed to said metallic frame.

4,051,769

SOLAR POWERED METHOD AND APPARATUS FOR VENTING GASEOUS MATERIAL FROM AN ENCLOSED SPACE TO ATMOSPHERE

Malcolm H. Nickerson, Chagrin Falls, and William R. Rinker, Cuyahoga Falls, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 27, 1975, Ser. No. 608,183
Int. Cl.² F24F 7/02

U.S. Cl. 98-43 R

8 Claims



1. Solar powered apparatus for venting gaseous fluid from a substantially enclosed space to the atmosphere comprising a fluid passage having an intake portion disposed to be placed in fluid communication with the enclosed space, said fluid passage having an exhaust portion, a chamber surrounding the exhaust portion of said fluid passage with the exhaust portion in fluid communication with the interior of the chamber, first pressure sensitive valve means between said exhaust portion and the interior of said chamber, said first pressure sensitive valve means being responsive to the fluid pressures in said fluid passage and in said chamber such that it permits flow of fluid from said fluid passage into said chamber when the fluid pressure in said fluid passage exceeds the fluid pressure in said chamber by a predetermined amount and blocks flow of fluid from said chamber into said fluid passage when the fluid pressure in said chamber exceeds the fluid pressure in said fluid passage by a predetermined amount, second pressure sensitive valve means between the interior of said chamber and the atmosphere, said second pressure sensitive valve means being responsive to the fluid pressure within said chamber and to ambient pressure such that said second pressure sensitive valve means is adapted to open to exhaust fluid material from said chamber to the atmosphere when the pressure within said chamber exceeds ambient pressure by a predetermined amount and said pressure sensitive valve is adapted to close and prevent flow of ambient air into said chamber when fluid pressure within said chamber falls below ambient pressure by a predetermined amount, means within said chamber for absorbing radiant solar energy for heating and expanding gaseous fluid material on the interior of said chamber, said first and second valve means being responsive to the expansion of gaseous fluid

which occurs due to solar heating, and being further responsive to the contraction of gaseous fluid material which occurs during periods of cooling of the gaseous fluid material on the interior of said chamber.

4,051,770

VENTILATORS FOR MOBILE HOMES, AND THE LIKE

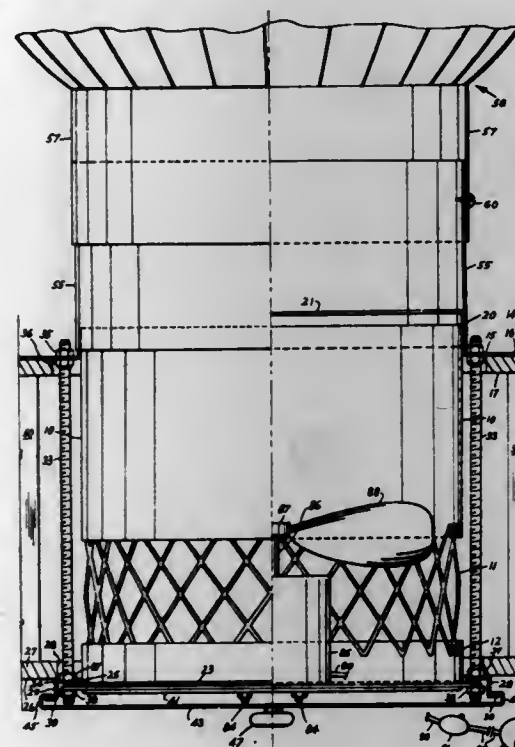
John V. Felter, Bill P. Taylor, Jr., and Kenneth M. Rudine, all of P.O. Box 7464, Houston, Tex. 77008

Filed Sept. 15, 1975, Ser. No. 613,088

Int. Cl.² F24F 7/06

U.S. Cl. 98-43 B

12 Claims



1. Ventilator apparatus comprising vertically disposed unitary tube means adapted for mounting through wall means, said tube means comprising an upper imperforate tubular portion and a lower imperforate tubular portion and an intermediate tubular portion formed of expanded sheet material in lattice form connected between said upper and lower tubular portions, said upper tubular portion being of plain tubular form throughout its length and being adapted to be trimmed at its upper end to reduce its vertical length to adapt to reduce thickness of said wall means, the upper end of said tube means comprising an air outlet and the lower end of said tube means and said intermediate tubular portion comprising air inlets, including a flash plate for engaging the upper surface of said wall means disposed freely around the upper end of said upper tubular portion and having an upstanding inner sleeve portion disposed around the upper end of said upper tubular portion, an outer tube engaged around said sleeve and extending upwardly therefrom, said flash plate and said outer tube preventing leakage around said ventilator apparatus at the upper surface of said wall means, said wall means including a roof and a ceiling and an attic space therebetween, said intermediate tubular portion being adapted to be positioned in said attic space, said lower end of said tube means having connection means adapted for connection to said ceiling, said upper end of said tube means being adapted to extend through said roof whereby air may be simultaneously ventilated from said attic space and from a room beneath said ceiling through said ventilator apparatus.

4,051,771

APPARATUS FOR OBTAINING LUPULIN-RICH PRODUCTS FROM HOPS

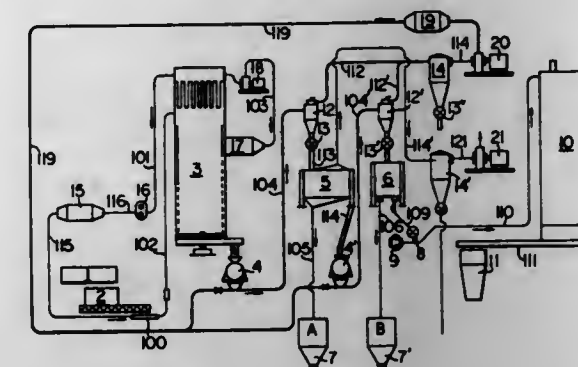
Junjiro Miyata, and Yasushi Kikuchi, both of Fukushima, Japan, assignors to Asahi Breweries, Ltd., Tokyo, Japan
Division of Ser. No. 669,872, March 24, 1976. This application June 30, 1976, Ser. No. 701,092

Claims priority, application Japan, Mar. 4, 1976, 51-23509

Int. Cl.² C12B 1/00

U.S. Cl. 99-276

13 Claims



1. An apparatus for obtaining a lupulin-rich product from hop cones, which comprises: a storage tank for containing frozen hop cones, said storage tank having a feeder at the lower end thereof for feeding frozen hop cones from said storage tank; a first crusher connected for receiving frozen hop cones from said feeder, said first crusher having first crusher screen means whose openings are relatively large; a first cold air conveying pipe connected for receiving crushed fragments that pass through the screen means of said first crusher and for conveying said fragments in a cold air stream; a first cyclone connected to said first cold air conveying pipe for separating the cold air from the fragments; a first sieving device connected to said first cyclone for receiving said fragments that are discharged from said first cyclone, said first sieving device having first sieve screen means for separating the relatively large size fragments from the relatively small size fragments; a second crusher connected to said first sieving device for receiving therefrom the relatively large size fragments that are retained on said first sieve screen means and for re-crushing said relatively large size fragments, said second crusher having second crusher screen means whose openings are smaller than the openings of said first crusher screen means; a second cold air conveying pipe connected for receiving re-crushed fragments that pass through said screen means of said second crusher and for conveying said re-crushed fragments in a second cold air stream; a second cyclone connected to said second cold air conveying pipe for separating the cold air from the re-crushed fragments; and a second sieving device connected to said second cyclone for receiving said re-crushed fragments that are discharged from said second cyclone and having second sieve screen means for separating the relatively large size re-crushed fragments from the relatively small size re-crushed fragments; said first and second cold air conveying pipes being part of a closed, cold air conveying system.

4,051,772

MACHINE FOR DISPENSING HEATED SAUSAGE FROM A COLD STORAGE COMPARTMENT

Reinhold A. Johnson, Ostra Hasselbacken 17, and Arne B. Svensson, Wilhelmbergsgavagen 8, both of 56100 Huskvarna, Sweden

Filed Dec. 9, 1975, Ser. No. 639,247

Claims priority, application Sweden, Dec. 9, 1974, 7415342; Sept. 19, 1975, 7510510

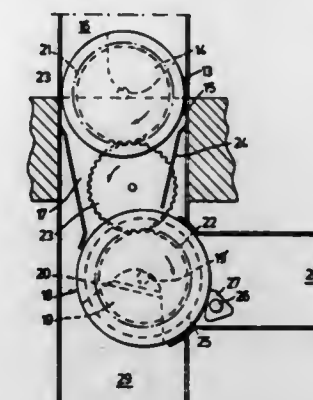
Int. Cl.² A47J 27/66

U.S. Cl. 99-427

4 Claims

1. A device for treating and transporting sausages, forming part of a vending machine, comprising a roller having a recess therein to receive said sausage, said roller being rotatably mounted about a horizontal axis permitting said product to fall

down by means of its own gravity into said recess when said roller is in a first angular position and in a second angular position of said roller the recess of said roller being so located that the product received therein is subjected to micro waves, a rotor means being provided to rotate the product in said



recess in said second angular position of said roller in order to rotate said product about its longitudinal axis, said recess of said roller in a third angular position of said roller being in register with an outlet opening through which the product leaves said roller by gravity.

4,051,773

MILLING ROLL

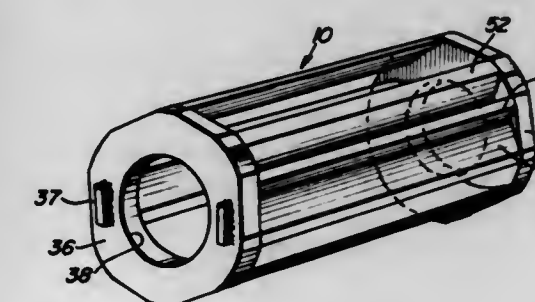
Lynn D. Staton, Rte. 1, Box 22 D, Stuttgart, Ark. 72160

Filed June 2, 1976, Ser. No. 692,234

Int. Cl.² B02B 3/02

U.S. Cl. 99-622

5 Claims



1. In a rice rolling machine having a frame supporting a stationary screen provided with a peripheral screen wall, a rotatable main shaft disposed centrally of said screen, an inlet at one end of the screen and an outlet at the other end thereof, a milling roll comprising a pair of longitudinally spaced end plates, a plurality of longitudinally elongated, spaced baffle plates rigidly interconnecting said end plates with the space between the baffle plates being open, each of said end plates being annular and including a large central opening receiving the main shaft of the rice milling machine, said baffle plates including a plurality of equally and circumferentially spaced first angled baffles having a radially inwardly inclined surface and an equal number of circumferentially spaced second arcuately curved baffles having a radially outwardly inclined surface, said first angled baffles serving to move rice kernels radially inwardly from the periphery of the milling roll and screen toward the main shaft during rotation of the milling roll and the second arcuately curved baffles serving to move rice kernels radially outwardly of the milling roll during rotation thereby rubbing the rice kernels together for removing the bran coating.

4,051,774

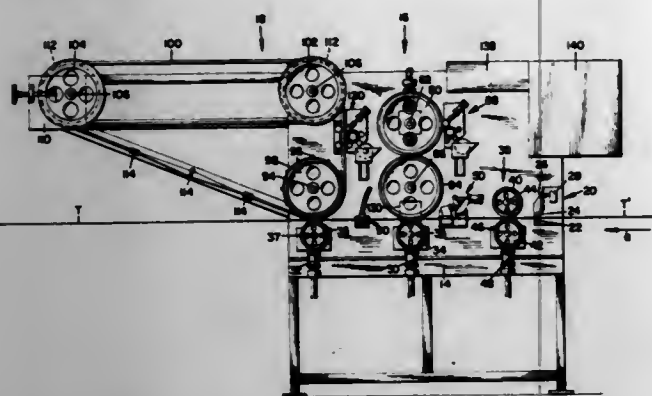
MACHINE FOR PRINTING MEASURING TAPES

Carl Kenneth Barnes, and John Owen Barnes, both of Suffield, Conn., assignors to Jack Barnes Engineering, Inc., Enfield, Conn.

Filed May 17, 1976, Ser. No. 687,107
Int. Cl.² B41F 17/10

U.S. Cl. 101—37

1 Claim



1. A machine for printing long flexible measuring tapes comprising:

a first printing station for printing inch graduations on a tape blank in one color,
a second printing station for printing foot graduations and other indicia on the tape blank in a second color,
means for moving the tape blank linearly through the printing stations,
the first printing station comprising a master print roll, a blanket roll and an impression roll,
the master print roll and blanket roll being in running engagement with each other and the blanket roll being in running engagement with the upper planar surface of the tape blank,
the impression roll being in running engagement with the lower planar surface of the tape blank and underlying the blanket roll, the second printing station comprising a perforated printing band entrained about a pin roll and about a pair of grooved rolls, the printing band having printing dies on one surface thereof in running engagement with the tape blank, and passing back and forth between the grooves of the grooved rolls, means for varying the pressure of the impression roll on the tape blank for controlling the spacing of the graduations printed on the tape by the blanket roll comprising a precision cam roll selectively rideable in clockwise and counter clockwise direction relative to a cam surface on the impression roll shaft, and wherein movement of the cam roll is controlled by a digital control unit based on information fed to said unit from an encoder wheel and a fiber optic control unit linearly spaced along the line of travel of the tape blank before and after the first printing station respectively for sensing and reporting graduation spacing, wherein one rotation of the encoder wheel is equal to one inch of linear travel of the tape blank, with each such rotation of the encoder wheel being reported to the digital control unit, and wherein the fiber optic control unit senses indicia printed at spaced intervals along the tape blank and reports to the digital control unit, which directs appropriate movement of the cam roll.

4,051,775

APPARATUS FOR AUTOMATICALLY POSITIONING WITH RESPECT TO A PREDETERMINED OPERATION STATION

Edward F. Watson, 28 Minton Ave., Chatham, N.J. 07928
Filed Oct. 23, 1975, Ser. No. 625,143

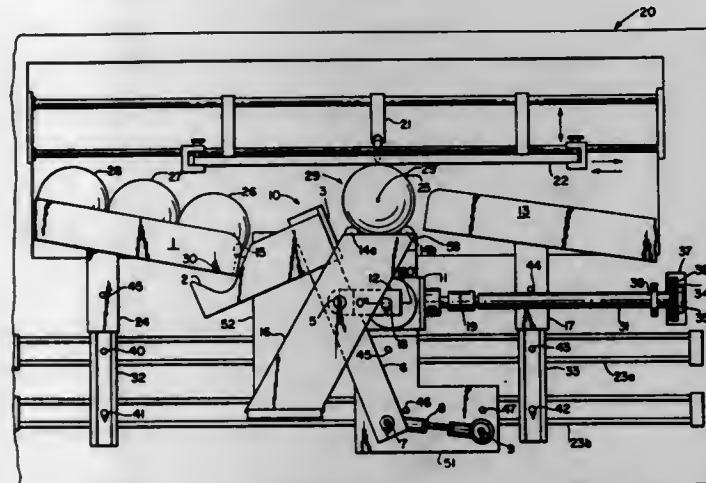
Int. Cl.² B23B 15/00; B41F 17/08

U.S. Cl. 101—38 A

8 Claims

1. An apparatus for transferring articles from a first location to a second location comprising:

a support base;
a crank mounted for rotation about a first axis;
means connected to said support base and said crank for driving said crank in rotation about said first axis;
an elongated cradle arm pivotally connected at an intermediate point thereon to said crank at a first pivot point located a first predetermined distance from said first axis;
a rocker arm having two ends, one end being pivotally connected to a first end of said cradle arm at a second pivot point located a second predetermined distance from said first pivot point and another end of said rocker arm being connected to said support base for pivoting about a fixed second axis;
cradle means connected to a second end of said cradle arm for picking an article from said first location and placing said picked article at said second location;
means for performing a predetermined operation on said article at said second location;
means connected to said second end of said cradle arm adjacent said cradle for pushing said article substantially sidewise from said second location;



said drive means rotating said crank means to cause said first pivot point at said intermediate point of said cradle arm to move in a circular path and said second pivot point at said first end of cradle arm to oscillate about said fixed second axis, whereby said cradle moves along an orbital path passing through said first location to pick an article therefrom, transferring the article for placement at said second location, subsequently to said pushing means pushing an article previously placed at said second location from said second location and moving away from said placed article as said cradle returns toward said first location and said operation means performs said predetermined operation, feed supply means for supplying said article at said first position, discharge track means for providing a path for said placed article pushed from said second location, and said discharge track means being arranged directly adjacent and to one side of the second location so that the push means does not lift the article at all but merely pushes same sidewise to said discharge track means.

4,051,776

DOWNSTREAM WEB TENSIONING FOR ROTARY SCREEN PRINTER

Johannes Zimmer, Ebentaler Strasse 133, A-9020 Klagenfurt, Austria

Continuation of Ser. No. 450,854, March 13, 1974, abandoned.
This application Apr. 30, 1976, Ser. No. 682,174

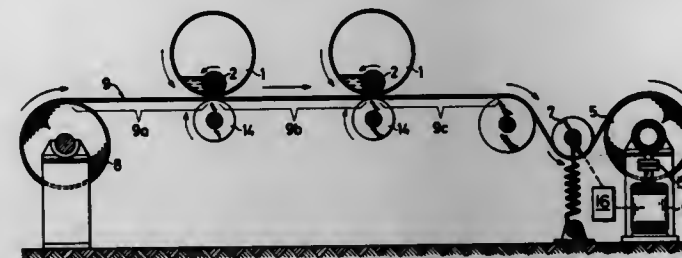
Int. Cl.² B41F 15/24

U.S. Cl. 101—118

5 Claims

1. In an apparatus for printing a flexible web of material, particularly a web of paper material, such apparatus being of the type including positively driven magnetic rollers; first drive means for positively driving said magnetic rollers at a first speed; second driving means for driving a web of material from a supply over said magnetic rollers; and hollow perforated cylindrical printing stencils, one each positioned to

contact and print a first portion of said web opposite a respective of said magnetic rollers; the improvement wherein said web is maintained substantially planar or flat in the area of contact with said cylindrical stencils;
said second driving means is positioned downstream of said cylindrical stencils and comprises means tending to drive said web in the same direction as said driven magnetic rollers, but at a second speed higher than said first speed; pressure means, including doctor rolls of magnetically attractable material, one each positioned within a respective one of said cylindrical stencils, for causing said cylindrical stencils to contact said first portion of said web with sufficient pressure to produce a friction connection and engagement between said web and said positively driven



magnetic rollers, and for thereby reducing the speed of movement of said first portion of said web in the area of contact with said cylindrical stencils to said first speed of said magnetic rollers, thus tending to create a speed differential between said first portion of said web and a second portion of said web which is downstream of said cylindrical stencils and which is driven by said second driving means, whereby said second portion of said web downstream of said cylindrical stencils is tensioned;
said first driving means for driving said magnetic rollers being independent of said friction connection and engagement between said web and said magnetic rollers; and means responsive to the tension thus created in said second portion of said web to reduce the speed of said second portion of said web.

4,051,777

STENCILING APPARATUS WITH FLOW THROUGH PRINT AND FLOW ACTION

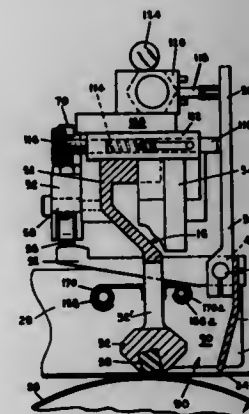
James A. Black, Kent City; Harry Russell Farwell, Cedar Springs, and Frank L. Porth, Morley, all of Mich., assignors to James A. Black, Kent City, Mich.

Continuation-in-part of Ser. No. 518,768, Oct. 29, 1974, Pat. No. 3,973,491. This application May 21, 1976, Ser. No. 688,610
The portion of the term of this patent subsequent to Apr. 10, 1993, has been disclaimed.

Int. Cl.² B41F 15/42

U.S. Cl. 101—123

2 Claims



2. Stencilling apparatus comprising:
means for supporting stock to be stencilled;
means for supporting a stencil screen above said stock supporting means;
an upstanding squeegee having a body with forward face

portion, a rearward face portion, and a lower resilient squeegee element for forcing fluid down through the stencil screen onto stock on said stock supporting means; an upright flow coater panel having a lower edge;
means for supporting said flow coater panel in spaced relationship behind said upstanding squeegee relative to the direction of advancement, forming a fluid reservoir therebetween and for causing said squeegee and said flow coater panel to be advanced simultaneously during a stencilling stroke;
said flow coater panel lower edge being mounted relative to the stencil screen for fluid flow from said fluid reservoir beneath said lower edge of said flow coater panel when said flow coater panel is advanced, to flow coat said screen for the next stencilling stroke;
passage means through said squeegee body, above said squeegee element, from said squeegee forward face portion to said squeegee rearward face portion, for direct flow through said squeegee body and into said reservoir, of excess fluid on the screen forwardly of said squeegee when said squeegee is advanced, whereby simultaneous advancement of said squeegee and flow coater panel in a stencilling and flow coating stroke results in a stencil-and-flow function keeping the screen covered with fluid, a portion of the fluid ahead of said squeegee being forced down through said screen, and excess fluid is not forced through said screen being able to flow from ahead of said squeegee through said squeegee body into said reservoir, and a portion of the fluid in said reservoir being caused to flow from said reservoir beneath said flow coater lower edge onto the screen to flow coat the screen for the next stencilling stroke.

4,051,778

ROLLER DEVICE FOR USE WITH PRESSURE SENSITIVE DUPLICATING MASTER AND METHOD OF OPERATION

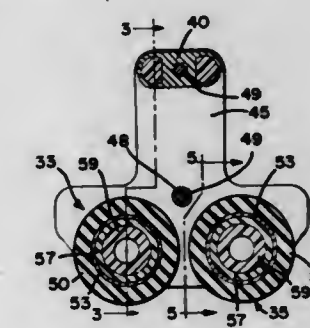
William D. Pfisum, and Mark E. Tullis, both of Dayton, Ohio, assignors to The Mazer Corporation, Dayton, Ohio

Filed June 28, 1976, Ser. No. 700,208

Int. Cl.² B41L 11/00

U.S. Cl. 101—133

6 Claims



1. A device for use with a pressure sensitive duplicating master for applying a duplicating pressure to the master and a sheet of copy paper positioned with the master on a hard surface comprising:
first roller means of a predetermined hardness for applying pressure, said first roller means having a central axis about which it may be rotated,
second roller means, of a hardness less than said predetermined hardness, for applying pressure, said second roller means having a central axis about which it may be rotated, and
frame means for mounting said first and second roller means side by side with their respective axes substantially parallel and laterally displaced and for permitting pressure to be applied simultaneously with said first and second roller means, whereby the quality of the copy produced is not adversely affected by irregularities in the hard surface since both said first roller means and said second roller

means apply duplicating pressure to all portions of the master and the sheet of copy paper.

4,051,779

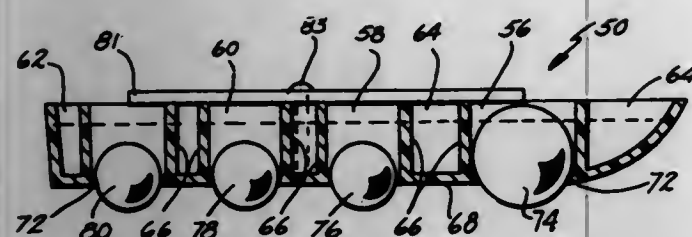
PAPER REGISTRATION CONTROL DEVICE FOR PRINTING PRESSES

Robert N. Zaagman, Wyoming, Mich., assignor to MRC Manufacturing Co., Grand Rapids, Mich.

Filed May 27, 1976, Ser. No. 690,378
Int. Cl.² B65H 9/06, 9/14

U.S. Cl. 101-242

2 Claims



1. A paper registration control device for use in a printing press of the type including a paper supporting surface over which paper is moved as it enters the press, forward head stops, a rigid bar overlying said feed surface, and a shiftable side guide block and which receives paper from a feed mechanism, said paper registration control device comprising:

a) an elongated, carrier member including spaced, parallel said members a transversely extending bottom member joining said side members and having an upwardly curved leading edge and a plurality of tandemly arranged holes extending vertically therethrough, each of said holes having an opening of reduced diameter where it opens through the bottom member of the carrier and the one of said holes closest to the leading edge having a diameter greater than the diameter of the remaining holes, said remaining holes being of equal diameter, said carrier member further defining an integral, downwardly opening slot extending longitudinally the entire length of said carrier, said slot being offset laterally from said tandemly arranged holes and dimensioned to receive the rigid bar of the press whereby the carrier is supported on said bar;

b) a plurality of spherical pressure elements, each disposed in one of said carrier holes and having a diameter slightly greater than the reduced diameter of said opening, a segment of each of said pressure elements projecting below the carrier, at least one of said pressure elements having a diameter and weight different from that of the others, said pressure elements arrangeable in different patterns along said carrier; and

c) guard means extending longitudinally of said carrier over said holes for preventing removal of said pressure elements from the top of said carrier.

4,051,780

LABEL FEED MECHANISM FOR PORTABLE LABELING MACHINES

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Keikyo, Tokyo, Japan

Filed May 14, 1976, Ser. No. 686,562

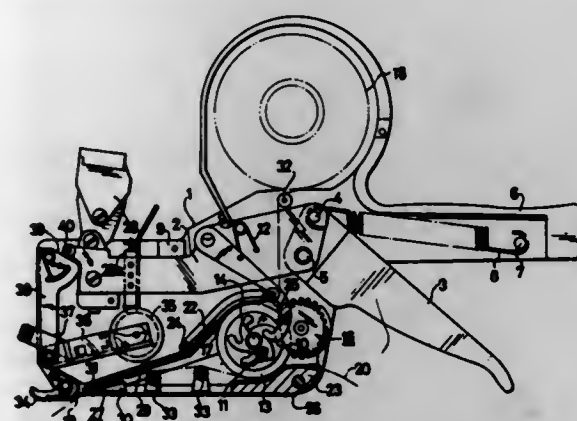
Claims priority, application Japan, May 15, 1975, 50-054308
Int. Cl.² B41F 1/08; B41J 1/08, 1/40

U.S. Cl. 101-305

9 Claims

1. A portable labeling machine comprising:
a) a frame; means for supporting and dispensing a continuous strip of labels; said frame including a passage therethrough having an entrance positioned to receive a strip of labels dispensed from said supporting means therefor; said passage extending through said frame and being adapted for having a label strip pass through said passage;
b) a label strip feed mechanism is said frame comprising:
a) first axis on said frame; a feed wheel mounted on said first

axis for rotation around said first axis; said feed wheel having a periphery; said feed wheel being located so that said periphery engages and moves said strip of labels along and through said passage as said feed wheel rotates;
a) a drivable element; a second rotation axis carried on said frame; said drivable element being mounted on and being rotatable on said second axis;
a) a drive gear assembly joining and in engagement with said drivable element and with said feed wheel such that rotation of said drivable element rotates said feed wheel;
a) a third pivot on said frame; a lever pivotally attached to said frame at said third pivot; said lever being pivotable around said third pivot between a first and a second position of said lever;
a) a fourth pivot on said frame; a yoke pivotally supported on said fourth pivot; said yoke being connected to said lever such that said yoke is pivotable between a third and a fourth position as said lever pivots between said first and second positions, respectively;



a) a drive element connected to said yoke and movable therewith; said drive element being connected to said yoke at a location spaced away from said fourth pivot, thereby to permit translational motion of said drive element upon pivoting of said yoke; said drive element engaging said drivable element such that movement of said yoke causes said drive element to rotate said drivable element, and thereby to rotate said feed wheel through said drive gear assembly; the motion of said drive element that is caused by motion of said yoke between said third and fourth positions rotates said drivable element through a first angular distance; said gear assembly including engaging gears shaped and dimensioned to create a gear ratio among them such that said feed wheel is rotated through a second angular distance, which is greater than said first angular distance, by movement of said yoke between said third and fourth positions.

4,051,781

INK ROLLER CARTRIDGE

Tatsuo Nishikawa, Tachikawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denchi Kabushiki Kaisha, Saitama, both of Japan

Filed May 3, 1976, Ser. No. 682,800

Claims priority, application Japan, May 28, 1975, 50-63887
Int. Cl.² B41F 31/30

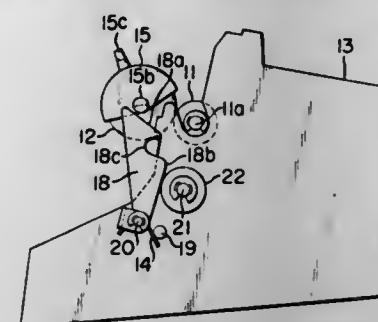
U.S. Cl. 101-348

4 Claims

1. An ink roller device for use with printing apparatus which includes a printing type drum, comprising:
a) a shaft;
an ink roller, integral with said shaft, for contacting the printing type drum to apply ink thereto;
an ink roller cartridge for accommodating said ink roller and formed with an opening for exposure therethrough of said roller, said cartridge including a pair of side plates each having a portion rotatably receiving said shaft;

means for holding said shaft at said receiving portions after the shaft has been positioned therein;
a pair of levers for supporting said receiving portions, said levers each having a recess for receiving one of said receiving portions and having adjacent sides forming an acute angle at one end thereof for guiding one of said

of the corresponding arm with respect to its calibrated scale to establish a running condition.



receiving portions toward the open end of its respective recess and toward one of the sides of the printing type drum; and
a pair of spring means for continuously urging said levers and said ink roller cartridge carried thereby toward the printing type drum.

4,051,782

DOSING DEVICE ON AN INK FOUNTAIN

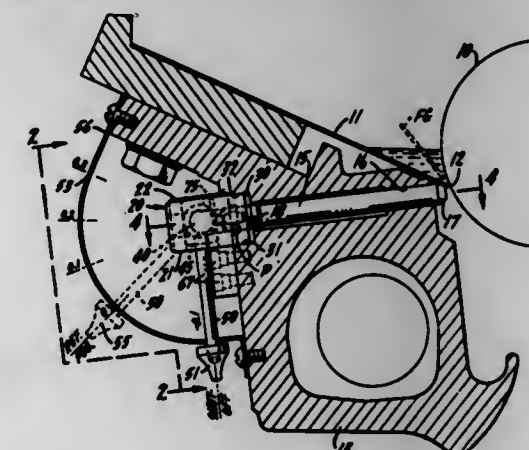
Eloy Fernandez, Henselstamm, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Nov. 9, 1976, Ser. No. 740,106

Claims priority, application Germany, Nov. 12, 1975, 2550720
Int. Cl.² B41F 31/04

U.S. Cl. 101-365

5 Claims



1. A mechanism for adjusting the blade of an ink fountain with respect to a fountain roller comprising, in combination, a frame, a plurality of zonal adjusting subassemblies spaced along the blade at equal intervals, each subassembly including a pin slidable in the frame at right angles to the edge of the blade, the pin having a tip and a rear end portion, the tip being positioned to engage the edge of the blade at an angle thereby to hold the blade closely spaced to the cylinder, a slide secured to the rear end portion of the pin and guided for sliding movement with respect to the frame, a rotatable adjusting member having an eccentric crank engaging the slide for positioning the same, the adjusting member further having an adjusting arm projecting radially therefrom, the arm having a calibrated scale including a reference mark fixed with respect to the frame, the adjusting member having a positive detent phased with the reference mark, the pin being threaded into the slide and the rear end of the pin being engageable by a turning tool so that when the adjusting arms are in detented reference position the blade may be preliminarily adjusted, zone by zone, into a reference spacing with respect to the roller by turning the pin in one direction or the other in each of the subassemblies, all of the reference marks and all of the scale graduations being in axial alignment with one another, the blade being finally and individually adjustable in each zone by movement of the corresponding arm with respect to its calibrated scale to establish a running condition.

MODEL RAILROAD LAYOUT

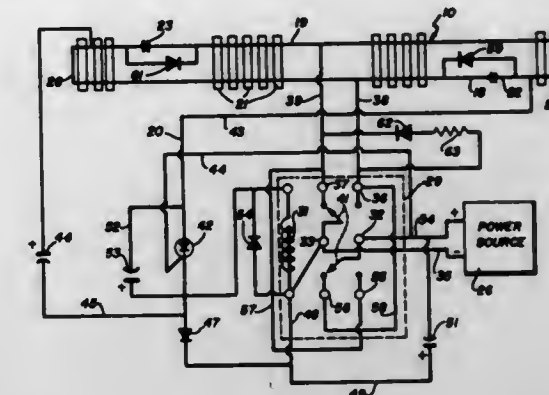
Frank Caliri, Marlboro, Mass., assignor to Peerless Industries Inc., Marlboro, Mass.

Filed July 1, 1976, Ser. No. 701,905

Int. Cl.² B61B 13/00

U.S. Cl. 104-151

7 Claims



1. Model railroad layout for use with a direct current motor-driven engine, comprising
a) a track having a finite length and consisting of two parallel rails, one rail having a switching means consisting of a gap in the rail adjacent one end of the track and the other having a switching means adjacent the other end of the track,
b) a source of direct current electrically connected to the track, one rail being connected to ground and the other rail to the positive voltage side, so that current passes from one rail, through a wheel of the engine, through its motor, and through another wheel to the other rail, and
c) control means to switch the polarity of the electricity applied to the rails to reverse the direction of the motion of the engine when it approaches a switching means, the control means reversing the engine when a wheel passes over a gap and electrically connects the rail on both sides of the gap.

4,051,784

FLEXIBLE ROTARY COUPLING

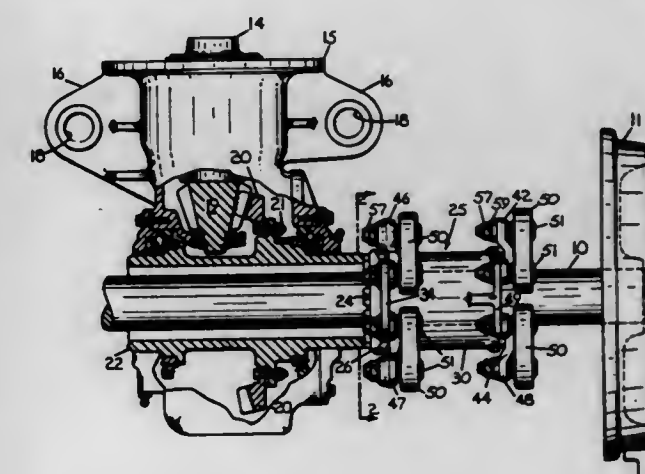
Donald Lloyd Ries, Dearborn Heights, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 12, 1976, Ser. No. 676,067

Int. Cl.² F16D 3/04, 3/62

U.S. Cl. 105-131

8 Claims



1. A coupling for transmitting torque from a rotary driving means to a rotary driven means comprising a first member adapted to be connected to said driving means, a second member adapted to be connected to said first member, and a third member adapted to be connected to said second member, the first member having a first end portion, the second member having a second end portion, and the third member having a third end portion, the first end portion of the first member being adapted to be connected to the second end portion of the second member, and the second end portion of the second member being adapted to be connected to the third end portion of the third member.

ber adapted to be connected to said driven means, an elongate member intermediate said first and second members and means drivingly connecting said first and second members respectively to opposite ends of said intermediate member, said means connecting at least one of said members to its respective end of said intermediate member comprising a plurality of links and connecting pins with each link having a pair of connecting pins with one end of each connecting pin seated within said link and with the pins extending in one direction away from said link with one connecting pin of each link secured adjacent its other ends to means extending radially outward from said one member and the other connecting pin secured adjacent its other end to means extending radially outward from said intermediate member.

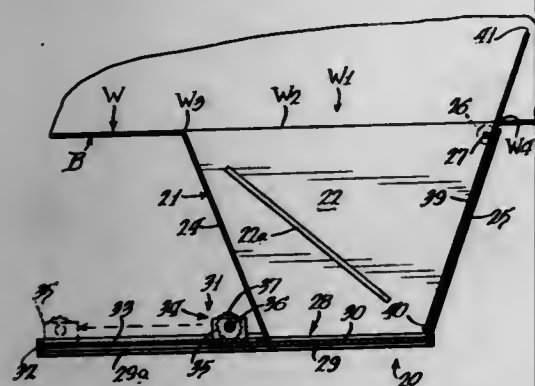
6. A drive axle assembly for a rail vehicle comprising a gear box including rotary output driving means, a coupling having a hollow interior and an axle extending through the interior of said coupling, a wheel at each end of said axle, said coupling comprising a first rotary member drivingly connected to said gear box output, a second rotary member drivingly connected to said axle between said wheels, an axially elongate member intermediate said first and second rotary members, radially directed extensions at each end of said intermediate member, and a plurality of links drivingly connecting each of said rotary members to an extension at one end of said intermediate member, each of said links being located on the side of its respective extension opposite from said first rotary member and including a pair of connecting pins projecting axially away from said link in the direction of said first rotary member, one of said pair of connecting pins being secured adjacent its projecting end to an extension of said intermediate member and the other of said pair of connecting pins being secured adjacent its projecting end to one of said rotary members.

4,051,785 DUAL DISCHARGE HOPPER DEVICE FOR BULK CARGO VEHICLES

Richard P. Besette, 13029 S. Hoyne Ave., Blue Island, Ill. 60406

Filed June 1, 1976, Ser. No. 691,465
Int. Cl.² B61D 7/06

U.S. Cl. 105—280



1. A dual discharge hopper device for the cargo body of a bulk cargo carrying wheeled vehicle, said body having a bottom wall provided with a rectangular opening, said dual discharge hopper device comprising, in combination:
a depending structure having two fixed sidewalls which bound first parallel sides of said rectangular opening, and two connecting walls which bound second parallel sides of said opening, one of said connecting walls being mounted on a pivot the axis of which extends between the fixed sidewalls immediately adjacent the bottom of the cargo body so that said one of said connecting walls may selectively abut the fixed sidewalls or swing clear of said sidewalls for uncontrolled discharge of material from the cargo body;
controlled discharge closure means at the lower end of said depending structure;
discharge control means for moving said controlled discharge closure means to any desired point between a

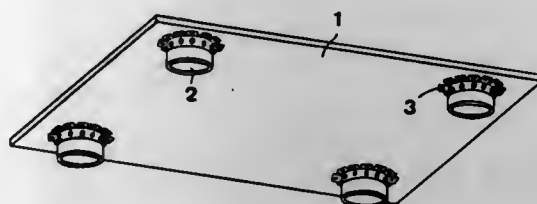
closed position in which it completely blocks the lower end of the structure and a fully open position in which said lower end is effectively unobstructed;
and a diverter panel mounted on a horizontal shaft that extends between the lower ends of the sidewalls immediately adjacent said one of said connecting walls, said diverter panel being movable between a generally upright controlled discharge position confronting said one of the connecting walls, and an uncontrolled discharge position inclined across the structure so the lower end of the structure is completely obstructed.

4,051,786 LOADING PALLET

Hans-Elov Nordgren, Runemo S-822 00, Alfta, Sweden
Filed June 23, 1975, Ser. No. 589,630
Int. Cl.² B65D 19/40

U.S. Cl. 108—51.1

1 Claim



1. A support comprising a sheet-like member defining a supporting surface, a plurality of supports underlying said sheet-like member, and a securing member individually securing each support to said sheet-like member, each support being generally circular in peripheral outline, and each securing member formed of readily bendable sheet metal and including a one-piece tubular portion wrapped substantially entirely around a respective support at one end and a flanged portion secured to said sheet-like member, said tubular portion having a plurality of integrally preformed securing elements extending radially into said support for the full depth of said securing elements beginning at their lines of connection with said tubular portion, and said flanged portion including a plurality of segments separately connected to said tubular portion thereby permitting wrapping of said tubular portion about said support, and each segment having at least one integrally formed securing element projecting therefrom into said sheet-like member.

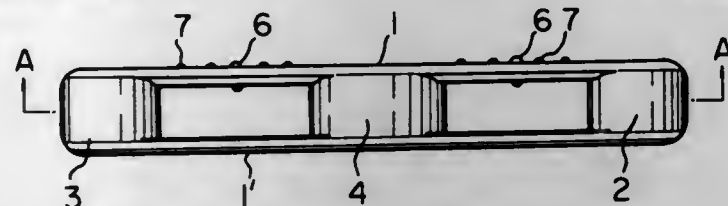
4,051,787 PLASTIC PALLET

Kiyoshi Nishitani, Yokohama; Ryuzo Ebina, Tokyo; Ikuro Sukekawa, and Shuji Shintani, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Sept. 29, 1975, Ser. No. 617,788
Claims priority, application Japan, May 6, 1975, 50-54044; May 20, 1975, 50-59935
Int. Cl.² B65D 19/44

U.S. Cl. 108—55.3

12 Claims



1. A pallet for a fork lift structurally comprising:
two mating component parts of thermoplastic resin wherein each of said components parts comprises a deckboard having inner and outer surfaces and girders integrally formed on said inner surfaces with at least one girder being disposed along each of the side edges of said deckboard and along a line intermediate and parallel to the side

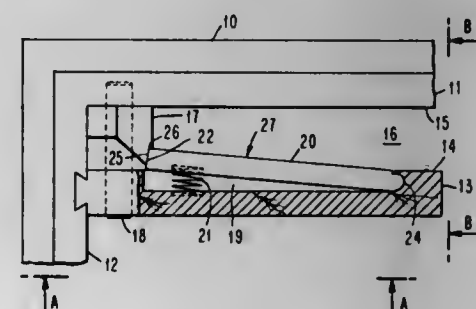
edges so as to define fork lift insertion openings therebetween,
at least one of said component parts being provided with numerous ribs, integrally formed on the inner surface of said deckboard, which are lower in projection than said girders and which in areas not covered by said girders are disposed decreased distances from one another in the neighborhood of the side edges of the deckboard,
said deck board being provided with an anti-slip means having an upper and lower portion and fitted into a hole penetrating a rib integrally formed on said deckboard so that the lower portion of said anti-slip means protrudes from said rib, and
said component parts being mutually melt adhered together at the respective bottom surfaces of said girders.

4,051,788 FOLDING TABLE

William E. Gindele, East Boothbay, Maine 04544
Filed Apr. 20, 1976, Ser. No. 678,688
Int. Cl.² A47B 3/00

U.S. Cl. 108—125

4 Claims



1. In a table having folding legs:
a top, a frame of side rails,
a further rail attached to said top associated with each corner formed by said side rails, having a wall facing an opposing wall of one of said rails which creates a channel for receiving a leg when in its folded position,
pivot means attaching each leg to the table having an axis perpendicular to the opposing walls of said further rail and one of said side rails;
locking means comprised of a substantially rectangular block having a leg bearing end and an opposite end, said leg bearing end being beveled and said opposite end having a convex rounded configuration,
a recess in said further rail, said recess being configured in a substantially rectangular shape and includes a concave, rounded end for receiving said convex, rounded end of said locking means to thereby provide a pivot point for said locking means, and retain said locking means within said recess when said leg is in its folded position, and means to force said locking means towards said opposing wall of said side rail.

4,051,789 WALL FIXTURE

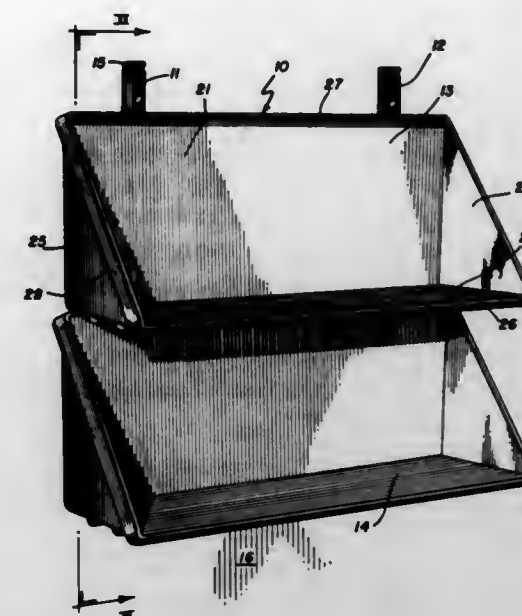
Robert T. Howitt, Leominster, Mass., assignor to Frem Corporation, Worcester, Mass.
Filed July 22, 1976, Ser. No. 707,669
Int. Cl.² A47B 5/00

U.S. Cl. 108—152

10 Claims

1. Wall fixture, comprising:
a. a pair of rails adapted to be mounted on a wall in spaced, parallel relationship, each rail being formed with a plurality of inclined slots, and
b. an appliance extending between the rails, the appliance having a main body with a surface facing the rails and having a horizontally-extending fin extending from the surface and lying in a slot of each of the rails, each of the fins having a tapered cross-sectional shape and being

wider adjacent the wall from which it extends than at the portion more remote from the wall, the shape of the slots



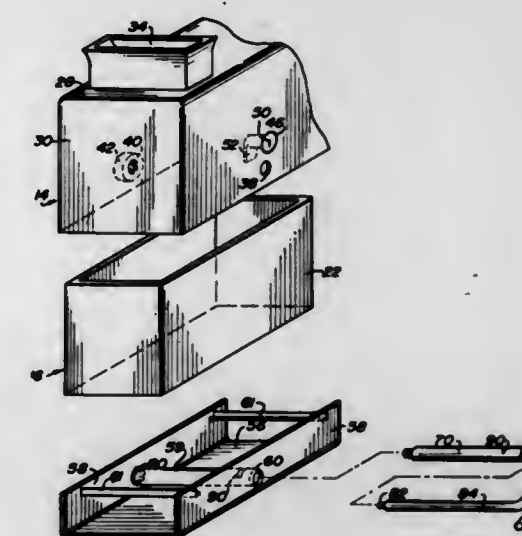
and the cross-sectional shape of the fin being substantially the same.

4,051,790 VEHICLE SAFE

William F. Meditz, 6821 E. Thornapple Drive, Mayfield Village, Ohio 44040, and James V. Congin, 5717 Wilson Mills Road, Highland Heights, Ohio 44143
Filed May 20, 1976, Ser. No. 688,412
Int. Cl.² E05G 1/00

U.S. Cl. 109—58

6 Claims



1. An enclosure having an access member movable between closed and open positions for selectively providing access to said enclosure, first releasable locking means movable between locking and releasing positions for releasably locking said access member in said closed position, said first releasable locking means including key operated first release means located within each enclosure for releasing said first releasable locking means, a limited access opening in a wall of said enclosure for providing limited access to said first release means by a key, second releasable locking means having key operated second release means accessible externally of said enclosure and including blocking means selectively movable between blocking and unblocking positions for selectively blocking and unblocking access through said opening to said first release means, said first locking means further including an elongated hollow member extended through said limited access opening and having inner and outer ends, said first release means being located at said inner end of said hollow member, said hollow member having a transverse opening therein, and said blocking means being movable transversely of said hollow member into

and out of said transverse opening in moving respectively between said blocking and unblocking positions.

4,051,791

COAL BURNING ARRANGEMENT

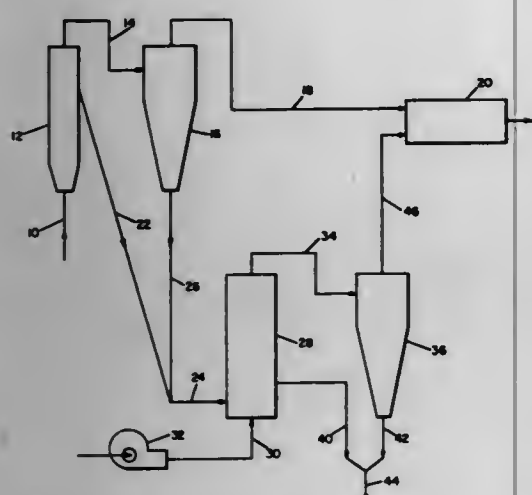
Alex. F. Wormser, Marblehead, Mass., assignor to Wormser Engineering, Inc., Marblehead, Mass.

Filed Aug. 15, 1975, Ser. No. 604,923

Int. Cl.² F23D 19/00; F23C 5/16; F23D 1/00

U.S. Cl. 110-28 R

20 Claims



- Coal burning apparatus which comprises, in combination:
 - a spouted fluidized bed pyrolyzer,
 - a fluidized bed combustor,
 - a first cyclone,
 - a second cyclone, and
 - an afterburner,
 - means for introducing pulverized coal and sorbent into said pyrolyzer,
 - means for transferring char and sorbent from said pyrolyzer to said combustor,
 - means for transferring gaseous materials with entrained particulate material from said pyrolyzer to said first cyclone,
 - means for transferring gaseous materials from said first cyclone to said afterburner,
 - means for introducing a combustion supporting gas into said combustor in quantity sufficient to maintain a temperature of combustion products below the fusion temperature of ash from the char,
 - means for transferring gaseous materials with entrained particulate material from said combustor to said second cyclone,
 - and means for transferring gaseous materials from said second cyclone to said afterburner.
- The method of burning coal which comprises the steps of
 - introducing pulverized coal and sorbent into a fluidized bed pyrolyzer,
 - carrying out in said pyrolyzer a reaction to produce char, desulfurized volatiles, and sulfur-bearing sorbent containing sulfur taken from said volatiles,
 - separating the char and sorbent from the desulfurized volatiles,
 - introducing the char and sulfur-bearing sorbent into a fluidized bed burner,
 - introducing into the burner a stoichiometric excess of air, said excess of air being chosen to produce an ash temperature below the fusion temperature thereof,
 - burning the char in contact with the sulfur-bearing sorbent and in heat-transfer relationship with the stoichiometric excess of air,
 - forming thereby dry ash, a desulfurized mixture of gases, and sorbent-bearing sulfur in increased amount,
 - separating said mixture of gases from said ash, and
 - burning said desulfurized volatiles in said desulfurized mixture of gases.

4,051,792 STRUCTURAL ORIENTATION AND PROTECTIVE APPARATUS FOR TILLAGE ASSEMBLY

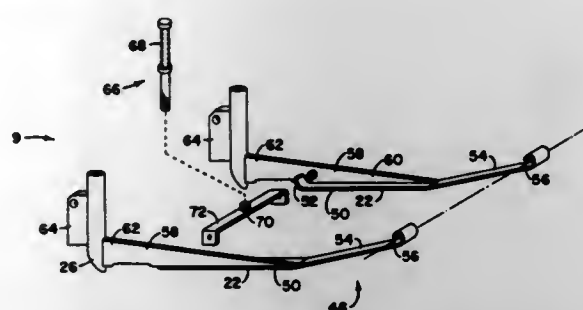
Heary William Brandt, Jr., Des Moines, and Donald Thomas Sorlie, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 15, 1976, Ser. No. 649,278

Int. Cl.² A01C 5/00

U.S. Cl. 111-85

8 Claims



- In a tillage unit having a cutter wheel mounted thereon, a structural orientation and protective apparatus, comprising:
 - skid means mounted on the unit independently of and adjacent to said cutter wheel of said tillage unit to control the depth of a furrow cut by said wheels;
 - seed tube means having a seed boot rearwardly spaced from the cutter wheel with a discharge portion rigidly connected to a rearwardly extending portion of said skid means in a manner such that said seed boot is vertically aligned with the furrow and protected by said skid means against foreign matter, said seed tube means being adapted to deposit seed in a cut furrow; and
 - depth adjustment means connected to said skid means for selectively adjusting the depth of furrow cut by vertically adjusting the cutter wheel and skid means relative to one another while said discharge portion of said seed boot is maintained in substantially the same relative position with respect to the ground level regardless of the selected depth of furrow cut.

4,051,793 EMBROIDERY MACHINE

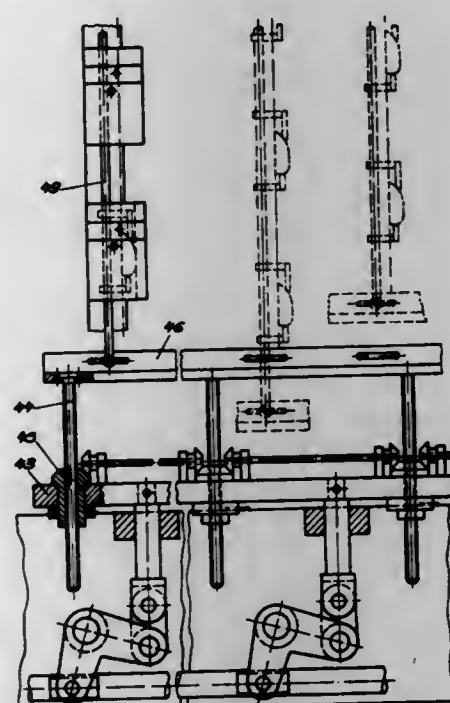
Rudolf Reich, Neuwied, Germany

Filed Mar. 9, 1976, Ser. No. 665,343

Int. Cl.² D05C 3/04

U.S. Cl. 112-83

22 Claims



- An embroidery machine having a plurality of embroidery stations containing embroidering tools, said machine comprising:

embroidering heads, in which the embroidering tools of each embroidering station are combined on the needle side, casings for the embroidering tools on the shuttle side, basic guides, which extend over the height of the embroidery field and to which the embroidering heads and the casings are mounted, adjustment bars mounted to the basic guides at the needle side and at the shuttle side for supporting the embroidering heads, girders connecting the basic guides at the needle side and at the shuttle side for synchronously adjusting the embroidering tools of each embroidering station at the needle side and at the shuttle side, and driving means for moving the adjustment bars with respect to the basic guides.

4,051,794

AUTOMATIC SEWING MACHINE

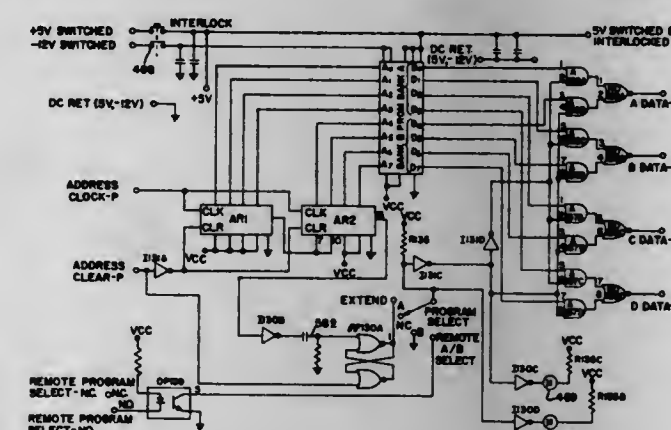
William P. Herzer, High Bridge, N.J., and Robert E. Cullen, Norwood, Mass., assignors to Union Special Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 496,748, Aug. 12, 1974, Pat. No. 3,982,491. This application July 3, 1975, Ser. No. 592,951

Int. Cl.² D05B 21/00

U.S. Cl. 112-121.12

41 Claims



- An automatic sewing machine, comprising:
 - memory means having a plurality of randomly addressable storage locations, said storage locations having a plurality of information bits defining a plurality of separate data banks with said storage locations sharing bits in separate banks;
 - address means for selecting said storage locations;
 - means for separately selecting any of said data banks of the selected storage locations and excluding at least one unselected bank at the start of a sewing sequence;
 - means for reading information from the selected data bank of the selected storage locations and for generating signals representing the read information; and
 - means responsive to said signals corresponding to the selected bank for forming a stitch pattern in a work piece.

4,051,795

CLOTH GUIDE MECHANISM IN A SEWING MACHINE

Tadashi Kotzuka, Hino, and Torao Ohchi, Chofu, both of Japan, assignors to Tokyo Juki Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 16, 1968, Ser. No. 762,231

Claims priority, application Japan, Sept. 23, 1967, 42-61139

Int. Cl.² D05B 35/10

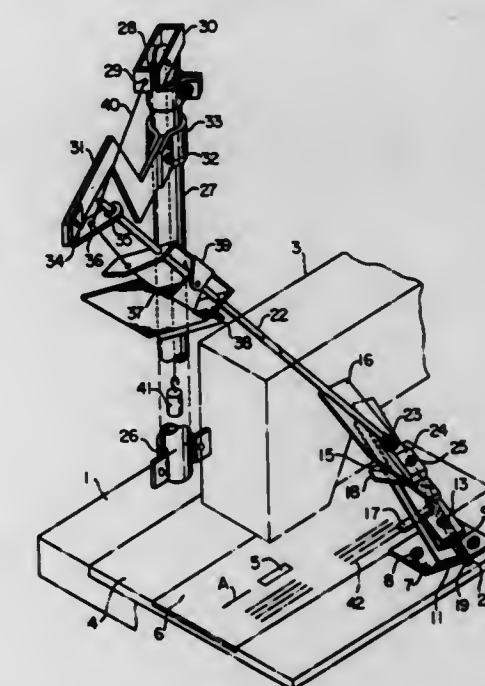
U.S. Cl. 112-153

8 Claims

- A sewing machine cloth guide mechanism of the type wherein a cloth is fed downwardly and in a first direction away from a sewing area of the sewing machine from a position above the sewing machine, the cloth is then fed in a second direction over a needle plate of said sewing machine and through the sewing area while a seam is sewed in the cloth in a direction

parallel to said second direction and parallel to the folded side edge, said cloth guide mechanism comprising:

- a first guide member extending over the needle plate with a first clearance therebetween;
- a second guide member positioned above said first guide member with a second clearance therebetween;
- said cloth passing through said second clearance when being fed in said first direction, and then passing through said first clearance when being fed in said second direction;
- a cloth positioning member attached to said first guide member and including upper and lower guide pieces, said lower guide piece extending through said first clearance, and said upper guide piece extending through said second clearance, said upper and lower guide pieces comprising means for guiding the folded side edge of said cloth while



- said cloth is fed in said first and second directions, respectively;
- said second guide member having an edge inclined to a line normal to said second direction;
- a guide rod extending upwardly from said second guide member;
- gripping means, slidably mounted on said guide rod, for resiliently gripping said cloth as it is led from the position above the sewing machine in said first direction;
- the feeding of said cloth in said second direction exerting a first force tending to urge said folded side edge of said cloth against said upper and lower guide pieces; and
- means, connected to said gripping means, for urging said gripping means upwardly along said guide rod and for thereby exerting a second force opposing said first force on said cloth.

4,051,796

METHOD OF BREAKING UP SHIP HULL

Mitsuo Itani, Chiba; Hiroyuki Kawashima, Yokohama; Takasuke Inoue, Kunitachi, and Mikio Maruyama, both of Tokyo, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1977, Ser. No. 766,020

Claims priority, application Japan, Mar. 18, 1976, 51-29615; Mar. 18, 1976, 51-29616; Mar. 18, 1976, 51-29617

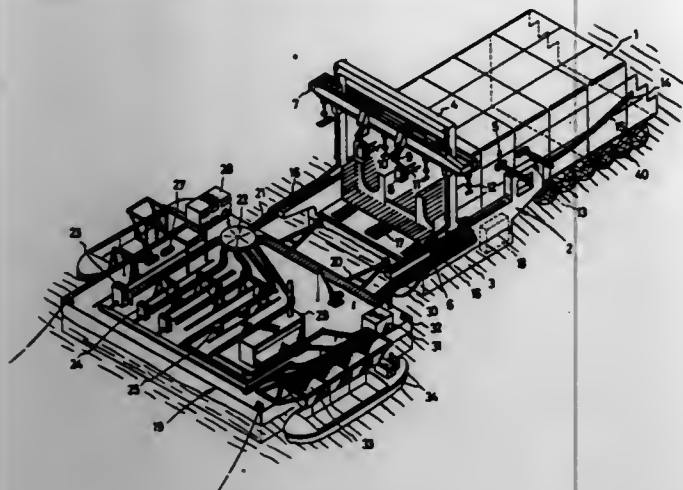
Int. Cl.² B63B 35/44; B63C 7/00

U.S. Cl. 114-44

4 Claims

- A method of breaking-up a ship hull characterized by utilizing a cutting workshop having its own buoyancy and a product making workshop connected to said cutting workshop and having its own buoyancy, drawing a hull to be broken up into said cutting workshop and breaking up said hull, transfer-

ring the obtained broken-up objects to said product making workshop where said objects are worked into given products,



power etc. necessary for said cutting workshop being supplied from said product making workshop.

4,051,797

STEEL BOAT HULL SALVAGING ASSEMBLY

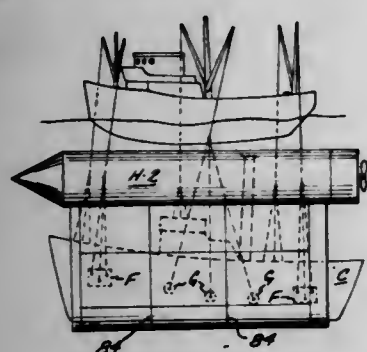
Erich Hausmann, 1025 S. Westlake, Los Angeles, Calif. 90006

Filed July 9, 1976, Ser. No. 704,058

Int. Cl.² B63C 7/08, 7/18

U.S. Cl. 114—51

2 Claims



1. In combination with a salvage vessel that has a source of electric power thereon, a plurality of power operated cables movably supported in depending positions from said salvage vessel and capable of being raised and lowered relative thereto, and a plurality of power operated electrical inducing conduits depending from said salvage vessel that may be raised and lowered relative thereto, an assembly for raising a sunken vessel having a steel hull, said assembly including:

- a closed circuit television system operatively associated with said salvage vessel said system including a waterproof camera supported from a first of said conduits, said camera capable of being lowered by one of said conduits to a position adjacent said sunken vessel to view the latter from said salvage vessel;
- electric motor driven means supported by a plurality of said cables and powered through one of said conduits for removing foreign material from said steel hull when in pressure contact with said foreign material;
- magnetic means for moving said electric motor driven means towards said hull to clean said foreign material therefrom and provide a plurality of clean spaced areas on said hull; and
- a plurality of fastening assemblies that may each be lowered by a plurality of said cables to positions adjacent said cleaned areas, each of said fastening assemblies including:
 - a heavy steel plate secured to at least one of said cables;
 - an electromagnet removably secured to said plate, said electromagnet in communication with one of said conduits, and said plate being magnetized when said electromagnet is energized;
 - a plurality of transversely disposed fastening members

mounted on said plate and capable of moving a distance less than that of their length relative to said plate;

- a plurality of electrically detonable explosive charges on said plate which when exploded drive said members partially into said hull when said plate is held in abutting contact with said hull by said plate being magnetized; and
 - switching means connected to said conduit, electromagnetic and explosive charges for first energizing said electromagnet with electric power from said conduit, second for directing electric power to said explosive charges to detonate the latter and third de-energizing said electromagnet to permit the latter to be separated from said plate and drawn aboard said salvage vessel by use of one of said cables attached to said electromagnet, and said sunken vessel being raised when said cables attached to said plates are tensioned and moved upwardly to raise said sunken vessel to the surface of the body of water on which said salvage vessel floats.
- first and second elongate containers of variable buoyancy that include remote controlled power means for driving said first and second containers in laterally spaced relationship through the body of water on which said salvage vessel float;
 - a plurality of flexible elongate members that extend between said containers; and
 - power means on said first container for reeling said flexible elongate members into the confines thereof when said first and second containers are disposed on opposite sides of said sunken vessel when said sunken vessel is in a partially raised position, with said flexible elongate members as they are reeled in drawing said containers to positions adjacent opposite sides of said sunken vessel, and said flexible elongate members cooperating on a cradle to partially support said sunken vessel as the latter is moved towards the surface of said body of water by increasing the buoyancy of said containers.

4,051,798

SELF-LOCKING CABLE TROLLEY

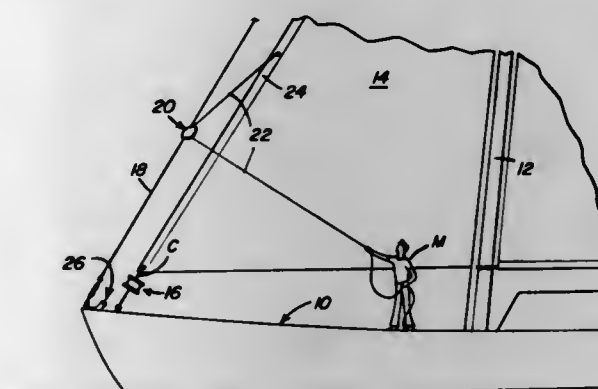
Mark W. Wade, West Palm Beach, and Donald A. Goodrum, Delray Beach, both of Fla., assignors to James Nemec, West Palm Beach, Fla., by said Donald A. Goodrum

Filed Apr. 13, 1976, Ser. No. 676,544

Int. Cl.² B63B 21/08

U.S. Cl. 114—199

10 Claims



10. A self-locking cable trolley, comprising, in combination:
- a length of a working line connected directly to the luff of a jib sail for permitting sag in the sail to be drawn up to a head stay cable associated with the jib; and
 - guide means mounted on the head stay cable for receiving the length of working line and permitting the working line to draw the luff of the sail up to the head stay cable.

4,051,799

RADIAL DEPRESSOR

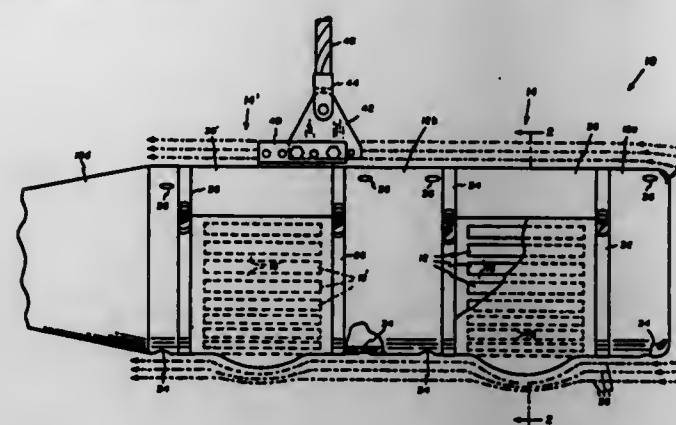
Albert E. Wallen, Winston Salem, and Paul L. Whitehead, Burlington, both of N.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 28, 1976, Ser. No. 700,675

Int. Cl.² B63B 21/00

U.S. Cl. 114—244

7 Claims



1. A vehicle adapted to be towed in a submerged state through a body of water and to generate vehicle depressing forces as a result of apparent flow of water relative to the exterior of said vehicle, said vehicle comprising:

an elongated hull having rigid walls defining an interior cavity, said walls being characterized by openings communicating between said cavity and the exterior of said walls;

means for flooding said cavity with water that is substantially static relative to said vehicle;

distensible membrane means disposed at predetermined areas of said walls and overlying said openings so as to separate said static water in said cavity from said flow of water relative to said vehicle and responsive thereto to distend into a negative pressure zone enhancing waterfoil; and

said membrane means having its maximum distension confined to the lower regions of said hull, whereby the resultant of radial forces acting radially about said hull is a depressing force urging said vehicle to sound.

a buoy fastened to the other end of the line, and a further anchor, lighter than the first-mentioned anchor, between said



4,051,801

DRIVE POSITION SIGNALLING APPARATUS

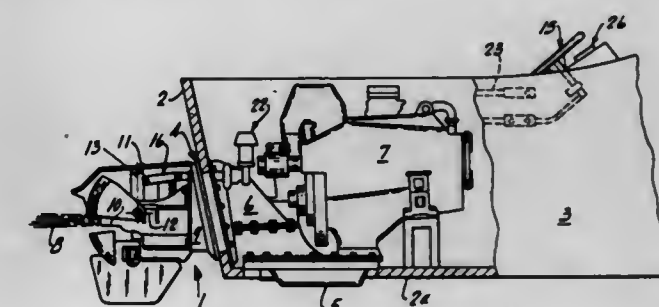
William L. Woodfill, Fond du Lac, and Edward F. Ginnow, Omro, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed June 23, 1976, Ser. No. 699,081

Int. Cl.² B63M 11/00

U.S. Cl. 115—12 R

17 Claims



1. A sensing apparatus for sensing the angular positioning of a pivotally mounted marine drive unit including a power positioning means, said power positioning means having a position related means having a precise degree of movement between first and second limits in positioning of the marine propulsion means between two opposite limit positions, comprising an electrical transducer means having a mechanical input means and movable between two opposite limit positions, means for mounting said transducer means with the mechanical input means located in parallel spaced relation to said position related means, a clutch means having a first clutch element secured to said mechanical input means and a second clutch element secured to said position related means, said first and second clutch elements extending from said mechanical input means and from said position related means and including constantly overlapping portions resiliently and frictionally engaging each other to position the transducing means in accordance with the power positioning means and permitting relative slipping motion of the elements with the mechanical input means in one of said opposite limit positions as the position related means moves to said first or second limit positions.

4,051,800

ANCHOR-WIRE ARRANGEMENT

Lars Farstad, Heimstadva. 7, 7000 Trondheim, Norway

Filed Mar. 30, 1976, Ser. No. 671,958

Int. Cl.² B63B 21/24

U.S. Cl. 114—297

3 Claims

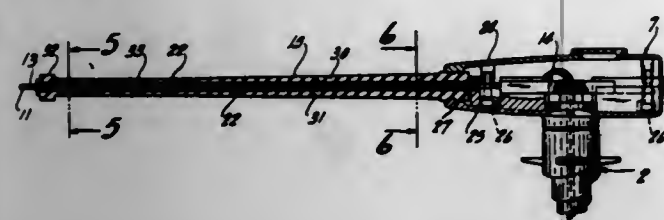
1. Arrangement of the pendant wire or chain for an anchor, where the pendant wire or chain is at one end fastened to the anchor head and is used for pulling loose and drawing up the anchor, a line with a smaller diameter than that of the pendant wire or chain and having one end fastened to the other end of the pendant wire or chain, which line has a length which is at least equal to the depth of the water at the anchoring location,

4,051,802 OPERATING HANDLE FOR PIVOTALLY MOUNTED TROLLING MOTOR

Owen Clarkson Russell, Butte Des Morts, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Sept. 4, 1975, Ser. No. 610,308
Int. Cl.² B63H 5/13

U.S. Cl. 115-17

9 Claims



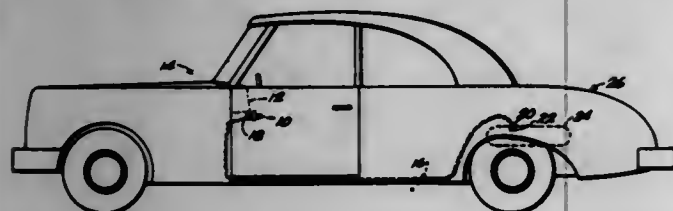
1. In a trolling motor apparatus including an outboard motor unit pivotally affixed to a horizontally located swivel bracket, the improvement in an operating handle comprising an elongated handle member, means securing one end of said member to the upper end portion of said outboard motor with the outer end defining a grip end, said rubber-like material being readily deformable to permit twisting and bending relative to said grip end and having sufficient stiffness to be self-supporting, and control cables extend through said handle.

4,051,803 AIR LEAKAGE INDICATOR DEVICE FOR A SPARE TIRE

Charles V. Arnone, 848 Brickell Ave., Miami, Fla. 33131
Filed Sept. 9, 1976, Ser. No. 721,701
Int. Cl.² B60C 23/04; G01D 13/04

U.S. Cl. 116-34 R

6 Claims



1. An air leakage indicator device for connection to an inflated spare tire of an automotive vehicle, the spare tire, mounted on a wheel with a valve stem provided with a normally closed valve core, being located in a storage compartment in a remote location relative to the passenger compartment of the vehicle, said air leakage indicator device comprising:

means including a pointer and a plurality of dial sections to indicate to a person in the passenger compartment of the automotive vehicle if the air pressure in the spare tire is or is not within a safe range for emergency use thereof, attachment means removably fixed to the outer end portion of the valve stem of the spare tire, including means on a connection portion of the attachment means and connected to actuate the normally closed valve core of the valve stem to an open condition, connecting means comprising a flexible air conduit having first and second end portions, fixedly connected at said first end portion to said valve stem attachment means and at said second end portion to said indicating means.

4,051,804 THAW-INDICATOR DEVICE

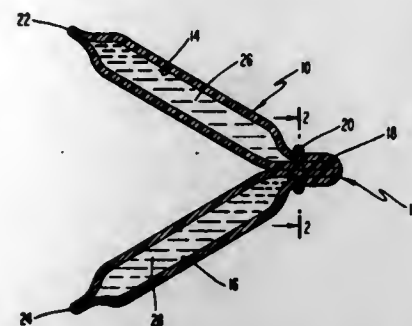
Merrill Garnett, East Islip, N.Y., assignor to Garnett-McKeen Chemical Corporation, East Islip, N.Y.
Filed Mar. 1, 1976, Ser. No. 662,533
Int. Cl.² G01K 11/00

U.S. Cl. 116-114.5

4 Claims

1. An improved thaw-indicating device for frozen articles comprising an elongate transparent elastomeric tube folded into a V shape to define first and second discrete closed end liquid containers separated by liquid tight interfacial engage-

ment of the interior tube wall surfaces at the apex of the V, first and second liquid dyes for producing a contrasting color upon intermixture thereof selectively contained in said first and



second closed end containers and means for selectively maintaining said liquid tight interfacial tube wall surface engagement temporarily at the apex of the V.

4,051,805 CAN WASHING AND COATING SYSTEM

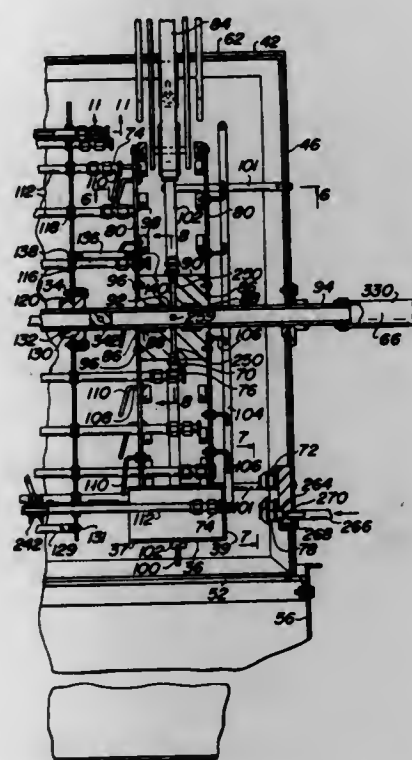
John E. Waldrum, Ambler, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Nov. 11, 1975, Ser. No. 630,822

Int. Cl.² B05C 7/02

U.S. Cl. 118-58

23 Claims



1. Apparatus for spraying the surface of a plurality of open, cylindrical containers with a fluid at a high rate of speed, each of said containers having a side wall encircling the longitudinal axis of the container and an end wall at one end of said side wall, said apparatus comprising an enclosed housing, hollow carrier means disposed within said housing for receipt of said containers, a stationary raceway disposed about the periphery of said carrier means, said carrier means being rotatable about a first axis for carrying said containers from an inlet location in said housing through a circular orbit about said first axis to an outlet location in said housing, said containers making contact with said raceway to cause said containers to rotate on their respective axes as they move along said orbit, first spraying means including plural heads for spraying a fluid therefrom, each of said heads arranged to reciprocate into and out of a respective one of said open containers as said containers traverse said orbit to spray the interior surface of said side wall and said end wall, second spraying means mounted within said housing and arranged to spray said fluid in a radial direction with respect to said first axis and along a major portion thereof to spray the exterior surface of said side wall and third spraying means stationarily mounted within said housing and ar-

ranged to spray said fluid along a portion of the length of said orbit to spray the exterior surface of said end wall.

4,051,806 APPARATUS FOR WAXING CARS

Daniel C. Hanna, 1133 SW. Rivington Drive, Portland, Oreg. 97201

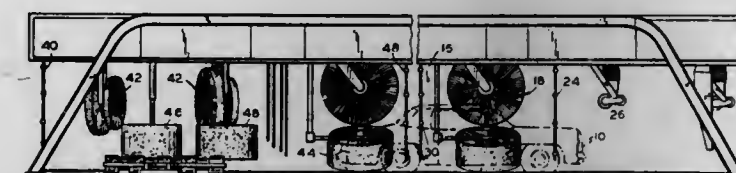
Division of Ser. No. 572,093, April 28, 1975, Pat. No. 4,015,032.

This application Nov. 4, 1976, Ser. No. 738,738

Int. Cl.² B05B 7/26

U.S. Cl. 118-63

4 Claims



1. In an apparatus for waxing cars, foam wax nozzle means for spraying a foamed mixture of wax and water onto a car to form a layer of foam on the car, means for brushing the foam layer to polish the wax onto the car and remove most of the water therefrom, second nozzle means for directing streams of a second mixture of self-polishing sealing wax and water onto the polished wax coating on the car, and means for blowing air onto the car to remove excess of the second mixture from the car, the brushing means being interposed between the foam wax nozzle means and the blower means so that the air from the blower means does not blow the foam off the car.

4,051,807 APPARATUS FOR APPLYING PREPARATION AGENTS TO A BUNDLE OF FILAMENTS

Felix Graf, Winterthur, and Louis Moser, Hettlingen, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

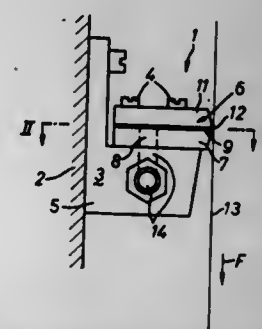
Filed Mar. 22, 1976, Ser. No. 669,466

Claims priority, application Switzerland, Apr. 3, 1975, 4217/75

Int. Cl.² B05C 3/00, 3/12

U.S. Cl. 118-401

6 Claims



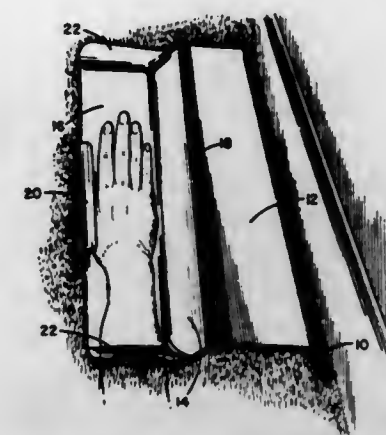
1. An apparatus for applying preparation agents onto a large filament bundle passing through in a substantially vertical direction, comprising an applicator head provided with a slit for applying the preparation agent and at least one guide edge for guiding the filament bundle, a supply duct for supplying the preparation agent to the slit, the applicator head embodying at least two oppositely situated surfaces forming the slit and the guide edge, said surfaces are provided at least at the region of the slit with a roughness assisting in the distribution of the preparation agent in the slit.

4,051,808 PAINT AND STAIN SHIELD

William Trupp, 901 Sandy Lane, Gastonia, N.C. 28052
Filed Mar. 11, 1977, Ser. No. 776,526
Int. Cl.² B05C 11/00

U.S. Cl. 118-504

6 Claims



1. A paint and stain shield for shielding the edges of carpets or the like while painting or staining the bottom of adjoining walls, said paint and stain shield comprising:

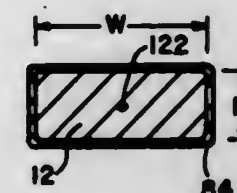
- a substantially planar and substantially rectangular lip portion of sheet-like material,
- a substantially planar and substantially rectangular bridge portion of sheet-like material extending from said lip portion along one of the long edges thereof;
- a substantially planar and substantially rectangular reflex portion of sheet-like material extending from said bridge portion along an edge opposite to the edge adjoining said lip portion; and
- a substantially planar and substantially rectangular handle portion of sheet-like material extending from said reflex portion along an edge opposite to the edge adjoining said bridge portion, the angles between said lip portion and said bridge portion, said bridge portion and said reflex portion, and said reflex portion and said handle portion being such that, when said lip portion is positioned between the edge of a carpet and the bottom of an adjoining wall, the line joining said reflex portion and said bridge portion is close to, but does not touch, the carpet and no portion of the paint shield other than said lip portion and said handle portion touches the carpet.

4,051,809 APPARATUS FOR CLEANING AND COATING AN ELONGATED METALLIC MEMBER

Frank R. Zickar, and Paul Voytk, both of Sharon, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sept. 22, 1976, Ser. No. 725,215
Int. Cl.² B05B 5/02

U.S. Cl. 118-630

17 Claims



4. Apparatus for applying an insulating coating on an elongated, continuously moving, metallic member having planar surfaces which define a substantially rectangular cross-sectional configuration in which the width dimension exceeds the height dimension, comprising:

- a coating chamber,
- a bed of finely divided, heat fusible particles of electrical insulating material in said coating chamber,

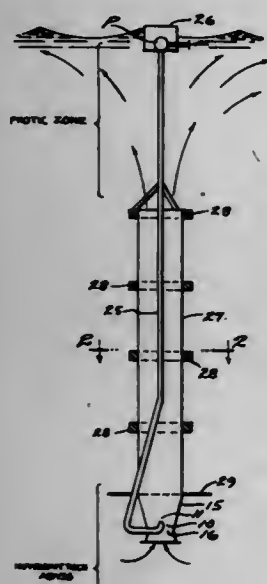
means providing a cloud of electrostatically charged particles above said bed,
 means for moving the metallic member through said cloud of particles, with the planar surfaces which define the narrower height dimension being oriented parallel with the surface of the bed of particles,
 means for electrically grounding the metallic member to cause said charged particles to deposit on the metallic member as it passes through said cloud,
 at least one baffle member in said coating chamber between the bed of particles and the metallic member, said at least one baffle member having a width dimension transverse to the movement direction of the metallic member which exceeds the dimension of the metallic member which is oriented parallel with the surface of the bed of particles, and means fusing the particles deposited on the metallic member to provide a film of insulating material thereon.

4,051,810

APPARATUS UTILIZING DEEP OCEAN NUTRIENTS
 Paul Breit, 910 10th St., Santa Monica, Calif. 90403
 Filed Nov. 17, 1975, Ser. No. 632,512
 Int. Cl.² A01K 61/00

U.S. Cl. 119—3

9 Claims



1. A floating apparatus for establishing a nutrient strengthened photic zone in a surrounding area of the ocean and including: a vessel adapted to float at the ocean surface, a member depending from the vessel and its lower end extending into the underlying nutrient rich waters, lift means comprised of a hydraulic pump immersed in and with an inlet to receive the supplement surface waters and a jet supplied with said supplement surface waters and carried by the lower end of the member with an outlet immersed in and disposed to discharge upwardly imparting vertical momentum to the underlying nutrient rich waters and thereby transferring the same into the overlying photic zone waters to enrich the latter with the former.

4,051,811

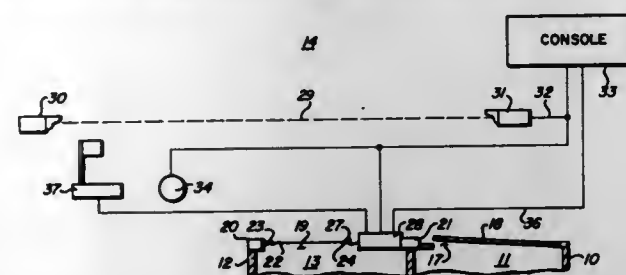
STARTING APPARATUS FOR RODEO EVENTS
 Arthur C. Smith, Phoenix, Ariz.
 Filed Sept. 1, 1976, Ser. No. 719,572
 Int. Cl.² A01K 1/00; A63K 3/02

U.S. Cl. 119—15.5 A

7 Claims

1. In a rodeo stall for detaining a contestant, which stall includes:
 a first stationary support member,
 a second stationary support member spaced from said first support member and defining an exit opening therebetween for said contestant,
 a flexible barrier secured at one end to said first support

member and having a free end extending substantially to said second support member, and
 biasing means normally urging said free end of said barrier from said second support member,
 an improved latching device for use in combination therewith for detachably engaging the free end of said barrier and for releasing said barrier in response to a predetermined signal, said latching device comprising:
 a. a frame for attachment to said second support member;



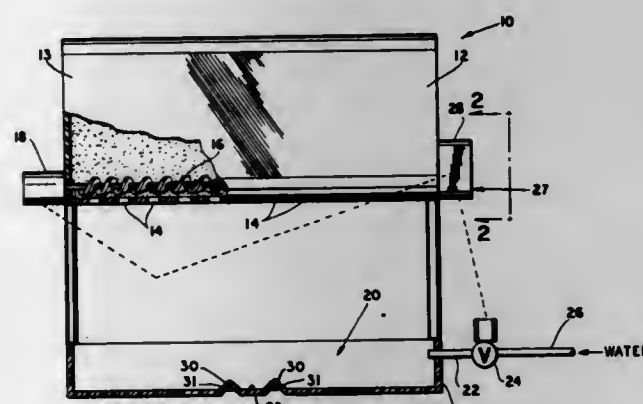
b. engagement means for detachably engaging the free end of said barrier and carried by said frame, said means normally holding said barrier against the force of said biasing means and releasing said barrier in response to the application of additional force to said barrier; and
 c. release means carried by said frame and cooperating with said biasing means for operatively disengaging said barrier from said engagement means.

4,051,812

AUTOMATIC ANIMAL FEEDING APPARATUS
 Guessman L. DeLoach, and Phillip H. Foster, both of R.R. No. 3, Metter, Ga. 30439
 Filed Aug. 23, 1976, Ser. No. 716,574
 Int. Cl.² A01K 5/02

U.S. Cl. 119—51.11

11 Claims



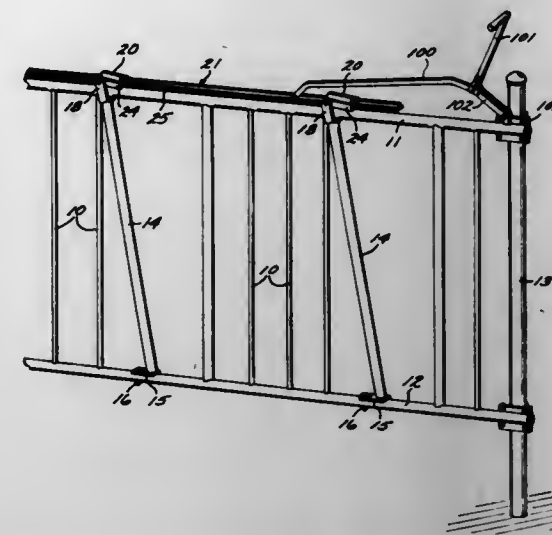
1. An animal feeding apparatus including a receptacle having a bottom, means for dispensing conductive animal food into the receptacle, a pair of conductive sensors mounted upon the bottom of the receptacle, means for controlling the dispensing means according to information received from the sensors, means for establishing a flow of electric current between the sensors when conductive food is positioned between the sensors, and means for operating the controlling means to cause the dispensing means to dispense additional food into the receptacle in response to the electric current flowing between the sensors falling below a predetermined level when the level of food within the receptacle is reduced, said predetermined current level being selected to require substantially all of the food within the receptacle to be removed before said predetermined current level is reached.

4,051,813

LOCKING STANCHION FOR CATTLE
 Teunis Albers, 18007 Arline Ave., Artesia, Calif. 90701
 Filed Sept. 15, 1975, Ser. No. 613,169
 Int. Cl.² A01K 1/00

U.S. Cl. 119—148

3 Claims



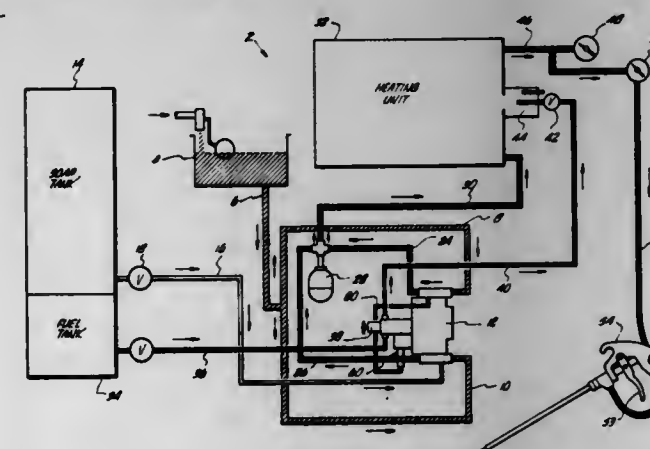
2. In a cattle locking stanchion of the type in which a plurality of substantially vertically extending release rails are pivotally mounted at their lower ends on a bottom rail, extend above a top rail, and are associated at their upper ends with a horizontally extending, reciprocally mounted master release rod located above said top rail and operative for simultaneous movement of all of said release rails between a vertical closed position and a slightly angular open position, the improvement comprising: a horizontally elongated release bracket for each of said release rails, each said release bracket having one end thereof pivotally connected to the upper end of one of said release rails for movement about a transverse pivot axis, the opposite end of said release bracket having a first portion removably received in an upwardly opening detent provided in said master release rod, the weight of said first portion urging said first portion downwardly into said detent whereby all of said release rails are movable between said open and closed positions upon reciprocation of said master release rod, each said release bracket being manually upwardly pivotable whereby the associated one of said release rails is pivotable independently of the others of said release rails, each said detent including opposite undercut extremities for receiving said first portion and preventing said first portion from moving upwardly whereby said first portion must be generally centrally located in said detent for upward movement.

4,051,814

HIGH PRESSURE WASHER
 William S. Jennings, West Covina, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.
 Filed Apr. 27, 1976, Ser. No. 680,966
 Int. Cl.² F22D 5/00; F23N 1/08

U.S. Cl. 122—448 R

10 Claims



1. A combination liquid and fuel pumping apparatus for use

in a pressurized hot fluid washer having an output conduit for applying the hot fluid, an operator controlled delivery valve, and heat exchanger means for heating the fluid including a fuel burner, comprising:

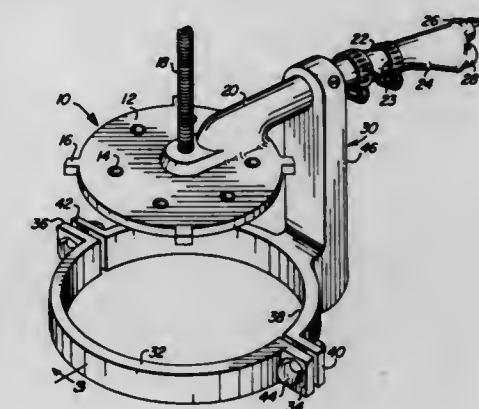
a liquid pump member adapted to being connected to the heat exchanger;
 a fuel pump member adapted to being connected to the fuel burner;
 a closed hydraulic prime mover means for applying a driving impulse force to both the liquid pump member and the fuel pump member including a by-pass conduit;
 means for reducing the force of the driving impulse force before applying the force to the fuel pump member;
 means for hydraulically sensing the liquid pressure downstream of the liquid pump member; and
 hydraulic means for opening the by-pass conduit to automatically stop the fuel pump member and the liquid pump member in response to a sensed predetermined liquid pressure.

4,051,815

FLUID INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINE
 Lavan E. Coberley, 2223 W. Colter, Phoenix, Ariz. 85015
 Filed Sept. 15, 1975, Ser. No. 613,170
 Int. Cl.² F02D 19/00

U.S. Cl. 123—25 A

10 Claims



1. In combination with an internal combustion engine having a carburetor, an apparatus for injecting fluid into said carburetor, said apparatus comprising:
 plate means connected to the carburetor of an internal combustion engine;
 a pump for providing a flow of pressurized air;
 conduit means secured to the plate means for providing a flow of fluid and pressurized air to the plate means;
 a first intake line secured to the conduit means and to the pump for providing a flow of pressurized air to the conduit means;
 a second intake line secured to the conduit means and disposed directly above the first intake line for providing a flow of fluid to the conduit means;
 a mixer chamber in the conduit means at the juncture of the first and second intake lines and spaced apart from the plate means for mixing the flow of pressurized air and the flow of fluid together; and
 an opening at the juncture of the conduit means and the plate means through which the flow of fluid and air flows into the carburetor.

4,051,816

METHOD OF AND APPARATUS FOR CONTROLLING AIR-FUEL MIXTURES INTO A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Kunji Masaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

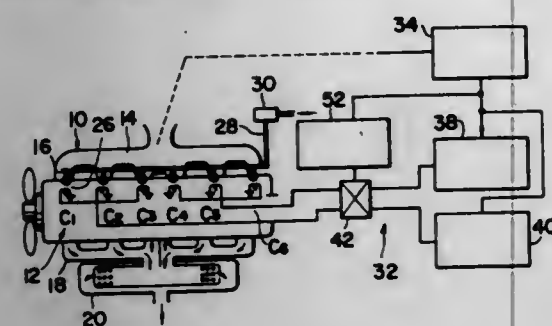
Filed June 5, 1975, Ser. No. 584,133

Claims priority, application Japan, June 13, 1974, 49-67463

Int. Cl.² F02M 51/00; F02B 75/10

U.S. Cl. 123—32 EA

9 Claims



1. A method of controlling an air-fuel mixture for an internal combustion engine, comprising the steps of alternatively forming a relatively rich air-fuel mixture having an air-fuel ratio lower than a predetermined air-fuel ratio and a relatively lean air-fuel mixture having an air-fuel ratio higher than said predetermined air-fuel ratio for a first combustion chamber of said engine, alternatively forming said rich and lean air-fuel mixtures for a second combustion chamber of said engine so that, when one of said rich and lean air-fuel mixtures is formed for said first combustion chamber, the other air-fuel mixture is formed for said second combustion chamber, sensing the lapse of a suitable time, and switching over said mixture formed for said first combustion chamber from one of said rich and lean air-fuel mixtures to the other air-fuel mixture and said mixture formed for said second combustion chamber from said other air-fuel mixture to said one air-fuel mixture in response to the lapse of said suitable time.

4,051,817

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tadashi Hattori, Nishio; Takamichi Nakase, Gamagori, and Minoru Nishida, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Japan

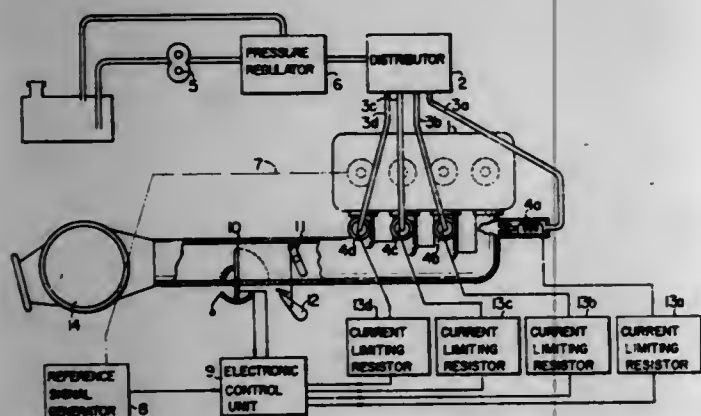
Filed Mar. 10, 1975, Ser. No. 556,953

Claims priority, application Japan, Apr. 18, 1974, 49-43566

Int. Cl.² F02B 3/00

U.S. Cl. 123—32 EA

4 Claims



1. A fuel injection system for an internal combustion multi-cylinder engine comprising: fuel injection means for injecting fuel under a predetermined pressure into each of a plurality of cylinders in said engine; an air-flow sensor arranged in the suction duct of said engine

for generating a first electrical signal corresponding to the quantity of air drawn into said engine; a reference signal generating means adapted to be connected to the crankshaft of said engine and having a rotor associated with said crankshaft and provided with as many equispaced means thereon as the number of said cylinders, a pair of detecting means arranged to generate a pair of signals upon engagement with said equispaced means in less than $720^\circ / (2 \times \text{the number of cylinders})$ of rotation of the crank shaft, and a flip-flop connected to said detecting means for generating a second electrical signal having a time width equal to the interval between said pair of signals; main computing means connected to said air-flow sensor and said reference signal generating means for repeating, in accordance with said first and second electrical signals, the charging and discharging of electrical energy, said charging being completed during said time width of said second electrical signal, said discharging beginning after completion of said charging, said main computing means generating, during the discharging, a third electrical signal for controlling the operating time and the operating time duration of said fuel injection means; and distributing means connected between said main computing means and said fuel injection means for separately distributing said third electrical signal to said fuel injection means in accordance with the firing order of said engine.

4,051,818

DEVICE FOR OBTAINING SIGNALS FOR THE CONTROL UNIT OF AN ELECTRONIC FUEL INJECTION SYSTEM

Jürgen Völckers, Grasseedorf, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

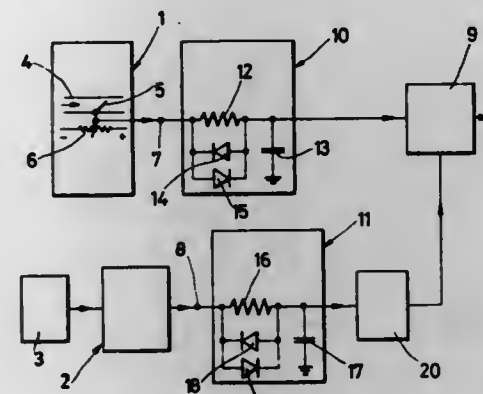
Filed Oct. 30, 1975, Ser. No. 627,290

Claims priority, application Germany, Nov. 23, 1974, 2455482; Feb. 13, 1975, 2506078

Int. Cl.² F02D 5/00

U.S. Cl. 123—32 EA

10 Claims



1. An electronic fuel injection system of an internal combustion engine comprising: rotational speed measuring means for measuring the engine speed; air measuring means for measuring at least one of the flow of air supplied to the engine and the air intake pressure; analog signal means for assuring the creation of analog voltage signals from the output signals of said measuring means; at least one stabilizing means having a low pass transfer characteristic with a cut-off frequency in the range from about 2 to 8 Hz, said stabilizing means receiving the analog signal of at least one of said measuring means and producing a signal in which the a.c. voltage components resulting from longitudinal vehicle vibrations that occur in the analog voltage signal have been dampened; and a control unit for controlling the injection of fuel in response to at least the dampened signal from said stabilizing means.

4,051,819

ROTARY BLOCK ENGINE

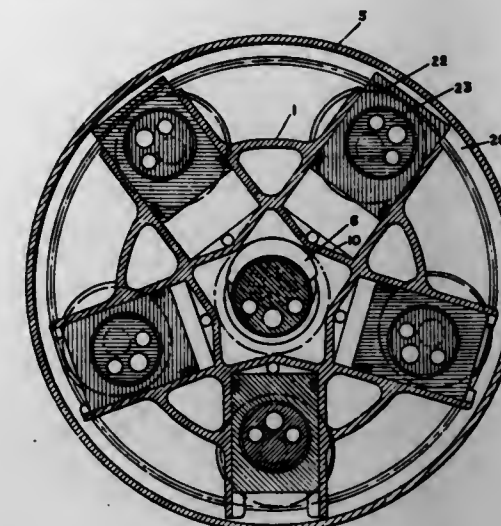
Sten Henstrom, Mossangatan 2, 234 00 Lomma, Sweden

Filed Mar. 24, 1976, Ser. No. 669,750

Int. Cl.² F02B 57/10

U.S. Cl. 123—44 B

7 Claims



1. In a rotary-block engine comprising a rotatable cylinder block having a plurality of radially mounted cylinders therein, a main shaft supporting said cylinder block and rotatable with said cylinder block, each of said plurality of cylinders having a reciprocating piston mounted therein which is moved in response to the explosion of a combustion gas in the combustion chamber of the cylinder, a plurality of secondary shafts, one for each of said plurality of cylinders, for rotatably mounting thereon the plurality of reciprocating pistons, and a stationary housing rotatably mounting therein said main shaft and said cylinder block, wherein the improvement comprises: said main shaft being an eccentric shaft and mounting said cylinder block on the eccentric thereof so that a point on said cylinder block traces a path in the form of an epitrochoid, means for fixing the spacing between said main shaft and said cylinder block and radially fixing the plurality of secondary shafts with respect to said main shaft, each of said secondary shafts rotating at a speed less than the speed of said main shaft and each of said pistons having a speed about said main shaft that is also less than the speed of said main shaft, and means for controlling the movement of said pistons so that they move in said epitrochoid manner.

4,051,820

ENGINE VALVING AND PORTING

Eyvind Boyesen, Huntington Valley, Pa., assignor to Performance Industries, Inc., Huntington Valley, Pa.

Continuation-in-part of Ser. No. 375,065, June 29, 1973, Pat.

No. 3,905,340, which is a continuation-in-part of Ser. No.

282,734, Aug. 22, 1972, abandoned, and Ser. No. 361,407, May

18, 1973, Pat. No. 3,905,341. This application June 11, 1975,

Ser. No. 586,138

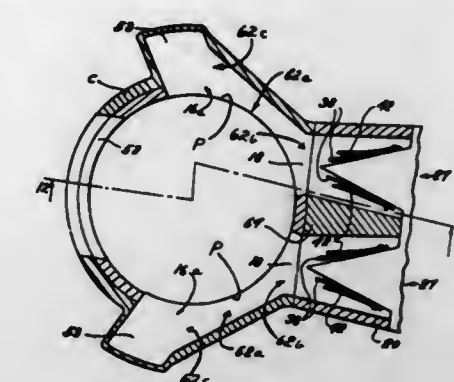
Int. Cl.² F02B 33/04

U.S. Cl. 123—73 A

6 Claims

1. A fuel intake system for a variable speed two-cycle crankcase compression internal combustion engine having a piston working in a cylinder with transfer porting extended between the compression and the intake sides of the piston and with an intake port adapted to communicate with the cylinder at the intake side of the piston when the piston is positioned to block the transfer porting, a fuel intake chamber for receiving fuel from a supply source and for delivering the fuel to the intake port, a ported valve seat presented downstream of the fuel flow through the intake chamber, a primary reed valve covering said seat and the valve port therein, said primary reed being

supported throughout substantially its entire periphery by said seat and being sufficiently flexible to open the port under the influence of decrease in pressure in the intake chamber incident to high speed engine operation but being sufficiently rigid to remain closed under the influence of decrease in pressure in the intake chamber incident to low speed engine operation, said



primary reed having a secondary valve port therethrough of smaller size than the port through the valve seat, and a secondary reed valve covering the secondary port and being sufficiently flexible to open the secondary port under the influence of decrease in pressure in the intake chamber incident to engine operation either at said high speed or at said low speed.

4,051,821

EXHAUST BACK PRESSURE CONTROL

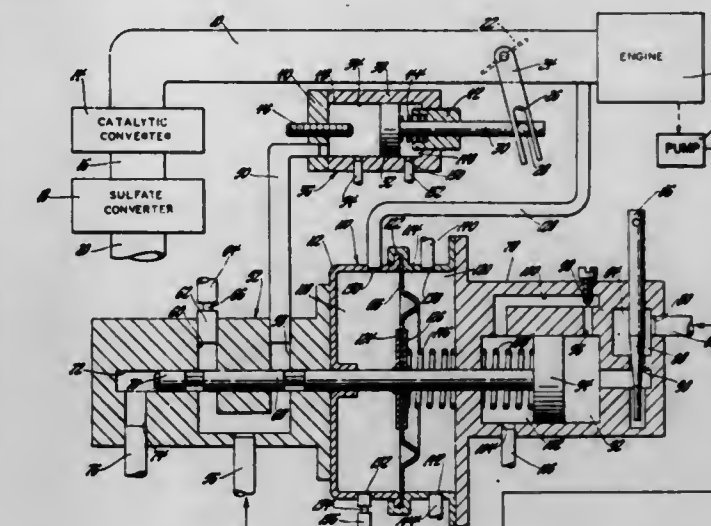
Charles A. Amann, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1976, Ser. No. 718,812

Int. Cl.² F02D 31/00; F01N 7/00

U.S. Cl. 123—97 B

3 Claims



1. In a motor vehicle having a fuel burning engine with an exhaust system, including components having variable flow resistance, an exhaust pressure control to automatically maintain a scheduled back pressure on the engine over a normal operating speed and load range despite changes in the flow resistance of the other exhaust components, comprising: a pivotal throttling valve located downstream from the engine and upstream from the variable resistance exhaust components; positioning means connected to said throttling valve for pivotal control of said throttling valve between open and a more closed operative position; an exhaust back pressure sensor including enclosure means with a flexible diaphragm responsive to the exhaust system pressure upstream from said throttling valve to produce a force on said diaphragm in one direction; an engine driven fluid pump for pressurizing fluid corresponding to operation of the engine; a controller assembly including a housing defining an interior space with an inlet thereto fluidly connected to said engine-driven pump for receiving pressurized fluid therefrom; said controller housing enclosing a piston member movable in response to fluid pressure within said interior space to produce a force on the piston

member in a direction opposite to said one direction of said diaphragm force; a fluid valve means including a reciprocal valving member connected to said diaphragm and said piston member for regulating the transmission of fluid pressure from said engine-driven pump to said positioning means, thereby transmitting pressurized fluid to said throttling valve positioning means corresponding to the effects of exhaust system back pressure and engine speed on the sensor and controller assembly; means responsive to closing off the engine throttle control for causing said exhaust throttling valve to move to a more open position to increase engine power at low speed and light load operating conditions.

4,051,822

IGNITION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Hiroshi Yoshida, Aichi, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

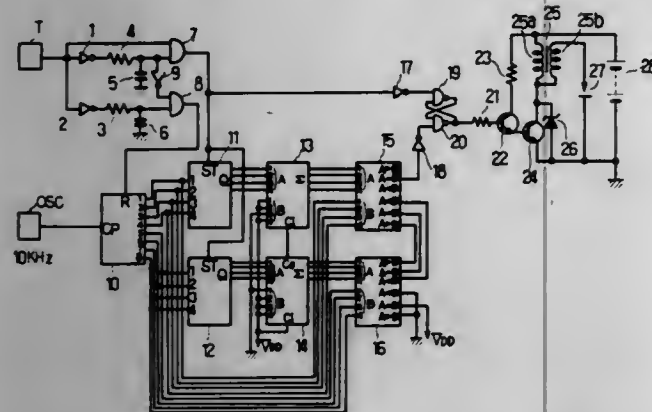
Filed Mar. 23, 1976, Ser. No. 669,475

Claims priority, application Japan, Mar. 31, 1975, 50-39483

Int. Cl.² F02P 5/04

U.S. Cl. 123-117 D

4 Claims



1. An ignition control system for internal combustion engines comprising:

- a battery;
- a timing pulse generator for generating timing pulses with the cycle time varying with engine operating conditions;
- a reference signal generator for generating a reference signal;
- a computation circuit, connected to said generator and said reference signal generator, for producing control pulses, by (1) subtracting a constant time period from said cycle time which is measured in response to said reference signal and (2) subtracting the remainder from said cycle time which is currently measured, thereby approximating the width of said control pulses to said constant time period;
- an ignition coil, connected to said battery and said computation circuit, for providing ignition energy in response to said control pulses from said computation circuit; and
- at least one spark plug, coupled to said ignition coil, for providing ignition sparks.

4,051,823

INTERNAL COMBUSTION ENGINE

Mitsuru Mogi, Tokyo, and Shoichi Matsumoto, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,160

Claims priority, application Japan, Dec. 24, 1974, 49-1202[U]

Int. Cl.² F02P 5/04

U.S. Cl. 123-117 A

2 Claims

1. In an internal combustion engine, having a fuel mixture intake passageway, a throttle valve rotatably mounted across said passageway and movable from a closed engine idling position to a widely opened position, and defining an atmospheric side

on one side thereof, and a vacuum side on an opposite side thereof,

a throttle valve control means including therein a first diaphragm means defining a throttle control vacuum chamber on one side of the latter,

said first diaphragm means being operatively connected to said throttle valve for rotating said throttle valve to a slightly opened position thereof in response to an intake vacuum pressure in said throttle control vacuum chamber, a first conduit selectively connecting said vacuum chamber of said throttle valve control means to said intake passageway at a point downstream of said throttle valve,

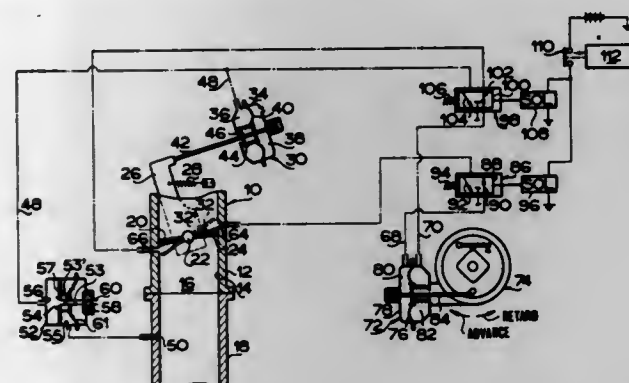
vacuum control valve means operable in response to the intake vacuum pressure in said intake passageway for selectively communicating said first conduit with said intake passageway and with the atmosphere, respectively, and

a distributor comprising a breaker plate and a vacuum servo means operatively connected to each other,

said vacuum servo means including therein a second diaphragm means defining first and second vacuum chambers on opposite sides of the latter, respectively,

said second diaphragm means being operatively connected to said breaker plate for biasing said breaker plate toward a spark timing advance position in response to vacuum pressure in said first vacuum chamber and for biasing said breaker plate toward a spark timing retarded position in response to vacuum pressure in said second vacuum chamber, respectively,

the improvement comprising:



a first solenoid valve means and a second solenoid valve means for being actuated in dependency on engine speed, respectively,

a second conduit connecting said first vacuum chamber of said vacuum servo means to said first solenoid valve means,

a third conduit connecting said first solenoid valve means to said intake passageway at a position adjacent said throttle valve such that said third conduit communicates with the atmosphere side of said throttle valve when the throttle valve is closed in idle position and communicates with said intake passageway at the vacuum side of said throttle valve when the throttle valve is slightly opened, respectively,

said first solenoid valve means communicating said first vacuum chamber in said vacuum servo means with atmosphere when engine speed is lower than a predetermined reference engine speed, and for communicating said first vacuum chamber with said intake passageway via said third conduit when the engine speed is higher than the predetermined speed, respectively,

a fourth conduit connecting said second vacuum chamber of said vacuum servo means to said second solenoid valve means,

a fifth conduit connecting said second solenoid valve means to said intake passageway at another position adjacent said throttle valve such that said fifth conduit communicates with the vacuum side of said throttle valve when the throttle valve is closed in idle position and communicates

with the atmospheric side of said throttle valve when the throttle valve is slightly opened, respectively, and a sixth conduit connecting said second solenoid valve means to said first conduit,

said second solenoid valve means communicating said second vacuum chamber in said vacuum servo means with said fifth conduit when the engine speed is lower than the predetermined speed, and for communicating said second vacuum chamber with said sixth conduit when the engine speed is higher than the predetermined speed, respectively.

4,051,824

INTERNAL COMBUSTION ENGINE FOR MOTOR VEHICLES

Katsuhiko Sugiura, Tama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

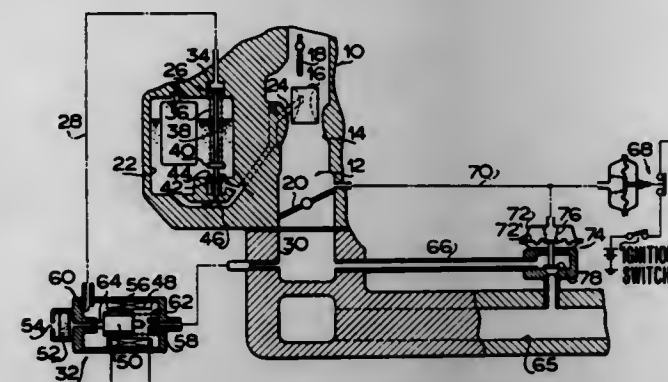
Filed Nov. 24, 1975, Ser. No. 634,787

Claims priority, application Japan, Nov. 30, 1974, 49-138762

Int. Cl.² F02N 25/06

U.S. Cl. 123-119 A

6 Claims



1. An internal combustion engine, comprising, an induction passage, a venturi formed in said induction passage, a throttle valve rotatably disposed in said induction passage for controlling the quantity of air-fuel mixture flow there-through, a fuel reservoir, means for supplying fuel to said induction passage in accordance with the quantity of air flow through said induction passage, means for supplying additional fuel to said induction passage, said means for supplying additional fuel comprising an additional fuel valve means for controlling the additional fuel and a vacuum means for operating said additional fuel valve means, an exhaust passage communicating with said induction passage, passage means for recirculating a part of exhaust gases from said exhaust passage into said induction passage at the downstream of said throttle valve, a first valve means for controlling recirculation of exhaust gases through said recirculating passage means, a vacuum conduit communicating said first valve means with an atmospheric side of said throttle valve in said induction passage, said first valve means including a servo means operatively connected to said induction passage at a location positioned on the atmospheric side of and adjacent to said throttle valve when said throttle valve is closed in idle position through said vacuum conduit, a spring normally biasing said first valve means for blocking flow of exhaust gases through said recirculating passage means, said first valve means for being acted on by vacuum in said induction passage against said spring to permit the flow of exhaust gases through said recirculating passage means, a first conduit for operatively connecting said vacuum

4,051,825

ENGINE HEATER

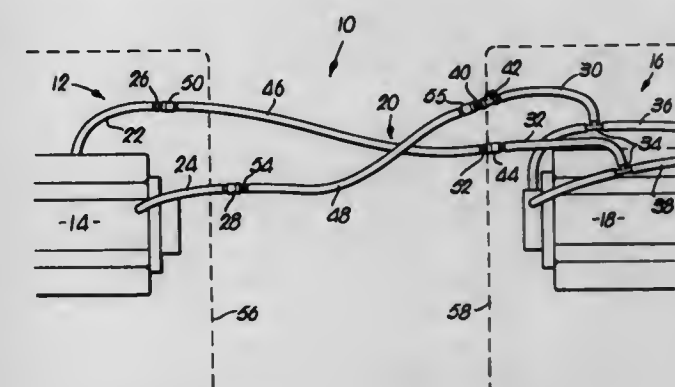
Hayden O. Elder, Troy, Kans., assignor to The Hay-Mar Corporation, Troy, Kans.

Filed Aug. 6, 1976, Ser. No. 712,244

Int. Cl.² F02N 17/02

U.S. Cl. 123-142.5 R

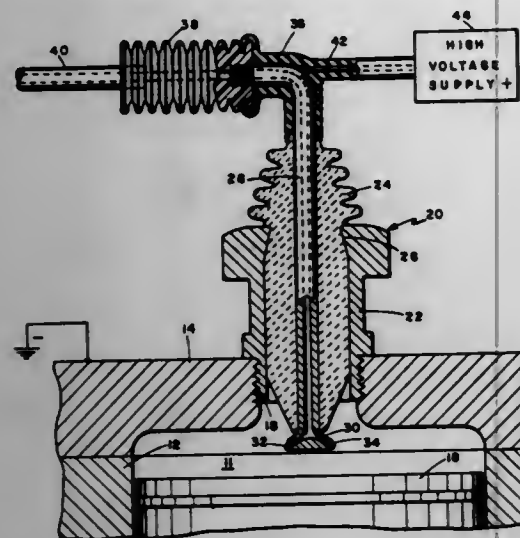
4 Claims



1. In combination with a cold, fluid-cooled automotive engine, apparatus for heating said cold engine to facilitate starting thereof, said apparatus comprising:

- an automotive service engine having a pressurized fluid-cooling system;
- first and second fluid conduit segments permanently connected to and in communication with the fluid cooling system of said cold engine;
- coupling means adjacent the outermost ends of said first and second segments for detachably connecting said segments to selectively present a closed fluid loop with said cold engine system, and alternately open-ended conduit segments when said coupling means are detached;
- first and second conduit sections permanently connected to and in communication with the fluid cooling system of said service engine;
- coupling structures adjacent the outermost ends of said first and second sections for detachably connecting said sections to selectively present a closed fluid loop with said service engine system, and alternately open-ended conduit sections when said coupling structures are detached;
- a pair of fluid-transfer conduits of length to span the distance between said conduit segments and sections; and
- attachment means adjacent the opposed ends of said transfer conduits for detachably connecting one of the transfer conduits between the coupling means of one of said segments and the coupling structure of one of said sections, and for detachably connecting the other of said transfer conduits between the remaining segment coupling means and section coupling structure, when said segments and sections are detached, in order to define a closed fluid loop with the cooling systems of said cold and service engines, whereby, upon running of said service engine with the cooling fluid therein in a heated condition, such heated fluid is circulated throughout the last-mentioned closed fluid loop for heating said cold engine and for facilitating starting thereof.

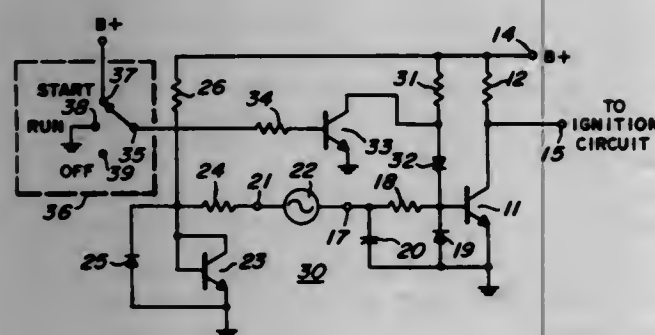
4,051,826
MEANS AND METHOD OF INJECTING CHARGED FUEL INTO INTERNAL COMBUSTION ENGINES
 Clyde N. Richards, 4867 Mission Blvd., San Diego, Calif. 92109
 Filed July 10, 1975, Ser. No. 594,748
 Int. Cl.² F02D 23/00
 U.S. Cl. 123—143 B 4 Claims



1. A method for injecting fuel in an electrically charged condition into a cylinder of an internal combustion engine comprising:

- injecting pressurized fuel through an electrically conductive fuel nozzle during a portion of the cycle of said engine;
- charging said nozzle to one polarity during the introduction of fuel therethrough, and reversing the polarity of the charge on said nozzle substantially at the termination of the fuel injection phase.

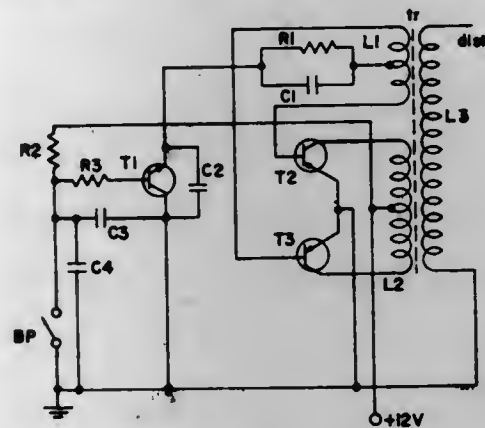
4,051,827
SELECTIVE THRESHOLD IGNITION CIRCUIT
 Zayack Antonio Caputo, Glen Ellyn, and Ronald William Rumpke, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
 Filed Jan. 12, 1976, Ser. No. 648,556
 Int. Cl.² F02P 1/00
 U.S. Cl. 123—148 E 16 Claims



1. A selective threshold ignition circuit adaptable for use in an electronic ignition system of an engine, said circuit comprising:

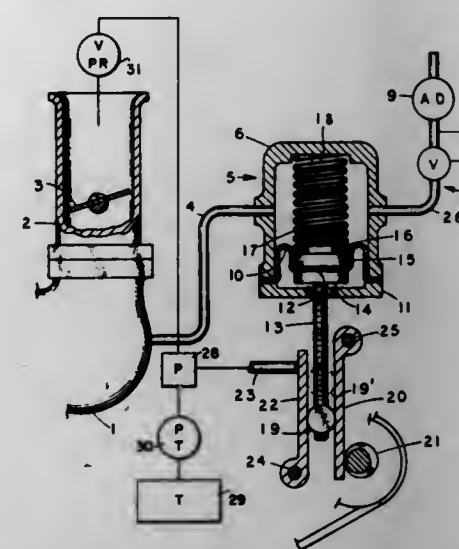
- sensor means for producing an AC electrical signal about a predetermined DC electrical reference level, said AC signal being created in response to and having a frequency related to the rotational movement produced by an engine;
- switching circuit means, having a predetermined DC threshold level, coupled to said sensor means for receiving said AC signal varying about said DC reference level and producing a corresponding spark timing signal by effectively comparing said received AC signal varying about said DC reference level with said DC threshold level and switching when said received AC signal varying about said DC reference level varies, with respect to said threshold level, from above to below said threshold level and from below to above said threshold level;
- selection means coupled to at least one of said sensor means and said circuit means for selecting at least first and second modes of operation for the combination of said sensor means and said switching circuit means in response to corresponding first and second control signals being received by said selection means, in said first mode of operation said DC reference level being substantially equal to said DC threshold value, in said second mode of operation said DC reference level being effectively different from said DC threshold level; and
- means coupled to said selection means for producing said first and second control signals and supplying them to said selection means; whereby said spark timing signal is adaptable for use in developing ignition pulses for the engine and the noise immunity of said ignition circuit is increased for one of said first and second control signals without substantially affecting the accuracy of the spark timing signal while a more accurate spark timing signal is obtained for the other one of said first and second control signals.

4,051,828
IGNITION SYSTEM FOR USE WITH INTERNAL COMBUSTION ENGINES
 Eugene Frank Topic, Druggs St., Glamorgan Shop. Center, Calgary, Alberta, Canada (T3E 3K1)
 Filed Dec. 29, 1975, Ser. No. 635,571
 Int. Cl.² F02P 1/00
 U.S. Cl. 123—148 E 1 Claim



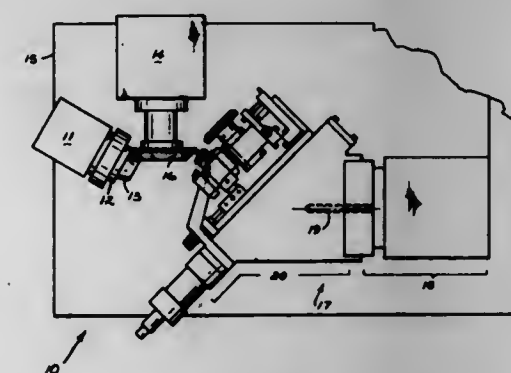
1. An ignition system for an internal combustion engine for improving the efficiency and reducing noxious emissions thereof by causing turbulent combustion by means of an electrical ignition impulse across a spark gap, said electrical ignition impulse having a sinusoidal waveform and a frequency of about 10,000 to 15,000 Hertz, said ignition system comprising:
 - a transformer having a power secondary coil connected to said spark gap, a power primary coil, and a feedback primary coil, said primary coils each having center taps,
 - a transistor power amplifier connecting said power primary coil and said feedback coil,
 - a switching transistor connected to said center tap of said feedback primary coil,
 - a DC bias voltage connected to said center of said power primary coil, and
 - breaker points connecting said switching transistor to ground.

4,051,829
AUDIBLE ENRICHMENT BLEED WARNING DEVICE FOR FUEL-INJECTED ENGINES
 Roger Owen Durham, 3944 Marathon St., Los Angeles, Calif. 90029
 Filed Nov. 5, 1975, Ser. No. 629,140
 Int. Cl.² F02B 77/00
 U.S. Cl. 123—198 D 6 Claims



1. In a fuel injection system for an internal combustion engine, said fuel injection system having a variable-stroke pump mechanism wherein the stroke is determined by a power fulcrum positioned by a sensing cylinder means which is connected to the intake manifold of the engine, and wherein an enrichment bleed means, comprising a bleed tube connected to said sensing cylinder means and an operator-controlled bleed valve connected to the bleed tube, whereby the pressure within the sensing cylinder means can be abnormally raised by opening the bleed valve, thus increasing the "stroke" of the variable pump mechanism; on "an audible enrichment bleed warning device connected to said enrichment bleed means, and operated by air passing through said bleed valve when it is open, said audible enrichment bleed warning device capable of omitting sounds audible to the operator and reminding him of the open enrichment bleed valve and rich running condition of the engine.

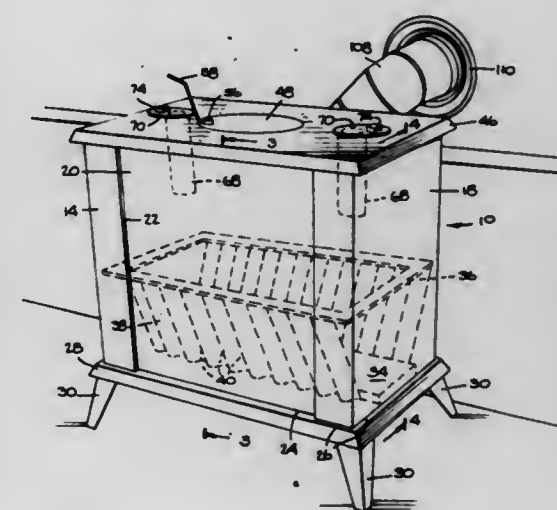
4,051,830
WHEEL DRESSING APPARATUS AND METHOD
 Paul Gruber, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio
 Filed May 11, 1976, Ser. No. 685,286
 Int. Cl.² B24B 53/00
 U.S. Cl. 123—11 R 10 Claims



1. In a grinding machine, having a rotatable grinding wheel with a nib-dressed main face and a wheel-dressed second face intersecting the main face, an improved wheel dressing apparatus for conditioning both the main and second faces in a one-direction stroke, comprising in combination:
 - a housing, fixed with respect to said wheel when dressing;
 - a carrier bracket, movable on said housing with respect to said grinding wheel;
 - a way system upon said housing to provide carrier bracket movement generally parallel to the nib-dressed main face;
 - a dressing nib carried by said carrier bracket so as to dress said main face as said bracket is moved parallel to said main face; and
 - a dressing wheel, rotatable on an axis transverse to said main face, and carried in tandem with said nib on said bracket so as to dress the second face through continued parallel movement of said bracket.

- a carrier bracket, movable on said housing with respect to said grinding wheel;
- a way system upon said housing to provide carrier bracket movement generally parallel to the nib-dressed main face;
- a dressing nib carried by said carrier bracket so as to dress said main face as said bracket is moved parallel to said main face; and
- a dressing wheel, rotatable on an axis transverse to said main face, and carried in tandem with said nib on said bracket so as to dress the second face through continued parallel movement of said bracket.

4,051,831
HEATING STOVE
 Eugene Peter Schellens, Essex, Conn., assignor to South Cove Corporation, Inc., Essex, Conn.
 Filed Sept. 2, 1975, Ser. No. 609,712
 Int. Cl.² F24B 5/04
 U.S. Cl. 126—76 8 Claims



1. A heating stove for wood-like organic material comprising, in combination, a fire box for receiving material to be burned substantially centrally therein, said fire box including sidewalls, bottom means connected towards the bottom of the sidewalls, and a cover mounted towards the upper ends of the sidewalls, and means for sealing the fire box so as to render it substantially air-tight, means for providing access to the interior of said fire box, at least one substantially vertically aligned draft tube depending downwardly from said cover into the fire box for receiving combustion air at substantially atmospheric conditions from the upper end thereof and directing a flow to impinge upon the hearth adjacent the material to be burned from above and substantially in a vertical direction, flue means mounted on the fire box above the material to be burned and in spaced relationship with respect to the draft tube for removing the products of combustion and maintaining the fire box at a pressure below atmospheric pressure, regulator means for regulating the flow of combustion air in said draft tube, said regulator means for the draft tubes comprising a support disc having an aperture therein for receiving the open upper end of the draft tubes, said draft tubes being fixedly mounted on said supporting disc, said supporting disc being fixedly mounted on said cover, said cover having an opening, an outer draft control disc, said cover having an opening for receiving said outer draft control disc, an inner draft control disc fixedly connected to the outer draft control disc and having a greater outside diameter with respect to the outside diameter of said outer disc to thereby form a lip portion which engages the lower surface of the cover to retain said discs in position with respect to said cover, said outer disc having an opening and said inner disc having an opening which are in alignment with each other and are of a diameter substantially equal to the diameter of said draft tube, the center line of the draft tube being off-set with respect to the center line of the inner and outer discs so that when said discs are rotated they progressively cover the open-

ing in the top of the draft tube corresponding to the extent of rotation.

5. A heating stove for burning wood-like organic material comprising, in combination, a fire box for receiving material to be burned substantially centrally therein, said fire box including sidewalls, bottom means connected towards the bottom of the sidewalls, and a cover mounted towards the upper ends of the sidewalls, and means for sealing the fire box so as to render it substantially air-tight, means for providing access to the interior of said fire box, at least one substantially vertically aligned draft tube depending downwardly from said cover into the fire box for receiving combustion air at substantially atmospheric conditions from the upper end thereof and directing a flow to impinge upon the hearth adjacent the material to be burned from above and substantially in a vertical direction, flue means mounted on the fire box above the material to be burned and in spaced relationship with respect to the draft tube for removing the products of combustion and maintaining the fire box at a pressure below atmospheric pressure, anti-warpage means for preventing warpage of the fire box during operation, said anti-warpage means comprising an inwardly projecting rib extending around the entire periphery of the fire box substantially medially of the height of said walls, said side walls comprising a front wall, a back wall and two end walls, said walls being interconnected in sealed relationship respectively, and said anti-warpage means further comprising an enlarged recess in the central portion of said front wall, and said bottom member having a downwardly extending outwardly angled apron portion extending around the periphery thereof, and said cover having a downwardly extending outwardly angled apron portion extending around the periphery thereof.

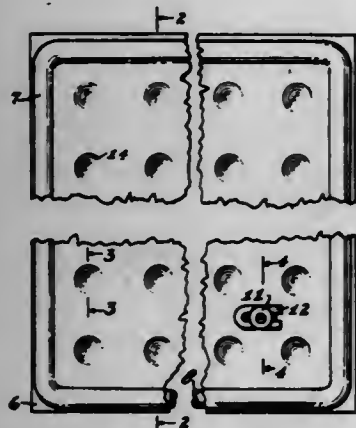
4,051,832 SOLAR HEATING PANEL

William Stelzer, 1354 Blue Heron Drive, Milford, Mich. 48042
Continuation of Ser. No. 678,167, April 19, 1976, abandoned.
This application Jan. 21, 1977, Ser. No. 761,497

Int. Cl.² F24J 3/02

U.S. Cl. 126—270

3 Claims



1. A solar heating panel for converting the sun's rays into heat, comprising a single, flat pane of glass, a sheet metal panel behind said pane of glass in spaced relationship therewith to provide a space between said pane of glass and said metal panel, said sheet metal panel and said pane of glass having peripheral outer portions, a peripheral hermetical seal between said outer portion of said pane of glass and said outer portion of said sheet metal panel, a vacuum in said space, said sheet metal panel having a blackened surface facing said pane of glass, evenly spaced projections pushed out of the plane of said sheet metal panel having sharp points resting against said pane of glass to resist the atmospheric pressure acting on said pane of glass and said sheet metal panel, said blackened surface serving to convert solar rays into heat to heat up said sheet metal panel. A vacuum connection arranged to be in communication with said space containing said vacuum, and means to close off said vacuum connection.

4,051,833 REINFORCED STRUCTURAL PANEL WITH INTEGRAL SOLAR ENERGY COLLECTING ARRAY AND METHOD OF PRODUCING AND ASSEMBLING SAME

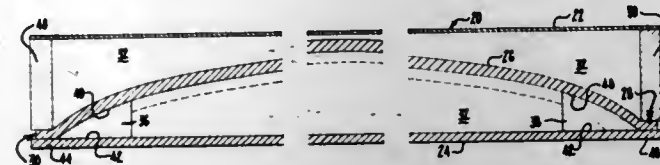
Daniel D. Vandament, 527 Fairview Ave., Mill Valley, Calif. 94941

Filed Nov. 19, 1975, Ser. No. 633,380

Int. Cl.² F24J 3/02

U.S. Cl. 126—270

17 Claims



1. A composite reinforced structural panel and solar energy collecting array suitable for rapid assembly to form the roof of a structure with a solar energy collecting array extending along a surface portion thereof, the structure including spaced-apart supports for receiving end portions of a plurality of the structural panels, each of the panels comprising,

a reinforced structural panel having a length suitable for spanning the space between the support members of the structure, the reinforced panel comprising an upper skin member and a lower skin member with a flexible member arranged in the form of an arch therebetween and secured at its ends to the lower skin member, adhesive insulating material intimately contacting both sides of the flexible arched member and completely filling the spaces between the flexible arched member and the upper and lower skin members,

wedge shaped members being arranged between the adjacent end portions of the flexible arched member and lower skin member while being securely connected thereto, end blocks also being secured to the ends of the lower skin member and overlapping the ends of the flexible arched member,

joint means for securing each of the panels to an adjacent panel,

a solar energy collecting array being mounted upon the upper skin of the reinforced structural panel, and manifold means providing an interconnection for the solar energy collecting array.

4,051,834 PORTABLE, LINEAR-FOCUSED SOLAR THERMAL ENERGY COLLECTING SYSTEM

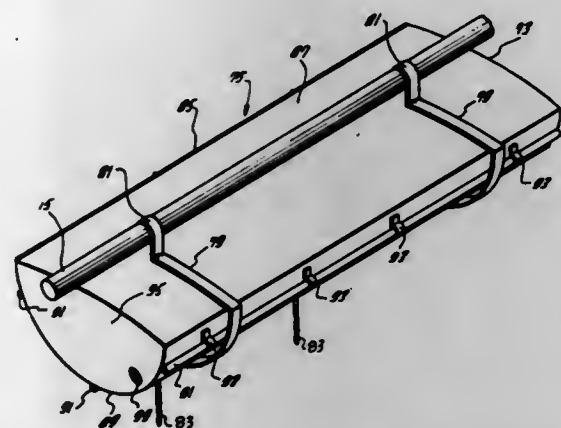
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles G. Miller, Pasadena, and Jens G. Pohl, San Luis Obispo, both of Calif.

Filed Apr. 28, 1976, Ser. No. 680,939

Int. Cl.² F24J 3/02

U.S. Cl. 126—271

12 Claims



1. An inflatable linear solar thermal energy collector comprising:

an extended casing of plastic material having both ends thereof sealed, a section of said casing being transparent; a valve means attached to said casing for admitting a gas into said casing to inflate it; a reflecting surface having a cylindrical surface of curvature contained within said casing; rigid means attached to said casing for supporting said casing, when inflated, in a suspended manner, said rigid means being adapted to removably attach to a supporting member; a conduit means extending the length of said casing for supporting said casing by said rigid means; and means for maintaining one edge along the length of said casing at a fixed perpendicular distance from said conduit means.

4,051,835 SOLAR HEATING PIPE

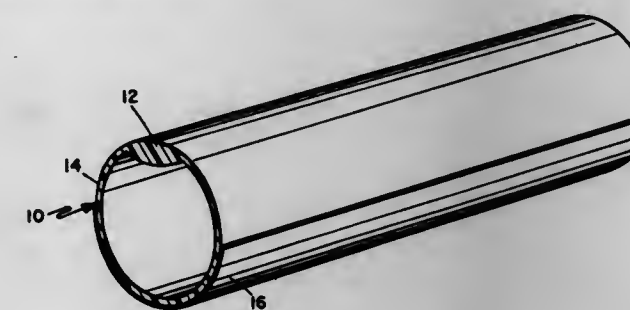
George Hinson-Rider, 300 Circle Drive, Santa Fe, N. Mex. 87501

Filed Nov. 17, 1975, Ser. No. 632,510

Int. Cl.² F24J 3/02

U.S. Cl. 126—271

4 Claims



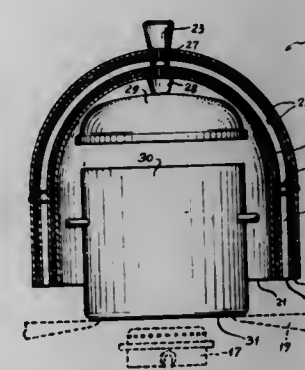
1. A solar heating pipe comprising, a fluid conducting pipe, at least one integral longitudinal portion of said pipe being transparent to solar heat rays, said portion being parallel with the longitudinal axis of said pipe, said portion comprising a cylindrical lens that focuses the solar heat rays to a focal axis within the volume of said pipe, and the side of said pipe opposite said lens portion being coated with a light ray absorbent coating.

4,051,836
DOUBLE-WALLED COVER FOR COOKING FOOD
Carlos Lagunilla-Leca, Francisco del Paso y Troncoso No. 324B6, Unidad Kennedy, 9 Mexico City, Mexico
Continuation-in-part of Ser. No. 526,341, Nov. 22, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,208
Claims priority, application Mexico, Dec. 5, 1973, 147878

Int. Cl.² A21B 1/52

U.S. Cl. 126—275 R

1 Claim



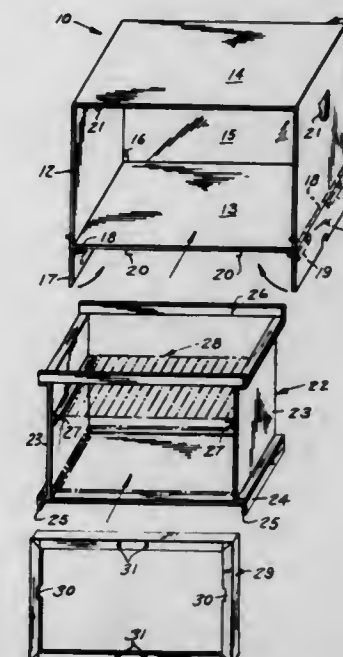
1. A cover having a double wall for cooking food which is placed over a burner comprising an outer wall in the shape of a bell, a manipulation knob located on said outer wall, an inner

wall in the shape of a bell, a plurality of spacers located between said outer wall and said inner wall to secure said walls together in spaced relation, a first chamber for conserving the heat emanating from said burner defined by said inner wall which is open at its lower end only, and a second chamber substantially surrounding said first chamber defined by said inner and outer walls which is open at its lower end only to admit hot air thereto, the first chamber being in direct communication with heat rising upwardly from said burner, and each of said walls of the cover including a metallic layer with a thermal insulating layer, each of the walls of the cover including three layers, the intermediate layer being thermally insulating and the two outer layers being metallic, and a kettle and a lid therefor, an adapter secured to the upper inside portion of said cover and the top of said lid to secure said lid to said cover, the lower edges of said cover being at the same level as the bottom of said kettle when resting upon a grate placed upon said burner which supports said cover and said kettle.

4,051,837
ATTACHABLE CAMP OVEN
Ambrose Norman, Box 67, Unalakleet, Alaska 99684
Filed June 18, 1976, Ser. No. 697,618
Int. Cl.² F24C 15/00

U.S. Cl. 126—275 R

3 Claims



1. An attachable oven for a camp stove, comprising in combination, an outer casing of hollow configuration, said outer casing having hinged plate means secured thereto, for adaptation to a camp stove, an inner casing received within said outer casing having adjustable means for supporting a grill, a door frame secured to said inner casing with door means hingeably secured thereto, grooved support rail means removably received on edges of said hinged plate means, and lock means secured to said outer casing for retaining said hinged plates.

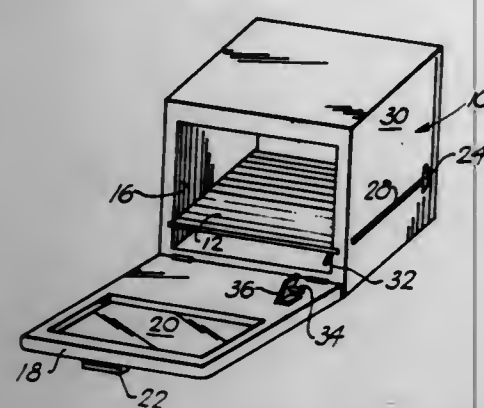
4,051,838
OVEN RACK
Cheryl Pinckney, 60 Magnolia Ave., Mount Vernon, N.Y. 10553
Filed Apr. 27, 1976, Ser. No. 680,855
Int. Cl.² F21C 15/16

U.S. Cl. 126—340

2 Claims

1. An oven comprising: an oven chamber having a side wall, at least one rack slidably mounted in said oven chamber, an elongated slot in said side wall, a handle connected said rack extending through said side-wall and slidable within said elongated slot to slide said rack into and out of said oven chamber,

a cover pivotally mounted on said oven adapted to close said oven chamber, and
cooperating means mounted on said rack and cover for pivoting said cover to open said oven chamber in response to said rack being slid out of said oven chamber,
said cooperating means including:
a downwardly extending push pin fixed to said rack, and



a bracket on said cover having a kick pin in abutment with said push pin when said rack is fully housed within said oven chamber and when said rack is at its furthestmost extension out of said oven chamber in which position said kickpin serves as a stop restraining further movement of said rack.

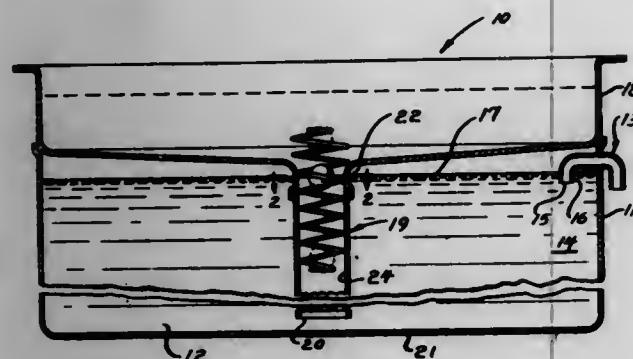
4,051,839

LIME BREAKUP MEANS

Stanton H. Petry, Arlington Heights, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.
Filed Feb. 27, 1976, Ser. No. 661,844
Int. Cl.² F24H 1/00

U.S. Cl. 126-344

8 Claims



1. In a hot water heater having a heating tank, heating means for heating water in said tank, an outlet from the tank, and duct means defining an inlet flow passage extending downwardly into said tank for delivering water into a lower portion of said tank to be heated therein, improved means for preventing blockage of said flow passage by lime forming across the flow passage at the upper level of the water in the heating tank and flow passage as the result of heating thereof, said blockage preventing means comprising: a float having a horizontal cross section smaller than that of said flow passage; and cage means movably holding said float in said flow passage while permitting free flow of water downwardly therethrough, the float being vertically movably disposed at said upper water level in said flow passage.

4,051,840

DYNAMIC AORTIC PATCH

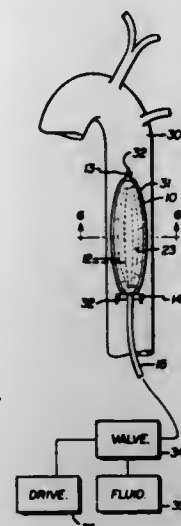
Adrian Kantrowitz, Pontiac, and Paul S. Freed, Oak Park, both of Mich., assignors to Sinai Hospital of Detroit, Detroit, Mich.

Filed Jan. 5, 1976, Ser. No. 645,735

Int. Cl.² A61M 1/03; A61F 1/24

U.S. Cl. 128-1 D

4 Claims



1. In a mechanical auxiliary blood pumping apparatus such as an aortic patch or the like adapted to be surgically implanted in an aortic vessel for assisting blood circulation and including a flexible, air tight bladder to be systematically inflated and deflated by application of fluidic pressure, and an envelope for said bladder having a non-thrombogenic surface facing the interior of the aortic vessel, the improvement comprising: said bladder and said envelope being distinct, separate, independent components of said apparatus, said envelope being adapted to be implanted and sutured into the aortic vessel in a tight, sealing relationship to the intima of the vessel to prevent leakage and loss of blood outwardly of the vessel, with said non-thrombogenic surface facing the interior of said aortic vessel, and said bladder being thereafter removably positioned within said envelope whereby said envelope is permanently implantable without damage to said bladder such as by puncturing during suturing and the like and whereby said bladder is insertable and removable without removal of said envelope and thus without extracorporeal bypass.

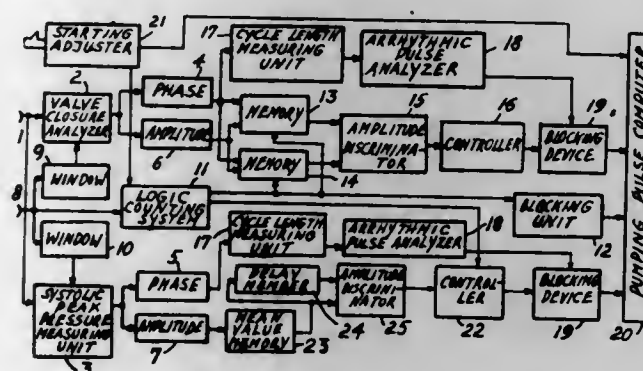
4,051,841

METHOD OF AND APPARATUS FOR AUTOMATICALLY CONTROLLING HEART-SYNCHRONIZED CIRCULATING PUMPS

Hervig Thoma, 40/5, Maroltingergasse, Vienna, Austria
Continuation-in-part of Ser. No. 435,387, Jan. 21, 1974, abandoned. This application Oct. 9, 1975, Ser. No. 620,996
Claims priority, application Austria, Jan. 31, 1973, 851/73
Int. Cl.² A61B 5/02

U.S. Cl. 128-2.05 R

14 Claims



1. A method of controlling a heart pump for assisting the circulation of blood in an animal, comprising the steps of

- coupling a heart sensor system to the body of the animal,
- selecting by a pumping pulse computer a non-critical pumping pulse obtained by reference to the existing heart rate for starting circulation assistance,
- analyzing the blood pressure beat for beat to obtain a calculated heart beat frequency,
- continuously regulating the pump rate by reference to the calculated heart beat frequency thus obtained,
- automatically interrupting the pumping action for one or more cycles, and effecting comparison measurements between characteristic values of blood pressure with and without pulsation by a time and pulse controlled timer during said interruption of the natural heartbeat with the heartbeat immediately preceding said interruption, and
- stopping the pumping function of said mechanical heart-pump in the event that the calculated heartbeat frequency is not obtained.

3. Apparatus for automatically controlling a heart synchronized circulating pump to control a patient's EKG and pressure parameters, said apparatus comprising, means coupling a heart sensor system to the body of a human patient whose heart is to be assisted by said pump and producing heart signals corresponding thereto, means for amplitude discriminating said heart signals, a period duration meter connected in series with said discriminator, a calculator connected to said meter for calculating an uncritical pumping pulse sequence, inlet means for the course of the blood pressure of the circulation, a pressure analyzer means connected in series with said inlet for determining the characteristic values of the blood pressure, means connecting the output of said analyzer over several heart cycles to said calculator, control line means for transferring the uncritical pumping impulses delivered by said calculator to a pump, a regulator connected to said pump, means connecting said calculator to said regulator for regulation of the operating cycles of said pump, a measuring cycle transmitter, circuit closer means for activating said measuring cycle transmitter, means connecting said amplitude discriminator with said measuring cycle transmitter, means connecting said measuring cycle transmitter both to said pump and said calculator, whereby for the control of the patient's EKG and pressure parameters a control system is provided and in that outlet lines both said regulator and said pump.

4,051,842

ELECTRODE AND INTERFACING PAD FOR ELECTRICAL PHYSIOLOGICAL SYSTEMS

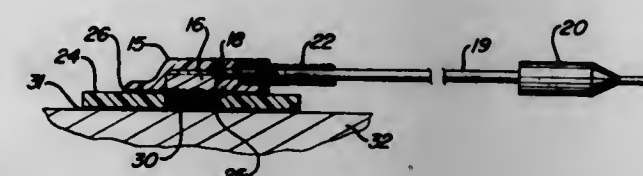
Patrick Michael Hazel, and Roberta Evans Wells, both of Littleton, Colo., assignors to International Medical Corporation, Englewood, Colo.

Filed Sept. 15, 1975, Ser. No. 613,520

Int. Cl.² A61B 5/04

U.S. Cl. 128-2.06 E

11 Claims



1. Apparatus for providing an electrical interconnection between a patient and electrical medical measurement equipment comprising:

an electrode assembly including a substantially flexible housing of electrically insulating material having a flat surface, an electrical conductor with a flat surface embedded and wholly contained within said housing with said flat surface thereof externally exposed from said housing so as to form a continuous coplanar flat surface with the flat surface of said flexible housing, and a conductive lead extending from said housing in electrical communication with said conductor, for completing an electrical circuit to the

measurement equipment by extension from said housing through a surface other than said coplanar flat surface,
a detachable, disposable pad assembly including an annular body composed of a flexible, closed cell material having first and second parallel but oppositely disposed, substantially flat surfaces with a central bore extending there-through, double adhesive surfaced disc means adhered to said first surface in surrounding relation to said bore and adhesively secured to said coplanar flat surface for releasably securing said pad assembly to said electrode assembly in proximity to said body with said flat conductor surface overlaying said bore, and an adhesive layer across substantially all of said second surface in surrounding relation to said bore adapted for retaining said pad assembly on the skin of the patient, and

electrically conductive gelatinous means filling said bore for providing a relatively constant, low resistance electrical circuit between the skin of the patient in proximity to said bore and said electrical conductor surface, said gelatinous means being of a normal thickness greater than that of said pad assembly so as to be urged through an opening in said disc means into firm engagement with the exposed portion of said conductor on the flat surface of said housing when said pad assembly is applied to the skin of the patient thereby establishing an electrical interface between the patient and the medical measurement equipment while permitting both effective cleaning of said electrode assembly and disposal of said pad assembly and said gelatinous means thereafter.

4,051,843

APPARATUS FOR THE DETERMINATION OF THE RESPIRATORY PASSAGEWAY RESISTANCE

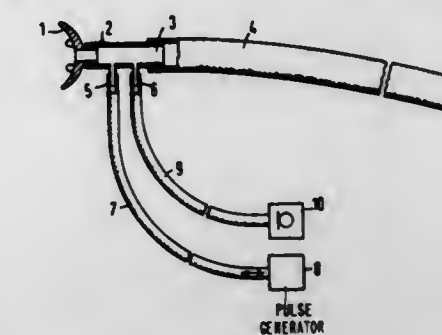
Manfred Franetzki, Erlangen; Volker Korn, Nuremberg, and Karl Prestele, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Feb. 20, 1976, Ser. No. 660,031

Claims priority, application Germany, Feb. 26, 1975, 2508319

Int. Cl.² A61B 5/08

U.S. Cl. 128-2.08

10 Claims



1. In an apparatus for the quantitative determination of the respiratory passageway resistance including a breathing tube, a flow resistance cooperating with the tube so as to be in the path of the breath flow, pulse generator means for subjecting the breath flow within the tube with higher-frequenced flow pulsations and pressure measuring means for measuring the pressure in said breathing tube, the improvement comprising:

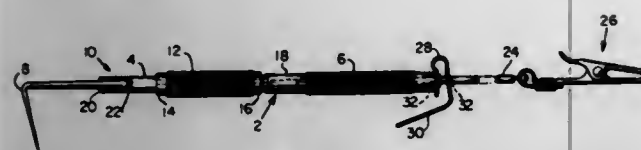
- said flow resistance being an elongate tube of predetermined length and internal diameter, which represents the approximately purely inductive part of a definite complex flow resistance with a known value (R_{ind});
- said elongate tube being connected with an open end of the breathing tube;
- said pulse generator means being an alternating-flow pressure pump connected with the breathing tube;
- said pressure measuring means being set for the frequency of said alternating-flow pressure pump;
- and measuring means for indicating the respiratory passageway resistance as a function of said known pulsation flow (I), said known flow resistance (R) and the measured pressure fluctuations (P).

4,051,844

TELESCOPING NEUROSURGICAL SCALP RETRACTORRobert D. Chialli, Somerville, Mass., assignor to Medico Developments, Inc., Boxford, Mass.
Filed May 7, 1976, Ser. No. 684,295
Int. Cl.² A61B 17/02

U.S. Cl. 128—20

2 Claims



1. A neurosurgical scalp retractor comprising an elongated frame, a first connector means at one end of said frame, said first connector means having a sharp point for penetrating said scalp, a rigid extensible member comprising a rod slidably disposed in said frame, releasable lock means for fixing said extensible member in a selected position to selectively determine the extent of said retractor, said lock means comprising leaf spring means attached to said frame and adapted to releasably exert a force upon said extensible member to prevent movement of said extensible member relative to said frame, and second connector means disposed at a free end of said extensible member.

4,051,845

DRAPE ASSEMBLY WITH POUCH AND METHOD

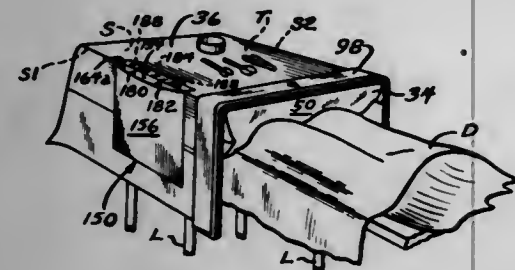
Robert F. Collins, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 664,136, March 5, 1976. This application May 5, 1976, Ser. No. 683,568

Int. Cl.² A61B 19/06

U.S. Cl. 128—132 D

16 Claims



1. A disposable drape assembly, comprising: a sterile drape comprising a sheet of flexible material; and a retaining pouch initially separated from said drape and having a back wall comprising a sheet of flexible material, a front wall comprising a sheet of flexible material, with said sheets defining a pocket and an opening for placement of articles in the pouch, and means for attaching the pouch to the drape at a selected location after placement of the drape with the back wall facing the drape.

4,051,846

LIFE SUPPORT SYSTEM FOR DIVERS

Clifford M. McClure, III, 7228 Governors Drive, Huntsville, Ala. 35895

Filed Feb. 2, 1976, Ser. No. 654,469

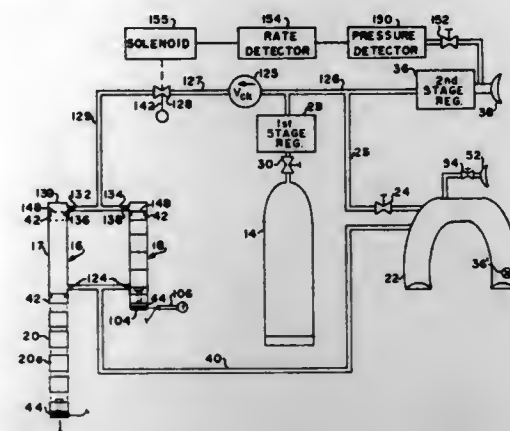
Int. Cl.² A62B 7/02

U.S. Cl. 128—142 R

7 Claims

1. Diving apparatus comprising: a source of gas pressure; a cylinder having an intermediate region between its ends for slidably holding weight means for effecting negative buoyancy comprising at least one weight member; a piston normally positioned in one end of said cylinder; a cap normally positioned in the opposite end of said cylinder and including releasing means responsive to a selected

force applied by said piston through said weights for releasing said cap from the end of said cylinder; and normally closed valve means connecting said source of gas pressure and said one end of said cylinder;



whereby upon the operation of said valve means, pressure is applied to said one end of said cylinder, forcing said piston and weight member in said cylinder toward said opposite end of said cylinder and applying a pressure on said releasing means, whereby said cap and weight are ejected from said cylinder.

4,051,847

ANESTHESIA REBREATHING APPARATUS

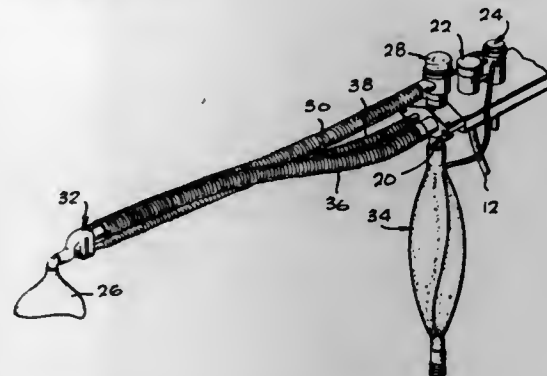
Melvyn Lane Henkin, 19640 Greenbriar Drive, Tarzana, Calif. 91356

Division of Ser. No. 448,816, March 7, 1974, Pat. No. 3,938,551, which is a division of Ser. No. 218,337, Jan. 17, 1972, Pat. No. 3,814,091. This application Oct. 24, 1975, Ser. No. 622,382

Int. Cl.² A61M 16/00

U.S. Cl. 128—145.6

2 Claims



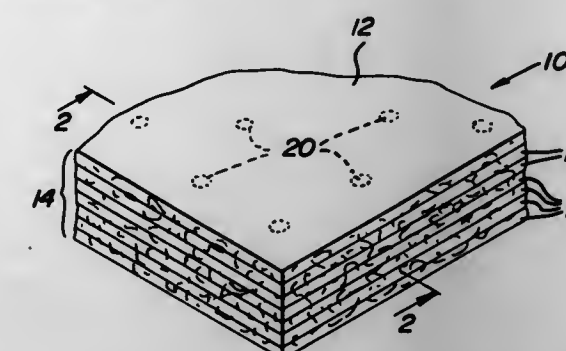
1. In a general anesthesia rebreathing system including (1) patient airway communication means, (2) fresh gas supply means, (3) at least one elongated breathing tube coupling said patient airway communication means and said fresh gas supply means, and (4) overflow valve means coupled to said breathing tube for venting excess gas therefrom at a normally encountered predetermined pressure, the improvement comprising: overpressure relief means including first and second valve surfaces for permitting gas flow therepast in response to a positive pressure differential thereacross greater than said predetermined pressure at which said overflow valve means vents excess gas from said breathing tube; means exposing said first valve surface to the pressure within said patient airway communication means and said second valve surface to ambient pressure; and means responsive to gas flow past said overpressure relief means for producing an audible alarm.

4,051,848

SYNTHETIC SKIN WOUND DRESSINGNorman S. Levine, 237 Arlingham Road, Flourtown, Pa. 19031
Filed Mar. 1, 1976, Ser. No. 662,748Int. Cl.² A61L 15/00

U.S. Cl. 128—156

12 Claims



1. A unitary wound dressing comprising an inner component for application to tissue denuded of skin, and an outer component bonded to and substantially coextensive with said inner component, said inner component being made of at least two substantially coextensive layers of knitted fabric each bonded to the other at closely spaced points which will allow said inner component to readily stretch in two dimensions, said inner component having a thickness and thread spacing suitable for uniform invasion by cellular elements from said denuded tissue, said outer component comprising a stretchable membrane which is permeable to gases, but impermeable to microorganisms.

4,051,849

CATHETER FEEDING SYSTEM

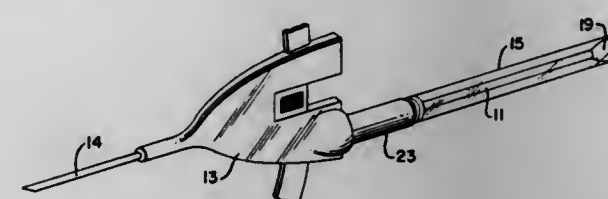
Mark P. Poncy, and Richard P. Poncy, both of 3660 E. Indus. Way, Riviera Beach, Fla. 33404

Filed Apr. 6, 1976, Ser. No. 674,162

Int. Cl.² A61M 5/00

U.S. Cl. 128—214.4

11 Claims



1. In a catheter placement and feeding system having a catheter fixture including a needle and a catheter having the front end thereof in said fixture and having the trailing end thereof extending out of said fixture from a catheter entrance in said fixture, said fixture adapted to guide said catheter along said needle when said catheter is fed forward into said catheter entrance, the improvement comprising: a tube for protecting the sterility of said catheter attached to said fixture at said catheter entrance surrounding the trailing portion of said catheter extending out of said catheter entrance, said tube having a flexible, resilient, cylindrical portion and a pleated portion, adapted to collapse axially, adjacent to said cylindrical portion and located between said cylindrical portion and said fixture, said cylindrical portion immediately adjacent to said pleated portion being sufficiently flexible to permit said catheter to be grasped through said cylindrical portion by pinching the cylindrical portion between the thumb and forefinger to collapse the wall of the cylindrical portion against the catheter and to provide a feel of the catheter through the wall of said cylindrical portion, said cylindrical portion being sufficiently resilient to return to its cylindrical shape after the pinching stress on the cylindrical portion has been removed.

4,051,850

DISPOSABLE MEDICAMENT INJECTOR

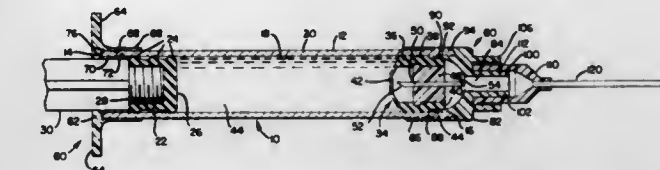
Edward A. Tischlinger, 7 Froghollow Road, East Lyme, Conn. 06333

Filed Nov. 21, 1975, Ser. No. 634,034

Int. Cl.² A61M 5/00

U.S. Cl. 128—218 NV

5 Claims



1. A disposable medicament unit comprising: a cylindrical barrel having inner and outer surfaces and open on both its front and rear ends, a plunger slidably carried in the rear end of the barrel in sealing relation to the inner surface of the barrel, a diaphragm assembly fixedly mounted in the forward end of the barrel, said diaphragm assembly including a hollow body portion having inner and outer surfaces, said hollow body portion fitting within the cylindrical barrel with its outer surface sealingly engaging the inner surface of said cylindrical barrel, a flexible wall closing off one side of the body portion to form a medicament chamber between the plunger and the flexible wall, a needle supported by the hollow body portion, said needle being spaced from the flexible wall and outside the medicament chamber, said needle being adapted to pierce the flexible wall when said wall is flexed into contact therewith to establish fluid communication between the medicament chamber and the needle, a nose cap assembly fitting on the forward end of the barrel, and a finger grip assembly on a rear end portion of the cylindrical barrel, and the finger grip assembly comprises a body portion with finger gripping elements extending outwardly therefrom and an inner and an outer wall extending forwardly from said body and spaced from each other so as to snugly receive the rear end portion of the barrel therebetween.

4,051,851

DIAPHRAGM ASSEMBLY FOR A MEDICAMENT DISPENSING UNIT

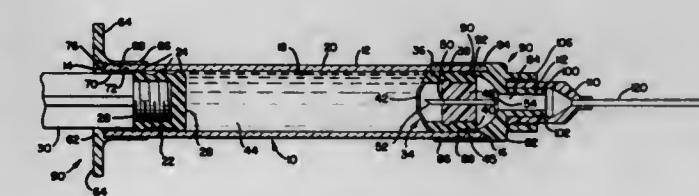
Edward A. Tischlinger, 7 Froghollow Road, East Lyme, Conn. 06333

Filed Mar. 31, 1976, Ser. No. 672,392

Int. Cl.² A61M 5/00

U.S. Cl. 128—218 NV

4 Claims



1. In a medicament dispenser comprising a cylindrical barrel having a front and a rear end, a plunger slidably carried in the rear end of the barrel to sealingly close off the rear end of the barrel, a diaphragm assembly mounted in the front end of the barrel to close off that end of the barrel, the improvement residing in the diaphragm assembly which assembly comprises a body sized to sealingly fit within the barrel, said body having a hollow portion facing the rear end of the barrel, a flexible wall closing off the hollow portion to form a medicament chamber between said flexible wall and the plunger, a needle mounted by means fitted within the diaphragm body and carried by the body with its end spaced from the flexible wall, said needle being spaced from the flexible wall and adapted to

pierce the flexible wall said wall is flexed inwardly under the action of the moving plunger to establish fluid communication between the medicament chamber and the needle.

4,051,852

ASPIRATING DEVICE

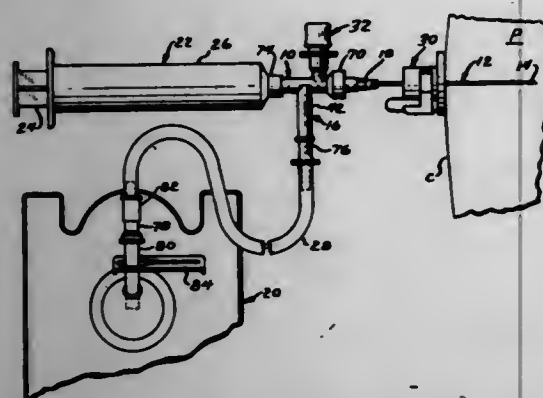
Frank K. Villari, Oak Park, Ill., assignor to The Kendall Company, Boston, Mass.

Filed June 26, 1975, Ser. No. 990,786

Int. Cl.² A61M 1/00

U.S. Cl. 128—278

21 Claims



1. A device for aspirating body fluids, comprising: a valve assembly having a first port to receive body fluids, a second port for passage of the body fluids from the valve assembly, a passageway communicating between the first and second ports, one-way valve means associated with the passageway to permit passage of body fluids from the first port to the second port and prevent passage of body fluids from the second port to the first port, a third port, a second passageway communicating between the third port and the first passageway intermediate said valve means and second port, and second one-way valve means associated with the second passageway permitting passage of body fluids from the first passageway to the third port and preventing passage of fluids from the third port to the first passageway; port means communicating with the passageway intermediate said valve means and first port, said port means being normally closed to prevent contamination of the device, and being openable to permit passage of fluid through the port means to the first port; and pump means communicating with said second port for aspirating the body fluids through the valve assembly.

4,051,853

DIAPER WITH EXTENSIBLE FASTENER

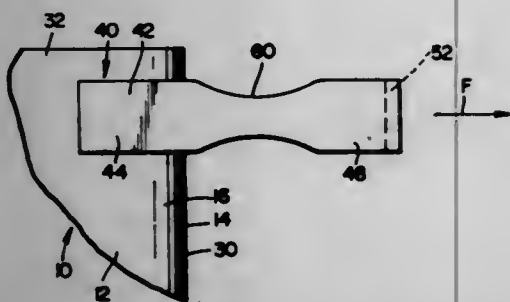
Francis L. Egan, Jr., Arlington Heights, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,612

Int. Cl.² A61F 13/16

U.S. Cl. 128—287

7 Claims



1. A disposable diaper comprising, an absorbent pad assembly, and a tape fastener comprising an elongated pressure-sensitive tape strip having a first section attached to a surface defined by a sheet of the pad assembly and a second securement section extending from the first section in a longitudinal direction of the tape strip for securing the diaper about an infant,

said tape strip having means for extending and elongating in length previous to failure of said sheet when forces are applied in a longitudinal direction of the strip comprising an adhesively coated backing of a non-reinforced, extensible, polymeric film, with said film having an ultimate elongation of greater than 50% in the longitudinal direction of the tape strip, and having modulus properties such that said film has an elongation of 50% at 5-10 lbs/in. width of force as applied to the second section of the tape strip in the longitudinal direction thereof.

4,051,854

DIAPER PANTIES FOR BABIES

Gabrielle Leonie Aaron, Paris, France, assignor to Anciens Etablissements Rene Aaron, Paris, France

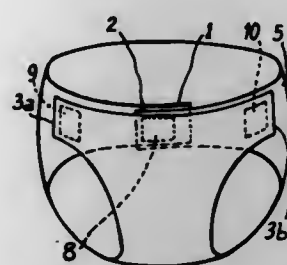
Filed Jan. 20, 1976, Ser. No. 650,624

Claims priority, application France, Jan. 24, 1975, 75.02209

Int. Cl.² A61F 13/16

U.S. Cl. 128—284

12 Claims



1. A diaper panty of the body comprising a piece of fabric material formed with a center flap having a first portion to be placed between the legs and a second portion at each end thereof to be turned upwardly around the body, an ear flap extending from each side of one of said portions of said center flap to be folded around the body to accommodate the body size and to be adjacent to said other second portion of said center flap, the entire outer surface of said piece of material having a raised fiber surface, and at least one fabric fastening member having fabric fastening means thereon complementary to the raised fiber surface of said piece of material and for direct attachment and fastening thereto to hold the ear flaps in a fixed position with respect to the center flap.

4,051,855

ELECTROSURGICAL UNIT

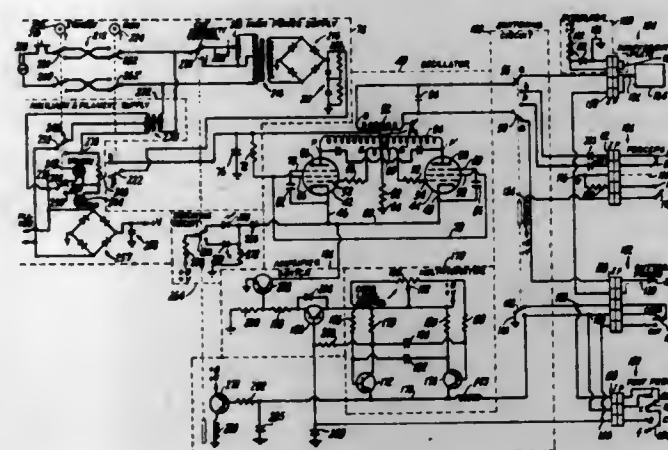
Max Schneiderman, Clifton, N.J., assignor to IPCO Hospital Supply Corporation, Whaledent International Division, New York, N.Y.

Filed Feb. 6, 1976, Ser. No. 655,887

Int. Cl.² A61B 17/36; A61N 3/00

U.S. Cl. 128—303.14

22 Claims



1. An electrosurgical unit comprising: vacuum tube oscillator means for providing an ungrounded output of a given frequency;

power supply means including a transformer for supplying said oscillator means with a high voltage; coagulation output means for coupling to said oscillator means, and providing a coagulation signal for use in coagulation procedures; cutting output means for coupling to said oscillator means, and providing a cutting signal for use in cutting procedures; switching circuit means for selectively connecting said coagulation output means or said cutting output means to said oscillator means; intensity control means for coupling to said power supply means, and varying the voltage supplied to said oscillator means, said intensity control means including a variable coil in parallel with said transformer for controlling the output voltage across said transformer; modulation means for coupling to said oscillator means, and providing intermittent operation of said oscillator means, said modulation means including a multivibrator means, and coagulation level control means for varying the duty cycle of said multivibrator means; and operation control means in said switching circuit means for interconnecting said intensity control means to said power supply means when said cutting output means is connected to said oscillator means, for interconnecting said modulation means to said oscillator means when said coagulation output means is connected to said oscillator means, and for disconnecting from said oscillator means one of said modulation means or said intensity control means when the other is connected thereto.

4,051,856

PNEUMATIC ROTARY CLASSIFIER

William B. Reed, and Floyd W. Bigsby, both of Saskatoon, Canada, assignors to Western Roto Thresh Ltd., Saskatoon, Canada

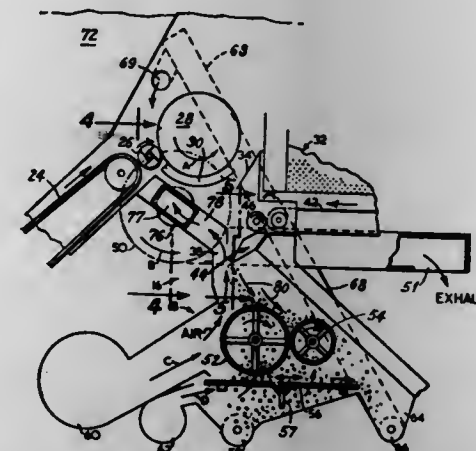
Continuation of Ser. No. 601,589, Aug. 4, 1975, abandoned, which is a continuation of Ser. No. 503,181, Sept. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 369,004, June 11, 1973, abandoned, which is a continuation of Ser. No. 222,084, Jan. 31, 1972, abandoned. This application Apr. 26, 1976, Ser. No. 680,447

Claims priority, application Canada, Nov. 22, 1971, 128236

Int. Cl.² A01F 12/18

U.S. Cl. 130—27 HF

3 Claims



1. In a threshing machine having a rotary threshing cylinder, concave and an associated deck, a cleaning and classifying device for aspirating or pneumatically separating chaff from grain comprising:
 - a. panel means defining a vertically oriented throat disposed below said concave for passage of grain and chaff there-through by gravity from said concave and deck;
 - b. a pneumatic separation area in said throat comprising an airflow channel disposed adjacent to and communicating with said throat and first fan means at the end of the passage remote from the throat which, provides airflow from the throat into the fan;
 - c. rotary screens and second fan means below said throat for

further aspiration and mechanical separation of said chaff and grain; d. elevating means for transferring cleaned grain to a hopper on the threshing machine and; e. second elevating means for transferring uncleaned grain back to the rotary threshing cylinder for reclassification.

4,051,857

DENTAL FLOSS HOLDER

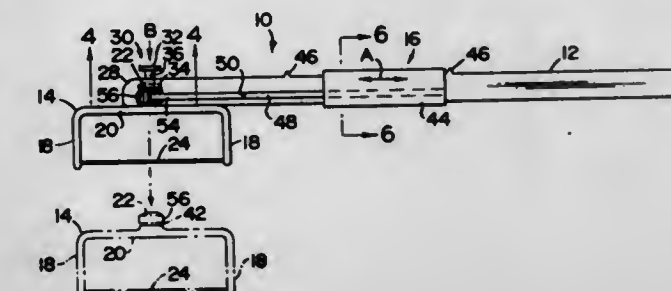
James B. Zambito, 1504 S. Arroyo, Tampa, Fla. 33609

Filed Aug. 26, 1976, Ser. No. 717,998

Int. Cl.² A61C 15/00

U.S. Cl. 132—91

2 Claims



1. In a dental floss holder comprising a handle, a floss holding head attached to said handle, and connecting means attached to said handle, both said head and said connecting means being dimensioned and configured to be detachably connected to one another, the improvement comprising head positioning means mounted on said handle in movable, engaging relationship to said floss holding head, said head positioning means comprising sleeve means disposed in contiguous, sliding relationship around a predetermined segment of the outer surface of said handle; arm means formed on said sleeve means and extending forwardly therefrom in substantially parallel relationship to the longitudinal dimension of said handle; track means dimensioned and configured to receive said arm means therein formed on said handle; and a plurality of stop means formed on said handle in motion-limiting relation to said sleeve means; said arm means further comprising a plurality of teeth means formed on the forward end thereof in operative relation to a predetermined portion of said head, said head including a plurality of cog means formed on said predetermined portion, whereby longitudinal sliding of said sleeve means results in corresponding intermeshing of said teeth means and said cog means to angularly orient said head with respect to the longitudinal dimension of said handle.

4,051,858

SOLVENT SINK AND DISPENSER

Anthony P. Mele, 5316 E. Emile Zola, Scottsdale, Ariz. 85254

Filed Dec. 27, 1976, Ser. No. 754,505

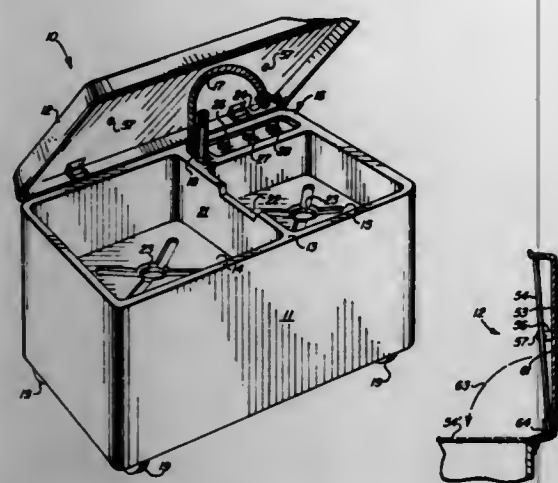
Int. Cl.² B08B 3/02

U.S. Cl. 134—56 R

7 Claims

1. A solvent sink and dispenser comprising in combination: a cabinet comprising an open top having a cover hingedly mounted along one of its top edges, a two compartment sink mounted in a recessed manner within the top of said cabinet, each of the compartments having a drain in the bottom thereof, a pair of fluid tanks mounted within said cabinet, a pair of fluid dispensing heads mounted in said cabinet for dispensing fluid into either compartment of said sink, a conduit system including a first valve means for selectively connecting in a closed system either of said tanks to said dispensing heads from said heads into one or more of the compartments of said sink through its drain and back to a selected tank, means for pressurizing said system, a second valve means connected in said system for selec-

ively connecting said conduit system to a given one of said dispensing heads,
a fire resistant plate hingedly mounted on said cover for movement to and from said cover, and



temperature sensitive means interconnecting said cover and said plate for releasing said plate for its movement away from said cover and over said sink when said cover is in an open position upon a fire occurring in said sink and effecting in a predetermined manner said temperature sensitive means.

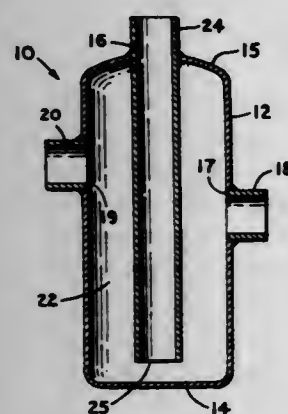
4,051,859 APPARATUS FOR DRAINING FLUID FROM A CONTINUOUSLY EVACUATED SPACE

George John Hoffman, 37 Adrienne Place, Staten Island, N.Y. 10308

Filed Sept. 26, 1973, Ser. No. 400,735
Int. Cl.² B67D 5/34

U.S. Cl. 137-154

1 Claim



1. Apparatus for draining fluid from a continuously evacuated space at first environmental pressure to a space at a second environmental pressure said second environmental pressure being relatively higher than said first environmental pressure, comprising:

collecting means in said continuously evacuated space at said first environmental pressure for collecting said fluid; trap means, said trap means comprising: a casing defining a chamber therein said casing having a bottom wall and a top wall, a fluid inlet line extending into said chamber, to a discharge point substantially adjacent to said bottom wall, a fluid drain line extending out of said chamber, said fluid drain line disposed in said casing at a position above said discharge point of said fluid inlet line, and a gas bypass line extending out of said chamber, said gas bypass line disposed in said casing at a position above the position of said fluid drain line;

means for communicating said fluid inlet line to said collecting means;

means for communicating said fluid drain line to said space at said second environmental pressure;

means for communicating said fluid drain line to said gas bypass line; and
means for communicating said gas bypass line to said continuously evacuated space at said first environmental pressure.

4,051,860

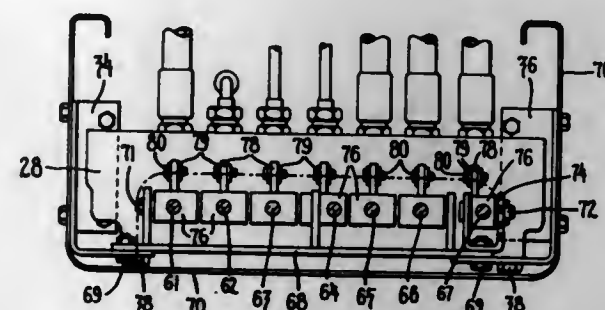
VALVE CONTROL MECHANISM

Allyn C. Dowd, Sterling Heights, and Hafibar Rahman, Detroit, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Dec. 15, 1975, Ser. No. 640,809
Int. Cl.² E02F 3/85; F16K 51/00

U.S. Cl. 137-271

9 Claims



1. A valve control mechanism for a plurality of uniformly spaced valve control elements disposed in a common plane, comprising: a support structure adapted to be disposed in fixed relationship to said common plane, a pair of valve control assemblies, each of said valve control assemblies including mounting brackets which are relatively separable having a plurality of control arms pivotally mounted on one of said brackets and at least one arm on the other bracket with one of said control arms being associated with a respective control element, said control assemblies connected together to form a manifold assembly removably replaceable as a unit on said support structure, attaching means for connecting the mounting bracket of a selected one of said pair of valve control assemblies to said support structure, said attaching means being the sole means required to be removed to release said bracket containing said manifold assembly from said support structure, a connecting means on each of said control arms adapted for connection to each of said control elements, respectively, said connecting means each including a connecting element removable to separate said control arm from the associated control element, one of said valve control assemblies having a separate control lever movable from a neutral position for moving each of said control arms, and the other of said valve control assemblies having a single lever movable from a neutral position for moving at least one control arm associated with adjacent valve control elements.

4,051,861

ARRANGEMENT FOR CONNECTING MANIFOLD BLOCKS

John E. Ellison, Newington, and Herbert M. Flink, East Hartford, both of Conn., assignors to Skinner Precision Industries, Inc., New Britain, Conn.

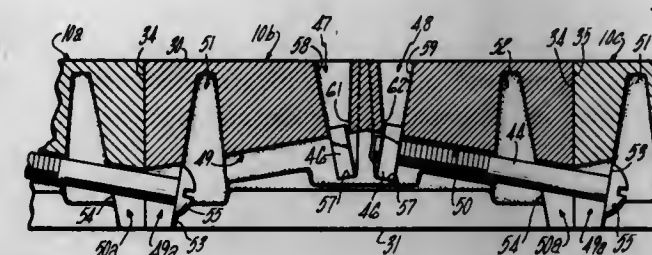
Filed Nov. 3, 1975, Ser. No. 628,379
Int. Cl.² F15B 13/08

U.S. Cl. 137-315

7 Claims

1. For use in operatively mounting a plurality of fluid control valves, a combination comprising a pair of valve mounting manifold blocks adapted to be stacked in aligned end-to-end abutment, the manifold blocks each having fluid passage means therein for conducting fluid controlled by valves mounted on an upper surface of the block, one block having an upper opening therein intermediate the ends of the block, a longitudinally extending slot and an end opening in one end of said one block communicating with the slot, the upper opening of said

one block being accessible from its upper surface and intersecting the slot, the other block having a cavity and an opening in one end of said other block communicating with the cavity, the end openings in the blocks being registrable with one another when the blocks are in aligned end-to-end abutment, an elongated fastener having a head fixed on one end and an opposite threaded end, the fastener longitudinally extending from the



slot in said one block into the cavity of the other block with the head of the fastener disposed within said cavity, and a nut received within the upper opening of said one block for threaded engagement with the threaded end of the fastener at the juncture of the upper opening and the slot for compressively engaging the ends of the blocks in fixed relation to one another.

4,051,862

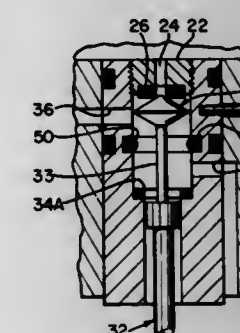
CONTROL VALVES

Harry M. Haytayan, Sunnyside Lane, Lincoln, Mass. 01773
Filed Dec. 15, 1975, Ser. No. 641,024

Int. Cl.² F15B 13/02

U.S. Cl. 137-454.2

14 Claims



1. A control valve comprising:

a hollow valve casing having (1) a slide bore for a slide valve unit, (2) first, second and third ports for conducting flow of fluid into and out of said casing, and (3) first and second resilient valve seats surrounding first and second openings leading to said first and second ports respectively, said valve seats being aligned with said slide bore; and
a slide valve unit having a valve stem slidably disposed in said slide bore and a valve head attached to the inner end of said stem and movable by said stem into engagement alternatively with said first and second valve seats, said valve head being generally diamond shaped in longitudinal section and being sized so that said valve head forms a close sliding fit with the surrounding portion of said casing, (2) fluid pressure applied via said first port and said first opening will force said valve member away from said first valve seat toward said second valve seat, (3) when it is engaged with either said first or second valve seat it will block flow of fluid through said first or second opening respectively, and (4) at all positions along its path of travel between the two valve seats it is incapable of blocking flow of fluid into or out of the casing via said third port.

4,051,863

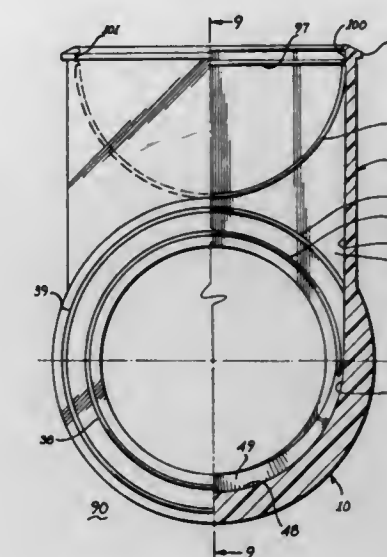
GATE VALVE WITH REPLACEABLE LINER

Robert C. Still, Tucson, Ariz., assignor to New Concepts, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 614,350, Sept. 17, 1975, Pat. No. 3,993,092. This application Aug. 23, 1976, Ser. No. 716,669
Int. Cl.² F16K 3/02

U.S. Cl. 137-454.2

10 Claims



1. A gate valve having a positionable gate disposed therein for regulating the flow of fluid intermediate an attached pair of pipes, said gate valve comprising:

- a gate having opposing surfaces and being positionable within said gate valve in a first and second position to open and close said gate valve and effect regulation of the flow of fluid;
- a one piece pliant liner for receiving, guiding and seating and gate, said liner including:
 - a chest including a gate passageway with opposing side walls spaced from the opposing surfaces of said gate disposed therebetween;
 - a ring defining a bore and extending downwardly from said chest in general planar alignment therewith;
 - a depression disposed within said bore for defining a seat and a guide for said gate;
 - first seal means disposed near the top of the opposing side walls within said chest and being in sealing contact with said gate for preventing a flow of fluid through said gate passageway intermediate said chest and said gate;
 - second seal means disposed within said depression for preventing a flow of fluid through the bore of said ring on seating of said gate within said depression; and
 - third seal means disposed on opposing side walls within said chest for sealing contact with the opposing surfaces of said gate for preventing a flow of fluid intermediate said chest and said gate when said gate is in the first position;
- a pair of castings for receiving said liner, each of said castings including:
 - bore for receiving a part of said ring;
 - a recess for receiving a part of said chest; and
 - attachment means for securing said pair of castings to one another to at least partially enclose said liner therebetween;

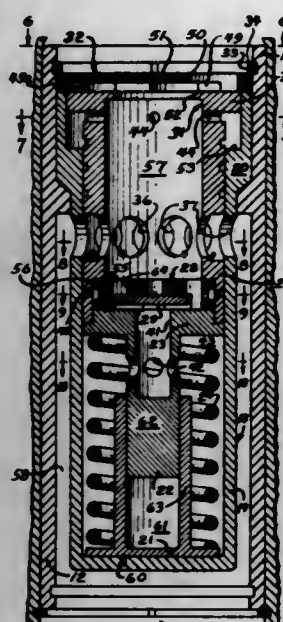
whereby, said liner includes seal means for precluding a flow of fluid intermediate said gate and said chest.

4,051,864 FLOW REGULATOR

Frank Iwatsuki, Evanston, Ill., assignor to Gould Inc., Cleveland, Ohio

Filed Oct. 21, 1975, Ser. No. 624,556
Int. Cl.² F16K 31/12

U.S. Cl. 137-504



15 Claims

tending outwardly of the valve casing; a first annular member coupled to the valve casing and including a part extending from said casing co-axially with the stem outwardly beyond where said stem enters said casing; a second annular member coaxial with the stem and coupled to the stem, the first and second annular members being of such length as to axially overlap in all normal working positions of the stem; and the first annular member being of an inside diameter larger than the outside diameter of the stem with its outwardly extending part defining a lubricant reservoir surrounding the stem where it enters the casing; and seal means located between the first annular member and the second annular member to form a seal therebetween.

4,051,866 VALVE POSITIONING HANDLE

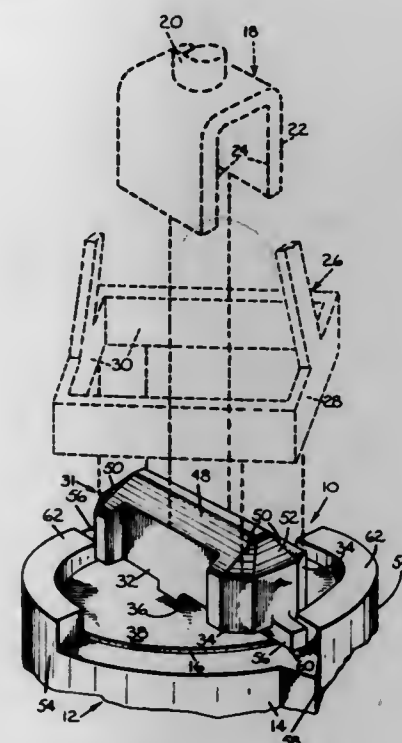
Earl A. Bake, Pittsburgh, and E. Frederick Schoeneweis, Coraopolis, both of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 636,844, Dec. 2, 1975, abandoned. This application Oct. 8, 1976, Ser. No. 730,929

Int. Cl.² F16K 5/04

U.S. Cl. 137-556.3

13 Claims



11. A valve positioning handle for a valve which valve includes a body member and a rotatable isolation member and is connectable to a distribution pipe member, at least one of said members being formed of plastic having a predetermined ultimate shear stress, said isolation member being disposed within said body member and rotatable about an axis to control the flow of fluid through said pipe member, said one of said members being capable of being destroyed or damaged if said ultimate shear stress is exceeded by the application of excessive forces thereto during rotation of said isolation member, said valve positioning handle comprising: an extended fitting having working surfaces thereon for receipt of at least one type of torque applying tool for rotating said isolation member; and a connecting section extending axially between said extended fitting and said isolation member, being formed of a pre-selected material and having predetermined cross-sectional dimensions as measured in a plane which is perpendicular to said axis to insure failure by torsional shear generally along said plane prior to generation of said excessive forces to said one of said members by said torque applying tool.

4,051,865 FLUID FLOW CONTROL VALVES

Glyn Cocking, and John Owen Jones, both of Cwmbran, Wales, assignors to Saunders Valve Company Limited, Wales

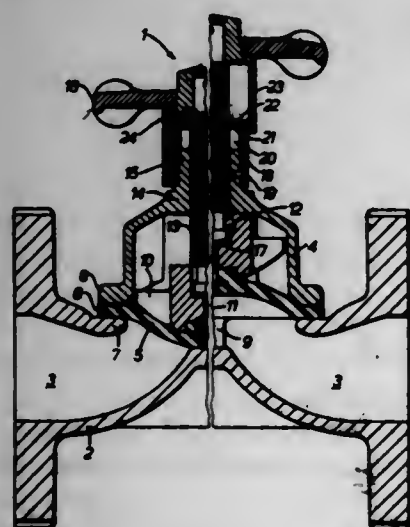
Filed Feb. 27, 1976, Ser. No. 662,130

Claims priority, application United Kingdom, Mar. 6, 1975, 9462/75

Int. Cl.² F16K 31/50, 7/16

U.S. Cl. 137-556

7 Claims



1. A fluid flow control valve comprising: a valve casing; an operating mechanism including an axially movable stem ex-

4,051,867 MULTITUBE VALVE

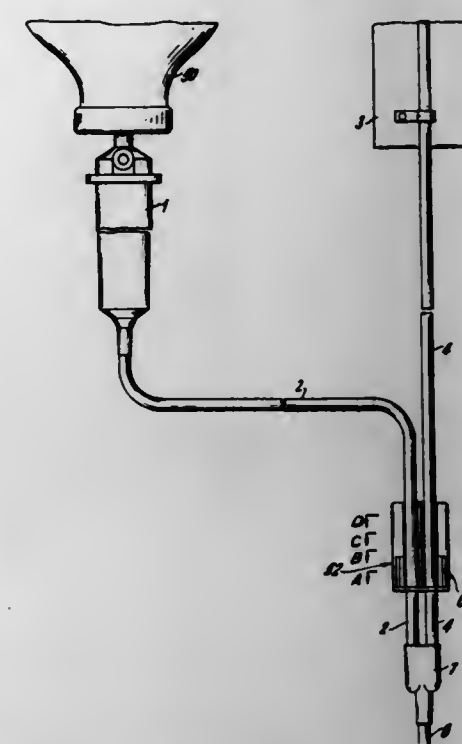
Hans-Jürgen Forberg, Lennah, Holst., Germany, assignor to Transcodan, Sven Hasted-Andersen, Germany

Filed Mar. 1, 1976, Ser. No. 662,301

Claims priority, application Germany, Mar. 5, 1975, 2509485
Int. Cl.² F16L 55/14

U.S. Cl. 137-595

11 Claims



1. A multiway valve for medical devices, chemical devices, etc. comprising a housing having an open front end and an open rear end, a plurality of tube channels defined between said front and rear ends through which individual tubes are adapted to be passed, each tube channel having a bottom tube support surface extending at least a portion of the distance between said front and rear ends and each having a second portion of the distance between said front and rear ends without a tube support surface so that the tube in the associated channel may be deflected below the level of said tube support surface, a clamp member movably mounted in said housing for movement backwardly and forwardly toward and away from each end of said housing and having a portion engageable with each tube when said clamp member overlies said tube at a place in which it is supported by said support surface, said clamp member being guided in said housing so that it is brought close enough to said support surface to compress the tube and at least reduce the flow therethrough, and guide means in said housing for guiding said clamp member for said backward and forward movement, said tube support surface in at least one of said channels is offset from said support surface of at least one of the other of said channels so that when said clamp member is positioned to close off at least a portion of the flow through one of the tubes it is located so that it does not effect the closing off of the cross-section of at least one of the other of said tubes, said clamp member being positionable in at least one position wherein at least one of said tubes is clamped off, in another position wherein at least two of said tubes are open and in a further position in which at least two of said tubes are shut off.

4,051,868 CONTROL DEVICE FOR A HYDRAULICALLY OPERATED CONSUMER

Hans Skov Andersen, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Mar. 23, 1976, Ser. No. 669,671

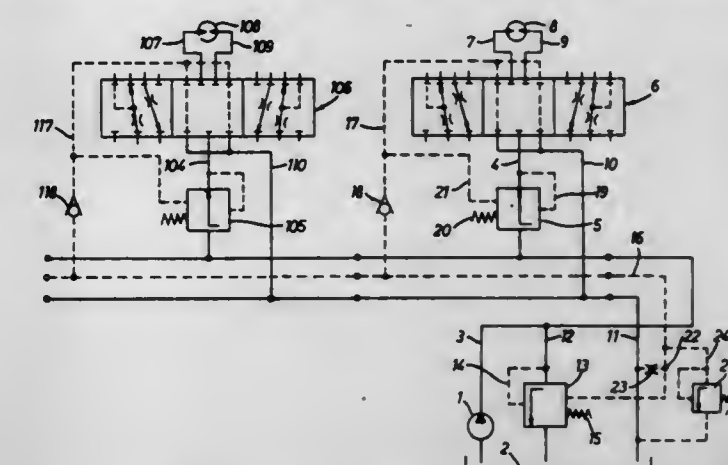
Claims priority, application Germany, Apr. 3, 1975, 2514624
Int. Cl.² F16K 11/00

U.S. Cl. 137-596.13

5 Claims

1. A pressurized fluid distribution system comprising a plurality of control valve units, each of said units being for a

hydraulically operated consumer unit and comprising a housing having a cylindrical bore, a spool type slide member slidably disposed in said bore, a plurality of operational ports in said housing opening into said bore, one of said ports being a supply port, two of said operational ports being first and second consumer unit ports on opposite sides of said supply port, two of said operational ports being return ports positioned outwardly from said supply port, two of said operational ports being first and second pressure sensing ports positioned outwardly from said return ports, conduit means in said housing connecting said first and second pressure sensing ports, said slide member having spools arranged to place said pressure sensing ports in fluid communication with said return ports when said slide member is in a neutral position, said spools being arranged to selectively pressurize either one of said consumer unit ports while exhausting the other one of said consumer unit ports, and said spools arranged to place said first pressure sensing port in fluid communication with said first



consumer port when it is being pressurized and place said second pressure sensing port in fluid communication with said second consumer port when it is being pressurized, a common supply line connected to said supply ports of said units, a common collecting sensing conduit connected to said pressure sensing ports of said units, a common return line connected to said return ports of said units, said control valve units being connected by said common supply line and said common collecting sensing conduit to a common differential pressure regulator, pressure relieving means to totally relieve the pressure in said common collecting sensing conduit when all of said control valve units are in their neutral operating states, and individual check valve means between said common collecting sensing conduit and the respective ones of said control ports of said control valve units to set the pressure in said common supply line so that the consumer unit with the highest load connected to any one of said control valve units receives an adequate predetermined pressure.

4,051,869 MIXING VALVE

James W. Holt, Brookland, and John K. Meeks, Jonesboro, both of Ark., assignors to Crane Co., New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,078

Int. Cl.² F16K 11/14

U.S. Cl. 137-636.1

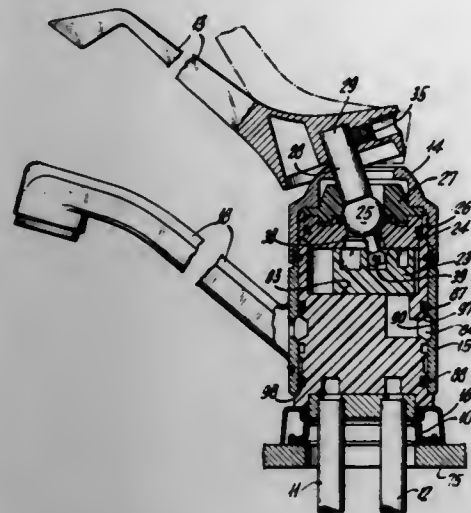
16 Claims

1. A mixing valve of the type having a single handle for controlling the volume and relative proportion of hot and cold water flowing through the valve including:

- a housing adapted to receive a valve cartridge, said housing having a hot water inlet port a cold water inlet port and an outlet;
- a valve cartridge positioned in said housing, said cartridge having a plurality of water inlet passages in communication with said inlet water ports, and, a seat in each water inlet passage;
- a plunger positioned in each of said water inlet passages, said plunger adapted to be seated within its respective

water inlet passage and to be freely slidable therein whereby inlet water displaces said plunger from its respective seat;

- d. a slider plate mounted above said plungers for sliding movement both radially and rotatably in a single plane with respect to the longitudinal axis of said valve car-



tridge, said plate having a plurality of cams adapted to restrict the movement of said plungers relative to said water inlet passage seats;

- e. means for sliding said plate to thereby position each of said plungers relative to its respective seat to thereby selectively control the volume of water through its passage to the outlet.

4,051,870

SINGLE HANDLE MIXER VALVE

Lars Nordentoft, Menden, Germany, assignor to Friedrich Grohe Armaturenfabrik, Hemer, Germany

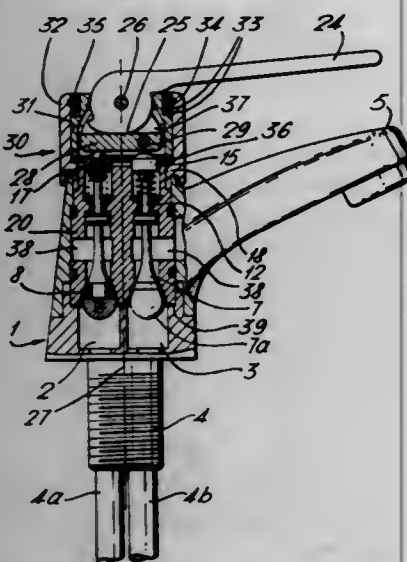
Filed Feb. 25, 1976, Ser. No. 661,349

Claims priority, application Germany, Feb. 28, 1975, 2508724

Int. Cl.² F16K 11/18

U.S. Cl. 137—636.2

3 Claims



1. A mixer valve for mixing hot and cold water sources and providing an output thereof and under the control of a single lever comprising, in combination:

- a valve housing;
- first and second inlets on said housing for respectively receiving said sources and said inlets respectively communicating with first and second passageways in said housing;
- mixing chamber in said housing in which said first and second passageways terminate at restricted openings therein and said chamber having an outlet opening;
- first and second valve members respectively disposed in said first and second passageways, each valve member having a stem extending through said chamber, through restricted bores in said housing and externally of said valve

housing, and each valve member having a tapered configuration which reduces in the direction of said stem, wherein the restricted openings of said chamber form valve seats for receiving the tapered portions of said valve members in sealing relationship therewith;

means for yieldably urging said valve members toward said valve seats;

a valve cap removably mounted to said valve housing and surrounding the extended ends of said valve stems;

a bushing member rotatably mounted in said valve cap and about an axis which is parallel to the axes of said valve stems;

a control plate pivotally mounted in said bushing about an axis which is spaced apart from the axis of said bushing member and perpendicular to the axes of said valve stems and being translatable for engaging one or both of the extended ends of said valve members in accordance with the angular position of said bushing member; and

a control lever pivotally mounted in said bushing above said control plate and about an axis which is parallel to the pivotal axis of said control plate, said control lever having an eccentric cam surface extending about its pivotal axis for engaging said control plate wherein the plurality of angular positions of said control lever about its pivotal axis and the axis of said bushing member selectively translate one or both of said valve stems away from said valve seats in accordance with the angular position of said bushing member and said eccentric cam surface thereby to control the mixing and output of said hot and cold water.

4,051,871

ELECTRONIC DEVICE FOR CONTROLLING WEFT YARN INSERTION IN LOOMS

Sergio Vella, Biella (Vercelli), Italy, assignor to ROJ Electrotex S.p.A., Biella (Vercelli), Italy

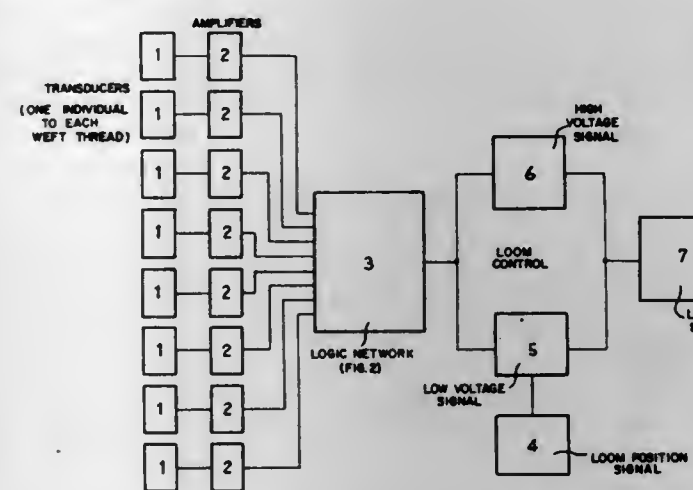
Filed Apr. 30, 1975, Ser. No. 573,903

Claims priority, application Italy, Apr. 30, 1974, 22117/74

Int. Cl.² D03D 51/34

U.S. Cl. 139—370.2

6 Claims



1. Electronic device for controlling weft yarn insertion in continuous weft feed looms, designed to stop the running of the loom and to provide a signal, whenever there is either breakage of a weft yarn or when a larger number of weft yarns than that scheduled, is inserted by mistake, characterized in that it comprises a plurality of transducers each activated by movement of a weft yarn and adapted to feed signals to a logic network when the yarn is in movement, there being a said transducer individual to each said weft yarn and means, downstream of said logic network, operated by the signals emitted by said network and adapted to activate a device for stopping the loom and providing a signal, said logic network comprising means for storing a predetermined law of insertion of the individual weft yarns corresponding to a certain weaving operation on the loom, and for comparing with said law the actual weft insertions detected by the transducers thereby to

stop the loom not only when fewer than a predetermined number of weft yarns is inserted in the loom but also when more than said predetermined number of yarns is inserted in the loom.

4,051,872

TRAVELLING-WAVE LOOM

Jary Ivanovich Komarov, ulitsa Mikiukho-Maklaya, 29, korpus 1, kv. 215; Viktor Mikhailovich Lakhmanov, Nagatinskaya naberezhnaya, 14, korpus 4, kv. 161, and Gennady Ivanovich Kovalev, Kronshtadtsky bulvar, 27, kv. 85, all of Moscow, U.S.S.R.

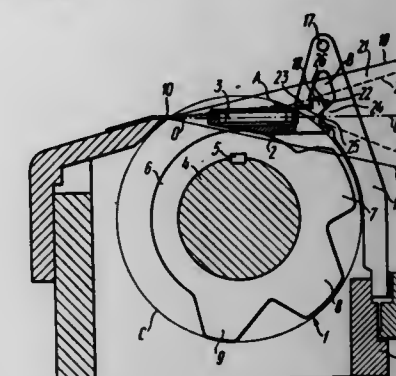
Filed June 9, 1976, Ser. No. 694,326

Claims priority, application U.S.S.R., June 16, 1975, 2144375

Int. Cl.² D03D 47/26, 49/60

U.S. Cl. 139—436

3 Claims pulleys being adapted for contact with the weft yarn during motion of the carrier in a second opposite direction.



1. A travelling-wave loom comprising: a cloth-forming mechanism composed of a rotary reed and a separating grate; disks with teeth forming the rotary reed of said cloth-forming mechanism, the crests thereof tracing out a trajectory with the disks rotating; plates forming a separating grate of said cloth-forming mechanism and having recesses forming a tunnel of the separating grate; weft thread carriers flying through the shed of the warp threads, each of the carriers having an abutment extending into said tunnel for partially accommodating each carrier in the tunnel of the separating grate and each carrier being provided with a side wall facing the plates of said separating grate, the latter plates respectively terminating on one side of the abutment of each carrier in a free end situated adjacent a top surface of each carrier, said carriers cooperating with one of the teeth of the disks of the rotary reed for accomplishing said flight through the shed; a groove being formed in each of said weft thread-carriers on the side wall thereof facing said plates of the separating grate; a projection on each of said plates of the separating grate engaging said groove of said weft thread carriers and having an end disposed as close as possible to the trajectories circumscribed by the crests of the teeth of said disks of the rotary reed so that with the disks rotating the teeth thereof are clear of said projections of the plates.

4,051,873

WEFT YARN CARRIER

Maurice J. Detonancourt, Lincoln, R.I., assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

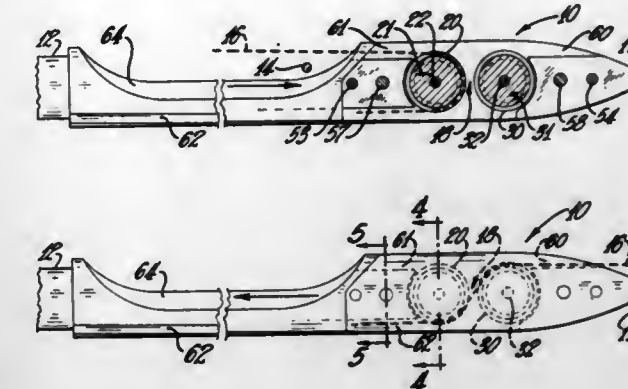
Filed Dec. 2, 1976, Ser. No. 746,929

Int. Cl.² D03D 47/02

U.S. Cl. 139—440

4 Claims

1. In a carrier for inserting weft yarn into a shed formed between warp yarns on a loom wherein the weft yarn is continuously supplied from a source located outside of the shed and is inserted into the shed by a carrier attached to a reciprocable inserter, the improvement comprising a pair of rotatably mounted pulleys positioned in said carrier, the first of said



4,051,874

SPRING LOOP KEY RING AND METHOD AND APPARATUS FOR MAKING SAME

Gilbert F. Hardy, 8191 Sterling Ave., Huntington Beach, Calif. 92646

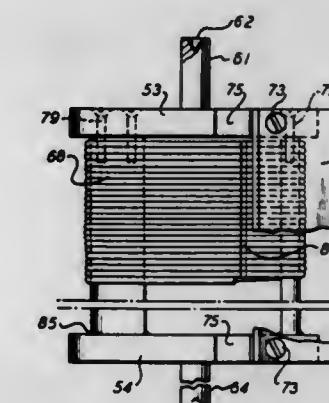
Division of Ser. No. 551,900, Feb. 21, 1975, Pat. No. 3,970,227.

This application July 9, 1976, Ser. No. 703,806

Int. Cl.² B21F 37/02

U.S. Cl. 140—88

5 Claims



1. Apparatus for making a key keeper having separated small and large half loops connected by straight, tangentially oriented side rods and comprising a semi-cylindrical first arbor, a semi-cylindrical second arbor parallel to the first arbor, means spacing the two arbors, pivot means fixed to the spacing means, and a clamp bar removably secured to the spacing means.

4,051,875

CONDUCTOR WRAPPING BIT

William J. Baker, and Clifford L. Galloup, both of Reed City, Mich., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Jan. 31, 1977, Ser. No. 763,948

Int. Cl.² B21F 15/00; B25F 1/00; H02G 1/12

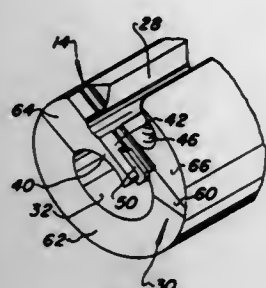
U.S. Cl. 140—124

8 Claims

1. A bit rotatable about a longitudinal axis for wrapping a flexible insulated conductor wire about a terminal in a series of helical convolutions comprising:

- an end face;
- a terminal receiving bore in said end face;
- a longitudinal conductor wire receiving groove in said bit and opening at one end to said end face;
- means forming a surface extending substantially transversely with respect to said axis across the opening of said groove to said end face for guiding and supporting said conductor wire after it is withdrawn from said groove; and,
- means forming a cutting edge disposed along said surface

and extending in a substantially transverse direction with respect to said axis for continuously slitting the insulation of said conductor wire in a substantially longitudinal



direction with respect to said conductor wire after said conductor wire is withdrawn from said groove and before said conductor wire is wrapped on a terminal.

4,051,876

MANUFACTURE OF TUBULAR TYPE BATTERY PLATES

Stanley Charles Foulkes, Deane, England, assignor to Chloride Group Limited, London, England

Filed Dec. 22, 1975, Ser. No. 642,734

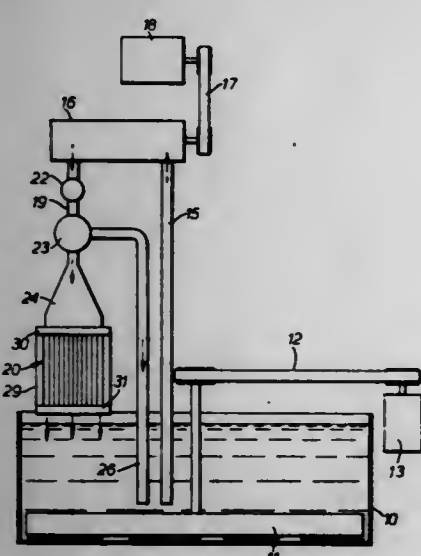
The portion of the term of this patent subsequent to May 3, 1974, has been disclaimed.

Claims priority, application United Kingdom, Dec. 23, 1974, 40962/74; Oct. 15, 1975, 42361/75

Int. Cl.² B65B 1/04

U.S. Cl. 141—1.1

11 Claims



1. A method for preparing enveloped plates for batteries by introducing an active material composition containing liquids into the porous envelope of the plate, when the envelope is assembled on the current conducting element of the plate, characterized by using an active material composition which is an alkaline active material composition wherein the composition is introduced into said envelope as a slurry having a rotating vane viscometer torque value of less than 0.006 lbs. ft. at 20° C. and after the envelope has filled, the back pressure in the supply of slurry to the envelope is allowed to build up to a pressure above 5 p.s.i. but not in excess of 100 p.s.i. and the pressure thereafter being released.

4,051,877

GAS COMPRESSION APPARATUS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an investment of Leslie S. Torp, Scottsdale, Ariz.

Filed Oct. 24, 1975, Ser. No. 625,734

Int. Cl.² B65B 57/00; F04B 17/00

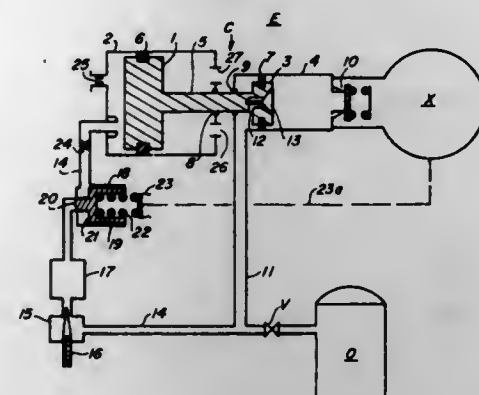
U.S. Cl. 141—4

16 Claims

5. Apparatus for transferring fluid from a low pressure to a higher pressure comprising:

a. a source of fluid under low pressure;

- b. a receiver for receiving fluid under high pressure;
- c. a first cylinder adapted to receive fluid from said low pressure source;
- d. a second cylinder, of smaller diameter than said first cylinder, adapted to receive fluid from said low pressure source and to deliver fluid to said receiver at a high pressure;
- e. first and second pistons rigidly connected to each other by a rod and adapted to reciprocate simultaneously within said first and second cylinders respectively;
- f. first vent means in said first cylinder and located on the rod side of said first piston for continuous communication with the ambient environment;
- g. first conduit means for supplying fluid from said low pressure source to said first cylinder;



- h. second conduit means for supplying fluid from said low pressure source to said second cylinder;
- i. third conduit means for delivering fluid at high pressure from said second cylinder to said receiver;
- j. capacitance means located in said first conduit means for receiving and storing fluid at low pressure;
- k. control means located between said capacitance means and said first cylinder and responsive to the pressure within said capacitance means and said receiver for intermittently releasing fluid from said capacitance means for expansion against the face of said first piston; and,
- l. second vent means in said first cylinder and located on the face side of said first piston for exhausting said intermittently introduced fluid after expansion against the face of said piston.

4,051,878

ROTARY FILLER APPARATUS

Peter M. Ohmels, Monroe; Robert L. Gehring, Sloatsburg, and Roger A. Hahn, Warwick, all of N.Y., assignors to Avon Products, Inc., Suffern, N.Y.

Continuation of Ser. No. 439,533, Feb. 4, 1974, abandoned. This application Feb. 12, 1976, Ser. No. 657,695

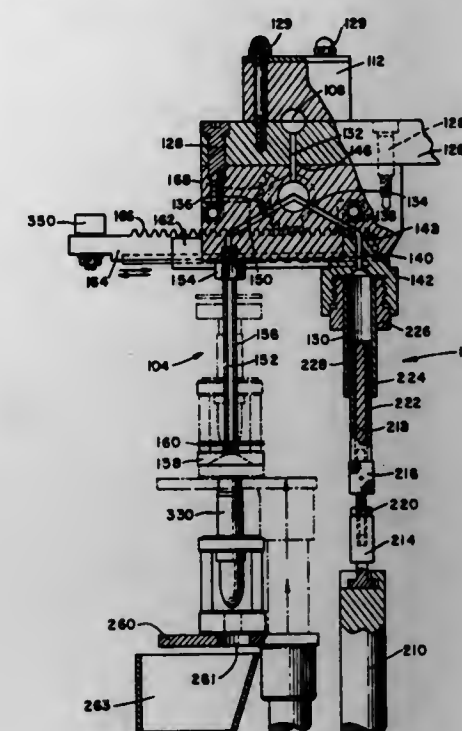
Int. Cl.² B65B 3/12, 43/42

U.S. Cl. 141—82

2 Claims

1. A filling apparatus for filling one after another a plurality of molds comprising a substantially continuous flow of molds with fluid material of the type which tends rapidly to set up and/or settle when not subject substantially constantly to flowing movement, said filling apparatus comprising a manifold, said manifold including an inlet to and an outlet from an elongated path, means for connecting a source of fluid material both to said inlet and said outlet whereby said fluid material after flow through an elongated path returns to said source, said connecting means including means for continuously flowing said fluid material into said inlet; at least one filling module including a stem having an inlet and an outlet, a cylinder, a piston movable in said cylinder in opposite directions between a pair of limit positions, passage means providing fluid connection between said elongated path, said inlet of said stem and said cylinder, said passage means including a cylindrical opening and having three paths directed radially of said opening at substantially equidistant spacing therearound, and wherein a first of said paths is connected to said elongated path, while a second of said paths is connected to said cylinder and a third of

said paths is connected to said stem, and a valve, said valve received in and rotatable about said cylindrical opening, said valve having internal passage means providing fluid connection between selected pairs of said first, second and third paths; means controlling the movement both of said piston in said cylinder and said valve in said cylindrical opening, said controlling means functioning when said piston moves in a cylinder charging direction to provide a fluid flow through said first



and second paths and when said piston moves in a cylinder discharging direction to provide a fluid flow through said second and third paths; means for supporting each said mold to be filled; and means for moving one of said support means and filling module relative to the other so that during filling of each said mold said outlet of said stem moves upwardly toward the opening of said mold, yet remains beneath the surface of said fluid material in said mold as said mold is filled.

4,051,879

APPARATUS FOR POURING LIQUID IN CUPS

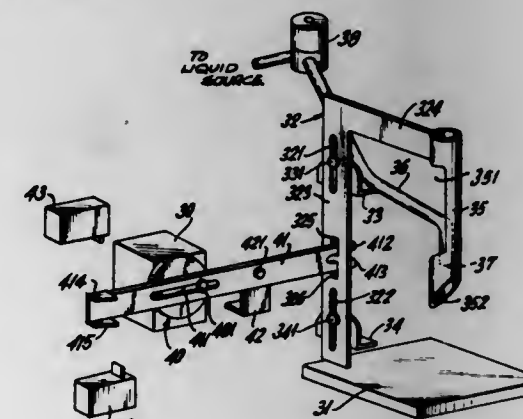
Katsunari Itagaki, Azuma, Japan, assignor to Sankyo Electric Company Limited, Itoesaki, Japan

Filed June 15, 1976, Ser. No. 696,393

Int. Cl.² B65B 3/34

U.S. Cl. 141—329

7 Claims



1. Apparatus for automatically perforating a cover of a container and pouring a predetermined quantity of liquid into said container including: means to support said container in a predetermined position; a movable tubular member having a longitudinal axis disposed substantially perpendicularly to said cover of said container when said container is in said predetermined position, said tubular member having a sharpened end

disposed adjacent to said cover and an elongated longitudinal aperture; driving means to move said tubular member in a continuous reciprocating motion in the plane of said axis with a stroke of sufficient length that said sharpened end of said tubular member perforates said cover of said cup; means to activate said driving means; a source of liquid; a fixedly mounted pipe having an input and an output end, said input end of said pipe being connected to said source of liquid and said pipe extending through said elongated aperture in said tubular member so that said output end is disposed within said tubular member; valve means to control the flow of liquid through said pipe; first detector means for detecting that said tubular member is at a first predetermined position perforating the cover of said container; timer means responsive to said first detector means to open said valve means for a predetermined period permitting the flow of liquid from the output end of said pipe; second detector means for detecting that said tubular member is at a second predetermined position spaced from the cover of said container; and means responsive to said second detector means to deactivate said driving means.

4,051,880

DUSTLESS ROUTERS

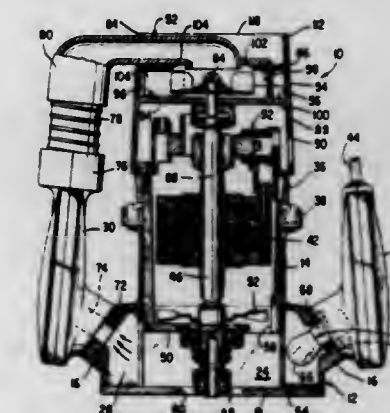
Charles E. Hestily, Greenville, S.C., assignor to The Singer Company, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,916

Int. Cl.² B27G 71/00

U.S. Cl. 144—252 R

10 Claims



1. A dustless portable electric router comprising: a. a base having a dust chamber formed therein, b. a handle connected to the base, c. a passage formed in the handle in communication with the dust chamber, d. a motor mounted to the base to be axially adjustable therein, e. the motor having a shaft therein rotatable to actuate the router, f. a blower having a rotor affixed to and rotatively driven by the motor shaft, g. a conduit interconnecting the handle passage to the blower whereby dust and debris collected in the dust chamber will be drawn into and discharged from the blower, and h. a dust bag connected to the blower to collect the blower discharge.

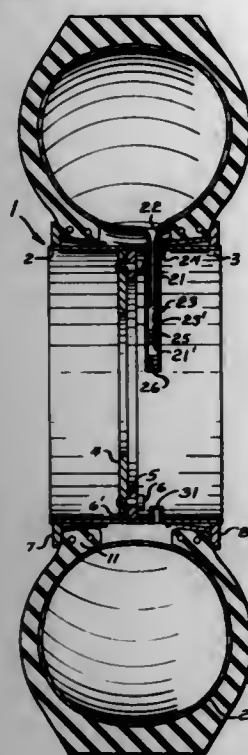
4,051,881 CURING RIM

Harold Severin Peterson, Fargo, N. Dak., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Mar. 15, 1976, Ser. No. 666,607

Int. Cl.² B25H 1/00

U.S. Cl. 144—288 A



9 Claims

sheet by infeed conveyor elements which are continuously moving at a first predetermined speed in said direction and simultaneously drivingly contacting the opposite surfaces of said sheet by outfeed conveyor elements located at positions close to and downstream of the positions at which said infeed conveyor elements drivingly contact said sheet, said outfeed conveyor elements continuously moving in said direction at a second predetermined speed which is slower than said first predetermined speed so that a uniform compression force is continuously applied to successive portions of the sheet in the direction of movement thereof and against the grain thereof sufficient to extract water therefrom, to cause the water content of the sheet to be more uniform along the length thereof and to break tubular membranes in the veneer sheets; and simultaneously confining said opposite surfaces of the sheet against movement transverse to said direction from the time the sheet enters between said infeed conveyor elements until the time it leaves said outfeed conveyor elements to prevent the sheet from buckling.

4,051,883 PUNCTURE-PROOF TIRES

Jakob Ippen, Leverkusen-Steinbuechel, and Friedel Stuttgarten, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

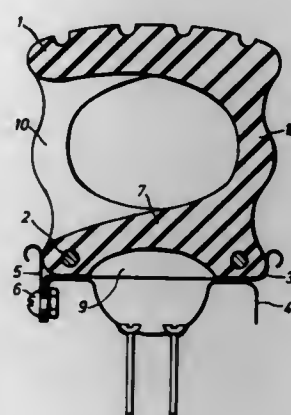
Filed Dec. 15, 1975, Ser. No. 640,719

Claims priority, application Germany, Dec. 19, 1974, 2460051

Int. Cl.² B60C 7/08

U.S. Cl. 152—324

3 Claims



1. A vehicle tire comprising an outer tread element, a foot adapted to contact a wheel felly, the foot having two peripherally-disposed outer portions, a resilient connecting portion connecting the tread element and the foot, the connecting portion comprising a plurality of radially and evenly spaced supporting members, consecutive supporting members being arranged on opposite sides of the center of the tire, the foot comprises two unstressed reinforcing circular wire cores disposed within the two outer portions of the foot, the tire comprises a plurality of segments alternately arranged in opposite directions, each segment comprising a portion of the tread, a supporting member and a portion of the foot, the segments having concavely curved inner walls and convexly curved outer walls, the foot has an indentation of the inner side thereof, the indentation extending around the entire circumference of the tire.

4,051,884 PNEUMATIC TIRE CONTAINING GEL LUBRICANT

Alan John Bourne, Sutton Coldfield, and Trevor John Walton, Tamworth, both of England, assignors to Dunlop Limited, London, England

Filed Nov. 24, 1975, Ser. No. 634,847

Claims priority, application United Kingdom, Dec. 4, 1974, 52342/74; Aug. 19, 1975, 34509/75

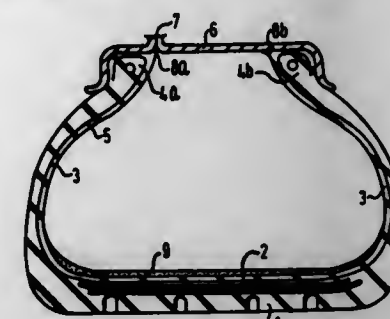
Int. Cl.² B60C 17/00, 21/08

U.S. Cl. 152—330 L

37 Claims

1. A pneumatic tire having on its internal surface a coating of

a lubricant gel having a viscosity and mechanical stability such that it remains on the tire surface and does not flow when the tire is in normal use in an inflated tire and wheel assembly, said gel comprising a poly(alkylene oxide) lubricant gelled with a finely divided silica having a surface area above 150 square meters/gram and a gel-strengthening amount of an ionic salt having a pH in the range 5.5 to 8.5 when in a 0.1 molar aqueous



solution, said salt being capable of producing a gel viscosity (measured at 20° C at a shear rate of 0.31 reciprocal seconds) in the range 3000 to 7000 Newton.seconds per square meter by mixing 2 milliliters of a suitably concentrated aqueous solution of the salt with 100 grams of the poly(alkylene oxide) lubricant and the silica in a lubricant:silica weight ratio of not greater than 92.5:7.5.

4,051,885 TIRE AND WHEEL ASSEMBLIES

Tom French; Reginald Harold Edwards, both of Sutton Coldfield, and Leslie Vernon Powell, Lichfield, all of England, assignors to Dunlop Holdings Limited, London, England

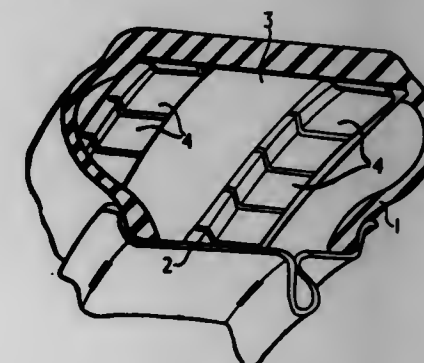
Continuation of Ser. No. 150,627, June 7, 1971, abandoned. This application Nov. 6, 1975, Ser. No. 629,522

Claims priority, application United Kingdom, June 20, 1970, 30027/70

Int. Cl.² B60C 17/00, 17/04

U.S. Cl. 152—330 L

16 Claims



1. A pneumatic tire having a tread area and a pair of sidewalls defining an interior surface, each sidewall having an annular bead and having attached to but separate from its interior surface a closed enclosing means extending around the circumference of the tire in a position opposite said beads and containing a lubricant for the interior surfaces of the tire, means for releasing said lubricant from said enclosing means onto the interior surfaces of the tire which contact each other upon substantial under-inflation or deflation of the tire to facilitate relative movement between the contacting interior surfaces of the tire.

4,051,886 SATURATED LIQUID/VAPOR GENERATING AND DISPENSING

Edward Alan Ross, Willowdale, Canada, assignor to Liquid Carbonic Canada Ltd., Canada

Division of Ser. No. 392,000, Aug. 27, 1973. This application

Mar. 1, 1976, Ser. No. 662,896

Int. Cl.² B22C 9/14

U.S. Cl. 164—16

26 Claims

1. A method of making a number of foundry cores serially in which a foundry aggregate mixed with a curable binder is

introduced into a core box cavity to form each green core and each green core is gassed by passing into it a predetermined dose of a vapor under pressure of a normally liquid curing agent for the binder and an inert carrier gas and then a purging gas is passed through the core to drive out unreacted curing agent, the improvement comprising,

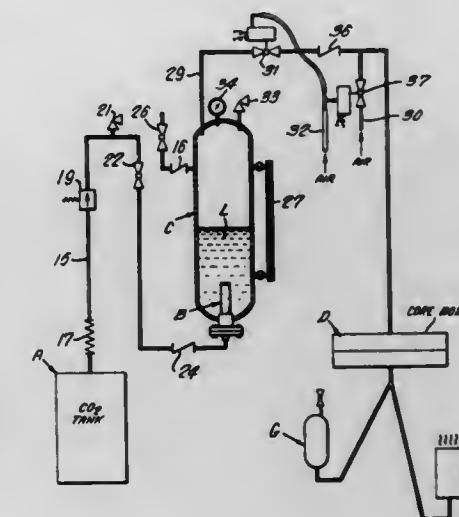
providing a supply of said liquid agent and an overlying supply of vapor in a pressure vessel under a predetermined pressure,

gassing a plurality of cores in series by dispensing vapor from the vapor space in a continuous series of intermittent bursts one to each core in succession, each burst producing a pressure drop within the vessel intervened by a short nondispensing period,

during each nondispensing period, flushing through each core a purging gas,

responsive immediately to the pressure drop caused by each burst introducing carrier gas under pressure into a bottom zone of the vessel during each burst and following nondispensing period until equilibrium pressure is restored therein and the vapor lost in said burst is replaced,

finely dividing said carrier gas as it is introduced to form in said liquid a mass of minute bubbles effective to provide intimate contact between gas and liquid whereby a saturated vapor is formed to the exclusion of entrained liquid and conveyed to the vapor space during each nondispensing period,



maintaining a relationship between the depth of the vapor space, the head of liquid above the introduction zone, the relative volume of each burst to that of the vapor space, the frequency of the bursts, and the initial size of the bubbles so as to ensure the presence in the vapor space of a true saturated vapor substantially free of entrained liquid.

23. An apparatus for the gassing of cold box cores with the saturated vapor in a carrier gas of a curing substance which is normally liquid at ambient temperatures, comprising,

a cold box having a core cavity for a core of finely divided aggregate and curable binder,

a pressure vessel for containing a body of liquid covered by an atmosphere of saturated vapor of a normally liquid curing substance under pressure,

a vapor-dispensing communication from an upper position in the vapor space in the vessel leading to the core cavity,

means for controlling the vapor-dispensing communication whereby saturated vapor of a curing agent for said binder is dispensed from the vessel in bursts of predetermined size,

near the bottom of the liquid space in the vessel a partition of a porous medium having in contact with the liquid an extensive surface having pores of mean diameter not greater than about 10 microns,

a source of carrier gas under pressure and communication therefrom to the side of the partition remote from the liquid,

a source of purging gas under pressure and a purging gas communication therefrom to the core cavity, means for controlling the purging gas communication whereby purging gas is supplied to the core cavity in predetermined amount, timing means for synchronizing the means for controlling the vapor communication with the means for controlling the purging gas communication, whereby, in a continuous cycle, an amount of vapor is dispensed effective to cure the core and immediately following an amount of purging gas is dispensed effectively to purge the core, means for regulating the pressure of the carrier gas supplied to a predetermined pressure whereby gas of substantially said pressure is passed through the partition to the liquid to form bubbles, responsive immediately to the pressure drop caused by the dispensing of each burst of vapor until equilibrium pressure is restored and the vapor lost in said burst is replaced by the introduction of additional gas.

4,051,887

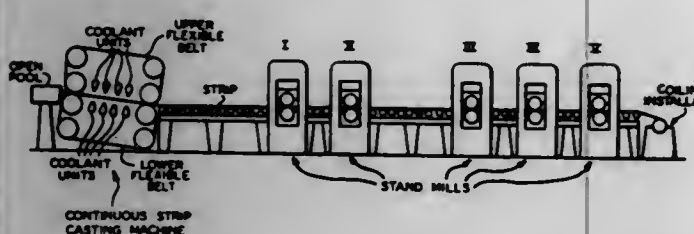
PROCESS FOR PRODUCING SHEETS AND STRIP OF ZINC-COPPER-TITANIUM ALLOY

Volker Groth, Offen; Adolf Stradmann, Datteln, and Erich Felsel, Puchheim, all of Germany, assignors to Rheinisches Zinkwerk GmbH & Co. KG, Datteln, Germany
Filed Mar. 8, 1976, Ser. No. 664,728

Claims priority, application Germany, Mar. 13, 1975, 2510985
Int. Cl.² B22D 11/12

U.S. Cl. 164-76

5 Claims



1. Process for producing deep-drawable sheets and strip by means of a continuous casting machine with moving flexible belts and continuous finish-rolling without change of direction, which comprises providing a zinc-copper-titanium alloy which is creep-resistant according to DIN 17 770 and foldable according to DIN 1 623, consisting of 1.5 to 5.5% copper, 0.05 to 0.25% titanium and balance zinc, wherein an increase in copper content is accompanied by a decrease in titanium content, continuously casting the zinc-copper-titanium alloy having a thickness of 6-24 mm and an effective width up to 2000 mm causing the slab to solidify simultaneously and uniformly from both sides at a constant volumetric solidification rate, and subsequently hot-rolling said slab at a temperature above 100° C in at least three, passes, each of which results in an effective reduction in cross-section not in excess of 80%.

4,051,888

LOW TEMPERATURE ENERGY CARRYING APPARATUS AND METHOD

Takamori Yamada, Kyoto; Shigoru Mori, Sakai; Kaoru Kato, Hirakata; Yasuyuki Arai, Osaka, and Katsumi Sakitani, Kawachinagano, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 485,998, July 5, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,833
Claims priority, application Japan, July 7, 1973, 46-76751

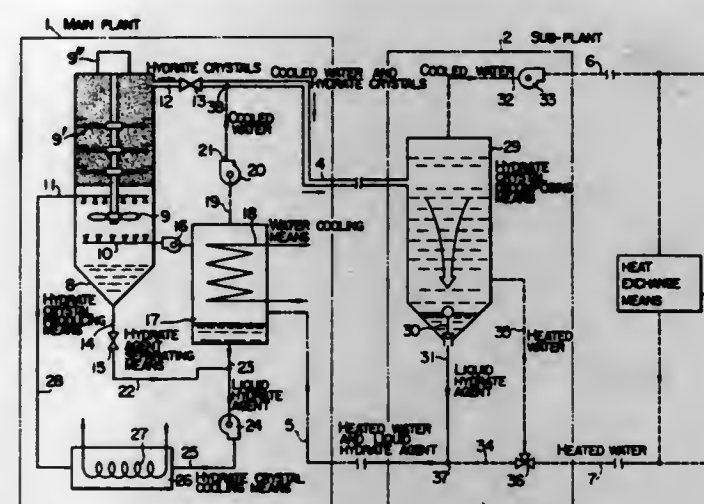
Int. Cl.² F28D 15/00

U.S. Cl. 165-1

7 Claims

1. A low temperature energy carrying apparatus comprising: a first water circulating system including a hydrate agent separating means (17) in which the hydrate agent is CH_3H_2 , CH_3FC , CFC_2 , CO_2 , CF_3Br , $n\text{-C}_4\text{H}_{10}$ or $i\text{-C}_4\text{H}_{10}$ disposed in the side of low temperature energy supply and having a water

cooling means (18), at least one heat exchange means (3) disposed in the side of users, feed conduit means (19, 21, 4, 32, 6) connecting said hydrate agent separating means (17) to said heat exchange means, return conduit means (7, 34, 5) connecting said heat exchange means (3) to said hydrate agent separating means (17), and a pump means (20) disposed in said feed conduit means (19, 21); a hydrate circulating system for circulating a liquid hydrate agent and hydrate crystals incorporated with said first water circulating system and a second water circulating system incorporated with said first water circulating system and said hydrate circulating system; said hydrate circulating system including a hydrate crystal producing means (8) disposed in the supply side, a hydrate crystal decomposing means (29) disposed in the users side, feed conduit means (12, 4) connecting said hydrate crystal producing means (8) to said hydrate crystal decomposing means (29), and return conduit means (31, 5, 23, 25, 28) connecting said hydrate crystal decomposing means (29) through said hydrate agent separating means (17) to said hydrate crystal producing means (8), said second water circulating system including said hydrate crystal decomposing means (29) and said heat exchange means (3) disposed in the users side, feed conduit means (32, 6) connecting said hydrate crystal decomposing means (29) to said heat exchange means (3), and return conduit means (7, 25) connecting said heat exchange means (3) to said hydrate crystal decomposing means (29) and including a pipe (7) and a



branch pipe (35) therefrom for receiving part of heated water flowing in said pipe (7) and returning the part to said hydrate crystal decomposing means (29), said three circulating systems being incorporated such that hydrate crystals discharged through said feed conduit means (12) from said hydrate crystal producing means (8) are mixed with cooled water from said hydrate separating means (17) at at least several percent thereof and are fed through said feed conduit means (4) to said hydrate crystal decomposing means (29) and then said hydrate crystals decompose in said hydrate crystal decomposing means (29) to effect cooling of said part of heated water returned through said return conduit means (7, 35) from said heat exchange means (3) by absorbing latent heat upon decomposition, said cooled water being fed through said feed conduit means (32, 6) to said heat exchange means (3) together with said cooled water from said hydrate agent separating means (17), while liquid hydrate agent formed in said hydrate crystal decomposing means (29) is returned through said return conduit means (31, 5) to said hydrate agent separating means (17) together with the remaining part of heated water from said heat exchange means (3), said liquid hydrate agent being separated from said heated water in said hydrate agent separating means (17) and returned through said return conduit means (23, 25, 28) to said hydrate crystal producing means (8), and further said pump means (20) allowing the pressure in said hydrate circulating system to be maintained in the liquid phase area of said hydrate agent.

4,051,889

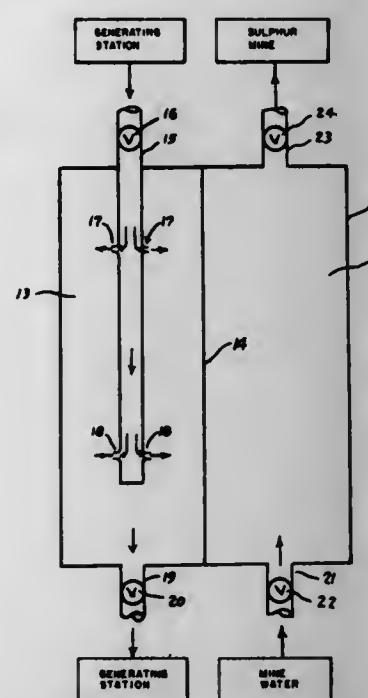
HEATING FRASCH SULPHUR MINE WATER USING WASTE HEAT

Xerxes T. Stoddard, 4617 W. 27th Ave., Denver, Colo. 80212, and Ruel C. Terry, 3090 S. High St., Denver, Colo. 80210
Filed Mar. 26, 1976, Ser. No. 670,986

Int. Cl.² F28D 17/00

U.S. Cl. 165-1

8 Claims



1. A method of coupling a steam-electric generating station to a Frasch process sulphur mine so that a portion of the waste heat from electric generation can be used in the process of mining sulfur, comprising the steps of establishing a coupling heat exchange means, diverting exhaust steam from the steam-electric generating plant into the coupling heat exchange means, circulating mine water through the coupling heat exchange means, reducing the pressure of the steam within the coupling heat exchange means, condensing the steam into water within the coupling heat exchange means with the resultant liberation of heat, transferring the heat from the hotter steam and condensed steam to the cooler circulating mine water, withdrawing the mine water, and directing the mine water to the sulphur mine.

4,051,890

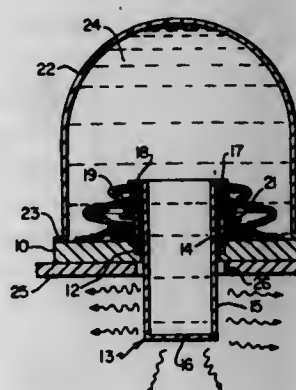
DIRECTIONAL HEAT TRANSFER UNIT

August S. Melchior, Rte. 4, Box 156, Wilson, N.C. 27893
Filed May 18, 1976, Ser. No. 687,561

Int. Cl.² F28F 13/00

U.S. Cl. 165-32

6 Claims



1. Apparatus for transferring heat from a heat source to a remote location comprising a base having an opening there-through, a hollow body means normally disposed on one side of said base but mounted for movement through the opening of

said base, said body means being closed at one end and open at the other end, flexible resilient skirt means connecting said other end of said body means to said base, shield means mounted on said base in spaced relationship with said skirt means and said other end of said body means, a heat expandable fluid medium entirely filling the space between said shield means and said skirt means as well as entirely filling said body means, whereby heat absorbed by said fluid medium causes said medium to expand and move a portion of said body means through the opening in said base so that heat in said body means is dissipated on the other side of said base.

4,051,891

HEAT TRANSFER BLOCK MEANS

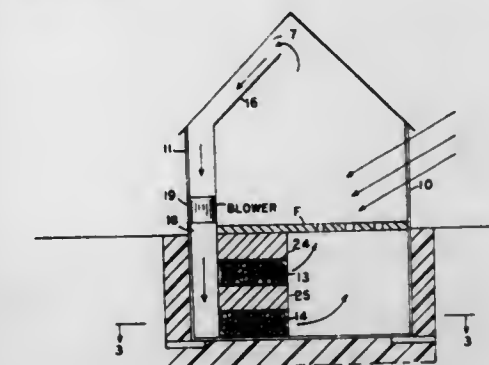
Henry Harrison, Locust Valley, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,502

Int. Cl.² F24D 5/02, 5/10, 11/00; F24H 7/02

U.S. Cl. 165-54

2 Claims



1. Heat transfer means comprising a plurality of modular heat transfer blocks adapted to form a passage for heat transfer fluid, exchanging heat with heat storage materials, when heat transfer blocks being in layered contact with said heat storage materials, each of said heat transfer blocks comprising a center core of substantially equally sized stones, said stones being cemented together with voids in between, and at least one modular heat transmitting panel cemented to the center core.

4,051,892

HEAT DISSIPATION SYSTEM

Arnold Otto Winfried Reinsch, 13170 Carousel Lane, Del Mar, Calif. 92014

Filed Dec. 16, 1974, Ser. No. 533,287

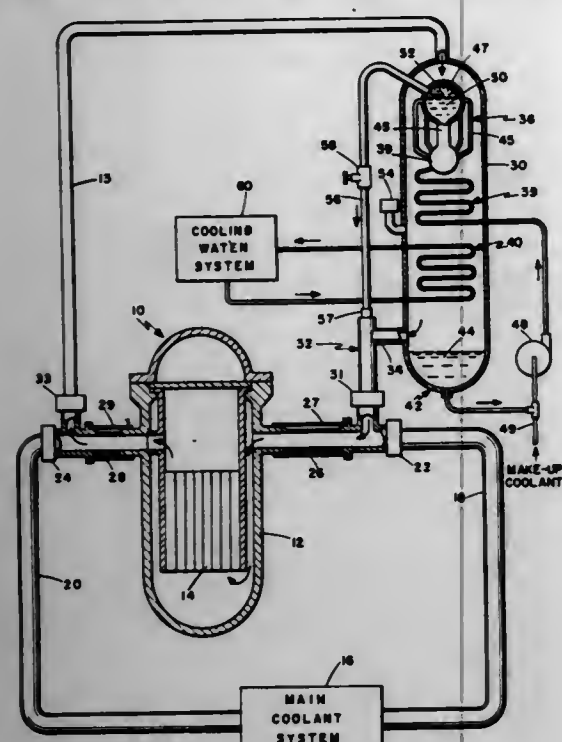
Int. Cl.² F28D 15/00; G21C 9/00

U.S. Cl. 165-107

5 Claims

1. A heat dissipation system comprising: a contained source of heat, a fluid circulation conduit for circulation of fluid to and from said contained source of heat, coolant fluid in said fluid circulation conduit consisting of a gaseous two-component mixture, one component being a condensable vapor at the conditions prevailing in the system, a jet circulator means in said fluid circulation conduit having a coolant fluid inlet and a coolant fluid outlet and having a motive fluid inlet, a vaporizer means in said fluid circulation conduit, containing a coolant fluid flow path with a coolant fluid inlet and outlet and a feed water flow path having a water inlet and a vapor outlet for extracting heat from said coolant fluid and thereby converting a condensed fraction of said coolant fluid in said feed water flow path into vapor, the coolant fluid outlet of the heat source being connected to the coolant fluid inlet of said vaporizer, said vapor having a pressure greater than the pressure of said coolant fluid in said fluid circulation conduit,

the vapor outlet of said vaporizer means is connected to said motive fluid inlet of said jet circulator means, the coolant fluid outlet of said vaporizer is connected to said coolant fluid inlet of said jet circulator means, said coolant fluid outlet of said jet circulator means is connected to the coolant fluid inlet of the heat source, heat rejection means in said fluid circulation conduit downstream of said vaporizer means but upstream of the heat source for removing heat from said coolant fluid and



partially condensing said condensable vapors into a condensed fraction of said coolant fluid, means incorporated in said heat rejection means for separating the condensed fraction from the remaining coolant fluid, and condensate delivery means for collecting said condensed and separated coolant fluid fraction and delivering it to the inlet of the feed water flow path of said vaporizer means.

4,051,893

AIR CURTAIN-PROJECTING VENTILATOR

Raul Guilbert, 8343 W. 4th St., Los Angeles, Calif. 90048

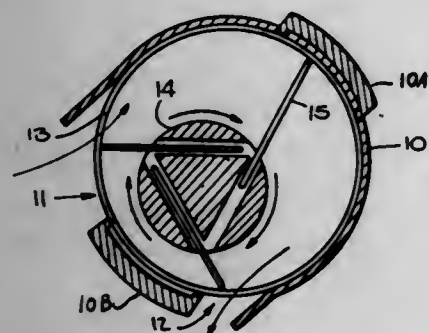
Filed Aug. 16, 1976, Ser. No. 714,832

Claims priority, application Argentina, Aug. 18, 1975, 259758; Aug. 18, 1975, 259759

Int. Cl.² F28F 13/12; F24F 9/00

U.S. Cl. 165—125

11 Claims



1. An air curtain-projecting ventilator formed by an elongated air pump comprising:

A. a stator assembly formed by a tubular casing having a relatively broad intake slot and a narrower outlet slot in parallel relation thereto, the slots extending longitudinally the full length of the casing, and an open-coil helix lining the casing, the convolutions of the helix bridging the slots

to define grids thereacross which in no way interfere with the flow of air through the slots;

B. a rotor shaft mounted eccentrically within the helix and extending the length thereof, said shaft being driven at high speed; and

C. a set of extensible vanes supported on said shaft, said vanes when extended by centrifugal force being caused to engage the convolutions of said helix and to slide therealong in an uninterrupted circular path whereby the helix functions to engage the vanes within the casing without interfering with the incoming flow of air through said intake slot and its ejection through said outlet slot to produce a high velocity air curtain.

4,051,894

SINGLE STRING HANGER SYSTEM

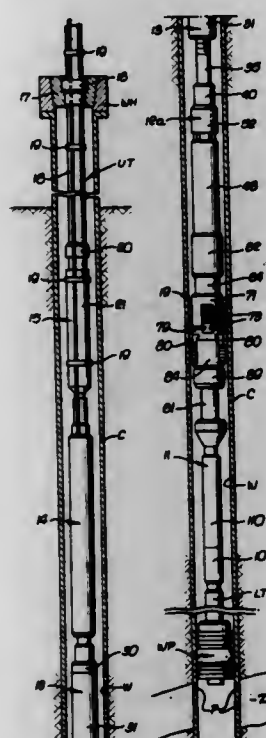
Bobby F. Goad, Spring, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed July 12, 1976, Ser. No. 704,125

Int. Cl.² E21B 7/12

U.S. Cl. 166—73

7 Claims



1. Well production apparatus comprising lower subsurface tubing hanger means adapted to be disposed in a well casing set within a well and to support lower tubing extending downwardly in the well casing from the lower hanger means, upper tubing hanger means disposed at the surface of the well, a well head seat at the surface of the well for said upper tubing hanger means, upper tubular means extending from said lower tubing hanger means to said upper hanger means, said upper tubular means including a spacer connected to said lower hanger means, safety valve means connected to the upper end of said spacer, and means including upper tubing connected to the upper end of said valve and to said upper tubing hanger means, control tubing connected to said safety valve for feeding fluid under pressure to said valve to actuate the same, said control tubing extending upwardly along said upper tubular means, means securing said control tubing to said upper tubular means, said spacer comprising upper and lower members and means interconnecting said members to change the effective length of said upper tubular means in responsive to movement of said upper tubular means, control tubing and upper member relative to said lower member to bring said upper tubing hanger means downwardly into engagement with said well head seat and with said upper tubular means engaged by said lower tubing hanger means.

4,051,895

POSITIONING TOOL

Hugh D. Embree, Lafayette, La., assignor to Production Specialties, Inc., Lafayette, La.

Filed July 14, 1976, Ser. No. 705,144

Int. Cl.² E21B 7/06

U.S. Cl. 166—117.5

5 Claims



1. A well valve handling apparatus for use in placing a valve in or removing a valve from a well tubing having a plurality of tubing mandrels each having a main bore therethrough and a side pocket offset from the main bore and including an orientation sleeve mounted in the main bore having a longitudinal orientation slot and a shoulder therein comprising:

- a. an elongated cylindrical body member;
- b. an elongated plunger telescopically and nonrotatably arranged in said body member;
- c. spring means abutting spaced shoulder means on said body member and elongated plunger to tend to urge said elongated plunger and body member into abutting relation adjacent their upper ends;
- d. a guide key pivotally mounted on said body member by a shear pin;
- e. said body member having a slot therein through which said guide key means projects outwardly from said body member;
- f. spring means yieldably urging said guide key means outwardly of said body member for engagement in the longitudinal orientation slot of the desired mandrel while allowing said guide key means to downwardly bypass sleeves above the desired location;
- g. shifting tool means pivotally supported by said plunger and adapted to support a valve to be positioned in the side pocket; and
- h. cooperating means on said body member and shifting tool means to retain said plunger and shifting tool means axially aligned in the main bore but operable on movement of said plunger relative to said body member for shifting said shifting tool means into the side pocket.

4,051,896

WELL BORE LINER HANGER

Amareswar Amancharla, Dallas, and Carter R. Young, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 533,935, Dec. 18, 1974, Pat. No. 3,946,807. This application Mar. 18, 1976, Ser. No. 668,288

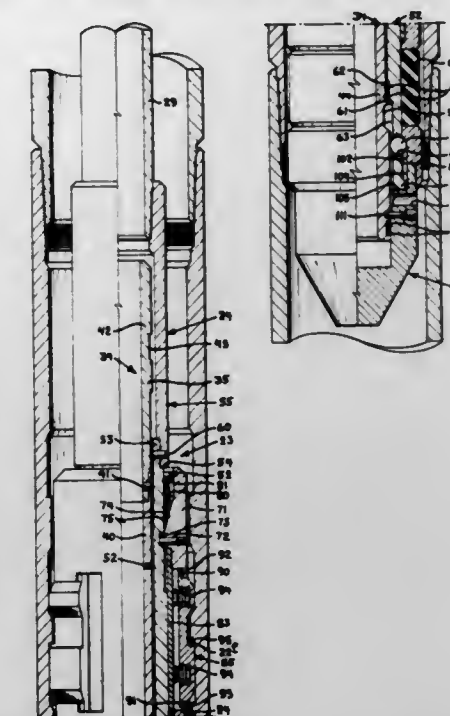
Int. Cl.² E21B 23/02, 43/10

U.S. Cl. 166—123

4 Claims

1. A casing hanger for supporting a string of lower casing from a landing nipple secured in a string of upper casing in a

well bore, said hanger comprising: a body mandrel having means at an upper end thereof for engagement of a running tool and means at a lower end thereof for connection with an upper end of a string of well casing; an expandable seal on said body mandrel for sealing around said hanger within a landing nipple; locating and locking keys on said body mandrel for locating said hanger at a landing nipple and locking said hanger against downward movement in said landing nipple; said body mandrel being movable relative to said seal and said locating and locking keys, said mandrel having means thereon to permit said locating and locking keys to expand and contract radially at a first upper position of said body mandrel and for locking said keys outwardly at upper and lower ends of said keys at a



lower position of said body mandrel; means including an operation shoulder on said body mandrel for compressing and expanding said seal responsive to downward movement of said body mandrel relative to said seal and said locating and locking keys; means between said locating and locking keys and said body mandrel releasably holding said body mandrel against movement relative to said locating and locking keys at a first upper position of said body mandrel and adapted to permit said body mandrel to move downwardly for expanding said seal and locking said keys outwardly responsive to a force applied to said body mandrel; and means connected with said locating and locking keys for holding said body mandrel at said lower position for maintaining said seal expanded and said keys locked outwardly.

4,051,897

WELL TESTING TOOL

George F. Kingelin, Rosenberg, Tex., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 30, 1975, Ser. No. 645,420

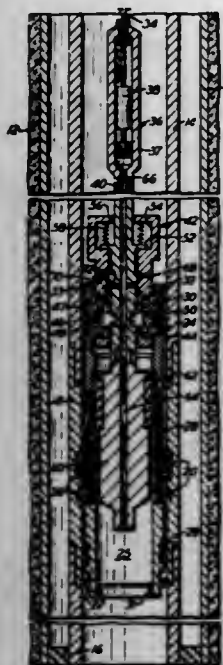
Int. Cl.² E21B 23/02

U.S. Cl. 166—125

14 Claims

1. In apparatus for use in a well having a tubing string extending down a borehole, a landing nipple connected in and forming a part of the tubing string and a locking mandrel set in the landing nipple, said locking mandrel having an opening extending longitudinally therethrough and a locking recess in the wall of the opening, a tool adapted to be run into the locking mandrel and retrieved therefrom on a wire line comprising an elongated stem, a stinger below the stem extending downwardly in the longitudinal opening in the locking mandrel, sealing elements around the stinger adapted to engage the wall of the opening through the locking mandrel positioned to prevent flow through the locking mandrel between the locking mandrel and the stem, a sleeve concentric with and longitudinally slidable on the stem, means limiting longitudinal move-

ment of the sleeve relative to the stem, locking dogs constructed and arranged to move radially outward in the sleeve into the locking recess of the locking mandrel to prevent movement of the tool upwardly relative to the mandrel, and



locking dog releasing means operable on lifting the tool to move the stem relative to the sleeve to retract the locking dogs from the locking recess to permit lifting of the tool from the mandrel.

4,051,898

STATIC HEAT-AND-MOISTURE EXCHANGER

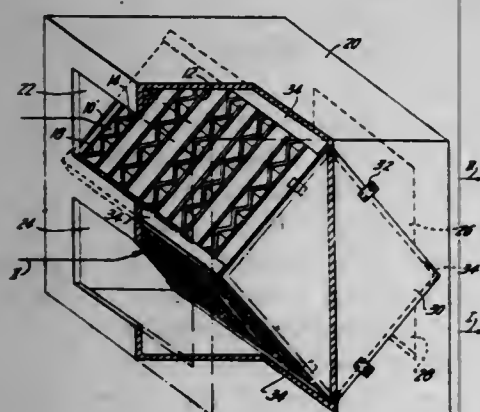
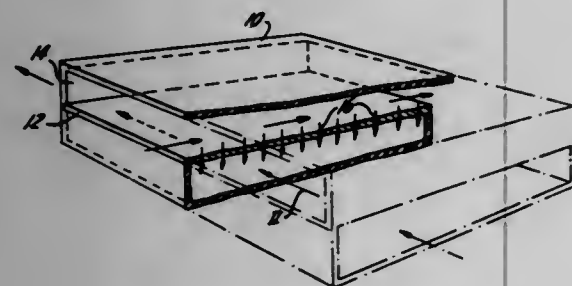
Masataka Yoshino, and Atsushi Oguri, both of Nakatsugawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 20,303, March 17, 1970, abandoned. This application Apr. 24, 1972, Ser. No. 246,994 Claims priority, application Japan, Mar. 20, 1969, 44-21477; May 8, 1969, 44-35421; May 12, 1969, 44-43466[U]; Aug. 20, 1969, 44-79026[U]

Int. Cl.² F28F 3/12

U.S. Cl. 165—166

9 Claims



1. A static heat-and-moisture exchanger core for transferring both heat and moisture between two fluid streams comprising: an enclosed shell structure having means therein defining a

plurality of openings; and heat-and-moisture transfer means statically disposed within said shell structure dividing the interior thereof into two static flow paths each communicating at opposite ends with one of said openings for effecting continuous and simultaneous transfer of both heat and moisture between two fluid streams having different temperatures and humidities flowing through respective ones of said static flow paths during use of the heat-and-moisture exchanger while the same is in a static state, said heat-and-moisture transfer means comprising a member disposed within and dividing the interior of said shell structure into said two static flow paths, said member being composed of a lamination consisting of an aggregate of fibrous material having a thickness of from 0.05 to 1 mm and which is sufficiently thermally conductive and sufficiently permeable to moisture to permit both temperature and humidity exchanges between the two fluid streams to be simultaneously and continuously effected through said member without intermixing of the fluid streams while maintaining the difference in efficiencies between the temperature and humidity exchanges at a value no greater than 40%.

4,051,899

RESET AND PULLING TOOL FOR MANIPULATING WELL SAFETY VALVE

John V. Fredd, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 668,286, March 18, 1976, abandoned, which is a division of Ser. No. 516,205, Oct. 21, 1974, Pat. No. 3,955,624. This application Oct. 5, 1976, Ser. No. 729,702

Int. Cl.² E21B 23/00, 31/02

U.S. Cl. 166—217

16 Claims



13. A reset and pulling tool for manipulating a go-devil type well safety valve in a well bore to reopen and latch said safety valve open and pull said safety valve from said bore, said tool comprising: a body having a bore therethrough; a plurality of radially movable flexible locking dogs on said body for coupling into a head end of said safety valve for resetting said valve and for pulling said valve from said bore; a longitudinally movable operator member within said body having side surfaces engageable with side surfaces along said locking dogs for holding said dogs at locking positions when said tool is coupled into said safety valve for resetting and for pulling said safety valve; means for moving said side surfaces on said operator member laterally to engage said locking dogs responsive to longitudinal movement of said operator member; means connected with said operator member for securing said tool in a tool string and for applying longitudinal forces to said tool

from said tool string; means between said operator member and said body for holding said operator member and said body against relative movement during a first mode of operation of said tool for reopening said safety valve; and means for releasing said operator member from said body for movement to a position for operation of said tool in a second mode when releasing said tool from said safety valve for retrieval from a well bore.

4,051,900

PROPPING MATERIAL FOR HYDRAULIC FRACTURING

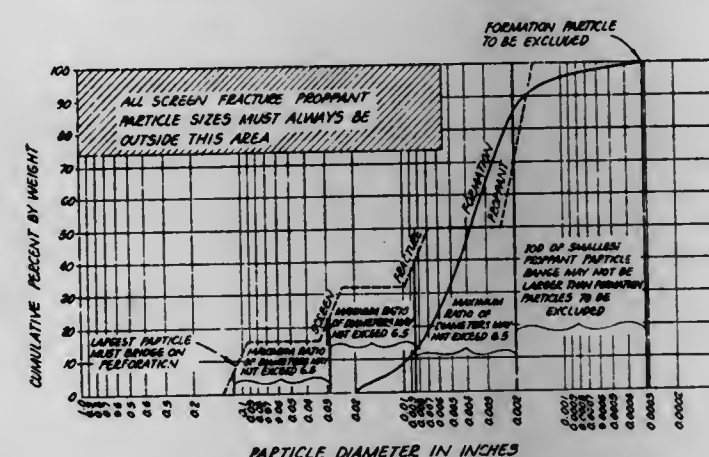
Dale Hankins, 243 Irene St., Bakersfield, Calif. 93305

Continuation-in-part of Ser. No. 479,134, June 13, 1974, abandoned. This application May 26, 1976, Ser. No. 690,147

Int. Cl.² E21B 43/04, 43/26

U.S. Cl. 166—250

7 Claims



1. The method of making a screen fracture proppant containing particles capable of retaining high operating permeability when utilized in specific geological and soil formations, which comprises the steps of:

- making a sieve analysis of the material of the specific formation to determine the diameter size measurement of the smallest particle thereof which is to be prevented from entering the openings of the proppant; and
- thereafter using as the proppant material a granular particulate having a diameter size measurement corresponding approximately to the diameter size measurement of said smallest particle of the formation multiplied by a factor no greater than 6.5.

4,051,901

PROCESS FOR WATER TREATMENT IN MOBILITY CONTROLLED CAUSTIC FLOODING PROCESS

Amir M. Sarem, Yorba Linda; Russell C. Darr, Oxnard; Dale L. Eichlepp, Santa Maria, and Robert B. Spratt, Westminster, all of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Oct. 12, 1976, Ser. No. 731,777

Int. Cl.² E21B 43/22, 33/138

U.S. Cl. 166—270

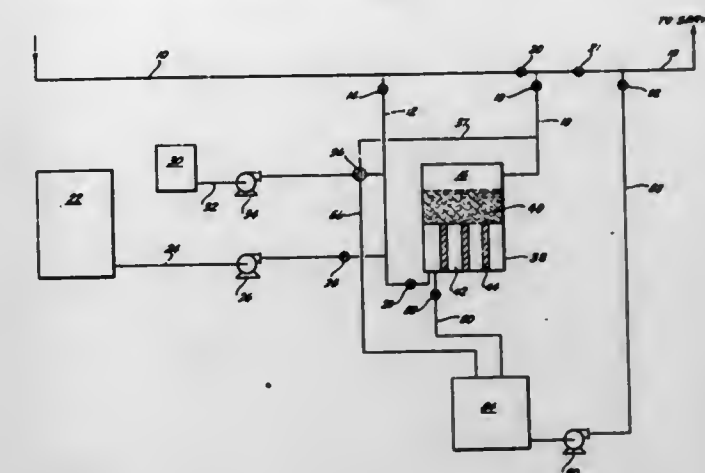
20 Claims

1. A process for recovering petroleum from a subterranean reservoir penetrated by an injection well and a production well spaced apart in the reservoir which comprises alternately injecting into the reservoir through the injection well for a selected time period a petroleum displacement fluid comprising a dilute alkaline aqueous solution of an alkali metal silicate and thereafter injecting for a selected time period a dilute aqueous precipitate-forming solution of a material that reacts with the alkali metal silicate to form a precipitate, said alkali metal silicate solution further containing alkaline insoluble, scale forming salts comprising cations which form insoluble silicates, the improvement comprising:

- separating said alkaline insoluble salts from said dilute aqueous alkali metal silicate solution prior to the injection of said solution into the reservoir thereby to reduce the

scaling tendency of said alkaline alkali metal silicate solution;

- contacting said alkaline insoluble salts with a dilute aqueous acid solution to dissolve said salts and to form a precipitate-forming solution comprising said cations which form insoluble silicates; and



- injecting into said reservoir said solution of step b subsequent to the injection of said alkaline alkali metal silicate solution where by contact between the solutions results in the formation of precipitate and the reduction of reservoir permeability in the area of contact.

4,051,902

SOIL CULTIVATING IMPLEMENTS

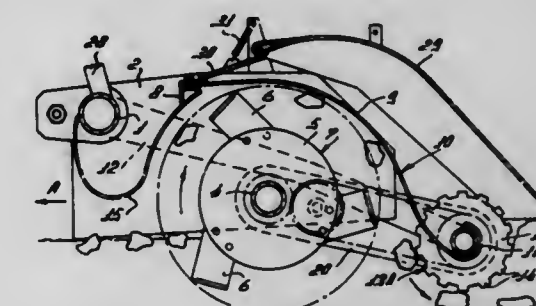
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland Filed Jan. 5, 1976, Ser. No. 646,582

Claims priority, application Netherlands, Jan. 7, 1975, 7500137

Int. Cl.² A01B 33/02, 33/16

U.S. Cl. 172—32

25 Claims



22. A soil cultivating implement comprising a frame and coupling means at the forward side of said frame that is connectable to a prime mover, a plurality of soil engaging members mounted side by side in a row that extends transverse to the direction of travel, said members being bars that extend downwardly to the rear into the soil with respect to the normal direction of travel, said bars being interconnected to one another adjacent their lower ends and positioned to guide stones and other debris downwardly into subsoil, the lower ends of said bars being interconnected by a shaft that extends transverse to the direction of travel and a plurality of discs being mounted on said shaft.

4,051,903

SOIL CULTIVATING MACHINES

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland Filed Oct. 9, 1975, Ser. No. 620,919

Claims priority, application Netherlands, Oct. 10, 1974, 7413312

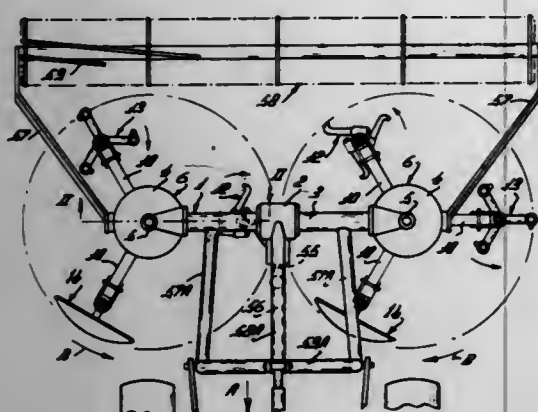
Int. Cl.² A01B 33/06, 33/10, 33/12, 33/14

U.S. Cl. 172—47

20 Claims

16. A soil cultivating machine comprising a frame and at

least one soil working member mounted on said frame, said soil working member being rotatable about an upwardly extending axis and driving means connected to rotate said soil working member about said axis, at least one soil cultivating means being mounted for free rotation on said soil working member, said cultivating means being releasably secured in mounting means on said working member and said mounting means comprising a first pivotal axis and a second pivotal axis, said



cultivating means being adjustable about both pivotal axes and fixable in any one of a plurality of different working positions relative to either pivotal axis, said cultivating means being journaled to said mounting means with a stub shaft and the longitudinal center line of at least part of said stub shaft on which said cultivating means is mounted, constituting said second pivotal axis, said cultivating means and said stub being turnable about said longitudinal center line and fixable in different angular positions, about said center line.

4,051,904

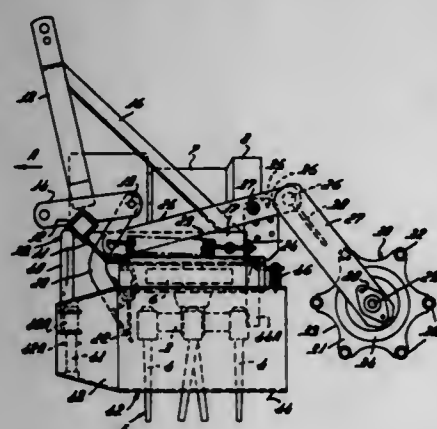
SOIL CULTIVATING IMPLEMENTS

Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands
Filed Dec. 18, 1975, Ser. No. 642,052
Claims priority, application Netherlands, Dec. 23, 1974, 7416758

Int. Cl.² A01B 33/06, 49/02

U.S. Cl. 172-49

7 Claims



7. A soil cultivating implement comprising a frame and a plurality of rotatable tined soil working members arranged in a row supported on a portion of said frame, said portion extending transverse to the normal direction of travel, a screen being mounted at each lateral end of said portion and positioned to cooperate with the tine means of the respective outermost soil working member of said row during rotation of that member, said screen being pivotable about an upwardly extending axis located near the front of said frame portion with respect to the normal direction of travel and said screen comprising a guide portion at its front end that is inclined to said direction of travel and positioned to deflect plants outwardly from the soil working members, a roller being positioned behind the soil working members and said roller being pivotably connected to said frame portion by spaced apart arm means, said arm means

including arms that are connected to the frame portion at locations intermediate opposite ends of those arms, connection means retaining said arms in chosen angular positions about pivotable connections thereof to said frame portion, said arms being spaced apart and interconnected by a transverse support that is located adjacent the rear of said frame portion, said transverse support being elongated and further arms being coupled to the transverse support and said further arms being inclined downwardly and rearwardly with respect to the direction of travel, the rear portions of said further arms coupled to said roller and retaining same in a supporting position for the implement, the outer circumference of said roller being formed by a plurality of elongate elements that extend in general alignment with the axis of rotation of the roller, said elongate elements being mounted on spaced apart supports that have recessed positioned between adjacent screening discs being positioned adjacent said further arms at the lateral ends of said rotatable supporting member.

4,051,905

DRILL FOR PERCUSSION DRILLING MACHINES

Werner Kurt M. Kleine, Uphusen, Germany, assignor to Gerbruder Heller, Uphusen, Germany
Filed Mar. 28, 1974, Ser. No. 455,896
Int. Cl.² E21C 15/02

U.S. Cl. 173-104

13 Claims



1. A drill for use in a drilling machine for working on rocks and concrete and especially for use with percussion drilling machines and rotary drill hammers, comprising an axially elongated drill shank formed of a hardened material and having a first end arranged to contact within the adapter of the drilling machine, said adapter being provided with an inner thread, said second end having an axially extending outer surface, wherein the improvement comprises that a unitary receiving part is disposed in mechanical interlocking surface contact connection with and extends at least partly about and laterally encloses the axially extending outer surface of the second end of said drill shank and is formed entirely of a plastic material which has a lower hardness than that of the material forming said shank, said receiving part having an axially extending radial inner surface in full surface contact with the axially extending outer surface of said second end of said drilling shank, said surfaces being formed for mechanical interlocking connection, said receiving part having further and axially extending radial outer surface provided with a thread for engagement with said inner thread of the adapter of the drilling machine so that because of its lower hardness said receiving part is deformable under the action of the torque transmitted to it by the adapter, said receiving part having a leading end closer to the first end of said shank and a trailing end spaced axially from the leading end, and the second end of said drill shank extending through said receiving part at least to the trailing end of said receiving part so that axial blows are transmitted directly to the second end of said drill shank.

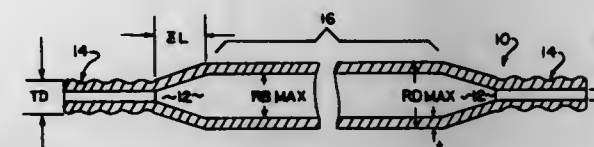
4,051,906

EXTENSION RODS USED IN PERCUSSIVE DRILLING

Edward Alfred Donegan, St. Catharines, Canada, assignor to TRW Canada Limited, Canada
Filed Mar. 3, 1976, Ser. No. 663,266
Int. Cl.² B25D 9/00

U.S. Cl. 173-131

7 Claims



1. A substantially round, percussive drill extension rod adapted to withstand high velocity strain pulses superimposed on rotary forces in percussive drilling comprising an elongated body having first and second externally threaded ends, a rod zone therebetween, and a substantially round, internal bore in the threaded ends and in the rod zone along the longitudinal axis of the body, said internal bore having a constant diameter throughout said rod zone and providing fluid communication through the extension rod along the longitudinal axis, said first threaded end having an outside diameter in the range of about 1.25 to about 2.5 inches, said rod zone having an outside diameter within a range from about equal to the outside diameter of said first threaded end to about 1.1 times the outside diameter of said first threaded end, said rod zone having an annular cross-sectional area equal to from about 0.64 to about 0.76 times the circular cross-sectional area of the outside diameter of said first threaded end, and said rod zone having an internal bore diameter equal to $2\sqrt{\text{circular cross section based on the outside diameter of the rod zone minus the annular cross section of the rod zone}} \div \pi$.

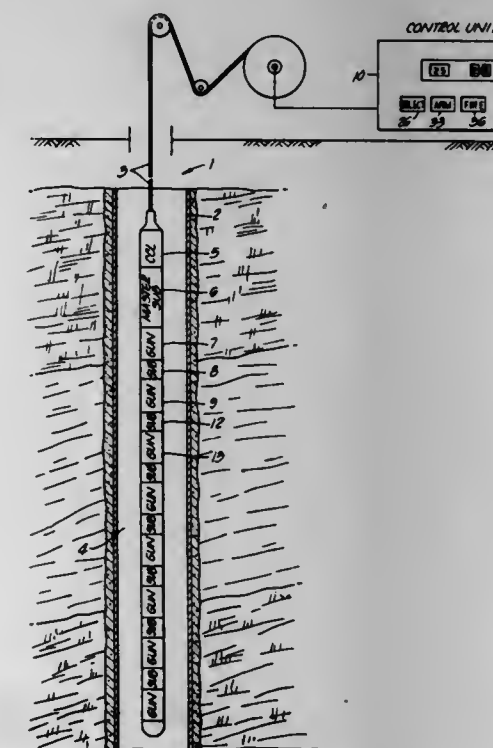
4,051,907

SELECTIVE FIRING SYSTEM

James D. Estes, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.
Filed Mar. 10, 1976, Ser. No. 665,807
Int. Cl.² E21B 43/116, 43/117

U.S. Cl. 175-4.55

4 Claims



1. A perforating gun firing system comprising, in combination, an array of guns vertically spaced in an elongated mechanical unit adapted for lowering into and positioning within a well bore, each of said guns being actuated by a slave sub associated therewith, and said unit having a master sub having its gun operatively connected therewith; an above-ground control means for producing and transmitting to said master

sub a series of electrical pulses, the number of which is indicative of the pre-selected slave sub to be armed and fired, said master sub including means responsive to said series of pulses and said slave subs including means selectively responsive to said series of pulses, whereby any of the guns in said array may be armed and fired in a selected order.

3. A slave sub means adapted for use in a perforating gun adapted for lowering into and positioning within a well bore, comprising an array of identical such sub means in series connection, said sub means being readily convertible to a jumper or shunt circuit upon receiving a pre-selected number of electrical pulses, and capable of arming and firing its gun upon receiving a different pre-selected number of pulses.

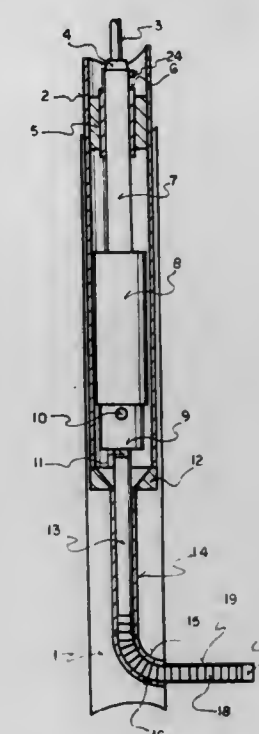
4,051,908

DOWNHOLE DRILLING SYSTEM

W. B. Driver, 19 Sheridan Road, Arnold, Md. 21012
Filed Nov. 5, 1976, Ser. No. 739,106
Int. Cl.² E21B 7/04

U.S. Cl. 175-78

2 Claims



1. Wherein the invention an improved downhole drilling system for the boring of small holes from and at right angles to a larger well hole, and the system comprises, a large diameter tubing string lowered in said well hole, a tube fitting, a small diameter tube section, said fitting attaches the uphole end of said section to the downhole end of said string, a ninety degree elbow, one end of said elbow being attached to the downhole end of said section, one end of said elbow interfaces with the wall of said well hole where a small hole is to be drilled, an electrical mechanical cable, a downhole electrical motor, said cable suspends and provides power to said motor in said string, said cable hoist said motor in and out of said string, a square pipe, a cable connector, said connector connects the uphole end of said square pipe to an end portion of said cable, said cable extends through said connector through said square pipe and connects to the uphole end of said motor, downhole end of said square pipe connects to the uphole end of said motor, a pump being of the advancing cavity type, rotor of said pump being helical shaped, output shaft of said motor connects to the uphole end of said rotor, a hollow rod, one end of said rod being open, one end of said rod being closed, closed end of said rod attached to the downhole end of said rotor, an output port through the wall of said rod near the closed end of said rod, housing of said pump connects to the downhole end of said motor and extends over and enclosed said output port, and input port through said housing above the uphole end of said rotor, a wire wound flexible drill pipe, a drill bit attached to the downhole end of said flexible drill pipe, a drill pipe stem,

uphole end of said drill pipe stem attached to the open end of said rod, downhole end of said stem attached to the uphole end of said flexible drill pipe, inside diameter of the downhole end of said fitting equal to the inside diameter of said section, inside diameter of the uphole end of said fitting equal to the inside diameter of said string, inside wall of said fitting diverges for the downhole end of said fitting to the uphole end of said fitting forming a funnel shaped passage so said bit, flexible drill pipe and stem can feed into said section without hanging up, inside diameter of said section being large enough to let said bit pass through and said flexible drill pipe and said stem operate inside said section but hole said flexible drill pipe straight, length of said being longer than the length of said flexible drill pipe, length of said stem being longer than both the length of said fitting and length of said section, an exhaust hole through the wall of said elbow near end of said elbow that interfaces with wall of said well hole, said pump pumps air, water or other fluids from inside of said string or well hole through said rod, said stem, said flexible drill pipe and said bit to flush cuttings from said small hole through said exhaust hole into said well hole, a square tube, a packer being of the type activated by rotation and released by an uphole pulling force and being shorter in length than said square tube, said packer constructed to and around said square tube, inside of said square tube being large enough to slip over said square pipe but not let said square pipe turn inside said square tube, length of said square pipe greater than the length of said square tube, difference in length of said square pipe and said square tube being greater than the length of said stem so the maximum length of said stem can be used when drilling said small hole, back swing when said motor starts causes said packer to activate and anchor to inside wall of said string and through said square tube eliminating rotation of said square pipe and said motor while a small hole is being drilled, said square pipe slips down through said square tube while a said small hole is being drilled, after said small hole is drilled said cable pulls said square pipe up through said square tube until the downhole end of said square tube interfaces with the uphole end of said motor and through said square tube an uphole pulling force is applied to said packer and causes said packer to release, a metal arm extending from one side of said square pipe near the uphole end of said square pipe keeps said square tube from slipping over the uphole end of said square pipe while being lowered in said string, length of said arm extends to the outside of square tube.

4,051,909

TURBINE DRILL FOR DRILLING AT GREAT DEPTHS
Werner Baum, Canoga Park, Calif., assignor to P.E.I. Incorporated, Canoga Park, Calif.

Filed Nov. 22, 1976, Ser. No. 743,914
Int. Cl.² E21B 3/08

U.S. Cl. 175-93

18 Claims

1. A drilling device having special utility for drilling at great depths in the earth's surface, said drilling device comprising:
a tubular drilling lance having a top end and a bottom end, said drilling lance adapted to being lowered to great depths in the surface of the earth and being raised therefrom;

an energy generating system disposed in said lance, said energy generating system being characterized by:

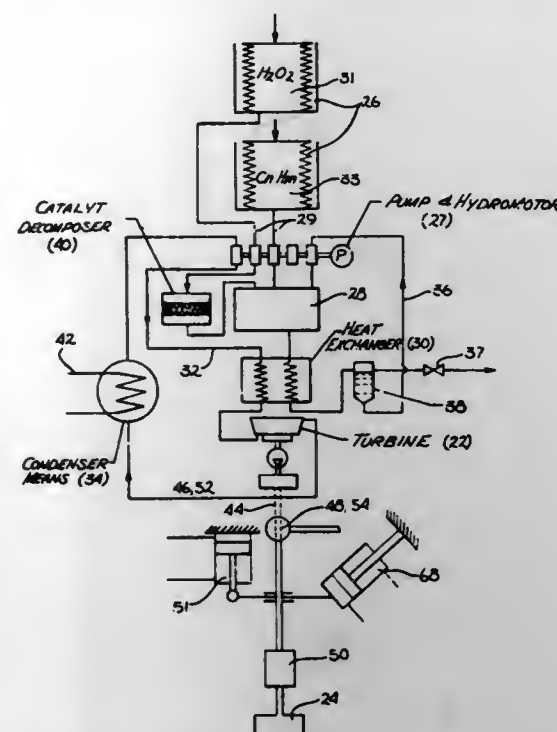
a. a fluid vaporizing system, said fluid vaporizing system comprising:

- i. at least one fuel container and fuel contained therein, said fuel container is a collapsible bellow-like container configured such that external pressure on said container provides a positive pressure on said fuel contained therein,
- ii. a reaction chamber coupled to said fuel container,
- iii. a heat exchanger coupled to said reaction chamber such that heat from said chamber is transferred to said heat exchanger,
- iv. vaporizable fluid communicating with said heat

exchanger whereby said fluid is caused to vaporize by said heat, and

v. condenser means directly coupled to said heat exchanger such that said fluid is selectively cooled and returned to said heat exchanger without loss of said fluid; and

b. a turbine coupled to said vaporizing system by a closed



fluid circuit such that said fluid is coupled from said heat exchanger to said turbine and further coupled from said turbine to said condenser means; and drilling means disposed adjacent to and extending outwardly from said bottom end of said drilling lance, said drilling means coupled to said turbine such that activation of said turbine by said fluid vaporizing system causes activation of said drilling means.

4,051,910

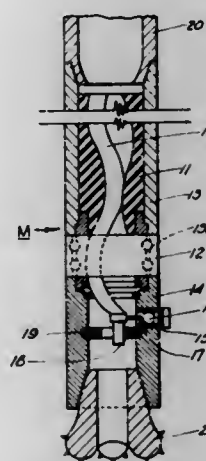
TWO WAY EARTH BORING FLUID MOTOR

Wallace Clark, 1830 S. German Church Road, Indianapolis, Ind. 46239

Filed Dec. 8, 1975, Ser. No. 638,639
Int. Cl.² E21B 1/06

U.S. Cl. 175-103

9 Claims



1. A fluid motor comprising a helical gear pair constituted by an inner member having an external helical thread, and a cooperating outer member having one more internal helical thread than the number of external helical threads on said inner member, a tubular casing, the outer member of said gear pair being fixed in said casing, a water swivel having an axial intake, said casing being secured to one of the relatively rotatable sections of said water swivel, and means associated with an end of said inner member and with the other relatively rotatable

section of said water swivel to prevent rotation while permitting gyration of said inner member relative to said outer member, and a tapered thread at the end of said tubular casing, and a tapered thread at the end of said other relatively rotatable section of said water swivel.

4,051,911

APPARATUS AND PROCESS FOR DRILLING UNDERGROUND ARCuate PATHS UTILIZING DIRECTIONAL DRILL AND FOLLOWING LINER
Martin D. Cherrington, Carmichael, Calif., assignor to Tidril Corporation, Sacramento, Calif.

Division of Ser. No. 506,920, Sept. 17, 1974, Pat. No. 4,003,440.
This application June 11, 1976, Ser. No. 695,240

Int. Cl.² E21B 3/12, 7/04

U.S. Cl. 175-107

3 Claims



1. Apparatus for drilling along an inverted underground arcuate path beneath an obstacle from a first position at or near ground level on one side of the obstacle to a second position at or near ground level on the other side thereof, said apparatus comprising:

a motor-powered directional drill adapted to be advanced into the ground along the arcuate path;

a trailing drill string connected to the trailing end of the directional drill;

a following liner disposed circumferentially about said drill string and having a length less than the length of the drill string so that the penetration of the following liner into the ground is less than the penetration of the drill string into the ground,

means for crowding and directing the directional drill and the trailing drill string into the ground from said first position on said one side of the obstacle and along said inverted arcuate path;

means for simultaneously powering said motor-powered directional drill to drill a pilot hole directionally along said path; and,

means for thrusting the following liner independently of said drill string into the ground circumferentially about the drill string to advance said liner about said drill string along the inverted arcuate path for a length less than the penetration of said pilot string into the ground.

4,051,912

PERCUSSION DRILL BIT

Kenneth M. White, Calgary, Canada, assignor to Western Rock Bit Company Limited, Calgary, Canada

Filed Apr. 23, 1976, Ser. No. 679,662

Claims priority, application Canada, Feb. 3, 1976, 244910

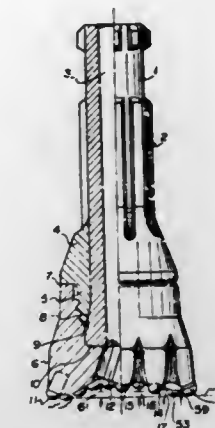
Int. Cl.² E21C 13/00

U.S. Cl. 175-410

7 Claims

1. A percussion drill bit having an anvil portion and a head portion, with connecting means therebetween to transmit torsional and percussive axial forces from said anvil portion to said head portion, a plurality of cutting inserts arranged on the cutting end of said head portion in a plurality of circumferentially-spaced groups, said cutting end having fluid flow passages thereacross separating said groups of inserts, at least some of said inserts being so arranged that during drilling operations said some of said inserts penetrate the formation being drilled by generally equal amounts and are thus subject to generally the same loading, corresponding sets of inserts, one set from each group, being at the same radial distance from

the drill axis, and successive inserts in one set, in the direction of rotation of the drill, being at progressively lesser axial distances from a reference plane transverse to the axis at the lowermost end of the head portion, and at the same axial dis-



tance from said reference plane as corresponding inserts in the other sets, the spacing between inserts in each set being substantially uniform, and the outermost of any radially adjacent pair of sets having a greater number of inserts than the innermost of said pair.

4,051,913

ELECTRONIC POSTAGE SCALE

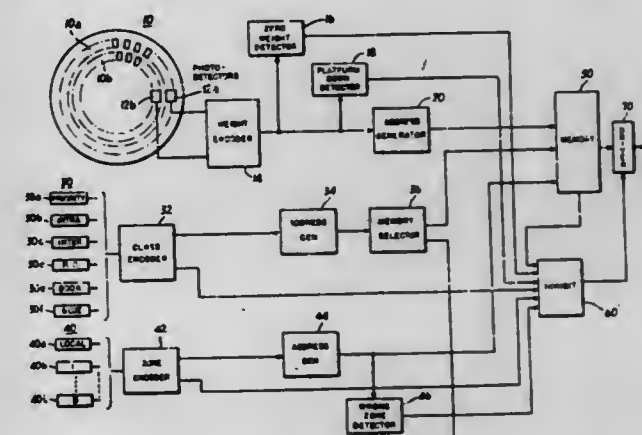
Dumitru Gudea, Chicago, Ill., assignor to Triser Scale and Manufacturing Company, Chicago, Ill.

Filed Jan. 27, 1976, Ser. No. 652,820

Int. Cl.² G01G 19/413

U.S. Cl. 177-25

19 Claims



1. A postage scale or the like for displaying the postal rate for a parcel to be shipped to a destination, comprising first selectively operable means for selecting the class of shipment of said parcel; second selectively operable means for selecting the relative destination zone of said parcel; weight data generating means for generating digital data corresponding to the weight of a parcel placed on said scale; memory means having a plurality of sections, each section corresponding substantially to at least one of said classes of shipment and storing, at addressable locations therein, postal rate data for each weight increment of a parcel to be shipped to each of said destination zones by said corresponding class of shipment; addressing means responsive to the selective operation of said first and second selectively operable means and to said parcel weight data for addressing a memory storage location associated with a parcel of determined weight to be shipped to a selected destination zone by a selected class of shipment; memory read-out means for reading out stored postal rate data from said addressed memory storage location; display means coupled to said memory read-out means for displaying an alphanumeric representation of said stored postal rate data; detecting means for detecting a plurality of conditions including the absence of a parcel from said scale, the removal of a parcel from said scale, the improper selection of a destination zone, the incom-

plate selection of a class of shipment and the addressing of an improper memory storage location; and inhibit means responsive to at least one of said conditions detected by said detecting means for inhibiting the display of an alphanumeric representation.

4,051,914

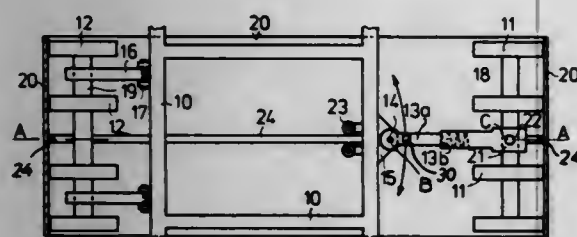
ENDLESS TRACK VEHICLE HAVING A STEERABLE END AND METHOD FOR OPERATING THE SAME
Jouma Toivo Tapani Pohjola, Haravatie 6, 90530 Oulu 53, Finland

Filed Jan. 27, 1976, Ser. No. 652,823

Claims priority, application Finland, Jan. 30, 1975, 750243
Int. Cl.² B62D 11/22

U.S. Cl. 180—9.44

18 Claims



1. In a method of operating a vehicle which has front and rear end roll means and an endless track means guided around said front and rear end roll means and capable of becoming shorter on one side and longer on an opposite side when the vehicle executes a turn, the step of angularly displacing at least one of said end roll means about an upright axis in a substantially horizontal plane while executing a turn with the vehicle, and simultaneously with the angular displacement of said one end roll means freeing the latter to assume an angular position determined by the endless track means which engages one end roll means, and including the step of turning a steering component connected between a frame of the vehicle and said one end roll means through a given angle with respect to the frame of the vehicle when executing a turn while simultaneously permitting said one end roll means to turn with said steering component but at an angle less than said given angle with respect to said frame while said one end roll means has its extent of angular displacement determined by said endless track means.

4,051,915

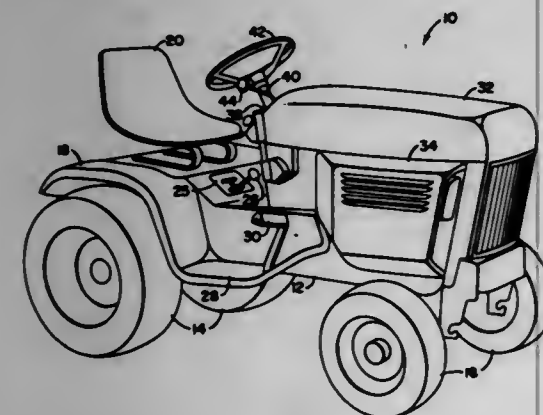
NEUTRAL START AND PARK BRAKE SAFETY INTERLOCK CIRCUITRY FOR A TRACTOR
Robert Nick Behrens, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Nov. 5, 1976, Ser. No. 739,077

Int. Cl.² B60K 28/00

U.S. Cl. 180—82 A

1 Claim



1. In combination with a lawn and garden tractor including an electrically responsive engine starting means and an ignition means, a transmission shift means movable between neutral-effecting and drive-effecting positions, park brake control means movable between park brake release and park brake

engage positions, and a power take-off clutch control means movable between clutch-engage and clutch-disengage positions, a safety interlock circuit, comprising: a source of electric energy; an ignition switch means connected to the source; a starting circuit including a first lead means connected between the ignition switch means and the engine starting means; a normally open power take-off clutch condition responsive switch means mounted for actuation to a closed position by the clutch control means only when the latter is moved to its clutch-disengage position; a first normally open transmission condition responsive switch means mounted for actuation to a closed position by the transmission shift means only when the latter is moved to its neutral-effecting position; said clutch condition responsive switch means and first transmission condition responsive switch means being connected between the ignition switch means and the engine starting means in the first lead means in series with each other and with the ignition switch means and the engine starting means; an ignition circuit including a second lead means connected to the ignition switch means and the ignition means; a second normally open transmission condition responsive switch means mounted for actuation to a closed position by the transmission shift means only when the latter is moved to its neutral-effecting position; a normally open park-brake condition responsive switch means mounted for actuation to a closed position by the park brake control means only when the latter is moved to its park brake disengage position; and said second transmission condition responsive switch means and said park brake condition responsive switch means being connected in said second lead means between the ignition switch means and the ignition means in parallel to each other, whereby the tractor cannot be started with the transmission or power take-off clutch engaged or driven with the park brake engaged.

4,051,916

APPARATUS FOR MOUNTING INSTRUMENT TO INSTRUMENT PANEL IN MOTOR VEHICLE

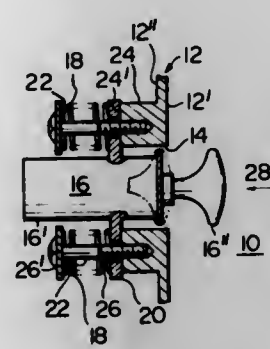
Takaaki Oda, Musashimurayama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Dec. 22, 1975, Ser. No. 643,610

Int. Cl.² B60K 20/08

U.S. Cl. 180—90

1 Claim



1. In a motor vehicle having a passenger compartment: an instrument panel having a first surface, on one side thereof, exposed to the passenger compartment and a second surface, on the other side thereof, the instrument panel having an opening formed therethrough; an instrument mounted to said instrument panel having a body disposed in an area on the said other side of said instrument panel and a knob projecting from the body into the passenger compartment through the opening formed through the instrument panel; means for holding the instrument in an operative position in which the knob projects into the passenger compartment by a predetermined amount from the first surface, but permitting the instrument to move in a sense tending to retract the knob from the passenger compartment upon application of a force exceeding a predetermined value on

the instrument in a sense tending to move the instrument toward the opening of the instrument panel; the instrument holding means including at least one projection on the second surface of the instrument panel adjacent the opening of the same; a plurality of bolts screwed into the projection, the bolts having shank portions, respectively, which extend in parallel with each other; a flange secured to the instrument, the flange being slidably mounted on the shank portions; and springs mounted around the shank portions, respectively, the springs being compressed to bias the flange into abutting engagement with the projection.

4,051,917

SOUND-DAMPING HOUSING

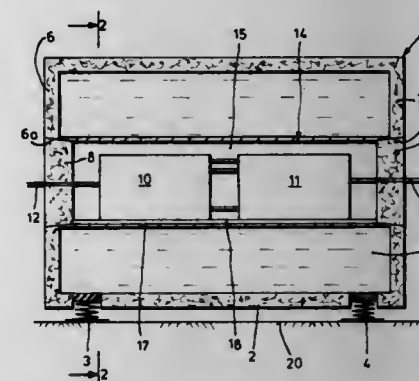
Edgard Grundmann, Fallersleben, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Feb. 18, 1976, Ser. No. 658,900

Claims priority, application Germany, Mar. 1, 1975, 2509065
Int. Cl.² F01N 7/16

U.S. Cl. 181—200

10 Claims



1. For use with a piece of sound-generating equipment, a sound-damping housing having inner and outer housing means surrounding each other, said inner housing means having a lower wall and said outer housing means having a support wall, said walls being arranged at different heights, said inner housing means forming a first chamber for receiving the piece of sound-generating equipment, said inner and outer housing means forming between themselves a second chamber for receiving and remaining filled with a sound-damping liquid during the operation of the piece of sound-generating equipment, said second chamber in sectional elevation completely surrounding said first chamber; and means communicating with said first chamber for allowing the insertion and withdrawal of the piece of sound-generating equipment into and out of said first chamber, in consequence of which said sound-damping housing and the piece of sound-generating equipment may be transported separately from each other.

4,051,918

SEISMIC ENERGY SOURCE

Joe M. Rogers, Houston, Tex., assignor to Applied Research & Development Company, Houston, Tex.

Filed May 16, 1975, Ser. No. 578,255

Int. Cl.² G01V 1/04

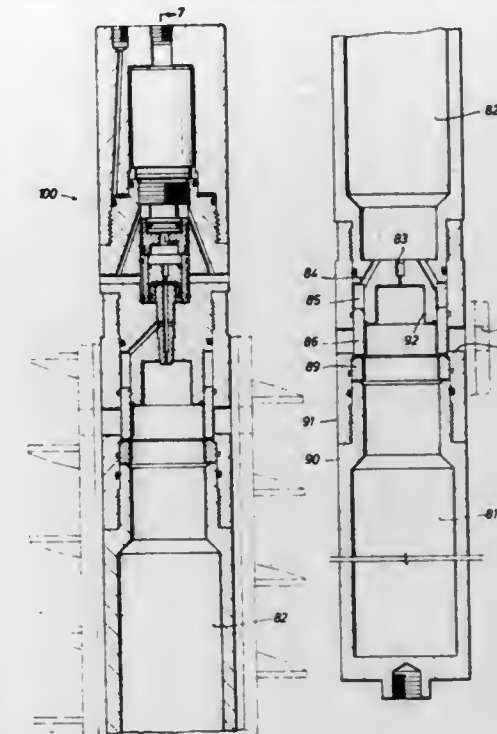
U.S. Cl. 181—119

7 Claims

1. An apparatus for creating a seismic shock wave to be propagated through the earth in seismic investigations comprising:

- an auger means having:
 - a helical flite thereon which is adapted to enter the earth on rotation;
 - an elongate body having means for receiving at least two pneumatically operable sonic shock wave creating

means, said sonic means cooperative with said auger means and having an opening from said body to the



exterior of said body for directing sonic energy into the earth below the earth's surface.

4,051,919

HIGH FIDELITY SPEAKER ENCLOSURE

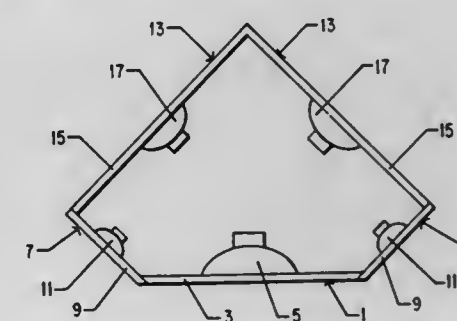
John M. Buettner, Willoughby Hills, Ohio, assignor to John M. Buettner, Willoughby Hills, Ohio

Filed Dec. 8, 1975, Ser. No. 638,555

Int. Cl.² H05K 5/00

U.S. Cl. 181—144

3 Claims



1. A vertically disposed high fidelity speaker array mounted in an enclosure, which array comprises:

- a. a full range speaker board,
- b. a pair of tweeter boards disposed at an angle from 120° to 165° with respect to said full range speaker board, and
- c. a pair of midrange speaker boards disposed at an angle between 5° and 85° with respect to said full range speaker board,
- d. said tweeter boards being disposed between and abutting said full range and midrange boards,
- e. each board bearing at least one speaker thereon, and
- f. all speakers being directed away from the area defined by said boards.

4,051,920
METHOD AND APPARATUS FOR VACUUM
EVACUATION AND PRESSURE FILLINGS OF SEALED
PIN JOINTS

Harold L. Reinsma, Dunlap, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

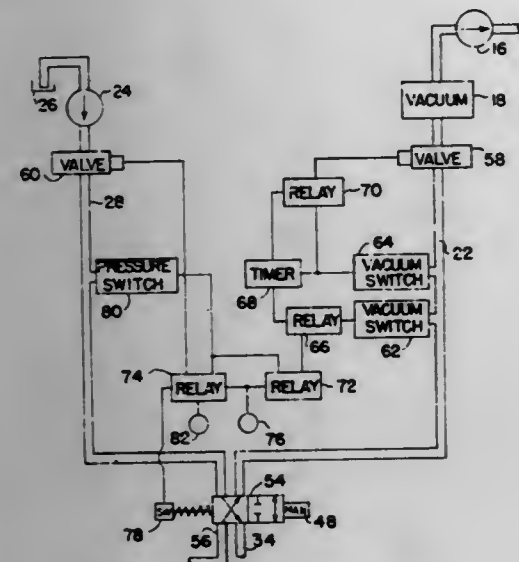
Filed Mar. 19, 1973, Ser. No. 342,763

Disclosure was also published under first Trial Voluntary Protest Program on Jan. 28, 1975

Int. Cl. F01m 11/04

U.S. Cl. 184-1 R

3 Claims



1. An apparatus for filling a lubricant reservoir comprising: gun means adapted for sealing engagement with an opening of the lubricant reservoir, a source of vacuum, a source of lubricant, and sequence timing and shutoff means for first intercommunicating said vacuum source with said lubricant reservoir by way of said gun to evacuate said lubricant reservoir and then intercommunicating said lubricant source with said lubricant reservoir to fill said lubricant reservoir with lubricant, wherein the sequence timing and shutoff means comprise timing means actuable upon evacuation of the lubricant reservoir to a certain level, and indicator means operatively coupled with said timing means for indicating that evacuation of the reservoir has been held at a level relative to said certain level for a given time.

4,051,921
GREASE PLUG

Jerome F. Sheldon, Milwaukee, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

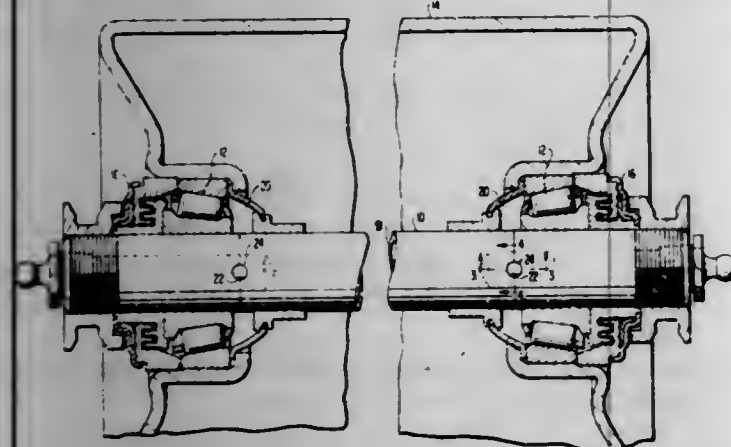
Continuation of Ser. No. 608,367, Aug. 27, 1975, abandoned.

This application Dec. 28, 1976, Ser. No. 755,104

Int. Cl. F01M 1/06

U.S. Cl. 184-1 D

26 Claims



1. The combination of a member having a through-greasing

passage and a cross hole extending from the through-greasing passage to the surface of the member and a grease plug releasably mounted in the cross hole so as to reduce the effective cross-sectional area of the cross hole, said grease plug comprising:

- a. a generally cylindrical plug portion having
 - i. a radius of size sufficient to cause said plug portion to fit snugly into the cross hole and
 - ii. at least one grease passage extending generally axially of said plug portion along the outer periphery thereof so that said plug portion reduces the effective cross-sectional area of the cross hole while still forming a grease opening, the effective cross-sectional area of the grease passage or passages being equal to the desired cross-sectional area of the cross hole, and
- b. a generally hook-shaped mounting portion
 - i. integral with said plug portion on one axial face thereof;
 - ii. made of a resilient material, and
 - iii. dimensioned so that the mounting portion can be readily pressed through the cross hole, but is prevented from working out of the cross hole by the spacing between the legs of the hook-shaped mounting portion.

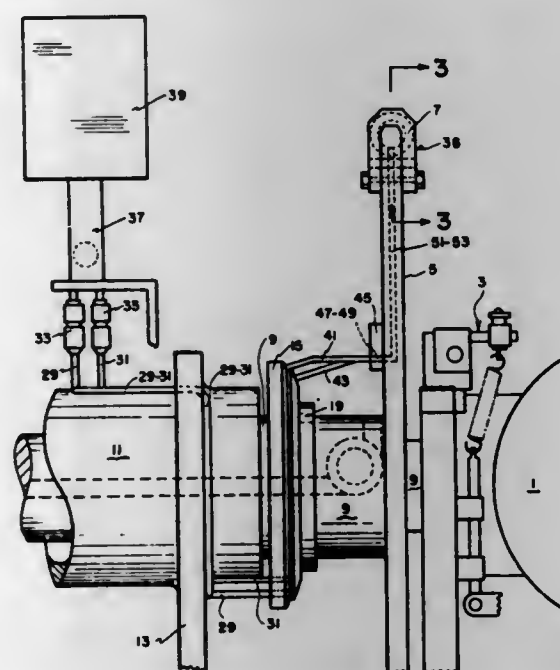
4,051,922
LUBRICATING SYSTEM FOR BEARINGS
 Vincent F. Sukle, Oakwood Village, Ohio (c/o Wean United, Inc., 948 Fort Duquesne Blvd., Pittsburgh, Pa. 15222)

Filed Aug. 13, 1975, Ser. No. 604,279

Int. Cl. F01M 11/02; F16N 7/36, 21/00

U.S. Cl. 184-7 R

6 Claims



1. An improved lubricating system for a wire buncher or similar machine for supplying lubricant to a flyer sheave bearing thereof, said buncher having a rotating shaft to which a flyer disc is secured and to which a flyer sheave is outwardly radially mounted, comprising:

- a stationary tube means, means for collecting lubricant, said means including a lubricant collecting ring rotatable with said shaft, said stationary tube means being so constructed and arranged that its one end receives lubricant from a stationary supply and its other end terminates in a manner to discharge lubricant into said ring and,
- a rotatable passage means providing lubricant communication with said ring for receiving said lubricant discharged therein, at least a portion of said rotatable passage means extending radially outward relative to of said flyer disc and terminating adjacent said flyer sheave, the arrangement being such that lubricant collected by said ring is forced by centrifugal force through said rotatable passage means to said flyer sheave bearing.

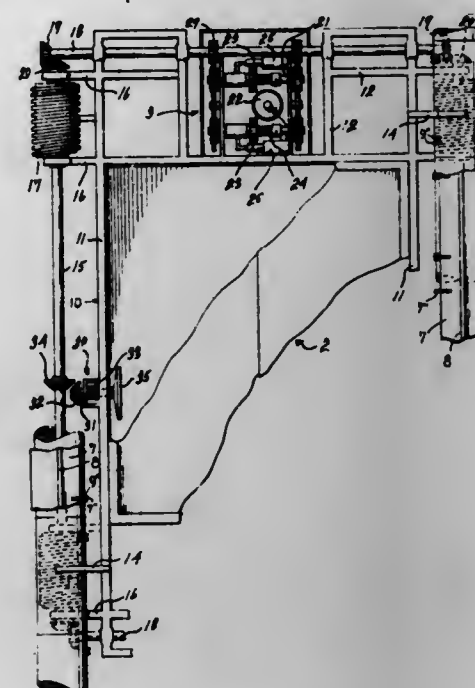
4,051,923
CABLELESS CAGE ELEVATOR
 Lionel Blanchette, and Adrien André Blanchette, both of 550 Decarie Boulevard, Apt. 6, Saint Laurent, Canada (H4L 3K9)

Filed Oct. 20, 1976, Ser. No. 734,256

Int. Cl. B66B 9/02

U.S. Cl. 187-25

2 Claims



1. A cableless elevator system comprising a pair of laterally spaced-apart upright channels, each adapted to be secured to a side wall of an elevator shaft, each channel of U-shape construction and opening towards each other, a series of hollow cylindrical sections removably fitted within each channel in end-to-end abutment, a series of locating pins locating and centering each cylindrical section within the respective channels, lugs protruding from each side of each channel, ears protruding from said cylindrical sections and engaged by said lugs, said lugs and ears having aligned holes and locking pins removably inserted into said aligned holes of said lugs and ears, each cylindrical section having a longitudinally extending slot having a width not more than one-third of the periphery of the cylindrical section, the slots of the cylindrical sections being in alignment and forming a continuous slot facing towards the slot of the cylindrical sections of the other channel when the cylindrical sections are removably secured in proper position in each channel, each cylindrical section having an internal square thread forming a continuity with the square thread of adjacent cylindrical sections, the sides of each channel forming an externally protruding and longitudinally extending guide ridge, a rectangular and planar vertically extending frame disposed between each assembly of channels and cylindrical sections, an elevator cage fixed within said frame, two driver units mounted on said frame: one on top and one at the bottom of said elevator cage and each including a transversely extending drive shaft entering at both ends into the respective cylindrical cylinder sections through the respective slots, bevel gears secured to the ends of the respective transverse drive shaft, within said cylinder sections, frame extensions carried by said frame and extending through the respective slots above and below said cage, a vertical shaft rotatably carried by said frame extensions and located upright within the respective assemblies of cylinder sections, a pair of worms spacedly secured on each vertical shaft and in threaded engagement with the threads of the cylinder sections at the top and bottom of the frame, a bevel gear secured to the top and bottom of each vertical shaft and in respective meshing engagement with the bevel gears of each transverse shaft, each drive unit further including a separate power means for driving the respective transverse shaft and clutching and reversing mechanism for clutching and declutching the respective transverse shafts and for reversing the direction of rotation of the same, and U-shape shackles carried by said frame and respectively engagable with

said guiding ridges of said channels at the top and bottom of said frame.

4,051,924
DEVICE FOR MOUNTING BRAKE SHOE OF BRAKE
FOR BICYCLE

Kiyokazu Yoshigai, Higashi-Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Kabushiki Kaisha, Osaka, Japan

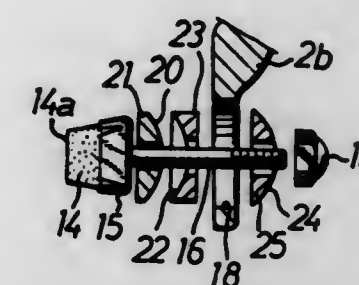
Filed Sept. 2, 1976, Ser. No. 719,739

Claims priority, application Japan, Oct. 15, 1975, 50-141571[U]

Int. Cl. B62L 1/12

U.S. Cl. 188-24

2 Claims



1. In a caliper brake for a bicycle including a pair of brake shoes disposed on the opposite sides of the rim of a wheel and engageable with a disengageable from the rim, a pair of brake arches each having a support bore for receiving a shoe stem of each of the brake shoes extending therethrough and nuts each screwed on the projecting end of each of the shoe stems extending through the support bore, a device for mounting the brake shoe comprising universal spherical surface assemblies coupling the brake shoe to the brake arch, each of the assemblies comprises a first washer having a convex portion and a second washer having a concave seat and a third washer provided between the nut and the brake arch, the third washer having a convex portion for seating the nut thereon, the convex portion of the first washer and the concave seat of the second washer being cooperative to freely adjust the position of the brake shoe when the nut is loosened and the brake shoe stem is inclined within the support bore thereof, so that the nut is tightly fastened with a brake block on the brake shoe properly opposed to the rim.

4,051,925
DISC BRAKES FOR VEHICLES INCLUDING A
SCREW-THREADED DRAW BAR ASSEMBLY

Peter Charles Knight, Birmingham, England, assignor to Girling Limited, Birmingham, England

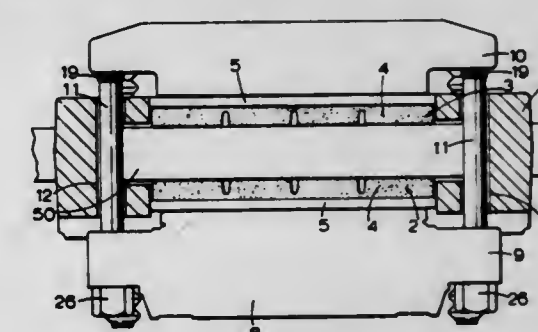
Filed Oct. 21, 1976, Ser. No. 734,670

Claims priority, application United Kingdom, Nov. 11, 1975, 46500/75; July 10, 1976, 28776/76

Int. Cl. F16D 55/224

U.S. Cl. 188-72.4

14 Claims



1. A disc brake comprising first and second friction pad assemblies for engagement with opposite faces of a rotatable disc, a relatively stationary carrier member, actuating means for urging said first friction pad assembly directly into engagement with a first face of said disc, a clamping member straddling a portion of the periphery of said disc, said clamping

member comprising first and second pressure plates which are chordal to said disc and are located on opposite sides thereof with said first pressure plate located adjacent to said first friction pad assembly, said second pressure plate acting on said second friction pad assembly, and circumferentially spaced draw-bars which interconnect said pressure plates at the outermost ends thereof and determine the axial spacing between said pressure plates, the reaction of said actuating means acting indirectly on said second friction pad assembly through said second pressure plate such that said second friction pad assembly is applied to a second face of said disc opposite said first face, a first end of at least one of said draw-bars having a screw-threaded portion at an end portion and a groove between said portions, a member having a screw-threaded bore into which said screw-threaded portion is screwed, means defining a groove in said bore, a releasable coupling between said one end of the said one draw-bar and said member having a screw-threaded bore, said releasable coupling comprising an abutment member retained by said groove-defining means in said member and engaged within said groove in said first end of said draw-bar.

4,051,926 DISC BRAKE

Yasuo Karasudani, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

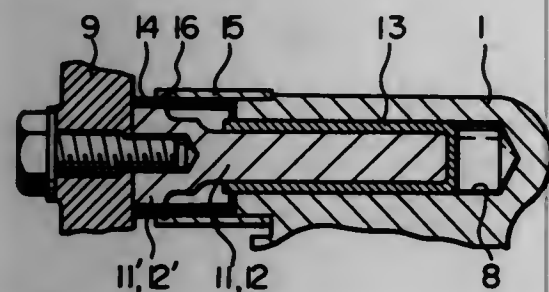
Filed Aug. 13, 1976, Ser. No. 714,324

Claims priority, application Japan, Aug. 19, 1975, 50-114178[U]

Int. Cl.² F16D 65/02

U.S. Cl. 188—73.3

3 Claims



1. A disc brake comprising a stationary member secured to a non-rotatable part of a vehicle, a caliper member, at least one pin secured to one of said members and the other member having a corresponding guide bore therein in which said pin is slidably positioned for slidably supporting the caliper member on the stationary member, and a rigid sleeve is secured to said other member around the open end of the guide bore and extending in the direction of the axis of said pin and sealingly surrounding a portion of said pin projecting out of said guide bore.

4,051,927 DISC BRAKE

Yasuo Karasudani, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Aug. 13, 1976, Ser. No. 714,325

Claims priority, application Japan, Aug. 18, 1975, 50-113528

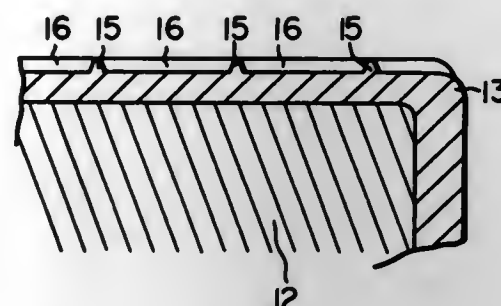
Int. Cl.² F16D 65/02

U.S. Cl. 188—73.3

2 Claims

1. In a disc brake wherein a caliper member is slidably supported by at least one pin on a stationary supporting member which is secured to a non-rotatable part of a vehicle, the pin being on one member and the other member having a guide hole therein slidably receiving the pin, the improvement comprising a bushing of resilient material and positioned between the peripheral surface of said pin and the peripheral surface of the guide hole, said bushing having at least one elongated groove in the peripheral surface thereof and extending in the direction of the axis of said pin for storing lubricant therein for

feeding the lubricant between the bushing and the surface slidable relative to the bushing, said groove having longitudi-



nally spaced walls therein partitioning the groove into a plurality of elongated recesses.

4,051,928 AUTOMATIC SHOE CLEARANCE ADJUSTING DEVICE IN SHOE DRUM BRAKE

Yoshihiro Hayashida, Chigasaki, Japan, assignor to Tokico Ltd., Japan

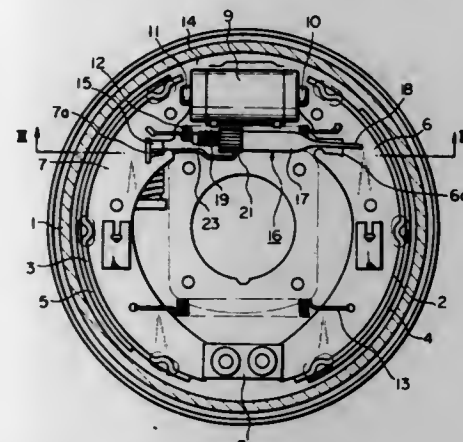
Filed May 26, 1976, Ser. No. 689,988

Claims priority, application Japan, May 30, 1975, 50-64995

Int. Cl.² F16D 65/56

U.S. Cl. 188—79.5 P

4 Claims



said coil spring means has a first end engaging said adjust lever at a torsional force receiving point;

said adjust lever has means engaging said lever at a torsional force transmitting point; said adjust lever has a portion engaging said lever at a fulcrum about which said adjust lever pivots in response to compressive force of said coil spring means; said torsional force receiving point and said torsional force transmitting point being positioned adjacent each other and at distances approximately equally spaced from the central axis of said supporting shaft; and said fulcrum being located at a position adjacent and closer to both said torsional force receiving point and said torsional force transmitting point than said central axis of said supporting shaft.

4,051,929

NON RETURN DEVICE

Norman Leslie Cyril Parfitt, Ashby-de-la-Zouch, England, assignor to Coal Industry (Patents) Limited, London, England

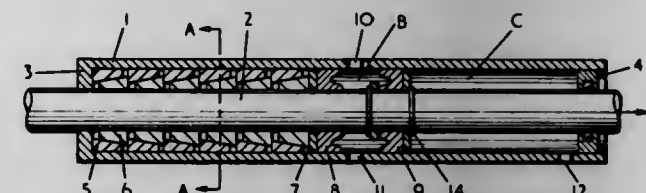
Filed Sept. 15, 1976, Ser. No. 723,659

Claims priority, application United Kingdom, Oct. 31, 1975, 45213/75

Int. Cl.² F16D 65/54

U.S. Cl. 188—196 C

9 Claims



1. A device which in normal use restricts the relative movement between two members to one direction comprising, a first of the members able to support the second of the members, at least one wedge shaped element positioned to grip the second member, and urging means to urge said at least one wedge shaped element to abut a passageway within the first member to cause locking co-operation between the two members, the element and the urging means, the urging means being actuated by attempted relative movement of the members in a forbidden direction opposite to the said one direction.

4,051,930

DISC BRAKE WITH GRAPHITE FRICTION LININGS

Jean Masclat, Paris, France, assignor to Messier-Hispano, Montrouge, France

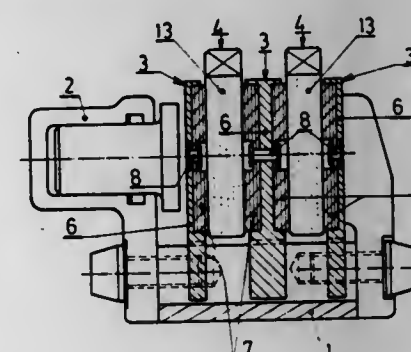
Filed Sept. 7, 1976, Ser. No. 720,836

Claims priority, application France, Sept. 12, 1975, 75.28090

Int. Cl.² F16D 69/02

U.S. Cl. 188—251 A

8 Claims



1. A disc brake comprising a rotor element and a stator element, one of said elements including a mounting member provided with a friction lining formed at least in part by a plurality of graphite plates, each of said plates having two flat side faces and a peripheral surface which is perpendicular to said two flat side faces, each of said plates being received in a recess provided in a side face of said mounting member, each said recess having a flat bottom surface and being of a depth

less than the thickness of said plate, the side wall of said recess being parallel to said peripheral surface of said plate and spaced from said peripheral surface of said plate by a distance greater than that necessary to permit thermal expansion and contraction between said mounting member and said plate means for retaining said plate in said recess, said graphite plates of one of said elements being formed of polycrystalline graphite, the other of said elements being formed as a unitary element of structural graphite.

4,051,931

HYDRODYNAMIC BRAKE

Denis Vignon, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

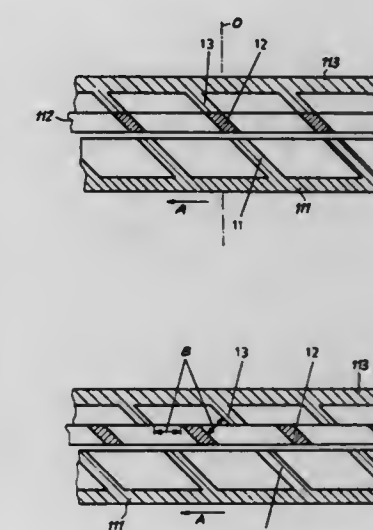
Filed June 11, 1976, Ser. No. 694,965

Claims priority, application Germany, June 14, 1975, 2526663

Int. Cl.² F16D 57/02

U.S. Cl. 188—296

9 Claims



1. A hydrodynamic brake comprising: a stator disk and a rotor disk coaxially juxtaposed, said disks having confronting faces each provided with an annular groove centered on the common axis of said disks, said disks being further formed with respective sets of angularly equispaced vanes subdividing each of said grooves into a multiplicity of pockets, said sets of vanes being aligned with each other in certain relative angular positions of said disks, the vanes of one of said disks being each split into first and second segments; a housing rigid with said stator disk forming a toroidal chamber around said rotor disk; and conduit means for alternately filling said chamber with hydraulic fluid and draining said fluid therefrom, the presence of said fluid in said pockets impeding the relative rotation of said disks; said one of said disks being split into a body carrying said first segments and an annular insert centered on said axis, said insert carrying said second segments and being limitedly rotatable about said axis between a first and a second position relative to said body for mutually isolating the pockets of said split disk by relatively aligning said first and second segments in said first relative position and for interconnecting the last-mentioned pockets at locations remote from the other disk by relatively offsetting said first and second segments in said second relative position.

4,051,932

FLUID PRESSURE CONTROL SYSTEM FOR A HYDRAULIC TRANSMISSION WITH A LOCK-UP CLUTCH

Hajime Arai, Aichi, and Kiyoshi Ohnuma, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

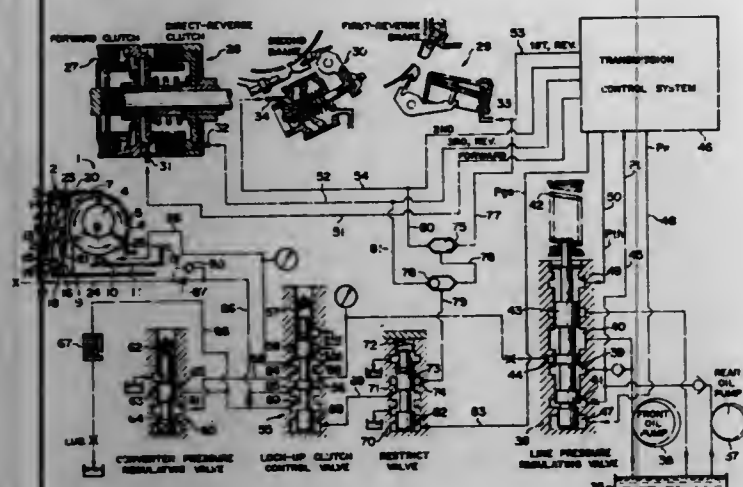
Filed Nov. 21, 1975, Ser. No. 634,039

Claims priority, application Japan, July 16, 1975, 50-86919

Int. Cl.² F16D 37/00; F16H 47/00

U.S. Cl. 192—3.3

2 Claims



1. In a fluid pressure control system for a hydraulic transmission with a lock-up clutch of the type which comprises a hydraulic transmission for hydraulically coupling an input member with an output member, a lock-up clutch for directly mechanically coupling said input member with said output member and a fluid passage for selectively supplying fluid pressure to said lock-up clutch, wherein said clutch is adapted to effect direct mechanical coupling of said input and output members when fluid pressure is supplied through said fluid passage, said system comprising a fluid pressure source, a lock-up clutch control valve having at least one actuating port and being adapted to take a first shift condition of connecting said fluid passage with said fluid pressure source and a second shift condition of connecting said fluid passage with an exhaust passage according to whether or not a fluid pressure is supplied to an actuating port, a change-over valve which makes a selection between two control fluid pressures for actuating friction engaging means of the transmission and delivers one of said two control fluid pressures to a second fluid passage connected to said actuating port of said lock-up clutch control valve in a changing-over manner of traversing an intermediate stage where the supplies of said two control fluid pressures are both substantially intercepted, and a restrict valve provided in said second fluid passage so as to selectively intercept said second fluid passage, said restrict valve being constantly supplied with a governor pressure so as to be actuated by said governor pressure in a manner of being kept closed to intercept said second fluid passage when said governor pressure is below a predetermined level and of being kept opened to communicate said second fluid passage when said governor pressure is above a predetermined level.

4,051,933

LOW INERTIA CLUTCH AND BRAKE SYSTEM

Jose A. Bencke, McKinney, Tex.; Tsuruo Otsuka, South Holland, Ill.; Steven R. Otsuka, Duncanville, and Samuel G. Sarkisian, Dallas, both of Tex., assignors to Vernon Allsteel Press Company, Dallas, Tex.

Filed Mar. 17, 1976, Ser. No. 667,700

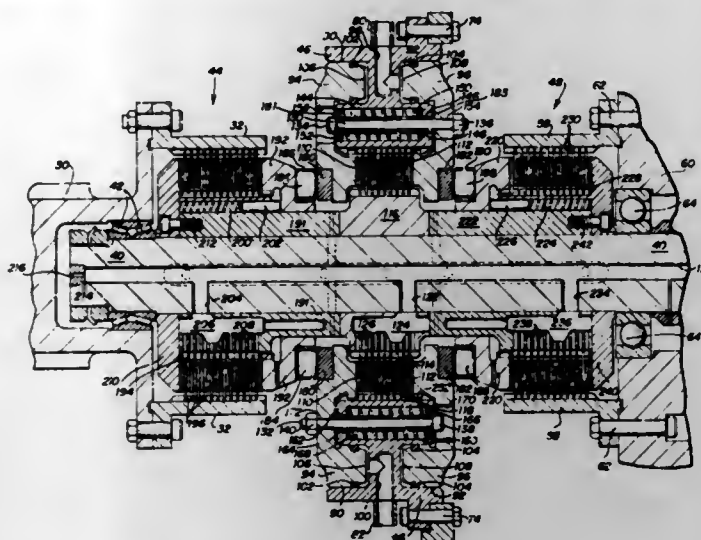
Int. Cl.² F16D 67/04, 25/10

U.S. Cl. 192—18 A

26 Claims

1. A low inertia clutch and brake system comprising:
a rotatable shaft,
a low speed clutch assembly including friction clutch surfaces mounted about said shaft,
a high speed clutch assembly including friction clutch sur-

faces mounted about said shaft and spaced from said low speed clutch assembly,
a brake assembly disposed between said low and high speed clutch assemblies and including friction surfaces mounted about said shaft, said brake assembly normally engaged to prevent rotation of said shaft,
a stationary housing disposed about said brake assembly, piston means mounted in said housing and operable in response to fluid pressure to selectively disengage said brake assembly and to engage one of said clutch assemblies,



spring biased means associated with each of said piston means being disposed radially outwardly of said brake assembly for normally urging said piston means toward said brake assembly to normally engage said brake assembly, and
means for selectively applying fluid pressure to said piston means in order to disengage said brake assembly and to engage one of said clutch assemblies.

4,051,934

BIDIRECTIONAL DRIVE COUPLING

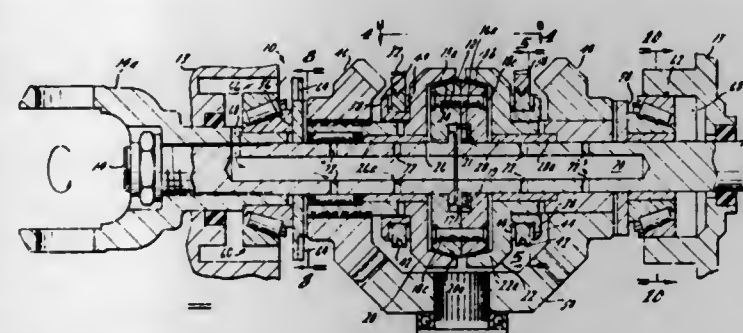
John W. Hurst, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 23, 1976, Ser. No. 679,529

Int. Cl.² F16D 43/21, 13/28

U.S. Cl. 192—21

19 Claims



1. In combination:
rotatable input and output shafts coaxially positioned in an end-to-end relationship in which the ends are at least proximate to each other;
a first rotary drive member fixed to the input shaft and coaxially rotatable therewith, the drive member being positioned on the input shaft at least proximate the output shaft;
second and third rotary drive members positioned to each side of the first drive member, the second drive member being carried on the input shaft and the third drive member being carried on the output shaft, each being axially movable to engage the first drive member, adjacent portions of the first drive member and the second and third drive members being provided with cooperating means for forming a driving-driven relationship when either of

the second or third drive members is axially moved into contact with the first drive member thereby causing rotation of the second or third drive member by the first drive member upon its rotation;
means for selectively placing the second and third drive members into individual contact with the first drive member and for placing both of the second and third drive members out of contact with the first drive member;
two rotary gears, one gear being adjacent a side of the second drive member opposite the side which contacts the first drive member, and being in a substantially axially fixed position on the input shaft, the other gear being adjacent a side of the third drive member opposite the side which contacts the third drive member, and being substantially axially fixed on the output shaft, the one gear being rotatable on the input shaft and the other gear being fixedly attached to the output shaft for rotation therewith, the gears and second and third drive members forming two drive member-adjacent gear pairs;
a plurality of complementary, radially distributed, overlapping helical camming surfaces on adjacent portions of the second and third drive members and the gears, the surfaces extending between each drive member-gear pair to drivingly couple them together for rotation, the complementary driving helical surfaces of one drive member-gear pair being opposite handed relative to those of the other drive member-gear pair, the camming surfaces of each pair being in mutual overlapping relationship over the complete range of axial movement of the respective second or third drive members whereby contact and rotation of either the second or third drive member with the first drive member causes rotation of the respective adjacently coupled gear through driving engagement between the corresponding complementary camming surfaces and the driving engagement of the camming surfaces urges the second and third drive member axially toward the drive member for more positive contact therewith while continuing to rotate the adjacent gear, and gear means interconnecting the two rotary gears whereby rotation of the gear on the input shaft causes rotation of the gear on the output shaft.

4,051,935

WORK TOOL

Eiji Nakayama, 1140 Yokkamachi, Sanjo, Japan (955)

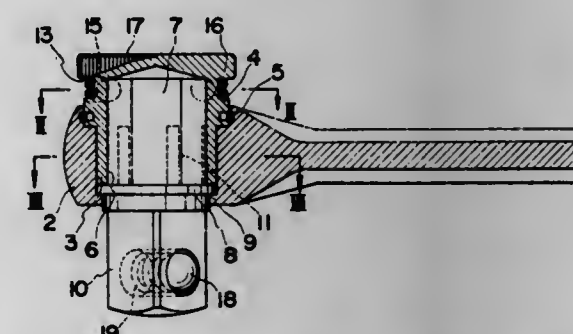
Filed Apr. 15, 1976, Ser. No. 677,136

Claims priority, application Japan, Apr. 18, 1975, 50-46329

Int. Cl.² F16D 41/08

U.S. Cl. 192—44

7 Claims



1. A tool for turning an object comprising: a tool handle having a head portion; a hollow cylinder encased in said head portion having a knob for switching rotational directions, a plurality of axial slots equally spaced around the circumference of said cylinder and having one or more openings provided at the upper portion thereof; a shaft of polygonal shape housed in said cylinder; rollers contained in said slots, said roller diameter being larger than the thickness of said cylinder and the number of said rollers and slots being similar to that of sides of said polygon; one or more steel balls contained in said one or more openings, said steel ball diameter being larger than the thickness of said cylinder and located between said rollers; resilient means inwardly pressing said steel balls to abut the

sides of said polygonal shaft whereby said rollers travel along the sides of said polygonal shaft and each is locked at either extreme end of travel so that said polygonal shaft may be turned in one direction when said tool handle is swung in one direction and said shaft will not turn when said tool handle is swung in the opposite direction.

4,051,936

FLUID COUPLING DEVICE AND VALVE SUPPORT USED THEREIN

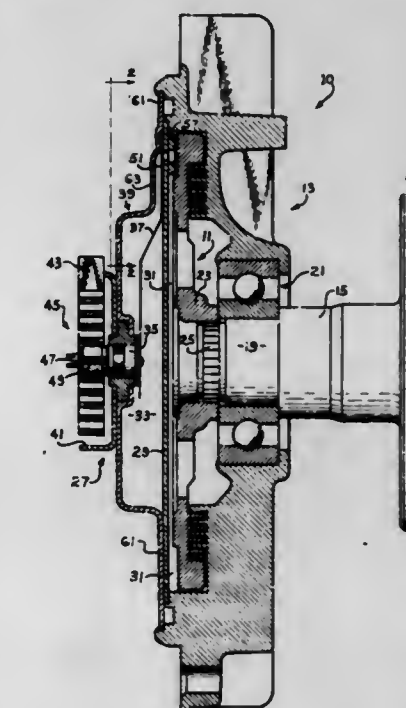
Richard T. Crisenbery, Parma, and Thomas H. Tinholt, Marshall, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed June 3, 1976, Ser. No. 692,402

Int. Cl.² F16D 35/00, 43/25

U.S. Cl. 192—58 B

18 Claims



1. A fluid coupling device including a first rotatable member, cover means associated with said first member to define a fluid chamber therebetween, a valve plate disposed to separate said fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable member disposed in said fluid operating chamber and being rotatable relative to said first member, said valve plate defining a discharge orifice adapted to permit the flow of fluid from said fluid operating chamber to said reservoir chamber, a generally flat valve member located within said fluid reservoir chamber and disposed to move in a plane substantially parallel to the plane of said valve plate, said valve member further being disposed to cooperate with said discharge orifice to vary the effective flow area thereof, temperature-responsive means operatively associated with said valve member to control the movement of said valve member, the range of movement of said valve member defining a valve operating area, one of said cover means and said valve plate including a generally planar restraining portion coextensive at least with said valve operating area, oriented substantially parallel to the plane of movement of said valve member and closely spaced therefrom during said valve member movement and being operable to engage said valve member in a surface-to-surface relationship and prevent excessive movement of the portion of said valve member adjacent said discharge orifice in a direction away from said valve plate.

4,051,937

HYDRAULIC CLUTCH RELEASE MECHANISM FOR MOTOR VEHICLES

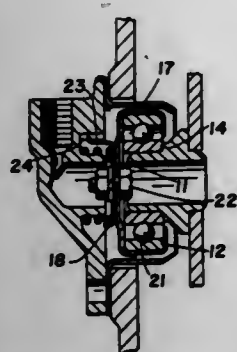
Roy Peter Garrett, Luton; Derek Ray Parkins, Dunstable, both of England; Manfred Brandenstein, Aschfeld, and Armin Olschewski, Schweinfurt, both of Germany, assignors to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Division of Ser. No. 349,298, April 9, 1973, abandoned. This application Jan. 26, 1976, Ser. No. 652,244

Int. Cl.² F16D 25/08

U.S. Cl. 192—88 A

6 Claims



1. A hydraulic release mechanism for automotive clutches and the like comprising a cylindrical housing open at one end, a bearing assembly located within said housing at said open end and comprising a non-rotating outer race ring having a cylindrical surface spaced from said housing, a rotatable race ring adapted to be connected to an operating element for said clutch and a plurality of rolling elements arranged therebetween, a cover plate abutting the pressure end of said bearing, a pressure plate mounted over said cover, means for securing said cover and pressure plates together, and spring means interposed between said pressure plate and the opposing wall of said housing, a flexible elastomeric wall secured to said bearing assembly between said pressure plate and said cover plate and to said housing and being folded within the space between said outer race ring and said housing to engage the cylindrical surfaces of said housing and said nonrotating race ring for axially slidable movement and radially floating movement with respect thereto, said wall defining with said housing a chamber for receiving fluid under pressure, the force of which is transmitted through the end of the nonrotating race ring, said rolling elements, and rotating race ring to said clutch operating element.

4,051,938

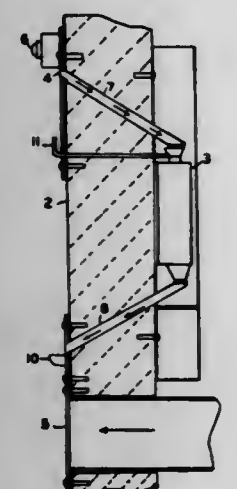
MEANS FOR OUTSIDE VENDING

Kenneth G. Brown, Wickham Ave., Mattituck, N.Y. 11952
Filed June 1, 1976, Ser. No. 691,229

Int. Cl.² G07F 9/06

U.S. Cl. 194—1 K

7 Claims



1. Means for installing, inside an exterior building wall, a vending machine coin box comprising,
a coin box mounted on the inside of the exterior building

wall, the coin box having a coin receiving aperture, a coin return slot and a coin return lever,
a first chute mounted in the exterior building wall and connected to the coin receiving aperture, said first chute extending downwardly from the outside of the wall,
a second chute mounted in the exterior building wall connected to the coin return slot, said second chute extending downwardly from the inside to the outside of the wall, whereby the coin box is protected from vandalism and burglary by the exterior building wall.

4,051,939

COIN OR TOKEN OPERATED AMUSEMENT DEVICE

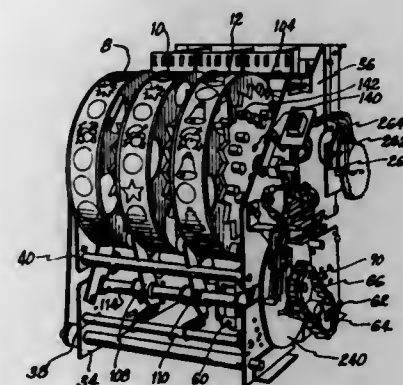
Francis T. Murphy, Glenview; Peter Sagan, Chicago; Martin B. Rosenthal, Park Forest, and Alfred R. Ostrowski, Oak Forest, all of Ill., assignors to The Seeburg Corporation, Chicago, Ill.

Filed Sept. 27, 1973, Ser. No. 400,726

Int. Cl.² A63F 5/04

U.S. Cl. 194—10

7 Claims



1. An amusement device comprising a rotatable wheel shaft, a plurality of wheels, one way clutches independently mounting each wheel on said wheel shaft whereby said wheels may be rotated in one direction when said shaft is rotated in that direction and are free to rotate in the same direction after said wheel shaft has stopped rotating, each wheel having a plurality of symbols appearing thereon, a plate mounted on each wheel and rotatable therewith, each plate having a plurality of stop means positioned thereon corresponding to various of said symbols on said wheels, a feeler shaft spaced from and coextensive with said wheel shaft, a plurality of feelers, one corresponding to each of said wheels mounted on said feeler shaft for rotation toward said wheel shaft and said stop means, means for stopping the rotation of each wheel sequentially, means for first restraining said feelers from rotation toward said wheel shaft and said stop means and then releasing them whereby said feelers may move into engagement with one of said stop means so that the angular position of each feeler provides an indication of the symbol on its associated wheel appearing in a particular straight line, electrical circuit means including a plurality of sets of contacts, means connected to each of said feelers for closing one pair of contacts in each set of contacts depending upon the angular position of the feeler, and said electrical circuit means including a control means connected to said sets of contacts and operative in the event the combination of symbols appearing in said particular straight line after said wheels have stopped rotating to provide an indication that a player has won.

4,051,940

MOSAIC NEEDLE PRINTER HEAD USING PLUNGER ARMATURE SOLENOID ARRANGEMENTS

Peter Kuelzer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 12, 1975, Ser. No. 603,937

Claims priority, application Germany, Aug. 14, 1974, 2439098

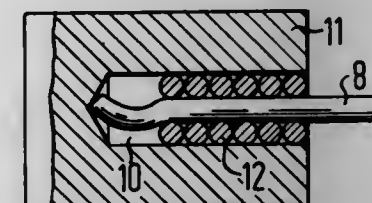
Int. Cl.² B41J 3/44

U.S. Cl. 197—1 R

3 Claims

1. In a printer needle-plunger armature assembly for use in a

mosaic needle printer head including a solenoid-actuated plunger armature and a printer needle operatively secured thereto, the improvement comprising means for connecting said printer needle and plunger armature in assembled relation, said connecting means comprising wall means forming a blind bore and an end wall in said plunger armature, means forming an end portion on said printer needle for insertion into said bore for abutment with said end wall, said connecting means including elastically deformable gripping means for holding said end portion of said printer needle in said bore, and means forming a helically wound wire disposed in said blind bore and



having a longitudinal dimension less than the corresponding dimension of said bore whereby said end wall of said bore and the inner end of said helically wound wire are disposed in spaced relation, said elastically deformable gripping means comprising a lateral deformation formed at the terminus of said end portion of said printing needle, said lateral deformation being straightened from a deformed condition to a straight condition upon being inserted into said helically wound wire and again assuming its deformed condition after it passes through said helically wound wire into the space in said bore between said end wall and said helically wound wire.

4,051,941

MATRIX PRINT HEAD WITH IMPROVED ARMATURE RETAINER

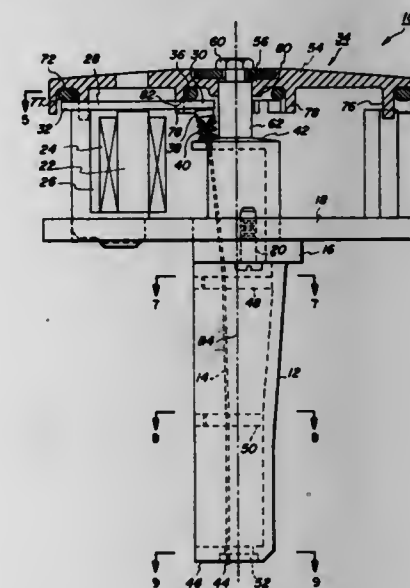
Donald G. Hebert, San Ramon, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed June 28, 1976, Ser. No. 700,417

Int. Cl.² B41J 3/50

U.S. Cl. 197—1 R

7 Claims



1. In a matrix print head comprising stylus guide means; a plurality of electromagnetic structures coupled to said guide means, each of said electromagnetic structures including a pole piece; a plurality of armatures disposed radially about said guide means, each of said armatures being associated with one of said electromagnetic structures to form an electromagnetic actuator for transferring electromechanical energy to a stylus, and each of said armatures having an inner end and an outer end projecting outwardly of the associated pole piece; a plurality of styli respectively associated with said plurality of armatures; each of said styli being carried by said guide means and having an armature engaging end for engaging the inner end of the associated armature and a printing end for impacting a record medium when the stylus is propelled through said guide

means by energization of the associated electromagnetic actuator; an improved armature retainer coupled to said guide means for maintaining each armature in engagement with its associated pole piece; said armature retainer comprising:

- a relatively rigid base member having a central portion connected to said guide means and a peripheral portion including means for receiving each armature at a predetermined location between its inner and outer ends; and
- a first relatively resilient O-ring mounted to the peripheral portion of said base member for simultaneously engaging the outer end of each armature in order to simultaneously bias each armature into engagement with its associated pole piece.

4,051,942

PRINTING APPARATUS

Takeo Suzuki; Ikutaro Inoue; Hideo Tamai, and Masatsugu Aoki, all of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

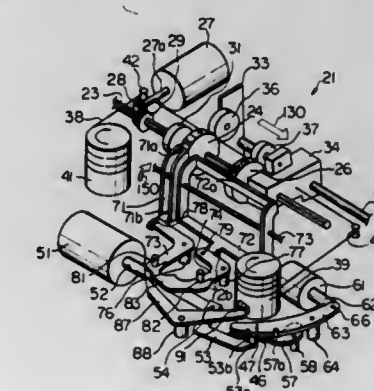
Filed Oct. 12, 1976, Ser. No. 731,460

Claims priority, application Japan, Oct. 11, 1975, 50-122787

Int. Cl.² B41J 1/24

U.S. Cl. 197—49

10 Claims



1. A printing apparatus comprising:
a rotatable spline shaft;
a first type wheel fixedly mounted on the spline shaft, the first type wheel being formed with a plurality of first type symbols on the circumference thereof;
a second type wheel longitudinally slidably mounted on the spline shaft for unitary rotation therewith, the second type wheel being formed with a plurality of second type symbols on the circumference thereof;
type selector drive means for rotating the spline shaft and thereby the first and second type wheels for type symbol selection;
stepping drive means for steppingly moving the second type wheel along the spline shaft from a first position to a second position;
a first printing hammer movably disposed adjacent to the first type wheel;
a second printing hammer movably disposed adjacent to the second type wheel, the second printing hammer extending between the first and second positions;
reciprocating drive means having reciprocating actuator member connected to the stepping drive means; and
hammer selector means for selectively connecting one of the first and second printing hammers to the actuator member in such a manner that the actuator member moves the selected one of the first and second printing hammers to strike the respective one of the first and second type wheels for printing when the actuator member is moved in a first direction and actuates the stepping drive means to move the second type wheel along the spline shaft by one step when the actuator member is moved in a second direction which is opposite to the first direction.

4,051,943

RIBBON CARTRIDGE

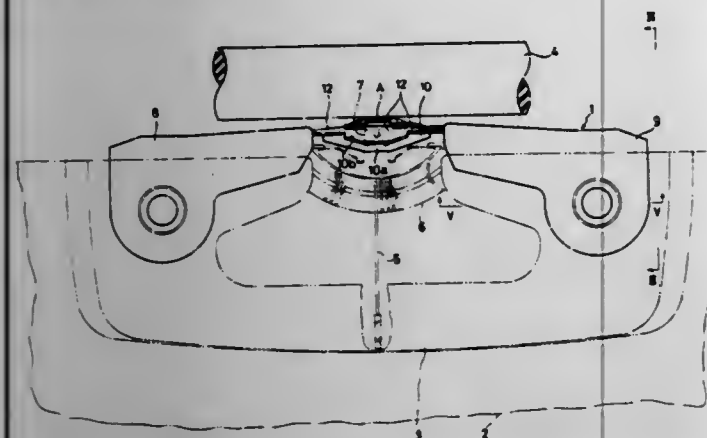
Masami Hanazono; Yukio Hishida; Toshio Nakai, all of Nagoya; Tomoyoshi Watanabe, Chiryu; Takanobu Hirayama, Chita, and Hideo Asakura, Kasugai, all of Japan, assignors to Brother Industries, Ltd., Nagoya, Japan

Filed Dec. 17, 1975, Ser. No. 641,673

Claims priority, application Japan, Jan. 9, 1975, 50-6308[U]
Int. Cl.² B41J 33/518

U.S. Cl. 197-151

1 Claim



1. A ribbon cartridge adapted to be removably installed on a typewriter having a plurality of type bars (5) with printing head portions, a platen (4), a type bar guide (7) to guide a type bar (5) from an at rest position to a defined print point (A) on the platen (4), a pair of ribbon drive means positioned on laterally opposite sides of said print point and driven in response to a typing action of said type bars (5), and ribbon feed and reverse means for changing the ribbon feed direction, said ribbon cartridge comprising:

- a pair of housings (8,9) which are positionable upon each of said ribbon drive means, each of said housings including an upper wall (11c) having an upper aperture, an arm portion (11b) extending towards said print point (A), a side wall (11a) having a vertical slot aperture (13) to allow a ribbon to pass into said arm portion (11b) and a bottom wall (19) having a bottom aperture (20);
- a ribbon spool (27) rotatably mounted in each of said housings, including pin connecting means which will be operatively connected to said ribbon drive means through said bottom aperture of said bottom wall when said housings are positioned on said ribbon drive means of said typewriter, and having a hand-operated turning knob extending upwardly through said upper aperture;
- a ribbon wound on said ribbon spools and passing through said vertical slot apertures (13) and adapted to cross in front of said print point (A) when fed from one ribbon spool (27) to the other; said ribbon having a ribbon reverse eyelet (42) near each end portions of said ribbon;
- a connecting arm member for connecting said two housings (8,9) made of a rigid metal strip, which has arm sections rigidly connected with said arm portions (11b) and has a center portion (10a) positioned in front of said type bar guide (7), said center portion of said connecting arm member having a U-shaped opening (10b) which permits the head portions of said type bars to pass through from an at rest position and strike said ribbon at said print point in a printing operation; and,
- an actuator (40) with bias means (44) pivotally mounted in each of said housings between said upper wall (11c) and said bottom wall (19) and usually biased for one direction, and being operatively connectable to said ribbon feed and reverse means, said actuators (40) respectively having a narrow slit (41) through which to allow passage of said ribbon, but not allow passage of said ribbon reverse eyelet (42), and said actuator (40) being rotated together with said ribbon reverse eyelet (42) in a direction away from said ribbon spool against a biasing force of said bias means (44) and actuating said ribbon feed and reverse means so as to change the ribbon feeding direction, when said ribbon

is fed from one ribbon spool to the other in response to a typing action and said ribbon reverse eyelet on the side of said ribbon spool which is supplying said ribbon arrives at the slit of said actuator on the same side of said ribbon supplying spool.

4,051,944

CAPSTAN DRIVEN, ENDLESS PRINTER RIBBON CARTRIDGE

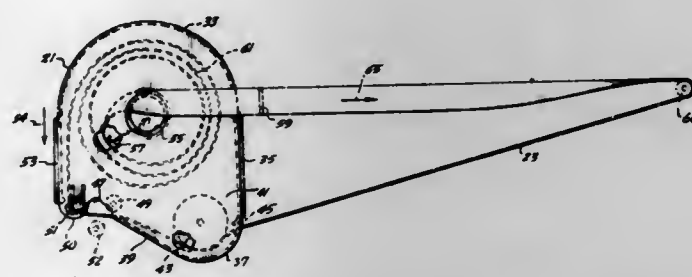
David G. Starr, Renton, Wash., assignor to Tally Corporation, Kent, Wash.

Filed May 17, 1976, Ser. No. 687,171

Int. Cl.² B41J 33/10

U.S. Cl. 197-168

10 Claims



1. A capstan driven, endless printer ribbon cartridge comprising:

- a generally flat cartridge housing suitable for housing a printer ribbon, said cartridge housing having a top wall, a base wall and an edge wall joining said top and base walls, said cartridge housing including an outwardly projecting appendage lying generally in the plane of the housing, said cartridge housing also including a ribbon inlet slot and a capstan drive aperture both located in the edge wall of said housing in the region of said appendage, said capstan drive aperture being formed in an inwardly curving indentation formed in the edge of said cartridge housing, said cartridge housing further including a central hub having a ribbon exit slot formed therein;
- guide roller means mounted in said appendage for receiving printer ribbon entering said appendage via said ribbon inlet slot and directing said ribbon toward said capstan drive aperture;
- pinch roller means mounted in said cartridge housing adjacent said capstan drive aperture for receiving ribbon directed by said guide roller means toward said capstan drive aperture such that when a drive capstan is positioned in said capstan drive aperture, said pinch roller means presses said ribbon against said drive capstan;
- an endless printer ribbon, a first portion of said endless printer ribbon forming a ribbon roll surrounding said hub and a second portion exiting from said cartridge housing via said ribbon exit slot and entering said cartridge via said ribbon inlet slot; and,
- a leaf spring affixed to said hub and projecting outwardly therefrom toward said ribbon roll, said leaf spring including a hook-shaped outer end curved in the direction of said tape exit slot;
- said leaf spring and said ribbon exit slot radially positioned about said hub such that said leaf spring holds said ribbon roll away from said hub in a manner such that an open space is formed between the hook-shaped end of said leaf spring and said ribbon exit slot, said ribbon passing through said space, directly from said leaf spring to said ribbon exit slot without impinging on the outer surface of said central hub after leaving said leaf spring.

4,051,945

ELECTRONIC TABULATOR FOR HIGH SPEED PRINTERS

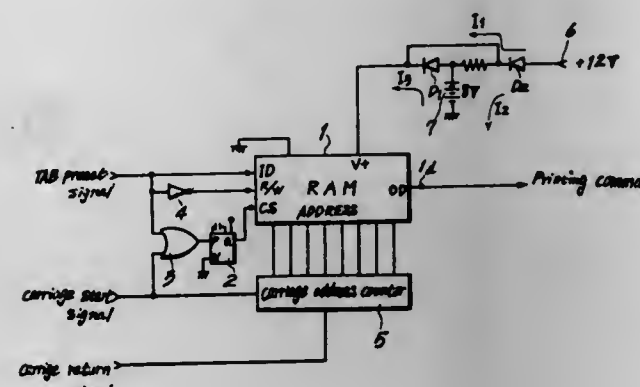
Isao Fujimoto, Kunitachi; Takeshi Kasubuchi; Masahiko Aiba, both of Nara, and Yoichi Shimazawa, Yamatokoriyama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Sharp Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 12, 1975, Ser. No. 603,924

Claims priority, application Japan, Aug. 12, 1974, 49-92493
Int. Cl.² B41J 21/00; H02J 9/06

U.S. Cl. 197-176

1 Claim



1. In a tabulator for use in high speed printers to provide print command signals as a function of the coincidence between a stored carriage position signal and a generated carriage position signal, in combination:

- random access memory means storing a plurality of signals representative of carriage positions to be tabulated;
- a carriage counter means for providing address signals representative of detected carriage positions in response to generated carriage position signals;
- said random access memory means being responsive to the coincidence of said position address signals and said stored carriage position signals for providing a printing command signal;
- power supply means driving said random access memory means and sustaining the information stored therein;
- a rechargeable battery; and
- circuit means continuously interconnecting said battery with said power supply means and said random access memory means to simultaneously charge said battery and enable and sustain said memory means by said power supply means when said power supply means is operative and sustain said memory by said battery when said power supply means is inoperative;

wherein said power supply means, when operative, has a first terminal voltage and wherein said battery means has a second terminal voltage of lesser magnitude than said first; and

wherein said circuit means comprises first and second diode means each having an input and output side and each connected in the forward direction thereof in series from said power supply adjacent said first diode means to said random access memory means adjacent said second diode means;

said battery having one terminal thereof connected to the output side of said first diode means and the input side of said second diode means;

said random access memory means receiving power from said power source through both said diode means and said battery being charged from said power source through said first diode means; and

said random access memory means receiving power from said battery through said second diode means upon failure of said power source.

4,051,946

MAGNETIC CONVEYOR

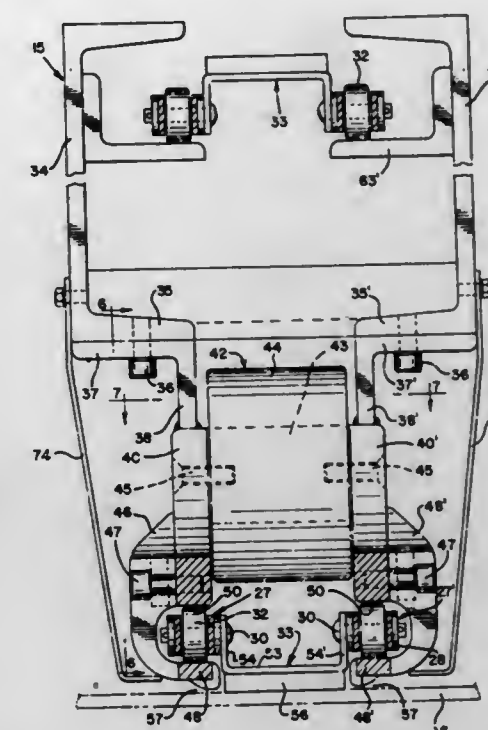
Dario Buccicone, Crown Point, Ind., assignor to Bucciconi Engineering Co., Inc., Gary, Ind.

Filed Mar. 12, 1976, Ser. No. 666,183

Int. Cl.² B65G 17/46

U.S. Cl. 198-477

10 Claims



1. A rail type magnetic conveyor unit for conveying magnetizable metal sheets comprising an elongate support frame, a plurality of magnets supported in spaced relation on said frame, a pair of transversely spaced, endless conveyor chains carried on spaced pairs of end sprockets which are mounted in longitudinally spaced relation on said support frame, guide rail members extending in transversely spaced relation along the bottom of said support frame, said conveyor chains having rollers positioned for riding on said guide rail members so as to traverse a straight path along the bottom of said support frame, and sheet carrying bracket assemblies extending between said conveyor chains, each of said magnets having depending laterally spaced pole extensions supporting portions of said guide rail members along opposite sides of said support frame, said magnets being positioned and arranged to exert magnetic force sufficient to hold sheets relative to said bracket assemblies so that the sheets travel with said conveyor chains.

4,051,947

TRANSFER APPARATUS FOR CIGARETTES OR THE LIKE

Peter Schumacher, and Helmut Niemann, both of Hamburg, Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Oct. 22, 1976, Ser. No. 735,064

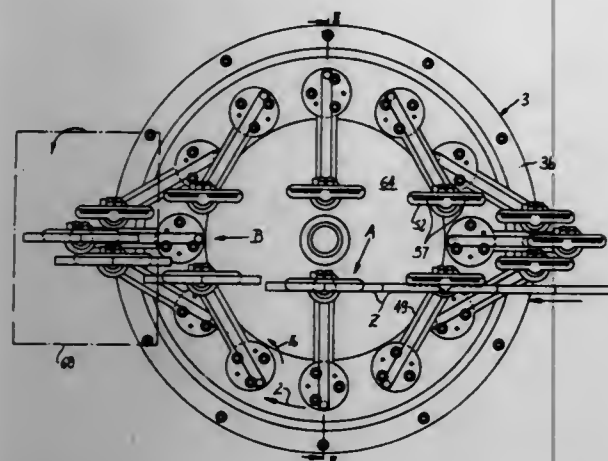
Claims priority, application Germany, Nov. 5, 1975, 2549512
Int. Cl.² B65G 47/22

U.S. Cl. 198-478

11 Claims

1. Apparatus for transferring cigarettes or analogous rod-shaped articles between first and second paths along which the articles respectively move lengthwise and sideways, comprising a planet carrier rotatable about a first axis; a first pinion rotatably supported by said carrier; a crank rotatable with and having a portion remote from the axis of said pinion; an article holder turnably supported by said portion of said crank; a second pinion coaxial with and rotatable relative to said first pinion; means for articulately coupling said second pinion with said holder so that the angular position of said holder with respect to said second pinion remains unchanged when the latter rotates about the axis of said first pinion; means for rotating said carrier in a predetermined direction; means for rotating said first pinion through one revolution counter to said

direction in response to each revolution of said carrier and for thereby orbiting said holder about the axis of said first pinion so that said holder travels along an endless third path having a first portion at a minimum distance from said first axis and nearer to said first path and a second portion at a maximum distance from said first axis and nearer to said second path, the



tangential speed of said holder respectively reaching a maximum and a minimum value in said first and second portions of said third path; and means for rotating said second pinion in response to rotation of said carrier in a direction and at a speed such that the orientation of said holder remains unchanged while said pinions orbit about said first axis.

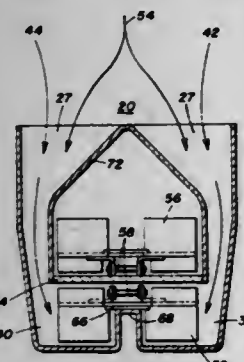
4,051,948

DUAL CONVEYOR SYSTEM

Walter James Sackett, Sr., Severna Park, Md., assignor to The A. J. Sackett & Sons Company, Baltimore, Md.
Continuation-in-part of Ser. No. 613,909, Sept. 16, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,828
Int. Cl.² B65G 47/18

U.S. Cl. 198—550

13 Claims



1. In a bulk material conveyor system having an input end and an output end, a conveyor apparatus which is secure against mixing of dissimilar conveyed materials which are being conveyed simultaneously and which comprises:

- a housing structure formed of a pair of opposed section means;
- means for separating said pair of opposed section means to form upper and lower passageways;
- a single continuous chain conveyor means disposed centrally within said upper and lower passageways, an upper portion of the said conveyor means being positioned within said upper passageway and being supported by and riding on the upper surface of said means for separating said pair of opposed section means, and a lower portion of said conveyor means being positioned within said lower passageway;
- means for driving said continuous conveyor means;
- a plurality of dual flight means spaced along and carried by said continuous conveyor means;
- bulk materials receiving means disposed at the input of said conveyor system for receiving bulk material, said bulk

materials receiving means having separate ports to receive two said dissimilar materials;
separate conveyor chamber trough means in said lower passageway to maintain separation of said dissimilar materials, and in which separate sections of said dual flight means travel; and
discharge means at the output end of said conveyor system, having separate ports to said separate conveyor chamber trough means to discharge two said dissimilar materials.

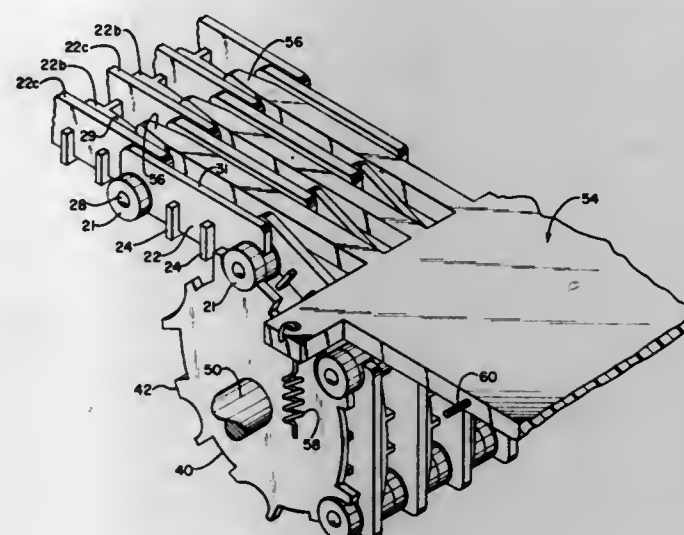
4,051,949

CONVEYOR SYSTEM

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.
Filed May 17, 1976, Ser. No. 687,029
Int. Cl.² B65G 15/30

U.S. Cl. 198—853

24 Claims



1. In a module for constructing a conveyor belt to be driven around a circular arc segment for use in conjunction with a conveyor comb having a plurality of spaced-apart parallel teeth, which module includes first and second like pluralities of link ends of substantially identical width, each being formed to circumscribe a pivotal hole through said width, said holes of said first plurality being arranged coaxially, said holes of said second plurality being arranged coaxially, the axes of respective holes of both pluralities of link ends being substantially parallel; and a plurality of spaced apart elongated members each integrally formed with and joining a pair of corresponding link ends of said first and second pluralities, said members being joined by at least one cross member also formed integrally therewith; said link ends being dimensioned and spaced apart by a distance slightly greater than said width;
the improvement wherein said plurality of elongated members comprises first and second groups, said elongated members of said first group having upper surfaces disposed at a first like height not below the upper surface of said cross member said members of said second group having upper surfaces disposed at a second like height above the height of said upper surfaces of the elongated members of said first group;
said first and second groups being arranged to form a multiplicity of channels adapted to receive said teeth.

4,051,950

HYGIENIC PROTECTIVE SHIELD

Harry Sigurd Valdemar Jirund, Lund, Sweden, assignor to Jarund Devello AB, Fjallbacka, Sweden
Filed June 23, 1975, Ser. No. 589,062
Claims priority, application Sweden, June 26, 1974, 7408416; Aug. 5, 1974, 7410017
Int. Cl.² B65D 85/38

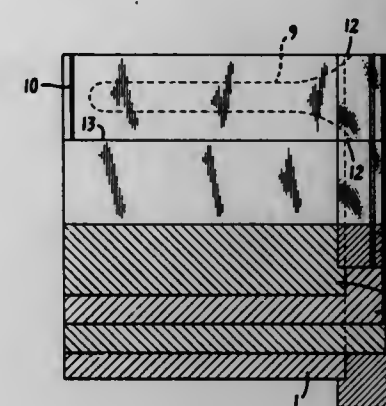
U.S. Cl. 206—306

6 Claims

1. An hygienic protecting shield for an object, such as a seat shield, a protecting glove, a shield for a thermometer or other

temperature sensing devices, and a shield for other instruments, which shield comprises:

- two adjacent plastic foils at least one of which is at least the same length as the part of the object to be received in the shield;
- at least one covering foil arranged on the outside of each of the two plastic foils to form at least four foil layers, the covering foils being shorter than the plastic foils and further arranged thereon to expose one end of the plastic foils;
- means removably attaching each covering foil to the adjacent plastic foil and sealing the plastic foils to each other along a line defining an object-receiving space between the plastic foils which is at least partly cut off from the remaining parts of the plastic foils and has an opening for receiving the object at the exposed end of the plastic foils,



the attaching and sealing means being spaced inwardly from at least a portion of an edge of the foils which is sufficiently close to the exposed end of the plastic foils and adapted in combination with the covering foils for facilitating a sideways tearing of the object-receiving part of the plastic foils from the covering foils and the remainder of the plastic foils; and

- a stiffening strip on the exposed end of each plastic foil which overlaps the corresponding covering foil, whereby the object-receiving part of the plastic foils is covered with the covering foils and stiffening strips until the shield is used to prevent contamination thereof and, for use, the object can be inserted between the stiffening strips into the object-receiving space between the plastic foils and the stiffening strip and the end portion of the shield then grasped and easily separated to provide an hygienic foil shield about the object.

4,051,951

PACKAGE HAVING MEANS FOR PROVIDING COAXIAL ALIGNMENT IN A STACK THEREOF

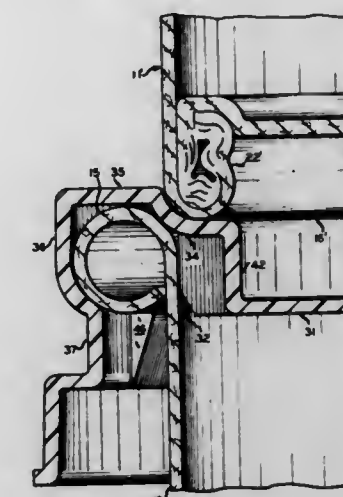
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed June 18, 1975, Ser. No. 588,130
Int. Cl.² B65D 21/02, 43/08, 5/68

U.S. Cl. 206—508

14 Claims

1. A package comprising a container and a closure therefor; said container having a circumferentially continuous sidewall and a bottom member, said bottom member being situated within the space defined by said sidewall adjacent the lower end of said sidewall, the upper portion of said sidewall curling outwardly and downwardly to form a rolled top rim, the lower portion of said sidewall curving inwardly to form a generally convexly curved bottom rim;
said closure comprising a first wall, a circumferentially continuous generally concavely curved second wall extending upwardly and outwardly from the upper extent of said first wall, a circumferentially continuous rim wall extending outwardly from the upper extent of said second wall, a circumferentially continuous skirt wall extending generally downwardly from the outer extent of said rim wall, and a diaphragm connected to the lower extent of

said first wall; said first wall at least generally conforming to the contour of the portion of said sidewall adjacent to and below the commencement of said rolled top rim; the maximum outside diameter of said first wall before the application of said closure onto its respective container being at least as great as the minimum corresponding dimension of the inside surface of the portion of said sidewall contacted by said first wall upon the application of the closure onto the respective container, thereby providing a frictional engagement of the closure and the respective container; the configuration of said second wall at least generally conforming to at least an outer portion of said curved bottom rim to provide a positioning means



for engaging the corresponding portion of the curved bottom rim of an at least substantially identical container superimposed thereabove as said curved bottom rim of said superimposed container enters the space defined by said second wall, thereby causing said superimposed container to be positioned on said second wall coaxially with said closure; said first wall being interrupted by a plurality of spaced apart support lugs which project inwardly from said first wall toward the central vertical axis of said closure, the upper surface of each of said plurality of support lugs extending inwardly from the lower extent of said second wall to serve as additional support surface for the curved bottom of said superimposed container.

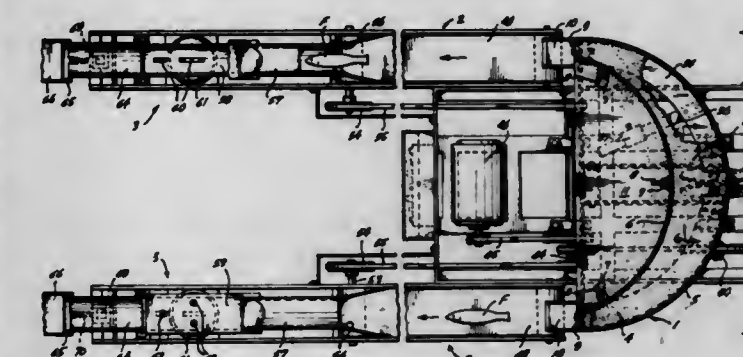
4,051,952

FISH CHARACTERISTIC DETECTING AND SORTING APPARATUS

Edward G. Hauptmann, and John Richard Green, both of West Vancouver, Canada, assignors to Neptune Dynamics Ltd., North Vancouver, Canada
Filed Sept. 5, 1975, Ser. No. 610,661
Claims priority, application Canada, Sept. 9, 1974, 208741
Int. Cl.² B07C 5/34

U.S. Cl. 209—73

18 Claims



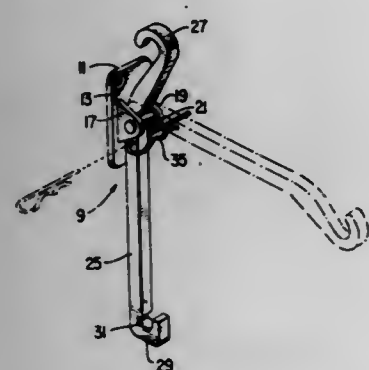
1. Apparatus for sorting fish including detector means for detecting a characteristic of fish, fish-moving means for moving fish past the detector means, and channeling means opera-

ble in response to the detector means to channel fish in accordance with the effect of the fish on the detector means, the improvement comprising the fish-moving means including fish-orienting and fish-singling means spaced a substantial distance from the detector means for orienting fish in disarray for lengthwise movement headfirst in single file, and substantially horizontal fish-accelerating means between said fish orienting and fish-singling means and the detector means for accelerating the fish in single file to space them apart prior to their movement past the detector means.

4,051,953 PIVOTAL SUPPORT

Walter D. Shoaf, R.D. 2, Atwood Drive, Belle Vernon, Pa. 15012
Filed Mar. 11, 1976, Ser. No. 665,055
Int. Cl.² A47F 5/08; D06F 53/00
U.S. Cl. 211-119.1

4 Claims



1. A pivotal support for use on a recreational vehicle comprising in combination:
 - a mounting plate adapted to be flush-mounted to an exterior surface of said vehicle and having a pair of spaced apart ears extending outwardly thereof;
 - a pivot pin carried by the ears in spaced relation to the mounting plate;
 - an arm positioned in a storage position between said pin and said plate and slidable relative thereto;
 - said arm including an aperture;
 - a hitch pin adapted to grip said arm via said aperture to lock it in said storage position;
 - said arm terminating in a forward hook and a rear abutment, said abutment having an offset slot for receiving said pivot pin to permit the arm to be pivoted from the storage position to an operative position oriented approximately 90° from said storage position with the abutment bearing against said mounting plate when the arm is in the operative position to maintain the arm in said operative position; and,
 - the thickness of said arm between the forward hook and rear abutment being less than the distance between the pivot pin and said mounting plate whereby the arm is moved from said storage position by sliding the portion of the arm between said forward hook and said rear abutment upwardly for pivoting about the pivot pin into said operative position.

4,051,954 COUPLER BUTT END REPLACEMENT METHOD AND PART

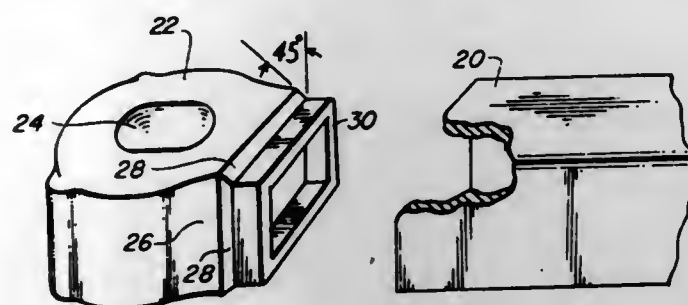
Leslie N. Roberts, Columbus, Ohio, assignor to Buckeye International, Inc., Columbus, Ohio
Filed June 10, 1976, Ser. No. 694,781
Int. Cl.² B61G 9/00

U.S. Cl. 213-62 R

14 Claims

1. A replacement part for a coupler having a hollow shank terminating in a butt end portion and severed at a first predetermined position to provide a front coupler portion having a hollow rear end defined by the severed perimeter wall of said shank, the improvement comprising:
 - a butt end part having a size corresponding to the original

size of the severed butt end portion and having a front end with a perimeter sized and shaped to correspond with the rear end of said perimeter wall, a projection on the front end of said part spaced inwardly of the perimeter of said part receipt in said hollow shank,

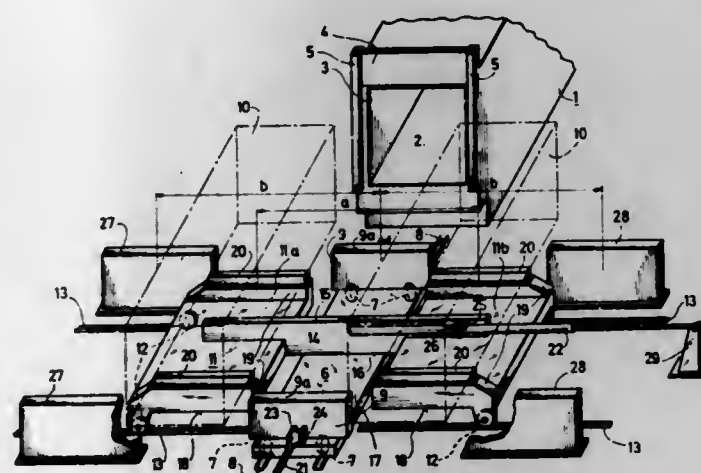


and a chamfer formed at the front end of said butt end part extending from the perimeter of the front end of said part inwardly and forwardly to said projection.

4,051,955
APPARATUS FOR CHANGING CONTAINERS AT AN EJECTION OPENING OF A REFUSE PRESS
Dietmar Kaffka, Willich, Germany, assignor to Lindemann Maschinenfabrik GmbH, Dusseldorf, Germany
Filed Oct. 6, 1976, Ser. No. 729,981
Claims priority, application Germany, Apr. 7, 1976, 2614921
Int. Cl.² B65B 63/02

U.S. Cl. 214-1 BB

4 Claims



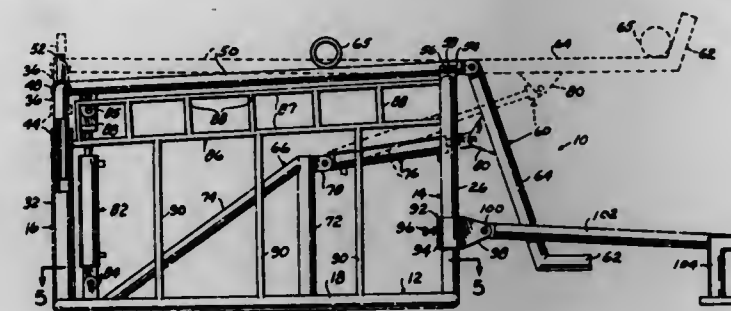
1. In apparatus for changing containers at an ejection opening of a refuse press, said apparatus comprising a transverse carriage, means for moving said transverse carriage in a direction transversely of a direction of pressing of said press, container supports on said transverse carriage, means for raising and lowering said supports, a longitudinal carriage with which said transverse carriage is arranged to co-operate, means for moving said longitudinal carriage in said direction of pressing towards and away from said ejection opening, and a rigid container support on said longitudinal carriage, said supports of said transverse carriage and said support of said longitudinal carriage being so arranged that a container resting on a support of said transverse carriage can be moved by said support of said longitudinal carriage into a pressing position at said ejection opening, the improvement wherein said transverse carriage comprises a first part and a second part, wheels movably mounting said first part on one side of said longitudinal carriage, further wheels movably mounting said second part on an opposite side of said longitudinal carriage, a member spanning said longitudinal carriage and rigidly interconnecting said first part and said second part of said transverse carriage, two stationary container storage supports, said stationary container storage supports being disposed one at one side of said longitudinal carriage and the other at an opposite side of said longitudinal carriage and being so located that said supports of said

transverse carriage are capable of transferring containers to and from said stationary container storage supports and said means for moving said transverse carriage being adapted to move said carriage between first and second limiting end positions and said supports of said transverse carriage being located one on said first part and the other on said second part of said transverse carriage.

4,051,956
HORIZONTAL PIPE HANDLING APPARATUS
J. T. Teague, P.O. Box 701, Elk City, Okla. 73644
Filed July 26, 1976, Ser. No. 708,667
Int. Cl.² E21B 19/00

U.S. Cl. 214-1 P

2 Claims



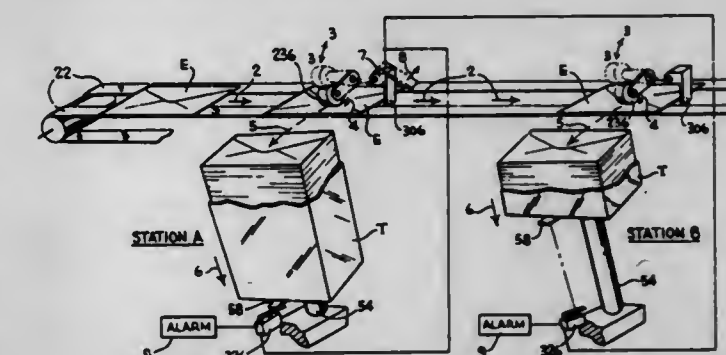
1. Pipe handling apparatus, comprising:
 - a pair of upright generally rectangular stand means arranged in spaced-apart relation transversely of a work path along which sections of pipe are to be moved;
 - top rail means comprising an elongated top rail extending transversely of the work path and pivotally connected at one end portion with each said stand means for vertical pivoting movement of its other end portion about a horizontal axis,
 - said top rail means cooperatively receiving and supporting a section of substantially horizontally disposed pipe when deposited thereon;
 - means including a top rail fluid pressure operated cylinder extending between and operatively connected at its respective ends with the respective said stand means and top rail opposite its said pivotal connection for inclining the longitudinal axis of said top rail means with respect to the horizontal to induce a gravity actuated rolling action transversely of the work path on a section of pipe when deposited thereon;
 - arm means comprising an elongated arm disposed transversely of the work path and pivotally connected at one end portion with the pivotally connected end portion of the respective said top rail for vertical pivoting movement of its other end portion toward and away from the surface of the earth and for receiving a section of pipe from said top rails when deposited thereon and lowering and releasing the section of pipe adjacent the surface of the earth;
 - a lateral normally upwardly directed stop secured to said other end portion of each said arm for normally maintaining a section of pipe on said arms; and,
 - other fluid pressure operated cylinders interposed between and operatively connected with each said stand means and said arms, respectively.

4,051,957
CONTAINER LOADING SYSTEM
Eriks Parups, Bradenton, Fla., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Continuation-in-part of Ser. No. 542,665, Jan. 21, 1975, abandoned. This application June 23, 1976, Ser. No. 698,863
Int. Cl.² B65G 57/14; B65H 29/18
U.S. Cl. 214-6 H

26 Claims

1. A container loading system for transporting and loading articles into containers, said system comprising:

means defining a feed path for transporting articles in serially; means for transporting said articles along said feed path; a first removable loading container having an open top disposed adjacent and substantially perpendicular to said feed path for receiving said articles, said first container being oriented at an incline approaching the vertical with its open top facing the feed path, said first container having signal means for providing a full load signal when said first container is full; a second removable loading container having an open top for receiving said articles, said second loading container disposed adjacent and substantially perpendicular to said feed path downstream from said first loading container, said second container being oriented at an incline approaching the vertical with its open top facing the feed path; means defining a first loading station disposed along said feed path for receiving said transported articles and ejecting the articles to said first loading container, said first loading station comprising a first limiting means disposed along said feed path for stopping each article as it is received at said first loading station, and a first ejecting



means for ejecting each stopped article at said first loading station to said first container; means defining a second loading station disposed along said feed path downstream of said first loading station for receiving transported articles and ejecting the articles to said second loading container when said articles are allowed to pass by said first loading station, said second loading station comprising a second limiting means disposed along said feed path for stopping each article as it is received at said second loading station, and a second ejecting means for ejecting each stopped article at said second loading station to said second loading container; switching means operatively connected to said first limiting means and said signal means for disabling the first limiting means from stopping received articles in response to said full load signal, whereby the articles are allowed to pass by the first loading station and are transported to said second loading station when said first loading container is full; and means for lowering each of said containers to sequentially receive articles that are ejected from said transporting means, said containers each being movable until full of said articles, whereby the signal means is activated to provide said signal.

4,051,958
PALLET UNLOADING AND ORIENTING DEVICE
Bruce E. Richardson; Gerald E. Wilson; Louis A. Lescelleux, and Rudy Oetliker, all of London, Canada, assignors to Labatt Breweries of Canada Limited, London, Canada
Filed Feb. 26, 1976, Ser. No. 661,757
Claims priority, application Canada, June 3, 1975, 228277
Int. Cl.² B65G 59/08

U.S. Cl. 214-8.5 C

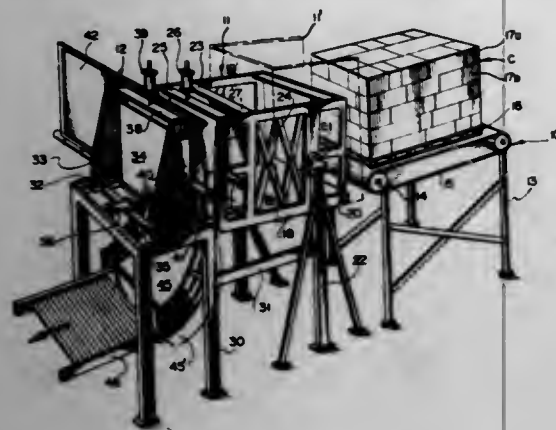
16 Claims

1. An apparatus for unloading and orienting articles stacked in tiers on a pallet comprising:
 - a. a tiltable pallet receiver having a pair of side frames, a

back wall and a bottom member, said receiver being supported on a support frame by means of pivotal mountings on said support frames, whereby it can in an upright position receive a loaded pallet with the bottom member substantially horizontal and then tilt until the pallet and tiered articles are resting on their sides on the receiver back wall forming a series of substantially vertical adjacent tiers;

b. means for intermittently advancing the tilted, loaded pallet in a primarily horizontal direction;

c. a single tier receiver for receiving a substantially vertical tier of articles during an intermittent advance of said



means for advancing the pallet, said tier receiver being horizontally movable for moving the received tier laterally away from the next adjacent tier;

d. clamp means for separately holding the substantially vertical tier received by the tier receiver and the adjacent vertical tier on the pallet while the tier receiver moves away from the pallet;

e. release means for dropping the tier of articles being held in the tier receiver; and

f. a delivery chute for receiving the dropped tier and delivering the articles in an upright position onto a horizontal table.

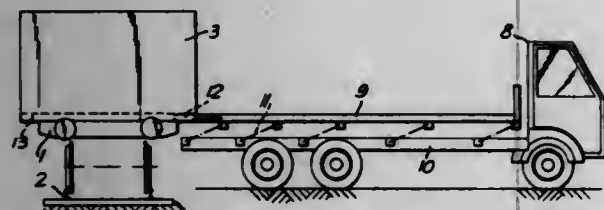
4,051,959 SYSTEM FOR HANDLING GOODS ON CARRIERS FOR COMBINED RAILWAY AND OVERLAND TRANSPORTATION

Flas Staff, Ski, Norway, and Christer Svensson, Laholm, Sweden, assignors to Linjegods A/S, Oslo, Norway and Lagaholm AB, Laholm, Sweden

Filed Mar. 24, 1976, Ser. No. 669,990
Claims priority, application Norway, Mar. 24, 1975, 751020
Int. Cl.² B65G 67/02

U.S. Cl. 214—38 BA

5 Claims



1. A system for handling goods on carriers for combined railway and overland transportation, comprising a truck having a carrying platform thereon that extends lengthwise of the truck, means to raise and lower the platform to adjust the platform to the height of a railway car, a sled that is movable lengthwise of the truck on guides on the carrying platform, means for moving the sled lengthwise along the platform to push or pull carriers along the platform lengthwise of the truck to or from a railway car, pegs on the sled that are movable transversely of the direction of movement of the sled along the platform, and means for moving said pegs transversely of the direction of movement of the sled along the platform thereby selectively to engage or withdraw said pegs from recesses or

holes in the carriers to connect or disconnect the sled from the carriers.

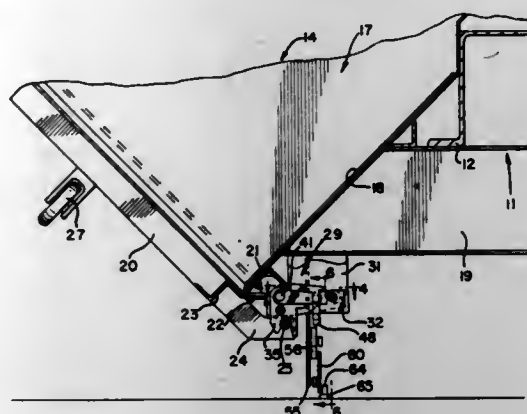
4,051,960 LOCKING END ACTUATING MECHANISM FOR RAILWAY HOPPER CAR DOORS

William Raksanyi, Hammond, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 26, 1976, Ser. No. 735,239
Int. Cl.² B65G 67/24

U.S. Cl. 214—63

10 Claims



1. A railway hopper car having a door hinged at its upper end to said car for outward swinging movement of its lower end to an open position and a keeper on said lower end of said door, the improvement of

a latch mechanism on said car adjacent said lower end comprising:

a bracket on said car,

a latch member having a keeper engaging portion in the closed position of said door extending vertically and blocking outward movement of said door,

means pivotally mounting said latch member above said keeper for clockwise and counterclockwise movement,

actuating linkage for said latch member including a first toggle link pivotally connected to said latch member,

a second toggle link including means pivotally connecting the same to said first toggle link,

means pivotally connecting said second toggle link to said bracket,

an unlocking lever including an upright arm, said lever being pivotally connected to the pivotal connecting means of said toggle links,

said lever including a second arm in the loading position blocking pivotal movement of said toggle links, and operating means exerting an upward thrust on said upright arm, thereby pivoting said second arm to an out-of-the-way position whereby said toggle links are pivoted, thereby swinging said latch member in a clockwise direction whereby said keeper is released from said keeper engaging portion to permit movement of said door to said open position.

4,051,961 AUTOMATIC TRASH PICKUP MACHINE

James P. Williams, Plainview, Tex., assignor to Williams Automatic Refuse Removal Corporation, Albuquerque, N. Mex.

Filed June 23, 1975, Ser. No. 589,638
Int. Cl.² B60P 1/36

U.S. Cl. 214—83.14

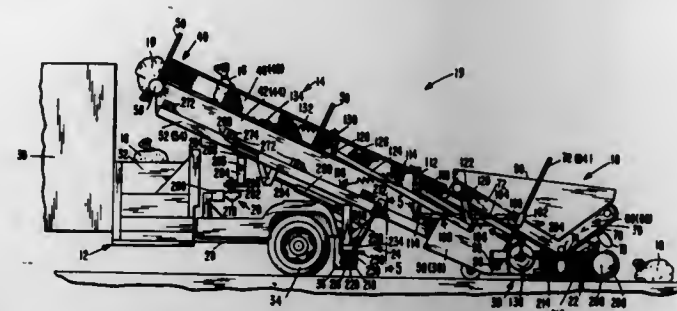
30 Claims

13. In an automatic trash pickup apparatus including means for picking up articles of trash from a surface and piling the trash on an inclined elevating conveyor for deposition in a storage portion of a vehicle on which the pickup apparatus is mounted, the improvement comprising:

a front elevating and turning bolster assembly for attaching

a forward end of the elevating conveyor to the vehicle, said bolster assembly including means for compensating

second position to its said first position for facilitating subsequent re-mounting of the loader on the tractor.



4,051,963 COMBINED HAY CARRIER AND FEEDER

William G. Coon, Jr., Box 196, Spickard, Mo. 64679
Division of Ser. No. 524,042, Nov. 15, 1974, Pat. No. 3,949,706.

This application Jan. 23, 1976, Ser. No. 651,963
Int. Cl.² A01K 5/00

U.S. Cl. 214—144

1 Claim

for compression of the vehicle's suspension as said pickup apparatus is swung laterally.

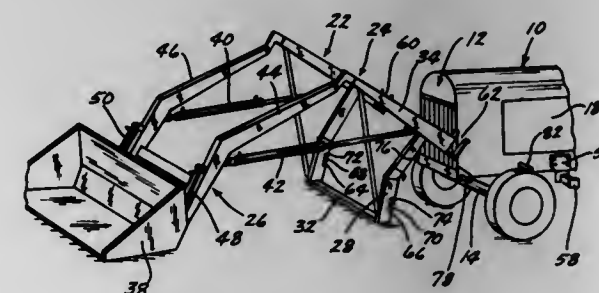
4,051,962 LOADER DEVICE FOR A TRACTOR

Neal W. Westendorf, Smithland, Iowa 51056
Filed Jan. 21, 1977, Ser. No. 761,322

Int. Cl.² E02F 3/62

U.S. Cl. 214—131 A

2 Claims

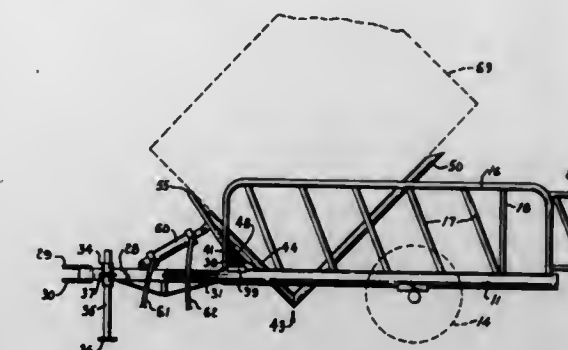


1. In combination,

a tractor having rearward and forward ends and opposite sides, a substantially horizontally disposed tubular member operatively secured to said tractor and extending laterally from each side of the tractor adjacent the forward end thereof,

connector means secured to said tractor at each side thereof rearwardly of the forward end thereof,

a loader device comprising a sub-frame means having spaced-apart and longitudinally extending side frame members having rearward and forward ends; a tower member operatively secured to each of said side frame members and extending upwardly therefrom; a boom means having rearward and forward ends and being pivotally secured at its rearward end to said tower members and being adapted to have a material handling implement connected to the forward end thereof; each of said side frame members having a forwardly extending slot formed therein having an open rearward end adapted to receive the laterally extending tubular members therein at times; said side frame members being operatively connected to said connector means, a lock means pivotally secured to each of said side frame members and having first and second ends; each of said lock means being pivotally movable between first and second positions; said lock means, when in its first position, having one end thereof positioned rearwardly of the tubular member received in said slot so as to maintain said side frame member on said tubular member; each of said lock means being pivotally movable to said second position wherein the other end of said lock means is in communication with said slot spaced rearwardly from said tubular member so that said tubular member may move rearwardly in said slot to enable the loader device to be removed from the tractor and wherein the said rearward movement of said tubular member will cause said lock means to pivotally move from its said



1. Apparatus for loading and transporting a large mass of hay, said apparatus comprising:

a frame;

a ground-engaging wheel assembly supporting said frame above the ground;

means adapted to couple said frame to a vehicle for towing thereby;

a horizontal cylindrical axle extending transversely across said frame and having opposite ends secured to said frame;

lift means carried on said frame, said lift means including a pair of tubular sleeves telescopically received on said horizontal axle, a pair of support members having top and bottom ends and being secured to said tubular sleeves immediately of said top and bottom ends, and a pair of hay-engaging forks secured to the bottom ends of said support members and extending generally rearwardly thereof; and

an extendable and retractable power cylinder connected to the top ends of said support members and connected to said frame for pivotally moving said lift means about said horizontal axle to thereby raise said hay mass from the ground to an elevated position upon retraction of said power cylinder and to lower said hay mass to the ground from the elevated position upon extension of said power cylinder.

4,051,964 DEVICES FOR COLLECTING BALES OF STRAW OR OTHER MATERIALS

Jan Gerrit Meijer, Lellens, Netherlands, assignor to Thomas Hauke Daniel Meijer, Lellens, Netherlands

Continuation of Ser. No. 462,943, April 22, 1974, abandoned.

This application Nov. 17, 1975, Ser. No. 632,628

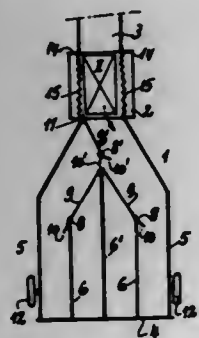
Claims priority, application Netherlands, Apr. 20, 1973, 7305658

Int. Cl.² A01D 87/12; B65G 57/32
U.S. Cl. 214—152

3 Claims

1. A process for collecting bales into a group, said process comprising: forming a bale feed path having a downwardly inclined portion and a substantially horizontal portion downstream of said inclined portion; forming two groups of two parallel collecting compartments on the horizontal portion of the feed path, said compartments lying in a common horizontal plane, each group of compartments being located at a respective side of a central longitudinal partition and each compartment having an inlet at one end portion; providing first bale diverter means on the inclined portion of the feed path, said first diverter means being pivotal about an axis between two

limit positions to divert bales to a respective one of said groups of compartments in each of the limit positions, and providing said first diverter with resilient flexible extension means downstream of said axis; providing second bale diverter means for each pair of compartments of the respective groups, said second diverter means being located on the horizontal portion of the feed path between the first diverter means and the inlet of the compartment, each said second diverter means being pivotal about an axis between two limit positions, in one of said limit positions the second diverter means opening the inlet of the outboard of its associated compartments and closing the inlet of the inboard of its associated compartments, and in the other of said limit positions, the second diverter means closing the inlet of said outboard of its associated compartments and opening the inlet of said inboard of its associated compartments, providing each said second diverter means with extension means downstream of its associated pivotal axis and biasing each said diverter means whereby it opens the inlet of its associated outboard compartment except when its corresponding extension means bears against a bale; feeding a first bale along said path; diverting the first bale towards the first group of compartments by means of the first diverter means, said first bale pivoting the first diverter means from one of its limit positions into the other limit position as said first bale engages

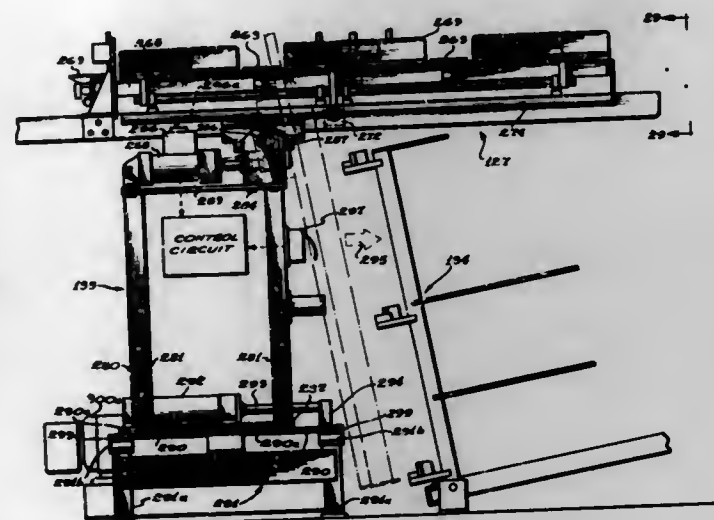


the flexible extension means of the first diverter means; feeding a second bale along the path; diverting the second bale towards the second group of compartments by means of the first diverter means, said second bale pivoting the first diverter means from its said other limit position into its said one limit position as the second bale engages the flexible extension means of the first diverter means; feeding further bales along the feed path such that successive bales are diverted alternately to the first and second groups of compartments by the first diverter means and each bale pivots the first diverter means into its opposite limit position as the bale engages the flexible extension means of the first diverter means; distributing the bales diverted by the first diverter means between the respective compartments of the corresponding group, said bales being distributed between the compartments by said biased diverter means such that said outboard compartments are first filled with a plurality of bales and then said inboard compartments are filled with a plurality of bales, said bales entering said outboard compartments pivoting each said biased diverter means by engaging its extension means and the last said bale of said plurality of bales received in each compartment maintaining said biased diverter means in position for filling the adjacent inboard compartment; and withdrawing the group of bales thus formed from the compartments.

4,051,965
FILLED BAG HANDLING AND STORAGE APPARATUS
Wallace W. Mojden, Hinsdale; Jose E. Davila, Chicago; George W. Hooper, Western Springs; Gerald M. Kwiatkowski, Dolton, and Howard W. Pantel, Jr., Woodridge, all of Ill., assignors to Fleetwood Systems, Inc., Countryside, Ill.
Division of Ser. No. 521,842, Nov. 7, 1974, Pat. No. 3,962,845, which is a division of Ser. No. 351,639, April 16, 1973, Pat. No. 3,878,949. This application Dec. 3, 1975, Ser. No. 637,470
Int. Cl.² B65G 1/06

U.S. Cl. 214—16.4 A

4 Claims

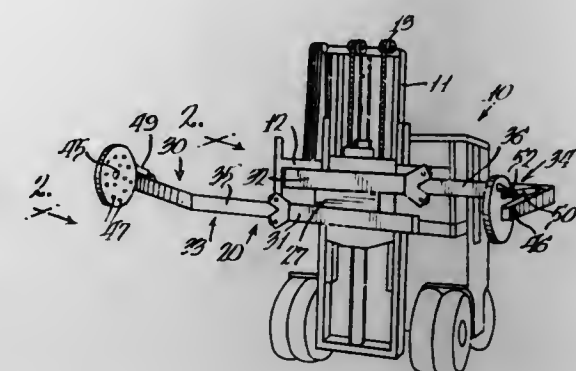


1. In combination, bag storage means including at least one storage bay, and bag handling apparatus for receiving filled bag elements at a packaging station, or the like, and automatically delivering and depositing said bag in said storage bay, said bag handling apparatus, comprising, stationary guide means extending from said packaging station in a first direction, a carriage assembly movable along said guide means both toward and away from said packaging station, and first drive means operably associated with said carriage assembly for effecting said movement, said carriage assembly comprising a lower frame unit engaged upon said stationary guide means and movable therealong upon operation of said first drive means, and an upper frame unit supported on said lower frame unit for relative movement in a second direction, generally transverse to the direction of movement of said lower frame unit along said guide means, and a second drive means for effecting movement of said upper frame unit relative to said lower frame unit in said second direction, a trough member pivotally mounted to said upper frame unit for movement between a generally horizontal position for receiving a filled bag from said packaging station, and a generally vertical position for depositing filled bags in said storage bay, said storage bay including at least one bay having an open end, filled bag engaging means mounted adjacent said end, said storage bay being disposed adjacent to, but, spaced from said guide means and being elongate in said second directions, such that upon disposition of a filled bag in said trough, said first drive means can be operated to move said carriage assembly along said guide means into alignment with the open end of said storage bay, and thereafter said second drive means can be operated to move said upper frame unit relative to said lower frame unit in said second direction to dispose said trough and an associated filled bag interiorly of the open end of said storage bay, such that upon operation of said second drive means to withdraw said trough from said storage bay, said filled bag engaging means will maintain said bag within said storage bay.

4,051,966
TIRE MANIPULATING APPARATUS
Larry G. Cotton, Clear Lake, Iowa, assignor to Iowa Mold Tooling Co., Inc., Garner, Iowa
Filed Oct. 23, 1975, Ser. No. 625,114
Int. Cl.² B66C 3/16

U.S. Cl. 214—332

7 Claims



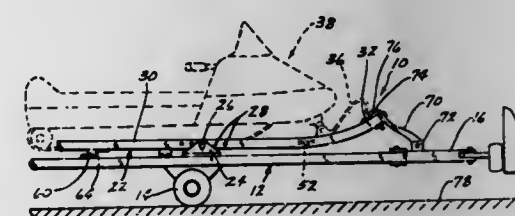
1. In a tire manipulating apparatus which includes a mounting member, means supporting said mounting member on a vehicle mounted structure for raising and lowering the mounting member, an axially rotatable head on the mounting member, and means for rotating said head, the improvement comprising, in combination:

means for moving the mounting member laterally on the vehicle mounted structure;
a pair of spaced, parallel, tubular housings on the rotatable head, said housings being in a common plane;
an L-shaped member operatively associated with each of said housings, each of said members having a first arm telescoped in one of the housings, and a second arm, at least one of said second arms being inclined with respect to said first arms so that the free ends of the second arms are coaxial;
opposed tire gripping elements at the free ends of the L-shaped members;
and power operated means for coordinately extending and retracting said L-shaped members so that the tire gripping elements may grippingly engage diametrically opposite areas of the tread surface of a tire the diameter of which is in a plane parallel to said tubular housings and normal to said common plane.

4,051,967
SNOWMOBILE TRAILER
Jarvis D. Sedgwick, 501 Fourth Ave., and Gordon C. Headlee, R.R. 1, both of Coon Rapids, Iowa 50058
Filed Aug. 12, 1976, Ser. No. 713,632
Int. Cl.² B60P 1/28

U.S. Cl. 214—505

8 Claims



1. A snowmobile trailer comprising, a trailer frame having front and rear ends and being U-shaped and open at its rear end, ground engaging wheels on said frame for supporting said trailer frame above the ground, a U-shaped sub-frame open at its rear end pivotally con-

nected along its side members to adjacent side members of said trailer frame for pivotal movement between raised and lowered positions with said forward end being up in said raised position and said forward end being down in said lowered position, said trailer frame and sub-frame being substantially open along their length between their side members, fastening means front and rear on said sub-frame for securing a snowmobile to said sub-frame, said front fastening means including a support portion at the front end of said sub-frame which engages the ground when said sub-frame is pivoted to said lowered position whereby the front end of said snowmobile may be moved thereon and be lifted off the ground when said sub-frame is pivoted to said raised position.

4,051,968
LOAD HANDLING METHOD AND APPARATUS
Navarre Andre Massey, P.O. Box 850, 542 River Drive, Fort MacLeod, Alberta, Canada (T0L 0Z0)
Filed Mar. 29, 1976, Ser. No. 671,416
Claims priority, application Canada, June 27, 1975, 230360
Int. Cl.² B60P 1/14

U.S. Cl. 214—506

15 Claims



1. In a flat bed trailer tiltable attachable to a hauling unit, comprising a flat bed platform provided, on its lower surface, with at least two longitudinal carriage guiderails, a movable wheel carriage assembly provided with rollers which engage the said carriage guiderails, the improvement which comprises: (1) a winch; (2) a winch cable engaged by the said winch and capable of being selectively connected to the forward lower edge of a load or to the forward part of the said wheel carriage assembly; (3) a linkage cable, one end of which is capable of being connected to the forward lower edge of the load, while the other end is capable of being connected to the rear part of the said wheel carriage assembly; (4) an idler sheave located at the rear of the said flat bed trailer, adapted to accept and guide said linkage cable.

13. A method of loading of a load onto a tiltable flat bed trailer provided with a wheel carriage assembly which is mounted for sliding movement relative to the bed in the direction of travel of the trailer, and a single power means connectable to said wheel carriage assembly and said load, said method consisting of operating said power means drawing the said load forward and onto said trailer when it is tilted downwardly at the rear and, simultaneously, drawing said wheel carriage assembly rearward thus returning the said trailer to a horizontal position.

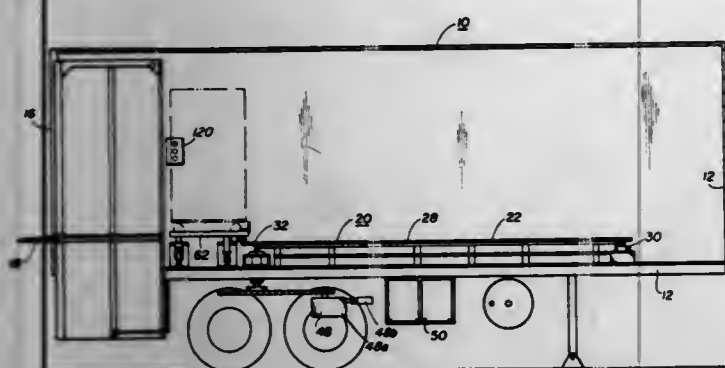
4,051,969
BULK DISTRIBUTION SYSTEM
George Homanick, Lathrup Village, Mich., assignor to PepsiCo Inc., Purchase, N.Y.
Filed Mar. 15, 1976, Ser. No. 667,156
Int. Cl.² B60P 1/64

U.S. Cl. 214—516

16 Claims

1. A load conveyor arrangement for the storage and conveyance of load-carrying roller carts in a loading vehicle having a loading platform, comprising: endless conveyor means having a pair of conveyor runs extending along the longitudinal length of said platform; a plurality of roller cart-supporting carriers being fastened to said endless conveyor means in predetermined spaced relationship along the length thereof, each of

said carriers being adapted to respectively support one of said roller carts, each said carrier comprising a pair of parallel spaced U-rails extending normally from said endless conveyor means above said loading platform, said U-rails being downwardly inclined towards said endless conveyor means, and at least one crossbeam interconnecting said U-rails so as to form a rigid bracket structure, said load-carrying roller carts each



having casters mounted thereon adapted to be supported on said U-rails; drive means operatively engaging said endless conveyor means for moving said conveyor runs and said carriers along said platform; and means for controlling the extent of movement of said endless carrier means and of said carriers for selectively positioning said carriers on said loading platform in either roller cart loading and unloading or transportation modes.

4,051,970

LIFT TRUCK LOAD HANDLING MAST

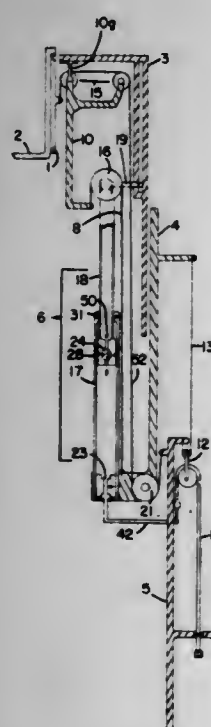
Keith E. Ramsey, Pleasant Lake, Mich., assignor to K-D Manufacturing Company, Waco, Tex.

Filed Nov. 7, 1975, Ser. No. 630,039

Int. Cl.² B66F 9/06, 9/08

U.S. Cl. 214—670

16 Claims



1. An extensible load handling mast for a lift truck comprising: a plurality of telescopic sections operably interconnected to extend and collapse including a first vertically fixed outer section, a second vertically movable center section, and a third vertically movable section; a load handling carriage movably mounted on a carrier assembly vertically movable along said third mast section, said third section comprising the top section of said mast when said mast is fully extended; a hydraulic ram comprising a single stage unit having a cylinder and one extendable piston rod operable in said cylinder, said ram being supported on said second mast section for vertical movement within said mast sections; and flexible line means movably supporting said carriage from said carrier at all positions of said

carriage along said mast from a lowest position of said carriage at full retraction of said mast to a maximum height position of said carriage at full extension of said mast and said flexible line means operably interconnecting said mast sections and said carrier and carriage to produce a four-to-one ratio in the raising and lowering of said carriage relative to said extendible piston rod for extending and collapsing said mast and raising and lowering said carriage along said mast responsive to operation of said ram.

4,051,971

HOME USE SEAL CONTAINER FOR FOOD VACUUM STORAGE

Piergiorgio Saleri, and Sergio Saleri, both of Via XXV Aprile 14, Rovato (Brescia), Italy

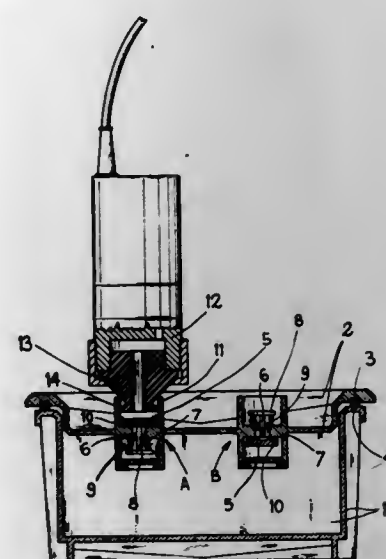
Filed Nov. 3, 1975, Ser. No. 628,242

Claims priority, application Italy, July 30, 1975, 5194/75

Int. Cl.² B65D 51/16

U.S. Cl. 215—260

5 Claims



1. Home use seal container apparatus for food vacuum storage, comprising as main structural elements a vessel and a lid superimposable on said vessel to form a storage chamber, a resilient gasket between said vessel and lid, an air seal valve secured with one of said structural elements, said valve comprising a housing integral with said one structural element and including a union projecting therefrom in a direction away from the other structural element, a flat shutter normally held in a closed position against an associated seating, a stem secured to said shutter, said stem extending with clearance through an aperture provided in said one structural element, a cap on said stem, a resilient member acting on said cap to urge the shutter to said closed position, and a suction pump comprising a casing of resilient material including an annular edge portion, said edge portion being dimensioned for insertion into said union to a given depth therein to form a sealed relation of said casing with said housing such that suction pressure developed by said pump will produce lifting of said shutter against the action of said resilient member and removal of air from the container, and means for selectively releasing suction pressure from within said storage chamber.

4,051,972

CANNING CLOSURE AND METHOD

Albert L. Botkin, 3018 Hood Ave., Chicago, Ill. 60659

Continuation-in-part of Ser. No. 572,160, April 28, 1975, Pat. No. 3,967,746. This application June 1, 1976, Ser. No. 691,564

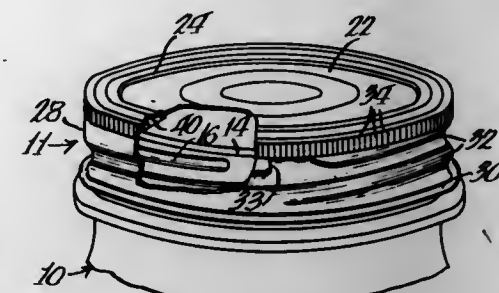
Int. Cl.² B65D 51/16

U.S. Cl. 215—260

21 Claims

1. A sealed package under vacuum comprising a container having a body portion and an upwardly-extending neck portion which terminates in an upper circumferential sealing lip and defines a mouth; helical container thread means on the outer surface of said neck portion; and a one-piece reusable

closure threadedly engaging said neck portion and sealingly secured to said container; said closure comprising a central cover section having an inner surface and an outer surface and terminating outwardly in a depending peripheral skirt having a helical skirt thread means complementary to and in threaded engagement with said container thread means, an annular



gasket comprising a resilient, compressible closed cell foam resilient at temperatures up to about 250° F. bonded to the inner surface of said closure adjacent to said skirt and being in sealing engagement with, and compressed against, said lip around the entire periphery of said lip, and limitor means displaced from said gasket for limiting the compression of said gasket material against said lip to a predetermined degree.

4,051,973

CANNING CLOSURE AND METHOD

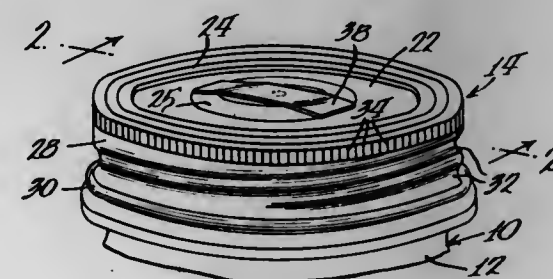
Albert L. Botkin, 3018 Hood Ave., Chicago, Ill. 60659

Continuation-in-part of Ser. No. 572,160, April 28, 1975, Pat. No. 3,967,746. This application June 1, 1976, Ser. No. 691,310

Int. Cl.² B65D 51/16

U.S. Cl. 215—260

15 Claims



1. A sealed package under vacuum comprising a container having a body portion and an upwardly-extending neck portion which terminates in an upper circumferential sealing lip and defines a mouth; helical container thread means on the outer surface of said neck portion; and a one-piece reusable closure threadedly engaging said neck portion and sealingly secured to said container; said closure comprising a central cover section having an inner surface and an outer surface and terminating outwardly in a depending peripheral skirt having a helical skirt thread means complementary to and in threaded engagement with said container thread means, a downwardly opening annular channel being defined in said central cover section adjacent said skirt, a resilient annular gasket disposed in, and bonded to, the inner surface of said annular channel and being in sealing engagement with said lip around the entire periphery of said lip, a portion of said central cover section presenting a substantially flat exterior surface defining an orifice and having a self-biased resilient member secured to said central cover section for disengageably overlying said orifice and normally sealing said orifice but venting said package when the pressure within said container exceeds atmospheric, a portion of said closure central cover section being inwardly dished and being maintained in that inwardly dished configuration when pressure within the sealed package is subatmospheric, said inwardly-dished portion being capable of springing preferentially to an outwardly dished configuration when the pressure within the sealed package is at least atmospheric.

4,051,974

SEALING APPARATUS

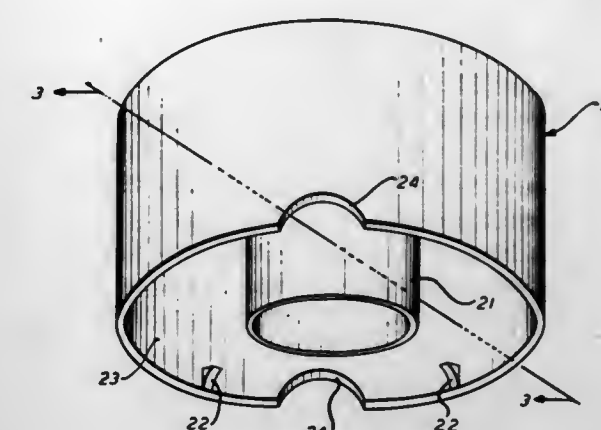
Charles J. Gentile, North Caldwell, N.J., assignor to Orange Products, Inc., Chatham, N.J.

Filed Feb. 18, 1976, Ser. No. 658,862

Int. Cl.² B65D 41/04

U.S. Cl. 215—329

4 Claims



1. An improved sealing apparatus for an applicator of the type having a means for sealing an exposed surface of an applicator from the environment, said sealing means comprising or included within a cap, wherein the improvement comprises:

- means for positively locking said sealing means to said applicator;
- means for unlocking said sealing means from said applicator; and
- means for disengaging said sealing means from said applicator comprising a plurality of arcuate surfaces concavely set in an interior wall of said cap and a plurality of cam surfaces extending upwardly from said applicator, such that said arcuate surfaces are in registration with said cam surfaces when said cap and applicator are in sealed position.

4,051,975

CAP FOR FUEL TANK

Hidetoshi Ohgida; Yoshiharu Sakai, both of Atsugi, and Hiroyuki Kawai, Tokyo, all of Japan, assignors to Nihon Radiator Co., Ltd., Tokyo, Japan

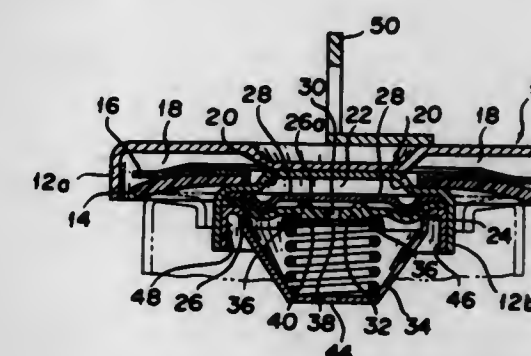
Filed Mar. 18, 1977, Ser. No. 778,849

Claims priority, application Japan, Mar. 25, 1976, 51-35186[U]

Int. Cl.² B65D 51/16

U.S. Cl. 220—203

8 Claims



1. A cap of a fuel tank comprising a lid member constructed of upper and lower plates to form a passage communicated with the air between both plates, a seating plate underlying said lid member and provided with a plurality of bores circularly arranged in the peripheral portion of the central flat field thereof, a diaphragm of a flexible material underlying said seating plate and provided with a perforation in the central portion thereof and an annular ridge surrounding the perforation on the upside thereof, a valve plate underlying said diaphragm and provided with a perforation in register with the perforation of said diaphragm, a casing disposed at the lowest

position in the cap and provided with a perforation in the bottom thereof, the peripheral portion of said diaphragm being fixedly interposed between the peripheral portion of said lower plate with intermediation of said seating plate and the flange portion of said casing, and a coil spring held in said casing and adapted to urge said valve plate upwardly.

4,051,976

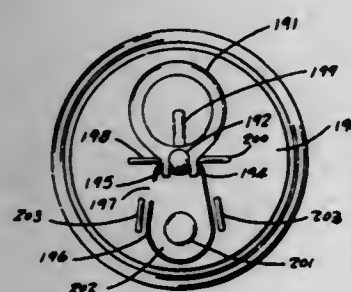
CONTAINER WITH ATTACHED CLOSURE

Walter Merton Perry, 76 Locust Hill Road, Darien, Conn. 06420

Continuation of Ser. No. 515,444, Oct. 17, 1974, Pat. No. 3,977,578, which is a continuation-in-part of Ser. No. 231,124, March 2, 1972, Pat. No. 3,843,011, and Ser. No. 514,069, Oct. 11, 1974, Pat. No. 3,952,912, which is a continuation-in-part of said Ser. No. 231,124. This application Aug. 9, 1976, Ser. No. 712,839

Int. Cl.² B65D 41/32

U.S. Cl. 220-269



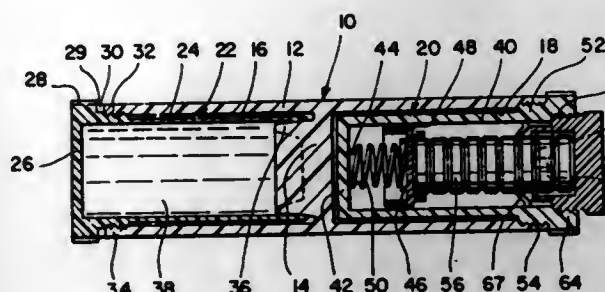
1. An improved easy open container having a top made of sheet material and having easy opening means therein, and in which said easy opening means comprises,

an openable segment in said container top and with said segment defined by a weakening score line which extends almost all the way around the periphery of said segment but with said score line interrupted at one point and thereby leaving a relatively short unscored section along said periphery, and which unscored section forms a permanent hingeable attachment means to anchor said openable segment to said container top after opening of said segment,

an elongated leverage lift tab means for manual leverage opening of said openable segment, and with said leverage lift tab means hingeably attached at a point along its length to rivet securement means, and with said rivet securement means permanently secured to said container top at a position on said top which is outward of said openable segment but close to said score line, and said leverage lift tab means having a longer outer lift end which overlies and extends outward over said container top beyond said openable segment, and having a shorter inner downward pressure exerting end means which extends partially over said openable segment in the region near said rivet securement means, and

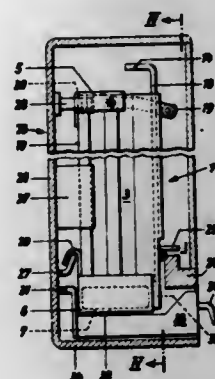
said inner downward pressure exerting end means having pressure contact means whereby when said outer lift end of said leverage lift tab means is manually raised upward to open said openable segment, said inner downward pressure exerting end means will move downward and cause said pressure contact means to exert high downward pressure against said openable segment in the region near said rivet securement means, and will cause rupture along said score line, and whereby said pressure contact means will cause downward bending of said openable segment into said container, and provide an opened area in said container top, and wherein said segment remains attached to said container top by at least said unscored section hingeable attachment means.

4,051,977
PILL AND WATER DISPENSER
Carolyn VeAlletto Steinfeld, New York, N.Y., assignor to Lawrence Peaka Associates, Inc., New York, N.Y., a part interest
Filed Apr. 14, 1976, Ser. No. 677,048
Int. Cl.² G07F 11/14
U.S. Cl. 221-96 7 Claims



1. A dispenser for holding and dispensing pills and water comprising tube means, the ends of said tube being open, bulk-head means in said tube for dividing said tube into a water chamber and a pill chamber, openable and closable pill dispensing means received by said pill chamber, water dispensing means received by said water chamber, the bottom of said water dispensing means comprising a cap for said water chamber whereby said water chamber and water dispenser is sealed when said water dispenser is received by said water chamber, said pill dispensing means comprising a pill receptacle having bottom wall means and side wall means, resilient means in said pill dispensing means for biasing pills upwardly from said bottom wall, retaining means at the top of said side walls for preventing pills in said pill receptacle from being biased out of said pill receptacle, cap means for sealing the top of said pill receptacle, clip means extending from said cap into said pill receptacle for gripping a pill through said retaining means and for pulling a pill through said retaining means when said cap is positioned to close said pill receptacle and removed to open said pill receptacle.

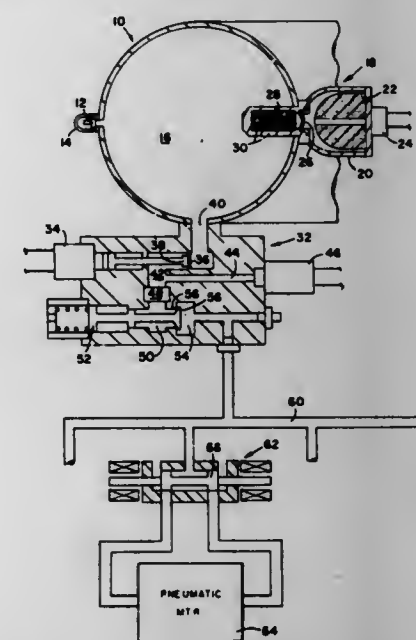
4,051,978
MERCHANDISE COMPARTMENTING ARRANGEMENT FOR AN AUTOMATIC VENDING MACHINE
Josef Kiefer, Herrieden, Germany, assignor to Sielaff GmbH & Co. Automatenbau Herrieden, Herrieden, Germany
Filed Jan. 13, 1976, Ser. No. 648,803
Claims priority, application Germany, Jan. 23, 1975, 2502626
Int. Cl.² B65H 1/00
U.S. Cl. 221-197 10 Claims



1. In a merchandise compartmenting arrangement for an automatic vending machine of merchandise packages; including actuating means operatively associated with merchandise compartments for dispensing the merchandise packages; at least one of said merchandise compartments being constructed as an independent self-supporting unit which is fillable with merchandise packages externally and separately from said vending machine, and is separately transportable with regard to the latter and insertable therein for filling of the vending machine with merchandise packages; means for receiving said

unit in said machine in an operative position for the dispensing of packages by operation of said actuating means, said unit having a dispensing aperture through which the merchandise packages are dispensable singly responsive to operation of said actuating means when the unit is in said operative position within said vending machine, the improvement wherein said unit has a front opening extending substantially the entire height of the unit for filling the unit with merchandise packages, said dispensing aperture being formed by a lower portion of said front opening, a cover plate for said unit extending substantially the entire height thereof and having an open position for filling the unit with merchandise packages through said front opening, and a closed position to enclose the packages in said unit during transport thereof, said cover plate covering said dispensing aperture in said closed position, means slidably supporting said cover plate for longitudinal movement thereof in the plane of the front opening, and projecting means on said cover plate for being operatively engaged when the unit is inserted into the machine to effect longitudinal upwards displacement of the cover plate relative to the unit to expose said dispensing aperture.

4,051,979
PNEUMATIC SERVO SYSTEM UTILIZING HEAT SQUIB AND EXPLOSIVE VALVE
James M. Smith, Fanibel Island, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 12, 1976, Ser. No. 685,552
Int. Cl.² B01J 7/00
U.S. Cl. 222-3 5 Claims



1. A pneumatic servo system comprising a container filled with inert gas, a heat squib mounted on the side of said container for heating the inert gas and increasing the pressure thereof when the heat squib has been ignited, an outlet from said container, control means connected to said outlet from said container a pressure regulator having an inlet, said control means including a piston actuated explosive valve interconnecting the outlet from said container to said inlet of said pressure regulator, a manifold outlet, and said pressure regulator being connected to said manifold outlet for delivering said inert gas to said manifold outlet at a predetermined pressure.

4,051,980
GRANULAR MATERIAL DISTRIBUTOR
Leroy Vydral, Rte. 1, Box 243, Smithville, Tex. 78957
Filed May 20, 1976, Ser. No. 688,148
Int. Cl.² B62D 33/00
U.S. Cl. 222-610 4 Claims

1. A material dispenser for selectively dispensing granular material from a dump truck of the type having a tiltable body portion with an open end and a tailgate pivotable about an axis

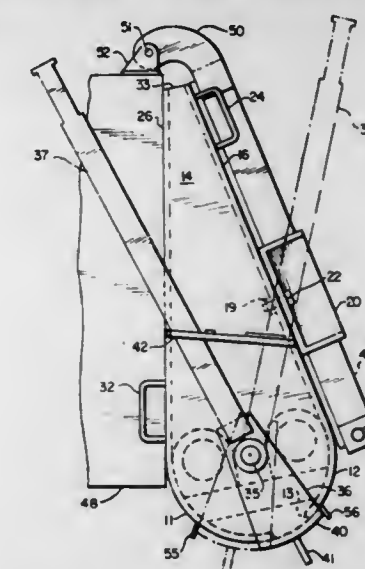
near the top of said open end, said dispenser comprising the combination of

an elongated upwardly opening, substantially semicylindrical trough having a central axis, said trough having a length greater than the width of said tiltable body portion; means in the lower portion of said trough defining a longitudinally extending slot dimensioned for permitting passage of granular material of a predetermined average size therethrough;

an elongated arcuate cover plate having a length at least as great as the length of said slot and having a curvature substantially the same as said trough;

hanger means for rotatably supporting said cover plate for concentric movement relative to and outside of said trough about an axis parallel with said central axis between a first position in which said cover plate lies immediately below and closes said slot and a second position in which said cover plate exposes said slot, said hanger means including

first and second end plates having a tapered configuration to conform to the opening between said body portion



and said partially open tailgate, said end plates being fixedly attached to opposite ends of said trough and having arcuate lower edges conforming to the shape of said trough,

first and second hanger plates attached to opposite ends of said cover plate and extending parallel with said end plates, and

axle means for rotatably supporting said hanger plates on said end plates;

lever means attached to one of said hanger plates for manually moving said cover plate; and

means for supporting said trough and said hanger means between the open end of said truck body portion and said tailgate with said tailgate in a partially opened position and with the upper portion of said trough at or below the level of the floor of said body portion, said means including

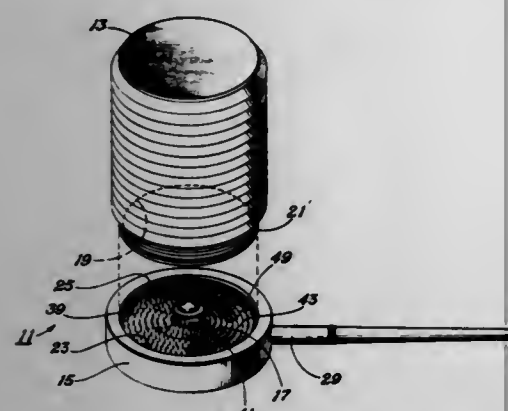
first and second wall portions extending upwardly from said trough and inwardly from edges of said end plates toward and beyond the sides of said tailgate, and clamp means on each of said wall portions for engaging and gripping said sides of said tailgate.

4,051,981
POWDER GUN
Louis John Mandlak, 116 Athena Drive, Fort Worth, Tex. 76114
Filed Dec. 15, 1975, Ser. No. 640,621
Int. Cl.² B05B 7/14, 11/04
U.S. Cl. 222-189 2 Claims

1. A powder gun adapted for dispensing a powder regardless of lumps that may tend to form therein comprising:
a. a hollow collapsible body that is normally biased to an

extended position and movable to a compressed position for discharging air and any powder therewithin from said body through an aperture and a dispensing member; said hollow collapsible body including:

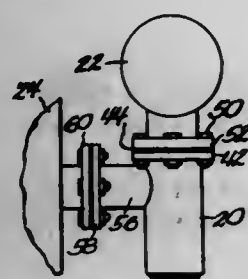
- i. a first aperture at one end; and
- ii. a first connection means portion for connecting said hollow collapsible body to a dispensing member;
- b. a dispensing member having:
 - i. a second aperture adapted to mate with said first aperture of said hollow collapsible body;
 - ii. a second connection means portion for matingly connecting to said first connection means portion for connecting said hollow collapsible body to said dispensing member, said second connection means portion being disposed adjacent said second aperture;
 - iii. a discharge port disposed in said dispensing member and penetrating through a wall thereof for discharging powder therethrough; and



- iv. a discharge spout connected with said discharge port for directing said discharged powder into a desired area; and
- c. a filter and lump break-up means disposed in said dispensing member immediately adjacent said discharge port for breaking up lumps and for filtering said powder and preventing entry of particles large enough to plug said discharge spout; said filter and lump break-up means comprising a rotatable disc rotatably mounted in said discharge member and having at least two sections of upstanding stalks disposed at a predetermined angle with respect to said disc; said stalks being of respective predetermined diameters and disposed at respective predetermined distances apart in the respective sections to achieve the desired filtering action and being sized and shaped to achieve the desired break up of any lumps that tend to form.

4,051,982 FAST RELEASE AERATOR FOR MATERIALS HANDLING

Harold M. Stetson, Neponset, Ill., assignor to Martin Engineering Company, Neponset, Ill.
Continuation-in-part of Ser. No. 502,547, Sept. 9, 1974,
abandoned. This application Sept. 29, 1976, Ser. No. 727,397
Int. Cl.² G05D 3/14; B67B 7/24
U.S. Cl. 222-195



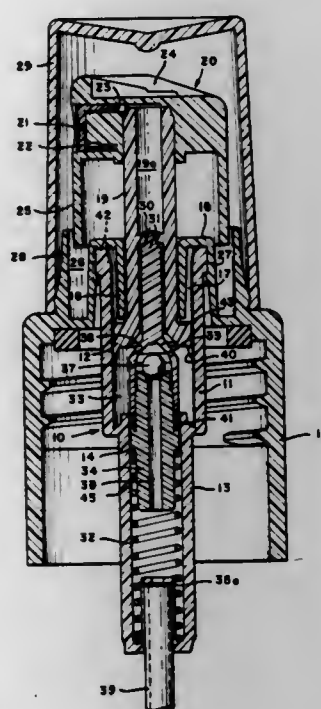
1. A quick release aeration system including a pressure

source; a gravity discharge container for flowable materials; an aerator including a hollow body having an inlet port at one end connected to said pressure source, a charge port at said other end, a tapered seating surface defined by said body internal thereto adjacent said charge port and a side discharge port disposed between said inlet port and said charge port and connected to said gravity discharge container, a unitary piston slidably disposed in said hollow body said piston defining a passage therethrough and said piston defining a tapered seating surface on one end thereof adapted to mate with said tapered seating surface of said hollow body; an air reservoir connected to said charge port for storing air at increasing pressures; valve means associated with said pressure source and said inlet port and adapted in one position to pressurize said inlet port and in another position to release pressure from said inlet port, whereby when said inlet port is pressurized said piston assumes a first position blocking communication between said side discharge port and said charge port and allowing air to pass from said inlet port through said passage in said piston to said reservoir and when said inlet port is depressurized said piston instantaneously moves to a second position allowing communication between said charge port and said side discharge port to allow a rush of pressurized air from said reservoir through said side discharge port to said container of flowable material.

4,051,983 PUMP SPRAYER

Walter F. Anderson, West Covina, Calif., assignor to Diamond International Corporation, New York, N.Y.
Filed Nov. 19, 1975, Ser. No. 633,315
Int. Cl.² B05B 1/00
U.S. Cl. 222-321

7 Claims



1. In a pump sprayer of the class which includes a pair of relatively aligned upper and lower pistons of large and small diameter respectively working in different diameter portions of a common pump chamber which has its lower end adapted for direct and open communication with a supply of liquid to be dispensed from a container through a dip tube connected to said lower end;

both of said pistons having valve controlled flow passages therethrough to permit only the upward flow of fluid through said pump chamber;
and means for reciprocating said pistons substantially in phase with each other for varying the volume of the pump chamber encompassed between said pistons;
the improvement wherein said small diameter piston is resiliently radially deformable and is normally in sealing relation with the inner wall of said pump chamber throughout its entire circumference;

said inner wall being formed with a protuberance located for

engagement with said small diameter piston at a predetermined axial location near the end of the downward stroke of said small diameter piston to locally inwardly deform a portion of the periphery of said piston so that entrapped air may escape from between said pistons into said lower end of the pump chamber and into said container through said dip tube to be replaced by liquid from said container.

4,051,984

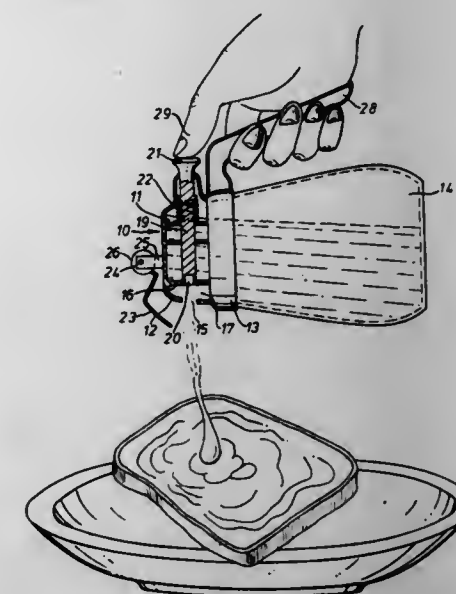
COVER FOR A CONTAINER

Hoi Ho, Kowloon, Hong Kong, assignor to Marigold Enterprises Ltd., Kowloon, Hong Kong
Filed Oct. 14, 1976, Ser. No. 732,387
Claims priority, application United Kingdom, Oct. 14, 1975, 42040/75

Int. Cl.² B65D 23/06

U.S. Cl. 222-471

13 Claims



1. A closure for a container, comprising an end wall portion, a peripheral wall portion extending from one side of said end wall portion, a wall spaced from said peripheral wall portion and extending from said end wall portion, means for attaching the cover to a container, a pouring opening in said peripheral wall portion, an aperture in said spaced wall aligned with said pouring opening and having a cross-sectional area less than that of said pouring opening, and a manually movable closure member which can be moved between a position in which it closes said aperture and a position in which the aperture is open.

11. A closure as claimed in claim 1, provided with a handle.

4,051,985

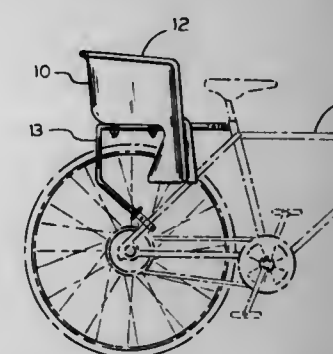
QUICK RELEASE CHILD'S BICYCLE SEAT

Irvin E. Berger, 4215 Grove, Skokie, Ill. 60076
Filed Dec. 1, 1975, Ser. No. 636,622

Int. Cl.² B62J 1/28

U.S. Cl. 224-32 A

3 Claims



1. In combination with a rear carrier adapted to carry a child on a bicycle having a seat tube assembly and at least one strut

member, said rear carrier being attached to tubular frame means having two ends, the improvement comprising:
seat bracket means including a hook means and being pivotally adjustably attachable to said seat tube assembly;
strut bracket means,
said strut bracket means being selectively positionable along said strut member;
yoke means including a yoke pin, formed at one end of said tubular frame means,
said yoke means further including latch plate means pivotally mounted to said yoke pin;
hand-tightenable yoke tensioning means,
said tensioning means positioned at said yoke means opposite said yoke pin,
said tensioning means adapted to hook to said seat bracket means;
said latch plate means having slots formed therein to register with said tensioning means when said tensioning means is hooked to said seat bracket means and said latch plate means is pivoted thereupon,
said tensioning means, when tightened, thereby compressibly maintaining said yoke means, said latch plate means, and said seat bracket means; and
hand-tightenable fastener means positioned at said strut bracket means, whereby said second of said frame ends may be compressibly maintained at said strut bracket means.

4,051,986

PHOTOCONDUCTOR STORING APPARATUS

Hubertus H. Tiggeles, Venlo, and Martinus P. Chlôd, Velden, both of Netherlands, assignors to Pitney-Bowes, Inc., Stamford, Conn.

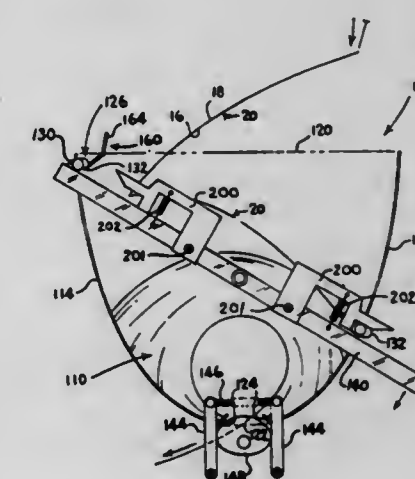
Filed Apr. 2, 1976, Ser. No. 673,006

Claims priority, application Netherlands, June 6, 1975, 7506724

Int. Cl.² B65H 17/42

U.S. Cl. 226-114

9 Claims



1. In a receptacle for a stack of zig-zag folded photoconductive web material having an imaging plane, conveying means for removing the web under traction via an outlet opening from the receptacle and for supplying the web material to an inlet opening of the receptacle, the receptacle having opposite guide walls arranged such that the stack is guided through the receptacle so as to cause the portions situated in closer proximity to the outlet opening than the inlet opening to form an arc which is concave-side oriented toward the outlet opening, whereby the stack is bowed, opposed tamping assemblies respectively movably mounted on opposite guide walls for contacting the folds of said web portions of the stack, and driving means for reciprocating the respective tamping assemblies along the guide walls, the improvement comprising: means for intermittently interconnecting the driving means and tamping assemblies, said interconnecting means including means for

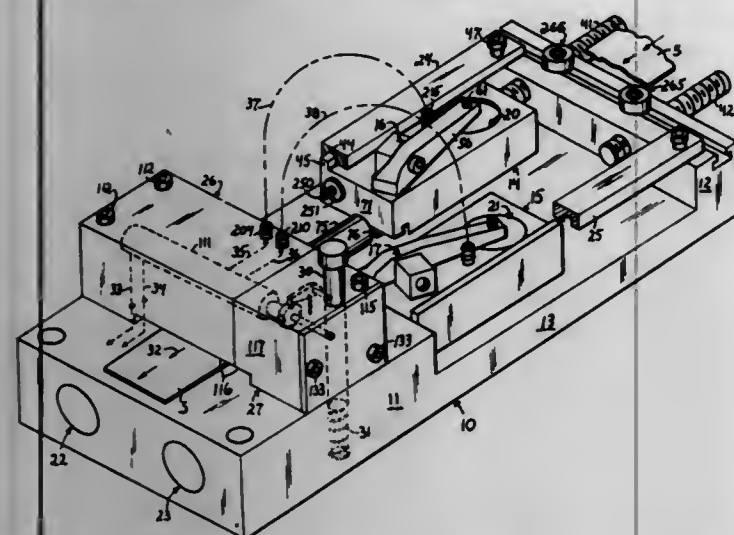
resiliently urging the tamping assemblies into sliding engagement with the guide walls.

4,051,987

HIGH SPEED STOCK FEEDER FOR PUNCH PRESSES AND THE LIKE

Albert W. Scribner, 6 Country Club Road, Darien, Conn. 06820
Filed Apr. 22, 1976, Ser. No. 679,438
Int. Cl.² B65H 17/36, 17/44
U.S. Cl. 226—115

30 Claims



1. A pneumatically operated duplex stock feeder for intermittently advancing stock into the work station of a punch press or the like having a reciprocating ram: comprising
a main frame;
a pair of alternately acting feed slides reciprocally carried by said main frame;
main fluid motor means carried by said frame for actuating said feed slides;
stock gripping means mounted on each of said feed slides;
gripper fluid motor means carried by said feed slides for actuating said stock gripping means;
a rotary valve means for controlling the operation of both said main and gripper fluid motor means; said rotary valve means including a valve block and a cooperating rotary valve member that is rotatably mounted in said valve block, said valve member being operative in successive predetermined discrete angular positions thereof to control the sequence of actuation of said fluid motor means;
control member adapted to be shifted between first and second operative positions by the movement of the ram of said punch press; and
stepper means actuated by the shifting of said control member for intermittently indexing said valve member to, and stopping said valve member at, said successive predetermined discrete angular positions thereof whereby said feed slides may alternately partake of a rapid succession of feed strokes.

2. A duplex pneumatic feeder for intermittently advancing stock into the work station of a punch press or the like: comprising

a main frame;
a pair of alternately acting feed slides reciprocally carried by said main frame;
stock gripping means carried by each of said feed slides;
gripper fluid motor means carried by each of said feed slides for respectively actuating said stock gripping means;
a pair of main fluid motor means for respectively actuating said feed slides and each including a piston and a piston rod;
valve means for controlling the operation of said main and gripper fluid motor means;
feed slide guide means carried by said main frame and cooperating with said feed slides so as to constrain the motion of the latter to rectilinear movement on said frame, said guide means being arranged to permit the axes of the

rectilinear paths of movement of said feed slides to be laterally shifted relative to the axis of said feeder; and coupling means disposed between the outer end of the piston rod of each main fluid motor means and its respectively associated feed slide for permitting said lateral shifting of the said path of movement of each of said feed slides relative to the axis of its associated piston rod.

18. In a pneumatically operated stock feeder for intermittently advancing stock into the work station of a punch press or the like and having a frame;

feed slide means reciprocally mounted on said frame;
stock gripping means carried by said feed slide means;
gripper fluid motor means for actuating said stock gripping means;

main fluid motor means for actuating said feed slide means; and primary valve means adapted to supply and exhaust pressure fluid to and from each of said fluid motor means so that said feed slide means may partake of a succession of feed strokes: the improvement comprising

auxiliary valve means associated with said feed slide means for controlling only the release of said stock gripping means; and means for operating said auxiliary valve means to one operative condition thereof just after completion of a feed stroke of said feed slide means whereby said stock may be released by said stock gripping means, said auxiliary valve means being adapted to be moved to its other operative condition under the control of said primary valve means when the latter initiates the supply of pressure fluid to said gripper motor means prior to each feed stroke of said feed slide means.

29. In a pneumatically operated stock feeder for intermittently advancing stock into the work station of a punch press or the like and having

a frame;
feed slide means reciprocally mounted on said frame;
guide means for maintaining straight line reciprocating movement of said feed slide means;
main fluid motor means for reciprocally actuating said feed slide means;

stock gripping means carried by said feed slide means;
gripper fluid motor means for actuating said stock gripping means; and

valve means for controlling the operation of said main and gripper fluid motor means so that said feed slide means may partake of a succession of feed strokes: the improvement comprising

said frame including a main block portion, an end block portion and an intermediate plate like portion interconnecting the lower regions of said main and end block frame portions, said feed slide means being mounted for reciprocation on the upper surface of said plate like frame portion;

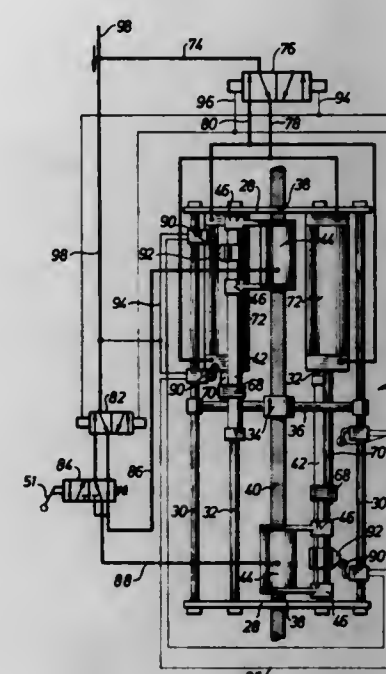
said guide means comprising a rail bar means which extends between said main and end block portions of said frame and which overlies said feed slide means, the bottom of said rail means and the top of said feed slide means being formed with a cooperating longitudinal groove and projection arrangement whereby said feed slide means is constrained to rectilinear movement on said plate like intermediate portion of said frame.

4,051,988

TUBE FEEDING DEVICE FOR USE IN CHARGING SHOTHOLES WITH EXPLOSIVE THROUGH A PIPE OR TUBE

Bengt Gunnar Wilhelm Egerstrom, Danderyd, and Bror Lennart Teodor Sternhoff, Stockholm, both of Sweden, assignors to Nitro Nobel AB, Gyttopp, Sweden
Filed Aug. 13, 1976, Ser. No. 714,193
Claims priority, application Sweden, Aug. 19, 1975, 7509262
Int. Cl.² B65H 17/38
U.S. Cl. 226—162

7 Claims



1. A device for feeding a tube into and out of a shothole for use in charging the shothole with an explosive, comprising a pair of clamping devices each having therethrough an axial bore through which a tube is adapted to be advanced, means guiding said clamping devices for reciprocable movement in a common path, and with their axial bores aligned coaxially of one another so that said tube may extend coaxially through both of said bores during the feeding thereof,

each of said clamping devices including a fluid pressure-operated wall of flexible material forming the axial bore through the device, and disposed selectively to grip the tube extending through said bore,

a pair of parallel cylinders each having a reciprocable piston rod operatively connected to one of said clamping devices to impart reciprocation thereto,

means for connecting said cylinders to a supply of fluid under pressure, and operative to cause said fluid to impart reciprocation to said piston rods simultaneously to move said clamping devices alternately towards and away from each other,

means including said guiding means for selectively and intermittently connecting said clamping devices to said fluid supply, when said devices are in one of their limit positions, and operative to convey fluid under pressure from said supply to the flexible walls in said clamping devices thereby to cause said walls momentarily to collapse radially inwardly and one at a time into gripping engagement with the tube extending through said bores, whereby during the period when one of said clamping devices is in gripping engagement with said tube the other clamping device will not be in operation, and will be moving in a direction opposite to that in which the tube is being fed, and

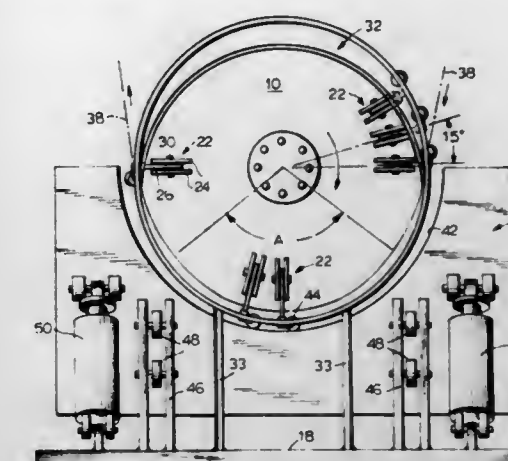
means for selectively changing the feeding direction of said tube by changing the mutual gripping sequences of said clamping devices.

4,051,989

CABLE PULLING APPARATUS

James N. Zehren, Bartlesville, Okla., assignor to TRW Inc., Cleveland, Ohio
Filed Sept. 24, 1975, Ser. No. 616,320
Int. Cl.² B65H 17/20
U.S. Cl. 226—190

6 Claims



1. Apparatus for moving a flexible elongated member, comprising a rigid wheel supported for rotation about an axis and having as a part thereof of circular abutment surface along the circumference of the wheel against which the elongated member is to be clamped during rotation of the wheel, a plurality of clamping means supported upon the wheel at positions spaced circumferentially of the wheel, each of said clamping means comprising a clamp element supported for movement toward and away from said abutment surface, guide means adjacent to the wheel for moving said clamp elements toward said abutment surface during a portion of the rotation of the wheel and for moving said clamp elements away from said abutment surface during another portion of the rotation of the wheel, and means for pressing said clamp elements toward said abutment surface and against said elongated member located between said clamp elements and said abutment surface during a portion of the rotation of said wheel intermediate the aforesaid portions, said pressing means comprising a stationary abutment surface, each of said clamp elements having means for engaging said stationary abutment surface said engagement with said stationary abutment surface applying a force to a clamp element and forcing the clamp element toward the abutment surface of said wheel to clamp said elongated member against the abutment surface of said wheel.

4,051,990

DEVICE FOR SECURING AN EXPANSION ANCHOR

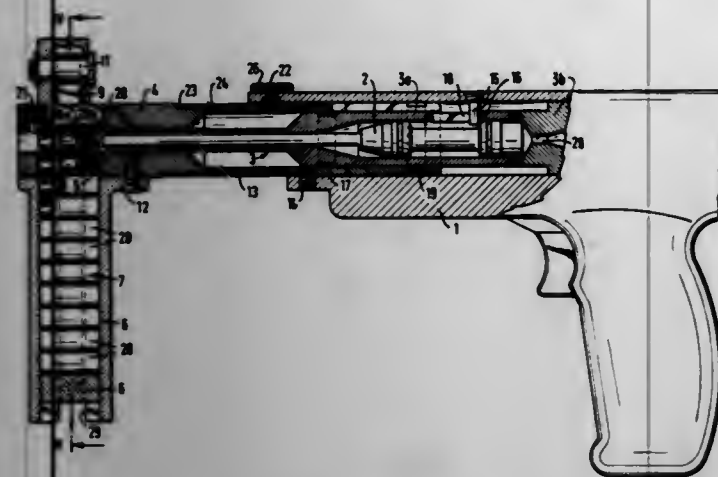
Franz Chromy, Feldkirch-Levia, Austria; Walter Winkler, Gams, Switzerland; Manfred Mähr, Schlins, and Fritz Mark, Mader, both of Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein
Filed July 1, 1975, Ser. No. 592,348
Claims priority, application Germany, July 8, 1974, 2432642
Int. Cl.² B25C 1/14

U.S. Cl. 227—10

12 Claims

1. A device for driving an expansion anchor, which includes an anchor sleeve and expansion element positioned within and axially displaceable within the anchor sleeve from a loading position to an anchored position, into a prepared hole in a receiving material, comprising a piston-type explosive powder charge driven setting gun, said gun comprising a housing having an axially extending first bore therein open in the firing direction of said gun, an expansion anchor guide member axially displaceably mounted within the bore in said housing and projecting outwardly from said housing through the open end of said bore, said guide member having an axially extending second bore therein in substantially parallel relationship with said first bore and the end of said second bore facing in the firing direction being open, the second bore arranged to receive an expansion anchor therein in the end facing in the

firing direction and first means and second means each axially displaceably mounted within said second bore, said first means being axially displaceable relative to said guide member for inserting the expansion anchor from the second bore into a prepared hole with the expansion element in the loading position within the anchor sleeve, and when the expansion anchor



is inserted into the prepared hole said second means being axially displaceable relative to said guide member and to said first means for driving the expansion element in the firing direction axially through said anchor sleeve from the loading position into the anchored position for securing the expansion anchor within the prepared hole.

4,051,991

STAPLER ATTACHMENT

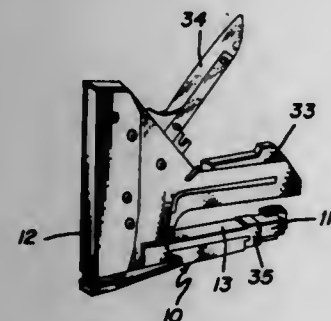
Harry M. Goodchild, Worcester, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.

Filed Nov. 19, 1976, Ser. No. 743,280

Int. Cl.² B25C 7/00

U.S. Cl. 227-155

9 Claims



1. Stapler assembly, comprising
 - a. a main housing having a grip handle and an operating handle,
 - b. an elongated staple storage compartment underlying the main body and extending in the same general direction as the grip handle, the compartment having a box-like cross-section with an upper wall and side walls,
 - c. a U-shaped staple track slidable along the compartment for loading staples and having a bottom wall which underlies the compartment and upwardly-directed side walls that embrace the side walls of the compartment, the side walls of the track having upper edges that lie substantially below the said upper wall of the compartment, so that a recess is formed by the said upper edge of the track and the side walls of the compartment, and
 - d. an attachment formed of an elastomer material and having a first portion lying against the bottom wall of the track with a pair of arms embracing the side walls of the track, the arms having inwardly-directed lugs that reside in the said processes, the attachment having a second portion that lies at an acute angle to the first portion and, carries

a staple-bending device in a position underlying the main housing.

4,051,992

CYLINDRICAL DISPLAY CONTAINER FORMED FROM A FLAT BLANK

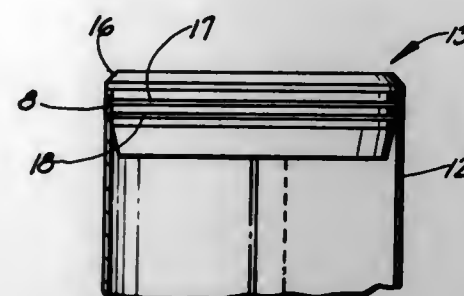
Robert M. Bergstein, Cincinnati, Ohio, assignor to Bergstein Packaging Trust, Middletown, Ohio

Filed Apr. 30, 1976, Ser. No. 681,819

Int. Cl.² B65D 3/04

U.S. Cl. 229-21

1 Claim



1. A display container consisting of a cylindrical body and a pair of end caps, said cylindrical body being formed from a knock-down, flat-folded blank having a paperboard body panel and a pair of attachment flaps hingedly connected to its opposite side edges, and a transparent body panel in opposing relation to said first named body panel with its opposite side edges secured to said attachment flaps, said transparent body panel being formed from a self-sustaining flexible sheet of plastic material, said first named paperboard body panel having a width equal to one-half the perimeter of the container body when erected into essentially cylindrical form, with the remaining one-half of the container body defined by said transparent body panel and said attachment flaps, said attachment flaps acting to hingedly connect the opposite side edges of said transparent panel to said paperboard body panel, whereby the flat-folded blank may be erected to cylindrical configuration by flexing the body panels outwardly relative to each other, whereupon the end caps may be inserted into the opposite ends of the cylindrical body to maintain it in erected condition and close its opposite ends, said end caps having annular body portions of a size to be snugly received in the ends of the container body when in essentially cylindrical form, at least one annular ridge on the body portion of each of said end caps, and ridge defining score lines in said paperboard body panel extending parallel to and adjacent the opposite end edges thereof, said score lines being positioned to enter into operative engagement with the annular ridges on the body portions of said end caps, whereby to tightly secure the end caps to said container.

4,051,993

POPCORN PACKAGE FOR TWO USERS

Alex J. Castoldi, Jr., West Newton, Mass., assignor to International Recreational Industries, Inc., Boston, Mass.

Filed Aug. 18, 1976, Ser. No. 715,622

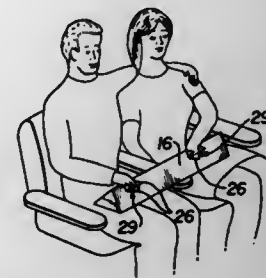
Int. Cl.² B65D 5/72, 5/10

U.S. Cl. 229-22

3 Claims

1. A package for a comestible allowing two theatre patrons seated side-by-side in two theatre seats to consume the comestible in said package conveniently, said package comprising an elongated continuous undivided package body having a single continuous comestible chamber, said package body having a flat bottom wall for stability when the package is resting on the laps of two users, the package body having a sufficient length to extend approximately between the centers of two adjacent

theatre seats, and means forming a pair of separated top product access and removal openings in the package body near



opposite ends thereof, the package body and said comestible chamber being otherwise closed.

4,051,994

BAG CLOSURE

Daniel Lawrence Donk, Phelps, and Robert Hutchins Olson, Pittsford, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

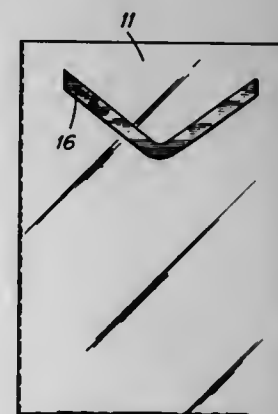
Continuation of Ser. No. 387,557, Aug. 10, 1973, abandoned.

This application Dec. 12, 1975, Ser. No. 640,319

Int. Cl.² B65D 33/30

U.S. Cl. 229-65

3 Claims



1. A thermoplastic bag comprising a front wall and a rear wall continuously joined together along the bottom and vertical side edges, said bag being opened at the top along the top edges of said front and rear walls, a single strip of metallic foil secured to one of said walls adjacent said open top edges of said bag, said foil being in the form of a V-like configuration with the apex of said V being vertically oriented with respect to said bag walls.

4,051,995

STUFFED ENVELOPE ASSEMBLY

Robert L. Wieman, Sycamore, Ill., assignor to Duplex Products, Inc., Sycamore, Ill.

Filed Dec. 1, 1975, Ser. No. 636,809

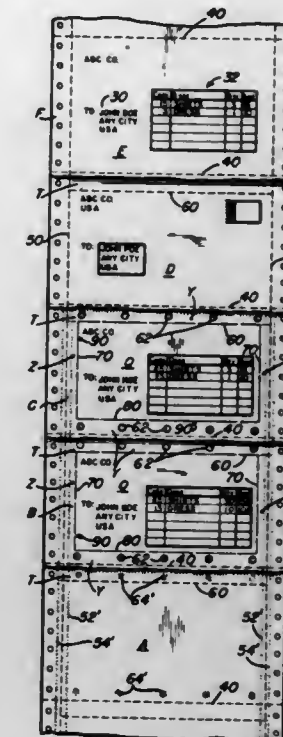
Int. Cl.² B65D 27/10

U.S. Cl. 229-69

10 Claims

1. A continuous assembly of record sheets and stuffed envelopes, which comprises
 - a plurality of overlying continuous plys,
 - longitudinal and transverse lines of weakening in each of said plys which subdivide them into similar sized record, front, insert and rear panels each of which have corresponding top, bottom and side edges with removable feed strips along their respective side edges,
 - another transverse line of weakening in spaced parallelism with the top edge of the insert, front and rear panels for defining a tear strip in and across the upper end of said panels,
 - other lines of weakening in the insert panels in spaced parallelism with the bottom and side edges thereof defining a central, removable portion,
 - means interconnecting the marginal portions of the front,

insert and rear panels along the tear strips and outwardly of the central, removable portion of the insert panels for defining a stuffed envelope which is separable along the first mentioned transverse lines of weakening from adjoining envelopes of the continuous envelope assembly, and



other means interconnecting the feed strips of the record, front, insert and rear panels of the envelope assembly, the record panel per se being disposed in free, overlying, aligned but unattached relationship with the front panel of its respective stuffed envelope.

4,051,996

TRAVEL ENVELOPE CONSTRUCTION HAVING INTEGRALLY FORMED BAGGAGE IDENTIFICATION LABELS

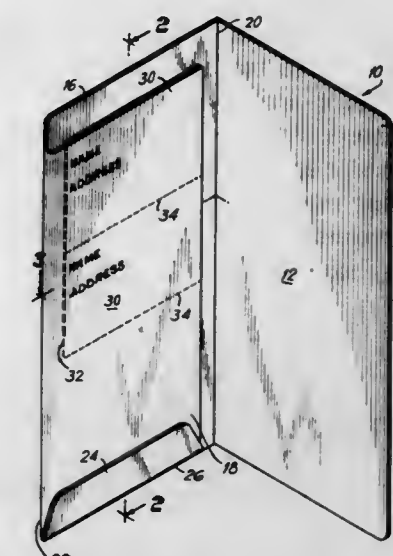
Martin I. Ross, New York, and Arthur M. Rogers, Far Rockaway, both of N.Y., assignors to Exclusive Envelope Corporation, New York, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,058

Int. Cl.² B65D 27/08

U.S. Cl. 229-72

49 Claims



1. A wallet-type envelope construction comprising
 - an outer panel, and
 - an inner panel,
 - said outer panel being secured to said inner panel along a common edge,
 - means for securing the bottom edge portion of said inner panel to the bottom edge portion of said outer panel,
 - said inner and outer panels having at least two other edges

disposed in unsecured and free relationship with respect to one another, said outer and inner panels defining a pocket therebetween capable of having tickets and the like positioned therein, at least a portion of said inner panel having an adhesive layer disposed on the rear surface thereof, said adhesive coated inner panel portion having name and address indicia thereon to form at least one identification label, and said identification label being a detachably secured portion of said inner panel.

4,051,997

MAIL REMINDER

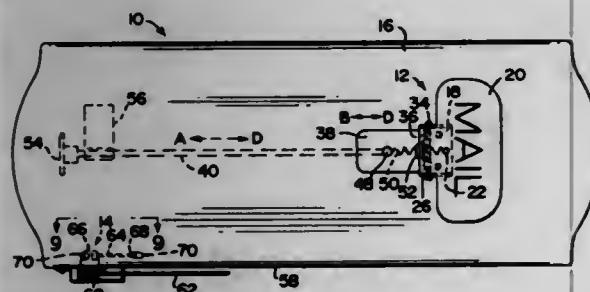
Steve Garcia, Tampa, Fla., assignor to James W. Donofrio, Tampa, Fla., a part interest

Filed Feb. 3, 1975, Ser. No. 546,680

Int. Cl.² B65D 91/00

U.S. Cl. 232-35

4 Claims



1. A mail reminder device of the type designed to be mounted on a mailbox including a flag operatively mounted thereon, said device comprising: a signal means disposed on the top of said mailbox, said signal means comprising an attachment plate fixedly attached to said top, an indicator hingedly connected to said attachment plate, a stop plate movably attached to said top in engaging relation to said indicator, first biasing means disposed in interconnecting relation between said attachment plate and said indicator, whereby said indicator is normally urged toward a substantially perpendicular position with respect to said top, and a stop arm slidably disposed on the inside of said top, one end of said stop arm being fixedly attached to said stop plate and second biasing means disposed in interconnecting relation between said stop arm and said top inside, whereby said one end of said stop arm and said stop plate are normally urged toward said indicator; and flag retractor means operatively connected to said flag, said flag including axle means movably interconnecting said flag to a side wall of said mailbox, said flag retractor means comprising an actuator arm slidably attached to one end of said axle on the interior of said mailbox, spring guide means fixedly attached to said axle between said actuator arm and said side wall, and spring means interconnecting said side wall and said spring guide means in substantially surrounding relation to said axle, whereby said flag is normally urged to a lowered position.

4,051,998

DIGITAL ELECTRONIC DATA SYSTEM FOR A FLUID DISPENSER

William P. Zabel, Fort Wayne, Ind., assignor to Tokheim Corporation, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 380,944, July 20, 1973, abandoned. This application Jan. 27, 1975, Ser. No. 538,888

Int. Cl.² B67D 5/08; G06F 15/20

U.S. Cl. 364-465

41 Claims

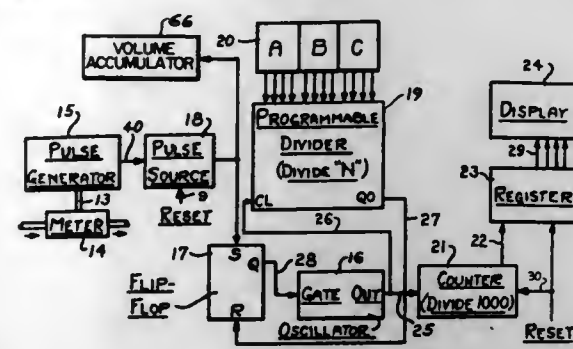
1. A data system for use in a fluid dispenser for producing an output signal corresponding in direct proportion to the accumulative cost of the fluid dispensed dependent upon a variable preset signal representative of a price for each unit volume of fluid actually dispensed, the combination comprising:

a. pulse generator means coupled to said dispenser for gener-

ating an enabling pulse for each predetermined fraction of a unit quantity of liquid dispensed;

b. oscillator means operable between an idle condition and an activated condition in response to a disabling pulse and said enabling pulse, respectively, for generating a burst of pulses in response to said enabling pulse;

c. presettable switch means manually movable through a plurality of positions for generating continuously a coded signal of varying weight proportional to the selected price for each unit volume of fluid;



d. registry means connected to said presettable switch means to receive said coded signal and to said oscillator means to receive said burst of pulses for producing said disabling pulse when the number of said oscillator means burst of pulses is equal to said coded signal; and

e. counting means including dividing means connected to said oscillator means to receive said number of said burst of pulses for dividing said number of pulses by said predetermined fraction of a unit quantity to generate an output signal proportional to the accumulated cost of said increment of fluid dispensed.

4,051,999

ENVIRONMENTALLY HEATED AND COOLED BUILDING

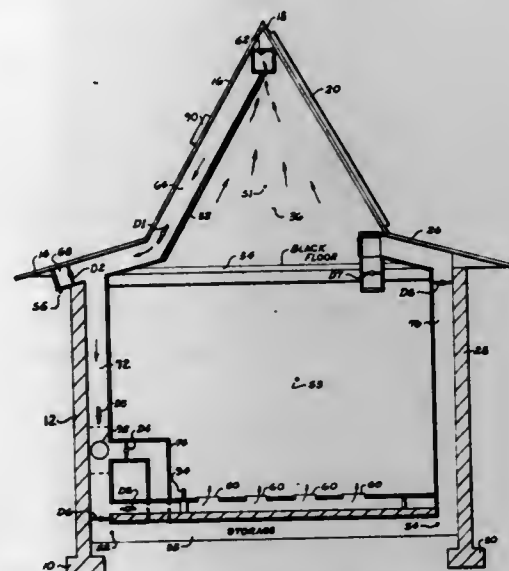
Floyd Randolph Granger, 24 Heard Drive, and Michael Gerard Granger, 10 Delores St., both of Greenville, S.C. 29605

Filed Apr. 5, 1976, Ser. No. 673,664

Int. Cl.² F24D 5/00, 11/00; F24J 3/02; G05D 23/00

U.S. Cl. 237-1 A

4 Claims



1. In combination a solar heated building comprising: a collector means carried in the attic of said building for absorbing solar energy and heating the air within said attic, a thermal storage chamber carried below the bottom floor of said building, said thermal storage chamber including a rock bed extending substantially under the entire area of said floor, a lower plenum positioned substantially in the middle of said rock bed extending transverse thereof, air flow passages provided in opposite walls of said lower plenum extending into said rock bed, duct means connected between said attic and said plenum

through which conditioned air passes between said attic and said storage chamber, a fan connected to said duct means for circulating air there-through, registers carried in said floor and connected to said duct means for supplying conditioned air to said building, said duct means including an outside air arm communicating with the air outside said building, power operated damper means provided in said duct means for selectively controlling the path that said air flows through said storage chamber, said building, said attic and through said outside air arm, said thermal storage chamber having an inlet and outlet through which air flows, first and second sensors positioned adjacent said inlet and said outlet of said thermal storage chamber generating signals indicating the temperature at said locations, additional sensors located to generate signals indicating the temperature of the outside air, the temperature of the air in said attic and the temperature of the air in said building, and control means connected to said sensors for activating said power operated damper means for controlling the air flow path through said building, storage chamber and said attic responsive to predetermined conditions.

4,052,000

SOLAR ENERGY AUGMENTED WATER HEATING SYSTEM

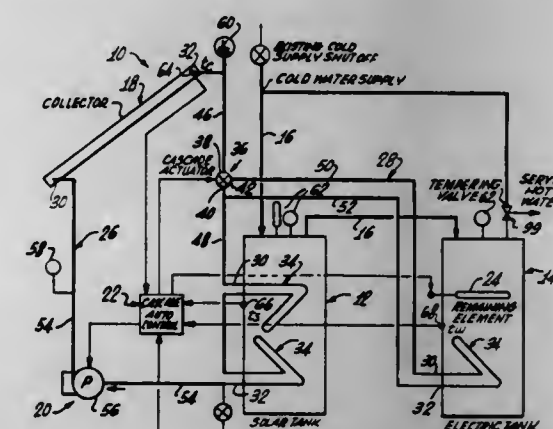
Terence C. Honikman, Santa Barbara, Calif., assignor to Allen K. Cooper, Santa Barbara, Calif., a part interest

Filed Apr. 19, 1976, Ser. No. 677,912

Int. Cl.² F24J 3/02; F24D 3/00

U.S. Cl. 237-1 A

24 Claims



22. A solar energy augmented water heating system, such as a domestic hot water system, comprising: a water storage and heating tank including a water heater, a solar energy storage tank, means for conducting water through said solar tank and then through said water tank, a solar collector, and means for circulating a heat transport liquid selectively either through said collector and said solar tank or through said collector, said water tank, and then through said solar tank.

4,052,001

HEATING SYSTEM

Alfred Vogt, Schaan, Liechtenstein, assignor to Interliz Anstalt, Vaduz, Liechtenstein

Filed Sept. 15, 1976, Ser. No. 723,607

Claims priority, application Austria, Oct. 1, 1975, 7516/75

Int. Cl.² F24D 3/00

U.S. Cl. 237-1 A

9 Claims

1. A heating system comprising:

a. first heating means for supplying thermal energy to a fluid to be heated;

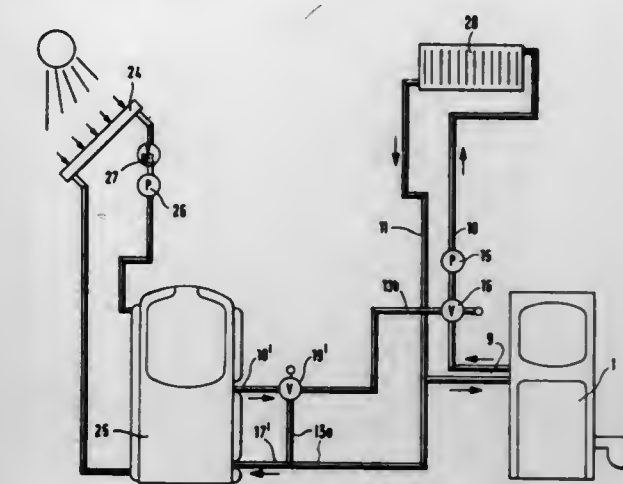
b. a return line and a discharge line respectively connected

to said heating means for feeding thereto the fluid to be heated and for withdrawing the heated fluid therefrom;

c. a mixing valve in said discharge line;

d. a three way valve having a first, a second, and a third port;

e. a by-pass line connecting said return line to said mixing valve, respective portions of said by-pass line connecting said return line to said first port and said second port to said mixing valve;



f. second heating means for supplying thermal energy to said fluid; and

g. an intake line and an output line connected to said second heating means for feeding thereto the fluid to be heated and for withdrawing the heated fluid therefrom, one of said intake and output lines communicating permanently with one of said first and second ports, and the other one of said intake and output lines communicating permanently with said third port.

4,052,002

CONTROLLED FLUID DISPERSAL TECHNIQUES

Ronald D. Stouffer, Silver Spring, and Harry C. Bray, Jr., Beltsville, both of Md., assignors to Bowles Fluidics Corporation, Silver Spring, Md.

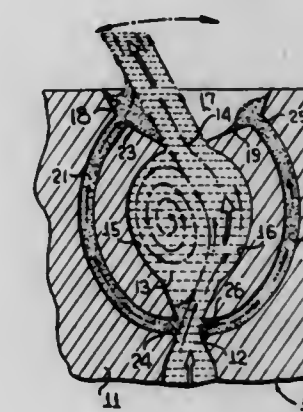
Continuation of Ser. No. 510,722, Sept. 30, 1974, abandoned.

This application Sept. 30, 1975, Ser. No. 618,208

Int. Cl.² B05B 1/08

U.S. Cl. 239-4

86 Claims



1. A liquid spray apparatus comprising: means adapted to receive liquid under pressure and form a liquid jet; means powered solely by the liquid under pressure for cyclically deflecting said jet in a prescribed path between extreme positions defined by a pair of walls; and means for flowing said liquid along said walls to prevent said jet from impinging directly on said walls when approaching said extreme positions; whereby said cyclically deflected jet breaks up into liquid droplets distributed over a spray pattern determined by said prescribed path.

4,052,003

LIQUID SPREADER CONTROL SYSTEM

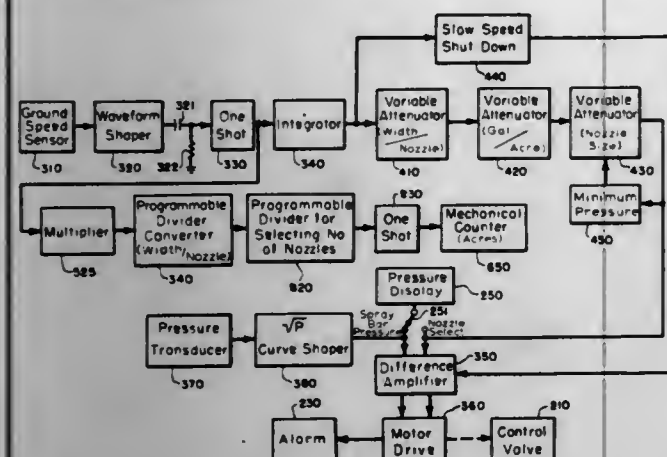
Ronald W. Steffen, Chatham, Ill., assignor to Dickey-John Corporation, Auburn, Ill.

Filed Aug. 6, 1976, Ser. No. 712,146

Int. Cl.² B05B 12/00

U.S. Cl. 239—71

26 Claims



1. An automatic control system for use with a vehicular liquid sprayer of the type which pumps the liquid to be sprayed at a desired pressure to a plurality of nozzles which dispense the liquid at a predetermined desired density relative to the area being sprayed, said density being a function of a plurality of liquid spraying parameters which may vary from one spraying application to another or from time to time during a given spraying application, said control system comprising: means for sensing the pressure of the liquid supplied to said nozzles and developing a corresponding electrical liquid pressure signal; means for measuring the ground speed of said vehicular sprayer and developing a corresponding electrical ground speed signal; programming means coupled to said ground speed measuring means for selectively modifying said ground speed signal to obtain a modified ground speed signal having a characteristic which corresponds to the values of at least two of said liquid spraying parameters required to obtain said desired density; means responsive to said liquid pressure signal and said modified ground speed signal for generating a corresponding valve control signal; and control valve means operatively coupled to said nozzles and responsive to said valve control signal for adjusting the rate of flow of said liquid to said nozzles to adjust the pressure of the liquid at the nozzles in accordance with said valve control signal, whereby the vehicular liquid sprayer is automatically adjusted to maintain the system pressure at the nozzles at the level which corresponds to the selected values of the liquid spraying parameters to thus spray the liquid at the desired density.

4,052,004

VIBRATORY ATOMIZER

Barrie James Martin, Shenfield, and Victor Ernest Bridger, London, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Feb. 18, 1976, Ser. No. 659,156

Claims priority, application United Kingdom, Feb. 19, 1975, 6549/75

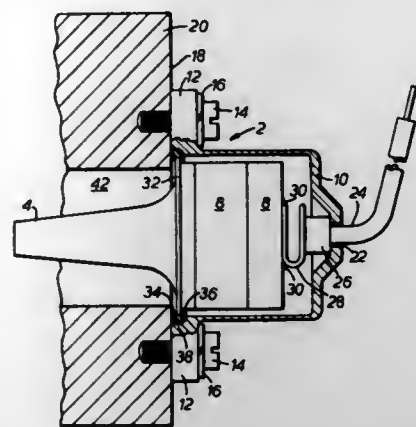
Int. Cl.² B05B 3/14

U.S. Cl. 239—102

5 Claims

1. A vibratory atomizer for atomizing a liquid due to vibrations of the atomizer, which atomizer comprises a nozzle portion from which the liquid is ejected, a body portion having vibration means, a cover which fits over the body portion, and resilient means adapted to mount the body portion within the cover, wherein said cover is fastened to a mounting surface and in which said resilient means engages the mounting surface, thereby to provide a seal at the point of engagement, and the

body portion and the cover both having means for positively locating the resilient means whereby the resilient means consti-



tutes the sole means for mounting the body portion within the cover.

4,052,005

OXYGEN LANCE NOZZLE

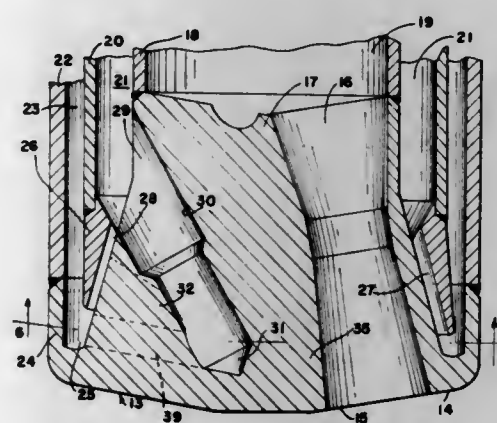
Nicholas M. Rymarchyk, Jr., Pittsburgh, Pa., assignor to Berry Metal Company, Harmony, Pa.

Filed Mar. 11, 1976, Ser. No. 665,841

Int. Cl.² B05B 15/00

U.S. Cl. 239—132.3

27 Claims



a nozzle tip having a cylindrical body connected to said conduits and provided with a lower face, gas passage means extending substantially vertically within said body communicating with said central gas conduit, said gas passage means including opening means in said cylindrical face,

a circumferentially extending flange formed at the lower portion of said body extending vertically upwardly and spaced radially outwardly from said body to provide a cylindrical water chamber about the lower portion of said body,

said second conduit being connected to said flange to provide communication between said second cooling passage and said cylindrical water chamber,

a ring-shaped shelf supported on said cylindrical body and projecting radially outwardly with respect thereto, said shelf being connected to said first conduit and having vertical passage means in communication with said first cooling passage and said water chamber,

water by-pass means in said body including inlet bore means communicating with said first water passage extending from the upper portion of said body diagonally inwardly and downwardly, and

outlet passage means in said body communicating with said inlet bore and extending radially outwardly and directly communicating with said cylindrical water chamber below said ringshaped shelf, said outlet passage means including means for effecting nucleate boiling of the water to maximize heat transfer thereto.

4,052,006

FOLDING SPRAY BOOM

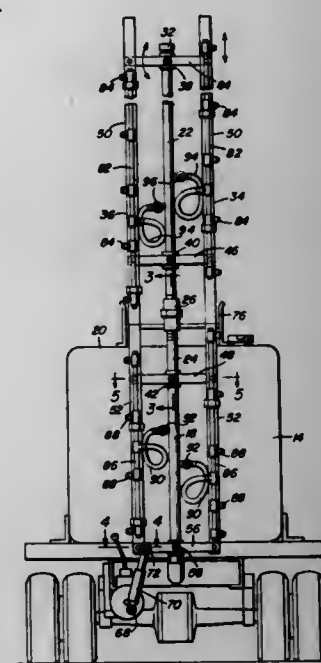
Henry G. Grass, Dinuba, Calif., assignor to James L. Grass and William H. Grass, both of Dinuba, Calif., part interest to each

Filed Sept. 29, 1976, Ser. No. 728,454

Int. Cl.² B05B 1/20, 3/14

U.S. Cl. 239—168

8 Claims



4,052,007

FLAP-TYPE TWO-DIMENSIONAL NOZZLE

Charles M. Willard, Crevecoeur, Mo., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 25, 1975, Ser. No. 635,187

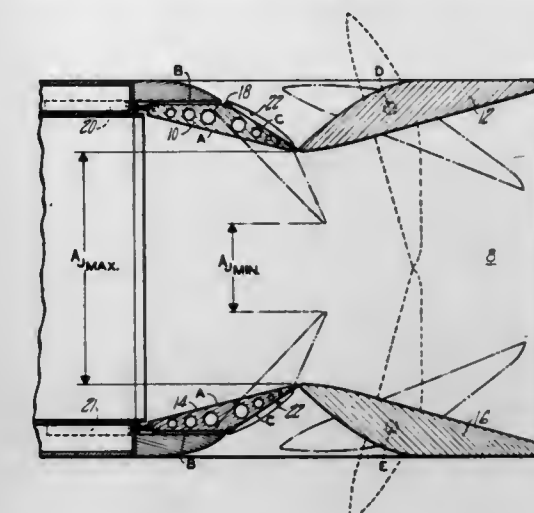
Int. Cl.² B64C 15/04

U.S. Cl. 239—265.29

5 Claims

1. A two-dimensional exhaust nozzle, said nozzle having a rectangular inlet, fixed sides extending rearwardly from each side of said inlet, a pair of throat area control primary flaps, one throat area control primary flap being located immediately

downstream of said rectangular inlet at the top thereof, the other throat area control primary flap being located immediately downstream of said rectangular inlet at the bottom thereof, first means for moving said pair of throat area control flaps between a position where the downstream ends form a minimum throat area and a position where the downstream ends form a maximum throat area, a pair of rotatable flaps, one rotatable flap being located downstream of the top throat area control primary flap, the other rotatable flap being located downstream of the bottom throat area control primary flap,



second means for moving said pair of rotatable flaps from a position where they form the divergent section of a convergent-divergent nozzle having the forward end of each rotatable flap positioned adjacent the rearward end of its cooperating throat area control primary flap when the throat area control primary flaps are at their position of maximum throat area to a position where they form an ejector shroud of an ejector nozzle having the forward end of each rotatable flap spaced outwardly from the rearward end of its cooperating throat area control primary flap when the throat area control primary flaps are at their position of minimum throat area.

4,052,008

BLOW GUN

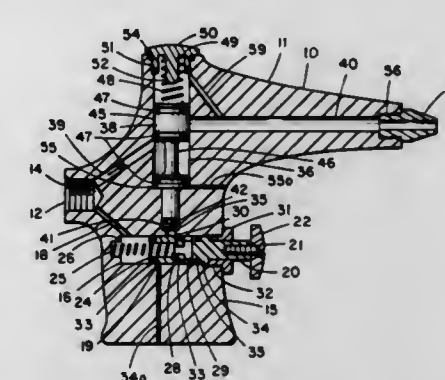
Gerald Lee Rogers, St. Louis, Mo., assignor to Chemetron Corporation, Chicago, Ill.

Filed Apr. 12, 1976, Ser. No. 676,105

Int. Cl.² B05B 1/00

U.S. Cl. 239—526

9 Claims



- a housing having an inlet adapted to be connected to a source of fluid and a fluid outlet, said housing also having a handle adapted to be grasped by an operator;
- a trigger movably mounted on said handle;
- a first valve member movably mounted in said housing for movement by said trigger, said first member being in communication with said inlet;
- a second valve member movably mounted in said housing, said second member being a spool valve and in communication with said inlet and outlet, said second member

having a first portion in communication with said first member, and a second portion for shutting off flow to said outlet and having a larger effective area than said first portion;

e. means for biasing said second member toward a position to shut off flow to said outlet; and

f. a bypass conduit in communication with said outlet and said second portion, said bypass conduit, upon blockage of said outlet, providing access for the fluid to said second portion to move said second member to shut off flow to said outlet when said trigger is depressed and said first member is open to the fluid for delivery to said first portion of said second member.

4,052,009

FIBERING SYSTEM AND APPARATUS

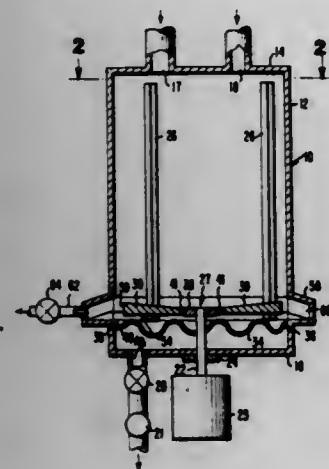
Ronald A. Penque, Glen Ridge, N.J., assignor to Bloccel Corporation, New York, N.Y.

Filed July 14, 1975, Ser. No. 595,855

Int. Cl.² B02C 19/18

U.S. Cl. 241-1

31 Claims



19. A process of defibering cellulosic material in medium comprising a mixture of a liquid and said cellulosic materials to be defibered, said process comprising the steps of:

impelling a liquid so as to propagate pressure waves through a moveable diaphragm membrane in contact with said liquid to said medium on the other side of said diaphragm so that said cellulosic material is defibered by said pressure waves.

4,052,010

SUSPENDABLE POROUS GLASS PARTICLES

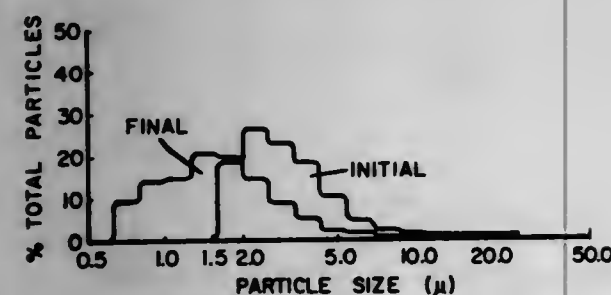
Frederick G. Baker, Tyrone, and David L. Eaton, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 1, 1974, Ser. No. 447,250

Int. Cl.² B02C 23/08, 23/20

U.S. Cl. 241-20

10 Claims



1. A method of preparing a suspension of porous glass particles of controlled particle size and useful as antibody carriers in solid phase radioimmunoassay comprising the steps of:

A. milling controlled pore porous glass particles having an average pore diameter between about 100 Å and 1200 Å to an average particle size of less than about 10 microns;

B. acid-washing the milled particles to remove contaminants and residues;

C. washing the particles to remove any residues from step (B);

D. mixing the washed particles with water to form a first suspension of the particles;

E. subjecting the first suspension to a first sedimentation step to assure removal of particles greater than about 10 microns;

F. subjecting the remaining first suspension to at least one more sedimentation step to sediment particles having an average particle size between about 0.7 and about 3.0 microns; and

G. suspending the particles of step (F) in water.

4,052,011

COMBINATION STACK MOVER AND PROCESSOR

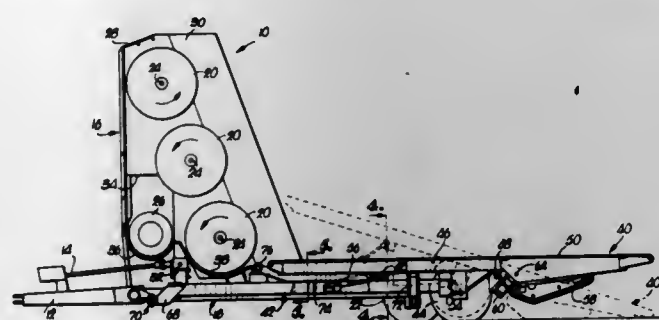
Merle Keith Burkhardt; Bruce Lynn White; La Vern Roy Goossen, all of Newton; Allen Andrew White, Peabody, and Harold William Voth, Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Jan. 28, 1976, Ser. No. 653,146

Int. Cl.² A01F 29/00

U.S. Cl. 241-30

9 Claims



1. A method of reducing a large mass of crop material including the steps of:

engaging an upstanding crop mass from beneath the latter with a horizontally moving conveying force to advance the mass in the direction of movement of said conveying force;

continuing said advancement of the mass using said conveying force only as the mass is progressively delivered into the mechanism for shredding the same;

passing said mass over a standby source of swingable lifting force on the way to said mechanism; and

after shredding most of the original mass using said conveying force only, restraining the remaining portion of the upstanding mass against tipover and feeding the same into the mechanism using said swingable lifting force only.

4,052,012

PORTABLE FLOUR MILL

Donovan R. Feist, Minot, N. Dak., assignor to Mill & Mix Company, Inc., Brigham City, Utah

Filed Mar. 13, 1974, Ser. No. 450,794

Int. Cl.² B02C 7/14

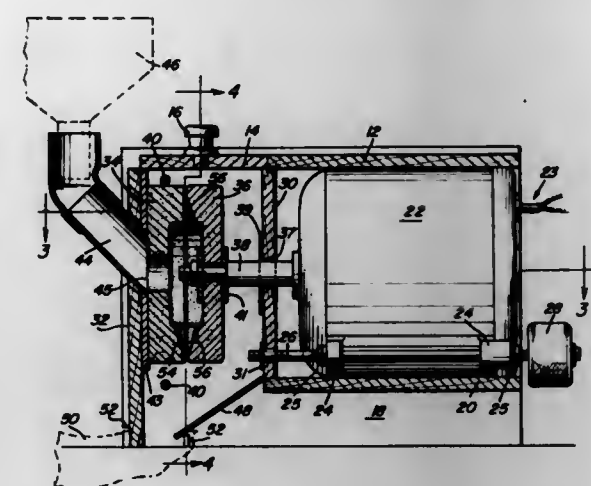
U.S. Cl. 241-100

13 Claims

1. A grain mill having one rotatable stone and one non-rotatable stone in facing relationship to each other, a grain feeding means associated with the non-rotatable stone to feed grain between the stones, collecting means for receiving ground material discharged from the peripheries of the stones, means for driving the rotatable stone, means for adjusting the spacing between said stones, said means for driving said rotatable stone and the means associated with said non-rotatable stone being surrounded by an outer housing including a top wall, vertical side walls, an exterior vertical end wall, a partial bottom wall under a motor for actuating the means for driving said rotatable stone, an interior wall parallel to said end wall and between said motor and said end wall, said means for adjusting the spacing between said stones including a sleeve portion on

the periphery of said motor, a threaded rod passing through said interior wall and said sleeve and having a turning knob attached at one end thereof, whereby manual rotation of said

out of grinding engagement with the cylindrical surfaces of the cutting discs of an adjacent said drum.



threaded rod, via said knob, moves said motor and associated stone toward or away from said non-rotatable stone for adjusting the spacing between said stones.

4,052,013

APPARATUS FOR SHREDDING RUBBER TIRES AND OTHER SCRAP MATERIALS

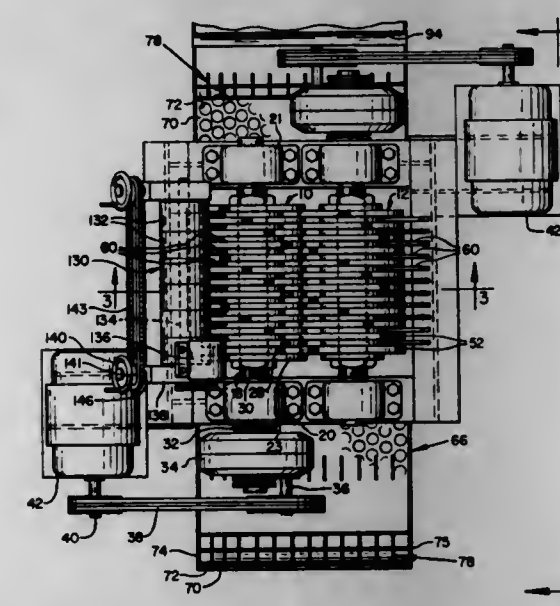
Stanley V. Ehrlich, and John T. Ehrlich, both of Portland, Oreg., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Mar. 8, 1976, Ser. No. 665,045

Int. Cl.² B02C 13/26

U.S. Cl. 241-101.2

3 Claims



1. A shredding apparatus comprising:

a pair of side-by-side parallel and generally cylindrical shredding drums,

each said drum defining a series of axially spaced-apart circular cutting discs,

each said cutting disc having a smooth cylindrical peripheral surface intersecting parallel opposed sidewalls so as to define a pair of substantially continuous circular cutting edges,

each said drum being mounted with respect to the other said drum such that discs of one drum extend into the spaces between discs of the opposing drum,

drive means for counterrotating said drums,

said rotatable grinding wheel means positionable alongside said drums with the axis of rotation thereof parallel to the axes of rotation of said drums and extending the length of the adjacent said drum when in an operating position,

said grinding wheel means including drive means for rotating said grinding wheel means about its axis of rotation and means for moving said grinding wheel means into and

4,052,014
ARRANGEMENT IN MILL DRUMS PROVIDED WITH WEAR PROTECTIVE LININGS

Erik Alfons Jonsson, Boliden, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

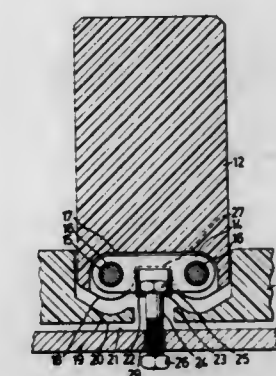
Filed Mar. 4, 1976, Ser. No. 663,765

Claims priority, application Sweden, Mar. 7, 1975, 7502606

Int. Cl.² B02C 17/22

U.S. Cl. 241-183

18 Claims



1. An arrangement in mill drums having wear protective linings and ore lifting and carrying means in the form of a wing comprised of an elastomeric material and extending radially inwardly from the lining of the mill drum, said wing being secured to the wall of the mill drum by means of securing means including a securing bolt which protrudes beyond the external surface of the wall of the drum through a corresponding bolt hole through said wall to receive a locking means for said bolt urgeable against the outside of said drum, said securing means extending into a root portion of said wing and being retained in said root portion by means of anchoring means, said securing means being surrounded by peripherally continuous wallings spaced apart along the wing, said wallings forming integral parts of the material of said root portion, said anchoring means extending in the longitudinal direction of said wing within said wallings and through said securing means, the securing means having at those parts thereof which extend into said root portion, yoke means also secured to the wall of the drum by said securing bolt and positioned transversely to the longitudinal direction of said wing and received in spaces between said wallings in said root portion, said yoke means having apertures therein, said apertures receiving said anchoring means.

4,052,015

FILAMENT WINDING APPARATUS

Ronnie D. Hand; Robert N. Chappellear, both of Anderson, S.C., and Dale R. Mueller, Toledo, Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Jan. 5, 1976, Ser. No. 646,739

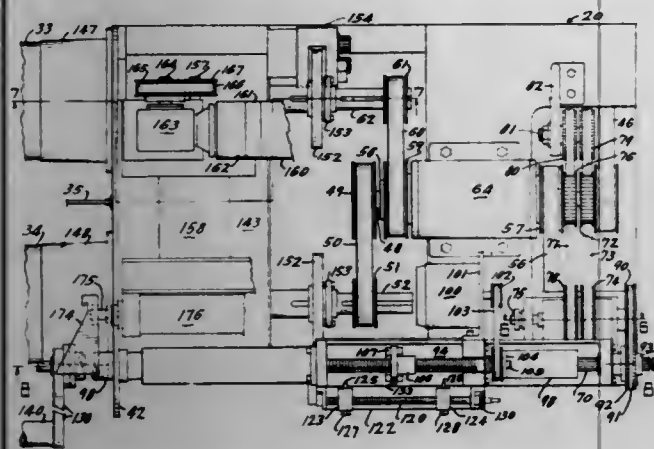
Int. Cl.² B65H 54/02, 54/28, 79/00

U.S. Cl. 242-18 G

3 Claims

1. Filament winding apparatus comprising a turret body mounted for rotation about a horizontal axis, means for periodically indexing the turret body, a pair of strand winding collets mounted on the turret body and respectively including a pair of winding collet shafts extending through the turret body for rotation respectively about axes parallel to and equal distances from the axis of rotation of the turret body, a pair of rotatably driven members mounted respectively on the winding collet shafts on the opposite side of the turret body from the winding collets, a first shaft spaced from the turret body axially thereof and mounted for rotation about an axis coaxial with the axis of rotation of the turret body, a hollow second shaft mounted concentrically of the first shaft for rotation independently thereof, the first shaft being longer than the second shaft and projecting outwardly from opposite ends thereof, a first pair of

rotatable driving members mounted respectively on first end portions of the first and second shafts, means respectively operatively connecting the first pair of rotatable driving members on the first end portions of the first and second shafts with the rotatably driven members on the winding collet shafts, a pair of variable speed motors respectively including a pair of motor shafts, a pair of rotatable driving members mounted respectively on the motor shafts, a pair of rotatably driven members mounted respectively on second end portions of the first and second shafts, means respectively operatively connecting the rotatable driving members on the motor shafts with the rotatably driven members on the second end portions of the first and second shafts, a second pair of rotatable driving



members mounted respectively on the second end portions of the first and second shafts, a strand oscillator shaft transversely spaced from the turret body and mounted for rotation about an axis parallel to the axis of rotation of the turret body, a rotatably driven member mounted on the strand oscillator shaft, a clutch shaft spaced from and parallel to the strand oscillator shaft, a pair of one-way clutches mounted on the clutch shaft independently of each other, a rotatable driving member mounted on the clutch shaft, means respectively operatively connecting the second pair of rotatable driving members on the second end portions of the first and second shafts with the clutches on the clutch shaft, and means operatively connecting the rotatable driving member on the clutch shaft with the rotatably driven member on the strand oscillator shaft.

4,052,016

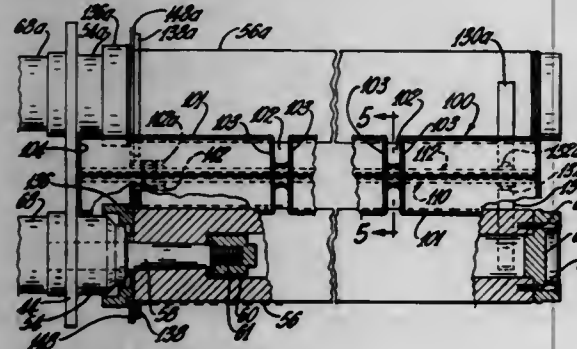
METHOD AND APPARATUS FOR REMOVING WOUND PACKAGES FROM A WINDING MACHINE

Cecil R. Cunningham, Aiken, S.C., and Alex P. Symborski, Newark, OH, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Sept. 11, 1975, Ser. No. 612,399
Int. Cl.² B65H 54/02

U.S. Cl. 242-18 G

9 Claims



1. Apparatus comprising, a frame, an indexable head mounted by the frame, collets mounted by the head and movable by said head to a package winding position and to a package removing position, means for rotating the collets at the winding station for winding a strand on one of the collets to form a package of strand, baffle means mounted by said head and disposed adjacent the collets, means for indexing said head

at the completion of the package at the winding station to move the collet bearing the completed package to the package removing station, and means mounted by the baffle means for moving the package along the length of the collet at the package removing station.

4,052,017

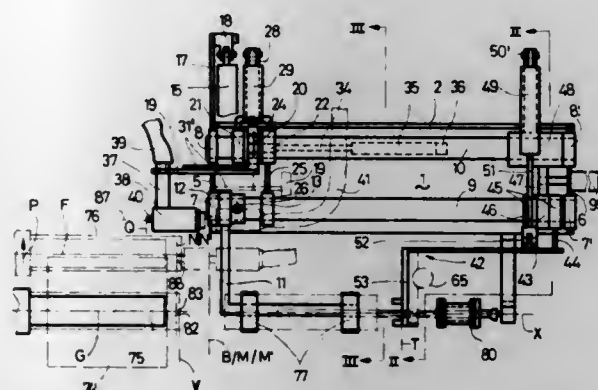
METHOD AND APPARATUS FOR AUTOMATICALLY CHANGING TEXTILE BOBBINS ON A CANTILEVERED BOBBIN CHUCK OF A TEXTILE WINDING MACHINE

Hugo Schür, Dattikon, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Apr. 9, 1976, Ser. No. 675,446
Claims priority, application Switzerland, Apr. 16, 1975, 4829/75

Int. Cl.² B65H 67/04

U.S. Cl. 242-35.5 A

15 Claims



1. A method of automatically changing textile bobbins on a cantilevered bobbin chuck of a textile winding machine, comprising the steps of:

- a. cutting and sucking-off a thread moving towards a textile bobbin package placed on the bobbin chuck;
- b. stopping the bobbin chuck;
- c. grasping the end region of the textile bobbin package and axially removing such textile bobbin package from the stopped cantilevered bobbin chuck and transferring it to a movable bobbin transporting device held in readiness in a direction substantially perpendicular to the direction of movement of said movable bobbin transporting device;
- d. positioning an empty bobbin tube into a ready position for donning onto the bobbin chuck;
- e. placing the empty bobbin tube onto the stopped bobbin chuck; and
- f. rethreading the sucked-off thread onto the empty bobbin tube placed on the bobbin chuck which in the meantime has been placed into rotation.

5. A bobbin change apparatus for automatically changing textile bobbins on a cantilevered bobbin chuck having a free end of a textile winding machine, comprising a bobbin package transporting device movable in a predetermined direction of travel, a bobbin tube gripper, means mounting the bobbin tube gripper to be axially movable in a bobbin package take-off direction between two terminal positions for taking-off a bobbin tube supporting a wound bobbin package from the free end of the bobbin chuck and for transferring the removed bobbin package to the bobbin package transporting device which is held in readiness, a bobbin package tube support arm, means for mounting said support arm for movement between a bobbin tube take-up position and a bobbin tube transfer position and in a direction substantially a right-angles with respect to the direction of movement of the bobbin tube gripper, said axially movable bobbin tube gripper being movable in a first direction for sliding an empty bobbin tube held in readiness by the bobbin tube support arm onto the free end of the bobbin chuck, a thread cutting and suction device, means for moving the thread cutting and suction device between a thread take-over position for cutting and sucking-off the thread moving towards the bobbin package and a thread transfer position for transfer-

ring the sucked-off thread to the bobbin tube supported on the bobbin chuck.

4,052,018

METHOD AND APPARATUS FOR COUNTING YARN-SPlicing FREQUENCIES OF SPINDLES IN AUTOMATIC WINDING MACHINE

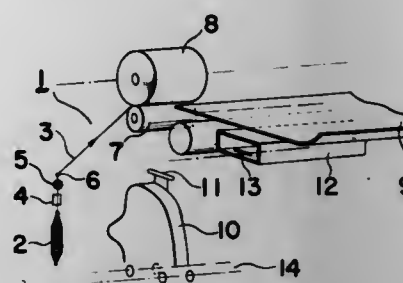
Takao Miyake, Neyagami; Katsue Koashi, Toyonaka, and Masato Sawada, Amagasaki, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

Filed Oct. 26, 1976, Ser. No. 735,415

Claims priority, application Japan, Feb. 13, 1976, 51-15035
Int. Cl.² B65H 63/00, 54/02, 69/04

U.S. Cl. 242-36

6 Claims



1. A method of counting yarn splicing operations due to normal and abnormal reasons in an automatic winding machine provided with a plurality of winding spindles and an automatic knotting machine circulating past said spindles for carrying out yarn splicing at each of said spindles when necessary, comprising the steps of detecting the operation of a slub catcher associated with each winding spindle and counting the number of operations as an indication of the number of yarn cuttings, detecting the occurrence of bobbin replacement for each winding spindle and counting the number of bobbin replacements, counting for each spindle the total number of the yarn splicing operations, and subtracting from the total number of yarn splicing operations the number of yarn cuttings and bobbin replacements for determining the number of yarn splicing operations due to causes other than the normal causes of yarn cuttings and bobbin replacements.

4,052,019

APPARATUS AND METHOD FOR WINDING ELASTOMERIC FIBER

Thomas David Dickson, Jr., San Jose, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Apr. 15, 1976, Ser. No. 677,240

Int. Cl.² B65H 54/00, 63/08

U.S. Cl. 242-47

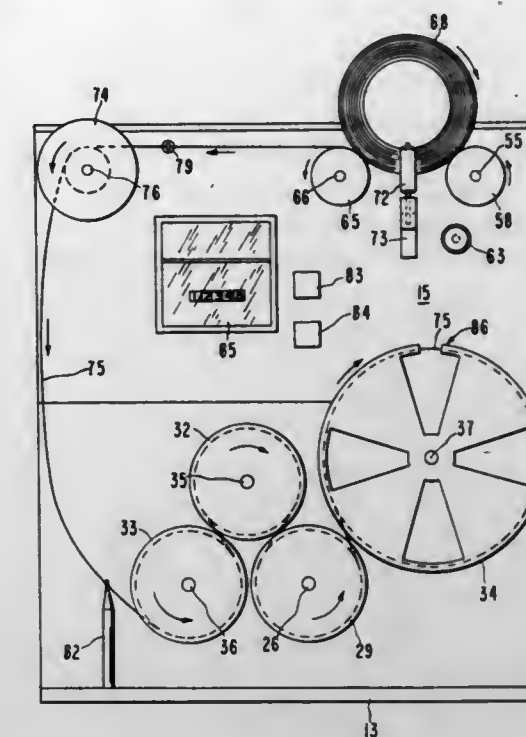
6 Claims

1. Apparatus for winding an elastomeric fiber under no or low axial tension comprising in combination:

- a housing;
- a pair of wheels mounted on the housing in spaced relationship to each other that are adapted to receive and hold a spool of said fiber in the space between them and rotate the spool in response to their rotation;
- a fiber take off pulley mounted on the housing over which the fiber from the spool is threaded;
- at least one fiber guide sheave mounted on the housing over which the fiber is threaded from the fiber take off pulley such that the fiber is wrapped about a substantial portion of its circumference;
- a wind up reel mounted on the housing into which the fiber is threaded from the fiber guide sheave and wound;
- means for driving the pair of wheels, the fiber take off pulley, the fiber guide sheave, and the wind up reel whereby the same are driven such that the linear speeds of the spool of fiber, the fiber guide sheave, and the wind up reel are substantially equal and the linear speed of the fiber

take off pulley is substantially greater than the linear speed of the spool of fiber; and

g. means associated with the pair of wheels for varying the rotational speed thereof whereby the linear speed of the



4,052,020

COMPUTER TAPE REEL

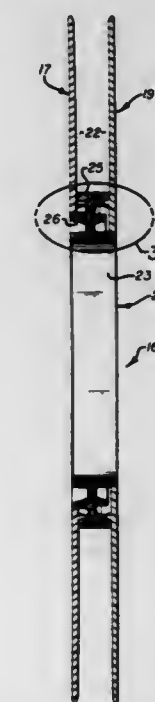
Jon A. Knox, 4625 E. Vista St., Long Beach, Calif. 90803

Filed Oct. 1, 1975, Ser. No. 618,392

Int. Cl.² B65H 75/18

U.S. Cl. 242-71.8

16 Claims



1. An improvement in a computer reel of the type which stores magnetic tape and comprises an annular hub and two annular flanges coaxial with the bore of the hub and securely attached to the hub to define a tape housing space; said hub including a hub table formed as its outside cylindrical surface and a reel mounting face formed as a lateral surface adjacent to said bore and located on the rear side of the hub, which is the side that faces a mating drive spindle; and an annular feeler

switch channel adjacent to said mounting face and coaxial with said bore; wherein the improvement is:

said hub consisting of a rigid annular hub core, which is the hub's major source of structural strength and dimensional stability, and a hub sleeve, which is a thin layer of plastic insert molded to the core and covering the outside cylindrical surface thereof; the outside cylindrical surface of said core unavoidably possessing geometric inexactitudes such as ovality, noncoaxiality with said bore, and molding sink depressions; the inside cylindrical surface of said sleeve being insert molded against said core to mate with the outside cylindrical surface of the core and to conform to all of said geometric inexactitudes thereof; said table, which is the outside cylindrical surface of said sleeve, being insert molded independent of the outside cylindrical surface of said core and with said hub bore serving as the core's locating surface so that the sleeve levels out the geometric inexactitudes of the outside cylindrical surface of the core and the table is rendered precisely coaxial with the bore, precisely cylindrical, and free of intolerable sink depressions.

4,052,021

BOBBIN HANGER

Zenzaburo Tsukumo, Ikeda, Japan, assignor to NTN Toyo Bearing Co. Ltd., Ikeda and Zenzaburo Tsukumo, Osaka, both of Japan

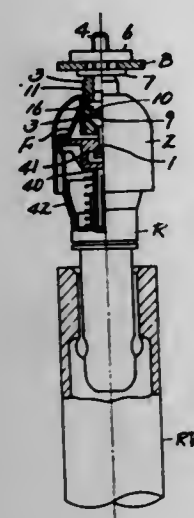
Filed Feb. 5, 1976, Ser. No. 655,488

Claims priority, application Japan, Jan. 17, 1976, 51-4283

Int. Cl.² B65H 49/02; D03J 5/08

U.S. Cl. 242—130.2

7 Claims



1. A bobbin hanger construction comprising bolt means for mounting at its upper end to a hanger attaching rail, bisected pivot housing means, cap means having an internal recess portion formed therein for receiving said pivot housing means thereinto, said bisected pivot housing means having an internal upper recess therein for receiving the bottom end of said bolt means thereinto, said pivot housing having an internal lower recess at its bottom end thereof, a bearing pivot element having its upper end thereof positioned within the internal lower recess of said pivot housing, a bisected rotary bearing member having an internal upper recess portion in the top portion thereof receiving the bottom end of said pivot element therein, the upper free end surface of said rotary bearing member having a top recess therein, said pivot housing means having a bearing hemisphere at its bottom end thereof positioned in the top recess of said rotary bearing member and a rotary housing member mounted on the body of said rotary bearing member in encircling relationship forming a vertical suspension element thereby for receiving a bobbin therein.

4,052,022

WINDING DEVICE

Johannes Martinus Reijnhard, Tilburg, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

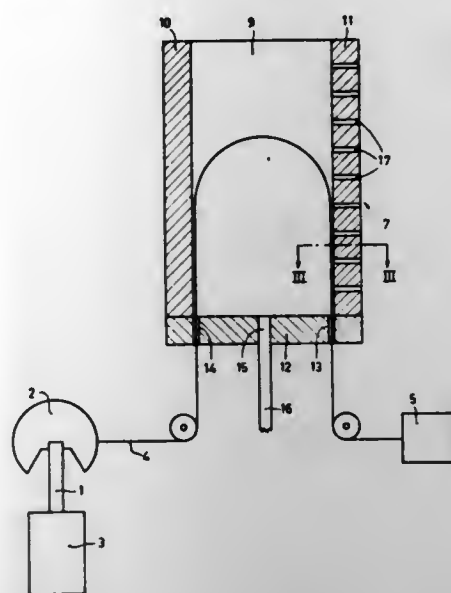
Filed Apr. 23, 1976, Ser. No. 679,803

Claims priority, application Netherlands, May 6, 1975, 7505279

Int. Cl.² B65H 59/10, 77/00

U.S. Cl. 242—147 A

5 Claims



1. A wire tension device for winding wire, comprising two plates having flat inner surfaces arranged parallel and at a fixed distance from each other, defining a gap therebetween; side strips between and connecting said plates; and an end closing member connected to said plates and said side strips, said member having an inlet opening and an outlet opening for passage of wire therethrough, and means for passing a flow of compressed gas through said closing member into said gap, wherein at least a portion of one of said strips is permeable to a flow of gas therethrough whereby wire passing through said device is subjected to friction against said one of said strips.

4,052,023

FILM EDITOR

Carl R. Schultz, 2802 Maryland Ave., Baltimore, Md. 21218

Filed June 3, 1976, Ser. No. 692,397

Int. Cl.² G03B 1/04; G11B 15/32

U.S. Cl. 242—180

13 Claims



4. A film editor comprising a film transport, said film transport comprising:

- a. two parallel plates;
- b. a central spindle rotatably mounted on said parallel plates and extending outwardly thereof;
- c. a film sprocket fixedly mounted on said central spindle outside said parallel plates;
- d. two outer spindles rotatably mounted on said parallel plates and extending outwardly thereof on the same side as said central spindle;
- e. two pairs of flanges one of which is mounted on each of said outer spindles outside said parallel plates, one of each pair of flanges being arranged to support a reel or turntable on which film may be supported in co-operation with said film sprocket and being freely mounted on its respective spindle and the other of each pair of flanges being rigidly attached to its respective spindle, each of said pairs of flanges being in facing, frictional contact; and
- f. first means for driving said central spindle and said outer spindles so that, when it is desired to have film move

towards a particular one of said outer spindles, that outer spindle is caused to turn and the other outer spindle is prevented from turning, said first means comprising:

- ii. a first pulley rigidly attached to said central spindle between said plates;
- iii. second and third pulleys one of which is freely mounted on each of said outer spindles between said plates and in position to co-operate with said first pulley;
- iv. two one-way clutches, one of which is mounted on each of said outer spindles and attached to one of said second and third pulleys;
- v. two further one-way clutches, one of which is mounted on each of said outer spindles and attached to one of said plates; and
- v. second means for rotating one of said spindles.

4,052,024

PNEUMATIC GEAR MOTOR APPLICATION

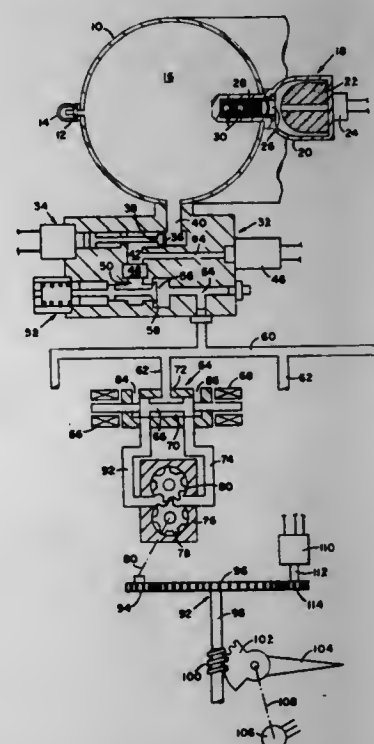
James M. Smith, Faniel Island, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 12, 1976, Ser. No. 685,553

Int. Cl.² F15C 3/12; F41G 7/00

U.S. Cl. 244—3.21

6 Claims



1. A pneumatic device comprising a source of pneumatic gas supply, means supplying said gas at a predetermined pressure to a manifold, servo valve means connected to said manifold for receiving said gas at said predetermined pressure and connected to a pneumatic gear motor for supplying and exhausting said gas to and from said pneumatic gear motor, a gear of said pneumatic gear motor being connected to reduction gearing that is driven by said pneumatic gear motor, and said reduction gearing being connected for driving a control fin and a position feedback potentiometer to indicate the position of the control fin.

4,052,025

SEMI-BUOYANT AIRCRAFT

Frank M. Clark, 707 W. Carrillo, Santa Barbara, Calif. 93101, and George M. Christner, 6277 Westmorland Place, Goleta, Calif. 93017

Filed Apr. 3, 1975, Ser. No. 564,853

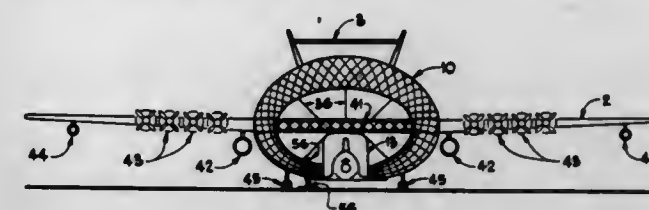
Int. Cl.² B64B 1/08, 1/20

U.S. Cl. 244—25

3 Claims

1. An aircraft structure including a fuselage shaped to provide substantial aerodynamic lift in an airstream with a minimum of aerodynamic drag, the fuselage including a rigid external framework formed by

a web of tension members longitudinally extending about the fuselage in a relatively helical pattern, the fuselage also including a central longitudinal channel extending internally of said framework along the lower portion of the fuselage substantially the entire length thereof for reinforcing the fuselage and defining an area for receiving cargo, the fuselage further including a bouyant envelope contained within the rigid external framework and pressurized to bear on and reinforce the external framework, the bouyant envelope being of a volume defined by the rigid external framework, the pressure of the gas enclosed in the envelope increasing as the air pressure about the aircraft decreases to exert a force upon and further reinforce the rigid external framework as the aircraft rises to operational altitudes and speeds,



a pair of wings attached to the fuselage in an opposed relationship and shaped to provide substantial aerodynamic lift in an airstream with a minimum of aerodynamic drag, the aerodynamic lift provided by the fuselage and the wings, together with the bouyancy provided by the bouyant envelope, being sufficient to maintain the aircraft airborne when in forward motion in an airstream, power means to impart forward motion to the aircraft, and sets of landing gear affixed to the fuselage at the forward, central and rearward portions of the aircraft, the landing gear sets being independently retractable and steerable permitting one end set of landing gear to be at least partially retracted and the aircraft turned on the central and other end set of landing gear when at rest turned on the central and other end set of landing gear when at rest upon the ground.

4,052,026

LOAD SUSPENSION EQUALIZING THIMBLE

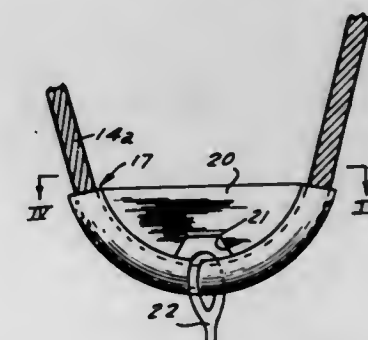
Roger D. Wood, Harrisburg, S. Dak., assignor to Raven Industries, Inc., Sioux Falls, S. Dak.

Filed May 24, 1976, Ser. No. 689,254

Int. Cl.² B64B 1/22

U.S. Cl. 244—127

9 Claims



1. A thermal hot air airship comprising in combination: an elongate aerodynamic shaped hot air retaining envelope of a flexible material; hot air pressure generating means carried on the envelope for pressurizing the envelope with heated air for supplying substantially the entire lift force during flight; tail members at the aft end of the envelope; a gondola carried beneath the envelope; a power operated propeller means on the gondola for driving the airship in horizontal flight; a plurality of suspension cables each cable having ends se-

cured to the gas envelope on each side adjacent the top of the envelope, the suspension cables being spaced from each other from the fore to the aft end of the airship and each cable being looped laterally in free hanging fashion downwardly beneath the envelope;

a thimble means on each of the cables beneath the envelope for sliding on each cable at the bottom thereof for equally distributing the vertical load through the suspension cables to each side of the envelope;

and means securing the gondola to the thimble means to be suspended therebeneath.

4,052,027

METHOD AND MEANS FOR SECURING RAILROAD CARS TO A BARGE DECK

Edward R. Taylor, #6-6750 Dow Ave., Burnaby, British Columbia, Canada (V5H 3G9)

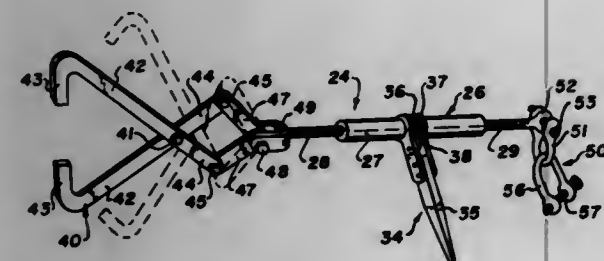
Filed Oct. 24, 1975, Ser. No. 625,715

Claims priority, application Canada, Nov. 28, 1974, 214847

Int. Cl.² B60P 7/00

U.S. Cl. 248—119 R

3 Claims



1. A tie-down device particularly adapted for use in securing a corner of a railroad car to a supporting surface having anchor members alongside the rails on which the car is adapted to roll, comprising:

a pair of clamping arms pivotally connected together intermediate their ends, having clamping jaws at their outer ends which are turned towards each other, and each clamping arm pivotally connected at its inner end to a lever arm, said lever arms being shorter than said clamping arms and being pivotally connected to each other and to one end of a rod means, said pair of clamping arms being pivotally connected together by a pivot means located nearer to its inner ends than its outer ends, the opposite end of said rod means including securing means for releasably connecting that end to an anchor member, said rod means including a tension applying means along its length including a pair of aligned and separate oppositely threaded portions, an internally threaded sleeve threadedly engaged with both of said threaded portions, such that turning of the sleeve about its axis moves the threaded portions towards and away from each other, and a manually operated ratchet lever engaged with the sleeve such that turning of the lever in one direction shortens the rod means to tighten the tie-down device and to apply a clamping force of the clamping jaws towards each other proportional to the applied tension.

4,052,028

STRUCTURAL STEELWORKER'S SAFETY CLAMP

Jose Cordero, Jr., 1647 Sweetwood Drive, Daly City, Calif. 94105

Filed July 6, 1976, Ser. No. 702,644

Int. Cl.² E04G 17/18; F21S 1/02; B66D 3/00

U.S. Cl. 248—228

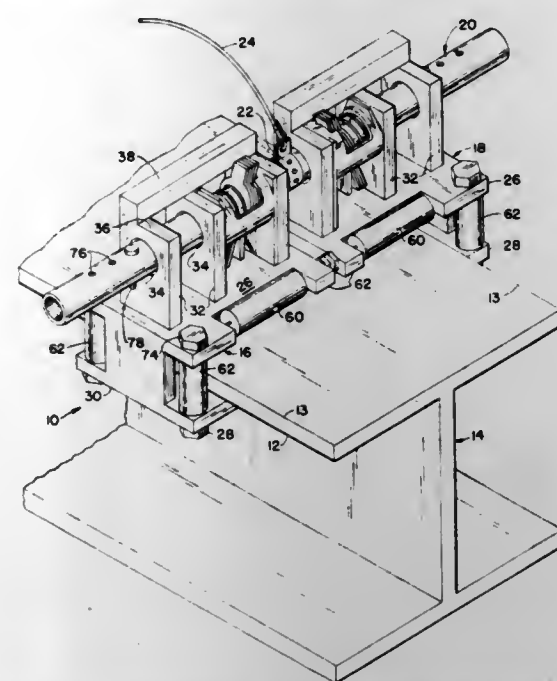
6 Claims

1. A safety clamp adapted to be slidably attached to an I-beam for providing a connection to which one end of a workman's lifeline may be attached, said clamp comprising:

an elongate bar member adapted to extend transverse said I-beam;

a pair of jaw members slidably coupled to said bar member,

each of said jaw members including opposed inner portions having U-shaped indentations adapted to receive a flange of said beam, at least one of said jaw members having a plate member that defines a leg of said U-shaped indentation of said one jaw member, said plate member being rotatably attached to said one jaw member for rotation in a plane parallel to and underlying said flange;



bearing means connected to each of said jaw members and disposed to engage a top surface of said I-beam flange; and locking means coupled to each of said jaw members for releasably securing each of said jaw members of said bar member to prevent movement of said jaw members away from one another.

4,052,029

COMPRESSIBLE MINE SUPPORT

Rodney C. Townsend, Johannesburg, South Africa, assignor to Mine Support Systems (Proprietary) Limited, Johannesburg, South Africa

Filed Sept. 3, 1975, Ser. No. 609,951

Claims priority, application South Africa, Sept. 5, 1974, 74/5649

Int. Cl.² E04G 25/00

U.S. Cl. 248—356

2 Claims



1. A compressible load absorbing mine support including a timber load-resisting element, a first sleeve of ductile mild steel surrounding said element completely in a direction transverse to its grain and extending beyond one end of the element to form a socket, a plunger consisting of a second timber element completely surrounded by a second sleeve of ductile mild steel, said plunger extending into said socket, said first and second sleeves being yieldable and deformable under significant loading so as to collapse without rupture, so that an increasing load applied across the support in the axial direction of said sleeves will cause the plunger to move telescopically into said first

sleeve to crush the timber elements while the ductile sleeve yieldably constrain the timber against expansion in a direction transverse to its grain.

4,052,030

SLIDE-IN MOUNTING BRACKET FOR CB RADIOS

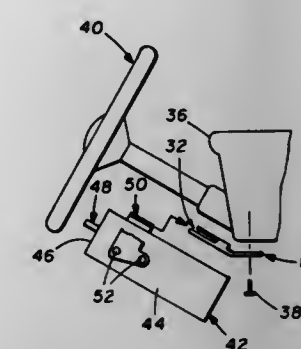
Billy J. Wright, Rte. 2, Box 279A, Wichita Falls, Tex. 76301

Filed Apr. 12, 1976, Ser. No. 676,112

Int. Cl.² F16M 13/00

U.S. Cl. 248—359

7 Claims



1. For use in conjunction with CB radios of the type having a chassis and a mounting bracket of predetermined thickness extending over the top of the chassis and spaced apart therefrom, a slide-in mounting bracket comprising:

a first plate including a mounting portion and an angularly upwardly extending portion;

the mounting portion of the first plate having a plurality of fastener receiving apertures formed therethrough whereby the mounting bracket may be secured on a vehicle;

a second plate equal in width to the first plate and extending parallel to and spaced a predetermined distance apart from the angularly upwardly extending portion of the first plate for receiving and retaining a CB radio mounting bracket therebetween and thereby securely retaining the CB radio while facilitating removal thereof; and

a standard comprising a top member and a pair of depending leg members spaced apart to receive the CB radio therebetween, the mounting portion of the first plate of the mounting bracket being secured to the top member of the standard.

4,052,031

ADJUSTABLE CONCRETE FORM APPARATUS

Samuel T. Melfi, 1601 NW. First Court, Boca Raton, Fla. 33432

Continuation-in-part of Ser. No. 600,048, July 29, 1975,

abandoned. This application July 26, 1976, Ser. No. 708,566

Int. Cl.² E04G 11/06

U.S. Cl. 249—19

6 Claims

1. A form apparatus for constructing a concrete building wall to extend up from the floor of the building at an outside edge of said floor without using scaffolding at the outside of the building, said form apparatus comprising:

an outer vertical form section having a lower end with an inside face for abutting engagement with said outside edge of the floor;

a pair of vertical end form sections at the opposite ends of said outer form section;

vertical pivot means at each end of said outer form section acting between the latter and the adjacent end form section for pivotal adjustment of each end form section to a position extending inward from said outer form section;

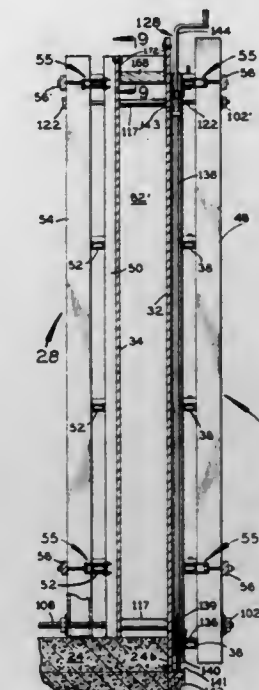
means on said outer form section near the top at each end for operatively connecting the upper end of a respective floor-mounted turnbuckle brace to said outer form section to support the latter from said floor;

elongated screw-threaded rods extending generally horizontally closely above said floor and operatively connected to said outer form section near its lower end, brackets loosely receiving said rods and attachable to said floor,

and nuts threadedly engaging said rods at the inner side of said brackets for pulling and holding the lower end of the outer form section tight against the outside edge of the floor;

lower spacer sleeves loosely receiving said rods and extending inward from said outer form section;

a vertical inner form section having upwardly extending slots therein which are open at its bottom edge to slip freely over said rods at the inner end of said lower spacer sleeves;



nuts threadedly mounted on said rods outward from said brackets for holding the lower end of said inner form section against the respective inner ends of said lower spacer sleeves;

tie rods connecting said inner form section to said outer form section near their upper ends;

and means operatively associated with said end form sections for releasably locking said end form sections to said inner form section with said end form sections extending inward from said outer form section.

4,052,032

EXTERIOR FORM SPREADER SYSTEM FOR THREADED END CONCRETE TIES

Peter R. Lovisa, 1040 Pelhamdale Ave., Pelham Manor, N.Y. 10803; Dusan Tausanovitch, 24 Crestwood Drive, Northport, N.Y. 11768, and Tullio E. Lovisa, 91 Whitson Road, Huntington, L.I., N.Y. 11743

Division of Ser. No. 525,887, Nov. 21, 1974, Pat. No. 3,920,214.

This application Nov. 6, 1975, Ser. No. 629,369

The portion of the term of this patent subsequent to Sept. 2, 1992, has been disclaimed.

Int. Cl.² F04E 11/06, 17/06; F16B 37/00

U.S. Cl. 249—40

5 Claims

1. In a concrete form system including spaced wall forms and a tie rod having threaded ends cooperating with said forms, the combination of

a. nut means internally threaded for engagement with the adjacent end of said tie rod,

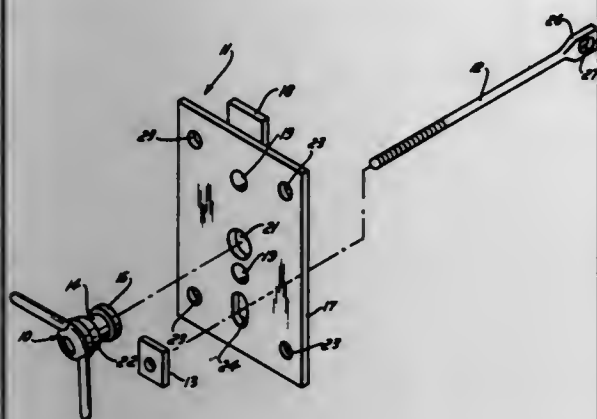
b. said nut means having a groove in the side thereof providing a pair of spaced opposed circumferential shoulders,

c. a plate washer assembly including a plate having a through hole receiving the axially inner of said shoulders therethrough,

d. means securing said plate assembly to the exterior of one of said forms with the end of said tie rod projecting through said hole,

e. said nut means being threaded on said tie rod to a position

wherein said inner shoulder thereon projects through said hole,
f. and said assembly including means movable thereon with respect to said through hole into releasable engagement within said groove establishing a driving relation between said shoulders and said assembly,



g. whereby threaded movement of said nut means on a tie rod will be transmitted through one of said shoulders and said assembly to cause movement of said form axially of said tie rod.

4,052,033

EJECTOR PIN RETRACTING MEANS FOR PLASTIC MOLDING DIES

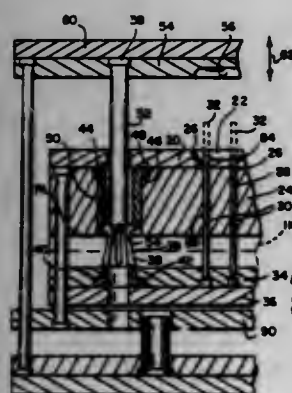
William L. Taylor, Phoenix, Ariz., assignor to Pixley Richards West, Inc., Tempe, Ariz.

Filed Sept. 29, 1976, Ser. No. 727,301

Int. Cl.² G05G 5/08; B29C 7/00; B29F 1/14

U.S. Cl. 249—67

5 Claims



1. A molding die employing an ejector pin retracting mechanism comprising:

- a first die member having a first molding cavity,
- a reciprocally operable member,
- an ejector pin mounted on said reciprocally operable member for movement into and out of said first molding cavity,
- a second die member having a second molding cavity,
- means for moving said first and second die members one relative to the other so as to open and close the first and second cavities,
- a return rod fixedly mounted on said second die member,
- a hollow cylindrical sleeve member defining a first bore extending therethrough fixedly mounted on said die adjacent said first die member,
- said rod being aligned concentrically with said first bore for reciprocal movement therein,
- a hollow tubular ejector pin return and detent means defining a second bore extending therethrough and having first and second ends,
- said detent means being connected to said pin carrying member in axial alignment with said first bore and having a plurality of spaced resilient fingers disposed around said first end of said second bore and biased toward each other, said fingers defining therebetween a circular cross-sectional

configuration the diameter of which is slightly less than the diameter of said rod,
the diameter of said second bore at its second end being larger than the diameter of said rod,
said rod when forced between said fingers spreads them apart a distance greater than the diameter of said first bore and when moved from a position between said fingers into said first bore causes said ejector pin carrying member to move said ejector pin into said first molding cavity,
said fingers when biased toward each other enough to cause them to enter said first bore prevents said return rod when said fingers are in said first bore from entering said second bore between said second fingers,
whereby upon predetermined reciprocal movement of said rod causes it to push against the end of said fingers to move said reciprocal member in a direction to move said ejector pin from said first cavity,
said fingers sequentially being forced out of said first bore causing said rod upon further movement to enter said second bore spreading said fingers apart and passing therebetween.

4,052,034

BAKING DEVICE

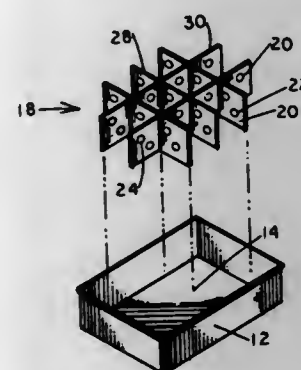
Josephine Marceno, 2719 Paulding Ave., Bronx, N.Y. 10469

Filed Dec. 4, 1975, Ser. No. 637,731

Int. Cl.² A21C 9/06

U.S. Cl. 249—110

7 Claims



1. A baking pan including side walls and a bottom, a partition strip dividing the pan into discrete baking compartments comprising a plurality of opposing and intersecting walled members removably seated in said pan on said bottom between said side walls, each of said members having a wall and a top portion and defining at least one through aperture on its wall, said aperture communicating with two of said baking compartments, each of said members including a substantially centrally disposed channel in fluid communication with said aperture, said channel including one inlet port disposed on the top portion of said wall member in communication with said aperture, said inlet port being of such size to receive a quantity of cake filling, which can travel through said channel and exit through said aperture into dough disposed between said walled members.

4,052,035

REMOTELY-CONTROLLED VALVE

Shaun S. Kenny, and Leonard J. Armstrong, both of Staten Island, N.Y., assignors to Conservocon, Inc., Staten Island, N.Y.

Filed Nov. 20, 1975, Ser. No. 633,797

Int. Cl.² F16K 31/143; F16L 27/04

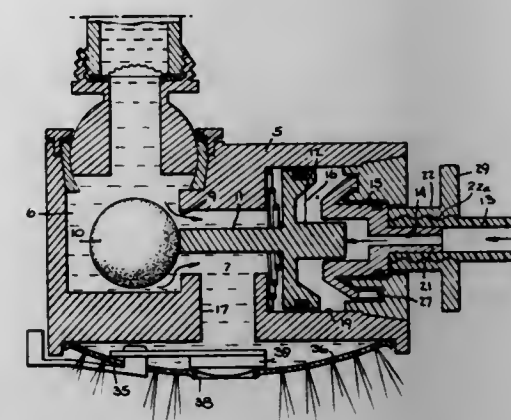
U.S. Cl. 251—14

5 Claims

1. A remotely-controlled valve attachable to the spout of a faucet for the control of water flowing therethrough comprising:

- a foot operated control member,
- a control valve member having adapting means to attach it to a faucet, said valve member having a body enclosing a

first chamber for accepting water from said faucet from a water inlet passage and a second chamber having a passage for directing exiting water from said control valve member, said first and second chambers being connected by means of an aperture, said first chamber having a valve ball placed within it, said valve ball being urged, by the force of water entering said first chamber from said faucet, against said aperture thereby preventing water flow from said first chamber to said second chamber, said control valve member connected to said foot-operated control member by means of a flexible conduit, said foot-operated control member, upon activation, applying fluid under pressure through said flexible conduit,
a cylinder within said control valve member,
a piston slidably disposed within said cylinder,
a piston guide chamber slidably disposed within said chamber having attached thereto an inlet member about which said flexible conduit is connected, said inlet member having a hollow passage for fluid or air under pressure from said foot-operated control member,



the flexible conduit connected to the end of said inlet member transmitting the fluid pressure therein to the end of the piston thereby causing said piston to slide within said cylinder in the direction of said valve ball, the actuating rod attached to said piston thereby moving said valve ball away from said aperture and allowing water to flow from said first chamber to said second chamber, and
means for manually urging said piston and its rigidly attached rod against said valve ball thereby moving said valve ball away from said aperture and allowing water to flow from said first chamber to said second chamber, said manual urging means comprising a clamp extending about the exterior of the flexible conduit adjacent to the end of the inlet member of the piston guide for retaining the conduit to the inlet member, and an override thumb ring attached to the clamp, said piston guide chamber undergoing linear movement with respect to said valve body by means of manual force applied to said override thumb ring, said linear movement being transmitted from said piston guide to said piston and its rigidly attached rod to said valve ball.

4,052,036

SLIDING DEVICE FOR THE GAS-TIGHT AND AIR-TIGHT CLOSURE OF A CONTAINER OPENING OR OF A CONDUIT

Siegfried Schertler, Haag, Switzerland, assignor to Vat Aktiengesellschaft für Vakuum-Apparate-Technik, Haag, Switzerland

Filed July 15, 1975, Ser. No. 596,121

Claims priority, application Switzerland, July 15, 1974, 9738/74

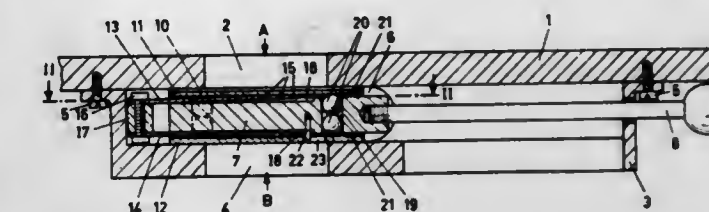
Int. Cl.² F16K 51/00

U.S. Cl. 251—144

21 Claims

1. A sliding device for the gas-tight and air-tight closure of an opening of given size in a body, said sliding device comprising a thick locking member (7;7') which is displaceable by means of a push rod (8) and which comprises a deflectable sealing plate (10;10') having a counter element (12;12') connected therewith by means of a spring member (13,14,35)

wherein the locking member (7;7') contains ball spreading elements (20) which rest against the sealing plate (10;10') and the counter element (12;12') to spread apart the sealing plate (10;10') and the counter element (12;12') when the locking member (7;7') has been moved into the closing position and to press the sealing plate (10;10') onto a seat of the body in a seal-tight manner through the intermediary of a narrow annular seat packing (11;11'), characterized in that a plurality of the spreading elements (20) are disposed in the



locking member (7;7') along a single closed line which, in the closing position of the locking member (7;7'), is located between the inner boundary line of the seat packing (11;11') and the boundary line of the opening (2,4) such that fluid pressure which acts on the sealing plate (10;10') within the enclosed area of the spreading elements and which is directed in the opposite direction to the sealing pressure at the seat to effect deflection of the sealing plate in the manner of a lever arm to produce an increased sealing pressure upon the seat packing.

4,052,037

DRINKING CUP STRUCTURED TO ENHANCE BEVERAGE BLENDING

Barrie Mair, Maidenhead, and Bernard Roy Schumann, Reading, both of England, assignors to Mars Limited, Slough, England

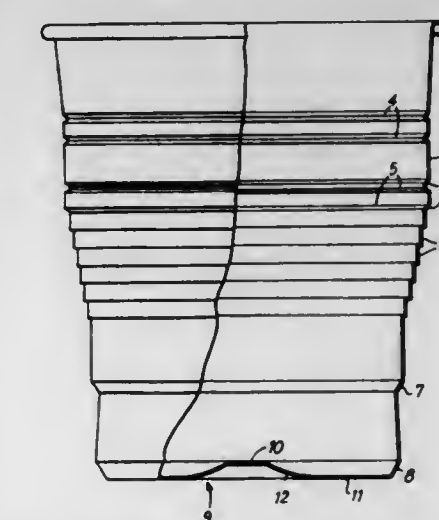
Filed May 22, 1973, Ser. No. 362,673

Claims priority, application United Kingdom, May 26, 1972, 25080/72

Int. Cl. B01f 1/00; B65d 3/06, 21/02

U.S. Cl. 366—341

2 Claims



1. A drinking cup adapted to facilitate the blending of a liquid with a charge of dry beverage ingredients stored in the bottom of the cup, the said cup being of the type having a general frustoconical side wall and a bottom wall joined to said side wall integrally therewith, the improvement characterized by the bottom wall having a relatively flat raised central area and a generally annular area extending outwardly from said central area to said side wall, said annular area having an upwardly concave cuspidal conical portion contiguous to and extending outwardly and downwardly from said central area and a flat portion merging with said concave portion and extending outwardly therefrom to a juncture with the said side wall, the juncture being formed as an annular shoulder flaring

outwardly and upwardly to join the bottom and side walls at obtuse angles therewith.

4,052,038

SCREW EXTRUDER FOR THERMOPLASTICS SYNTHETIC MATERIALS OR ELASTOMERS

Wilhelm Brand, Hannover, Germany, assignor to Hermann Borsdorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

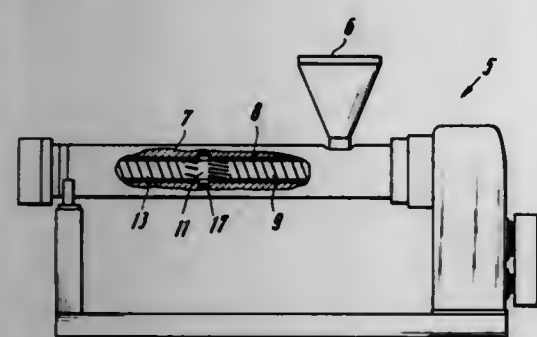
Filed Dec. 8, 1976, Ser. No. 748,565

Claims priority, application Germany, Dec. 24, 1975, 2558638

Int. Cl.² B29B 1/06

U.S. Cl. 366—90

3 Claims



1. A screw extruder for thermoplastics synthetic materials or elastomers having a screw rotating in a cylinder wherein the screw has a mixing part having a plurality of first grooves at an upstream position thereof inclined in the direction of feed, a plurality of second grooves at a position downstream of the first grooves and also inclined in the direction of feed and a grooveless portion between said first grooves and said second grooves, and the cylinder has a mixing part which surrounds said grooveless portion of the mixing part of the screw and has third grooves therein which extend axially or are inclined in the direction of feed, the number of said first grooves, said third grooves and said second grooves differing.

4,052,039

AUTOMATIC CUTTING TORCH ASSEMBLY

Nobuhige Koyano, Kanagawa, and Katsumi Inamori, Aichi, both of Japan, assignors to Iwatani Sangyo Kabushiki Kaisha, Osaka and Seimitsu Yodanki Kabushiki Kaisha, Tokyo, both of Japan

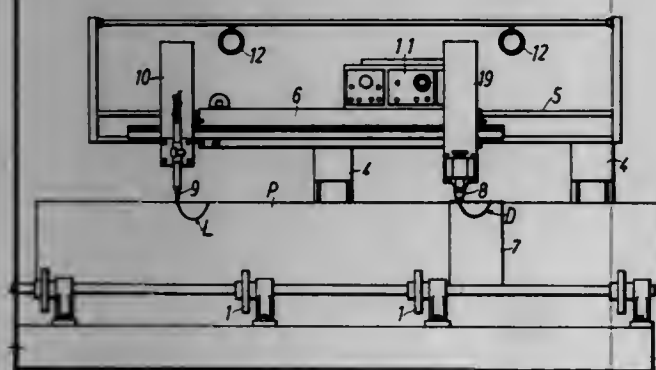
Filed Nov. 17, 1976, Ser. No. 742,641

Claims priority, application Japan, May 19, 1976, 51-64146

Int. Cl.² B23K 7/10

U.S. Cl. 266—57

1 Claim



1. An automatic cutting torch assembly for making a cut of any predetermined shape in a metallic pipe upon which a pattern line has been superimposed which is a replica of said predetermined shape, comprising, frame means, first and second shafts rotatably mounted on said frame means in transversely spaced relation, disk means attached to said shafts at spaced apart points longitudinally thereof for supporting said pipe, a first servomotor mounted on said frame means in driving relation to one of said shafts for rotating said pipe in either selected direction, longitudinally extending rail means mounted on said frame means in parallel relation to said pipe,

a beam member mounted on said rail means for movement relative thereto and parallel to said pipe, a second servomotor mounted on said frame means in driving relation to said beam member for moving said beam member in either selected direction, a rotatable photoelectric tracer unit for sensing and tracking said pattern line mounted on said beam member for rotation about an axis which is perpendicular to and intersects the horizontal axis of said pipe, a third servomotor carried by said beam member and being responsive to conditions sensed by said tracer unit, said third servomotor being in driving relation with said tracer unit for rotating said tracer unit in either selected direction to perform said tracking, a cutting torch unit mounted on said beam member and directed towards said pipe so that the axis thereof is parallel to the axis of said tracer unit and intersects the axis of said pipe, at least one of said units being adjustably positioned on said beam member so that the distance between said units may be selected during set-up, a resolver unit for sensing the instantaneous angular position of said tracer unit and translating the second signal into two signals which correspond to circumferential and axial components of said sensed angular position, means for transmitting said transmitted two signals to said first and second servomotors to simultaneously rotate said pipe and move said beam member axially so that the locus of said cutting torch is a replica of said tracked pattern line.

4,052,040

CUTTING TORCH AND GUIDE ASSEMBLY

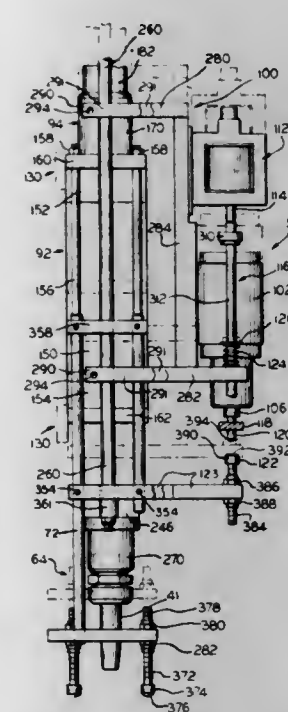
Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Filed June 30, 1976, Ser. No. 701,368

Int. Cl.² B23K 7/10

U.S. Cl. 266—68

8 Claims



1. In a cutting apparatus comprising a cutting torch mounted on a wheeled frame riding on a trackway for torch cutting of a work piece positioned for torch cutting along the path of movement of the frame and means for moving the frame along the trackway, the improvement wherein said torch comprises: a cylinder structure including means for mounting same in a vertical position on the frame, a torch body mounted in said cylinder structure for reciprocating movement axially and vertically of said cylinder structure and including a nozzle at the lower end of said torch body, a sensing device carried by said torch and comprising: a feeler member having a plurality of feelers disposed in uniformly spaced apart relation about said nozzle, said feeler member being mounted for a lost motion movement range axially of said cylinder structure relative to said nozzle,

and hydraulic means for supporting said torch body from said cylinder structure and for moving same axially of said cylinder structure, said hydraulic means including a hydraulic system for positioning said torch body relative to said cylinder structure to dispose said nozzle at a predetermined spacing above the work piece with said feelers resting on the work piece and said feeler member disposed in its said lost motion range to provide the operative position of said torch body for torch cutting purposes, and means for translating movement of said feeler member in its said lost motion range due to elevational changes in the work piece into adjustment of said flow orienting means to maintain said nozzle at said spacing above the work piece, on movement of the frame along the trackway for torch cutting purposes, said cylinder structure and said torch body comprising a hydraulic cylinder and piston device forming a part of said hydraulic means with said cylinder and piston device being connected in double acting relation in said hydraulic system for said positioning of said torch body relative to said cylinder structure.

4,052,041

APPARATUS FOR INJECTING GRANULAR MATERIAL INTO A MOLTEN METAL

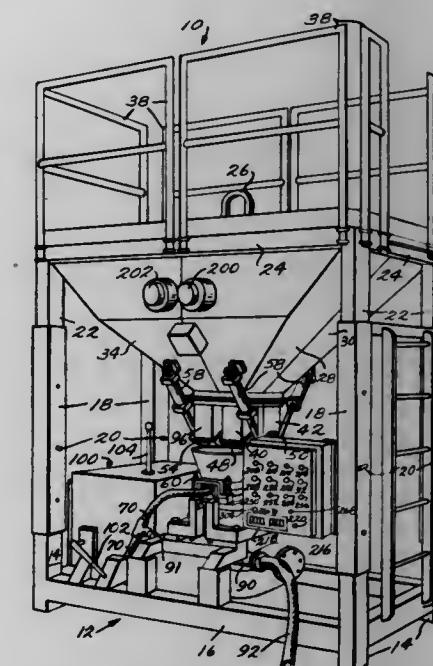
Gerald F. H. vonStroh, III, 2976 Staunton Road, Huntington, W. Va. 25702

Filed Dec. 15, 1976, Ser. No. 750,633

Int. Cl.² C21C 7/00

U.S. Cl. 266—81

25 Claims



1. Apparatus for injecting a predetermined amount of a free flowing granular material into a body of molten metal or the like comprising: a supply hopper for receiving a supply of granular material, said supply hopper having discharge opening means therein, means for controlling the flow of granular material received within said supply hopper outwardly through said discharge opening means, means for receiving the granular material flowing outwardly from the discharge opening means of said supply hopper under the control of said control means and feeding the same to an incremental volume forming position, means defining a confined flow path for the flow of air under pressure into a granular material entraining position and for the flow of air under pressure with granular material entrained therein from said granular material entraining position to a discharge end, the discharge end of said flow path defining means comprising a lance for the body of molten metal, valve means in said confined flow path upstream of said

4,052,042

APPARATUS FOR CLEANING BLAST-FURNACE EXHAUST GASES

Karl-Rudolf Hegemann, Essen-Bergerhausen; Gunther Finger, Wesel; Albert Brinkmann, Duisburg, and Helmut Weissert, Hamm, all of Germany, assignors to Gottfried Bischoff Bau kompl. Gasreinigungs-und Wasserruckkühlungs-Anlagen Kommanditengesellschaft, Essen, Germany

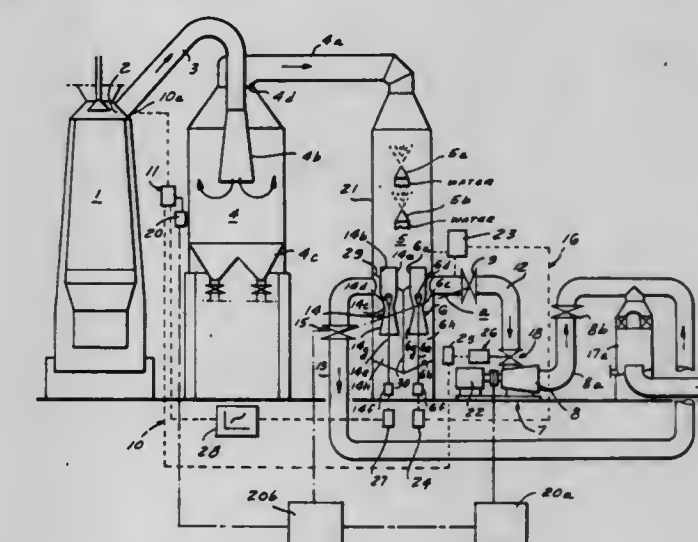
Filed May 21, 1976, Ser. No. 688,893

Claims priority, application Germany, May 24, 1975, 2523083; May 24, 1975, 2523082

Int. Cl.² C21B 7/22

U.S. Cl. 266—89

19 Claims



1. A gas-cleaning apparatus for a high-pressure furnace comprising: duct means connected to the head of said furnace for conducting an exhaust gas therefrom, the head of said furnace having a back pressure; a separator connected to said duct means for separating dust from said exhaust gas; a differential-pressure washer having an upstream side connected to said separator and receiving said exhaust gas therefrom; a main conduit connected to a downstream side of said washer; an expansion turbine unit connected to said main conduit for expanding gas traversing same, said differential-pressure washer being located ahead of said expansion turbine unit and washing gas from said duct means prior to the passage of the gas through said expansion turbine unit; a bypass conduit connected to said differential-pressure

washer for conducting gas therefrom around said expansion turbine unit;
 a quick-opening valve in said bypass conduit and a quick-closing valve in said main conduit for substantially concurrent operation to switch over flow of gas from said main conduit to said bypass conduit;
 means connected to said quick-opening and quick-closing valves so simultaneously operating same;
 a pressure-control valve connected to said bypass conduit for regulating flow therethrough; and
 control means connected to the head of said furnace and responsive to the pressure at the head of said furnace and connected to said expansion turbine unit and to said pressure-control valve for operating said unit when said main conduit is traversed by gas and operating said pressure-control valve when said bypass conduit is traversed by gas to maintain said back pressure substantially constant.

4,052,043

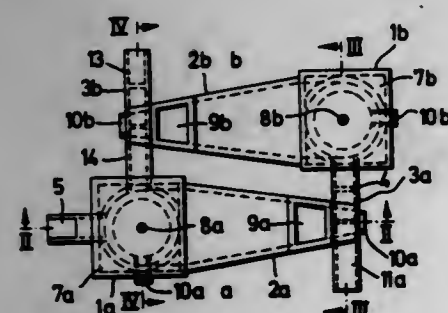
APPARATUS FOR CONTINUOUSLY REFINING MOLTEN METALS

Paul Rheinländer; Gustav Mahu, both of Wolfenbüttel, Germany; Klaus Schulz, deceased, late of Wolfenbüttel, Germany, by Ingrid Rühland, legal representative for Jörg Schulz, sole heir, Braunschweig, Germany, and Klaus Berner, Salzgitter-Lebenstedt, Germany, assignors to Stahlwerke Peine-Salzgitter Ag, Peine, Germany
 Division of Ser. No. 575,174, May 4, 1975, Pat. No. 3,985,549, which is a continuation-in-part of Ser. No. 825,643, May 19, 1969, abandoned, and Ser. No. 335,812, Feb. 26, 1973, abandoned, which is a continuation of Ser. No. 46,687, June 16, 1973, abandoned. This application June 30, 1976, Ser. No. 701,217

Claims priority, application Germany, June 18, 1969, 1930746
 Int. Cl.² C21C 7/10

U.S. Cl. 266—207

14 Claims



1. Device for continuously refining molten pig iron with oxygen and an addition of lime resulting in separate bodies of molten metal and slag comprising a reaction vessel having at least a first and a second refining stage portions each including an inlet into which liquid metal is continuously feedable, an outlet for separately removing molten metal and slag and an interconnecting section providing flow therebetween, each of said first and second refining stage portions forming a passage from the inlet through the interconnecting section to the outlet having a lower liquid level defining the upper level of the molten metal

and an upper liquid level defining the upper level of a layer of slag with the layer of slag located between the lower liquid level and the upper liquid level, means providing communication between said refining stage portions including a slag duct for passing out of the outlet of said second refining stage portion and into the inlet of said first refining stage portion at least part of the layer of slag therein, said slag duct having one end opening into said first refining stage portion and another end opening into said second refining stage portion at an elevation thereof higher than at which said one end opens into said first refining stage portion, at least one gas supply tube communicating with each of said first and second refining stage portions, and means for discharging slag and liquid metal from said reaction vessel, said discharge means comprising

ing openings spaced vertically from one another with one of said openings located in said first refining stage portions and the other said opening located in said second refining stage portion.

4,052,044

METHOD OF AND APPARATUS FOR THE DECRUSTING OF METALLURGICAL LANCES

Joseph Colling, Luxembourg; Carlo Heintz, and Alfred Unbekand, both of Kayl, all of Luxembourg, assignors to ARBED - Aciéries Reunies de Burbach-Eich-Dudelange, Luxembourg, Luxembourg

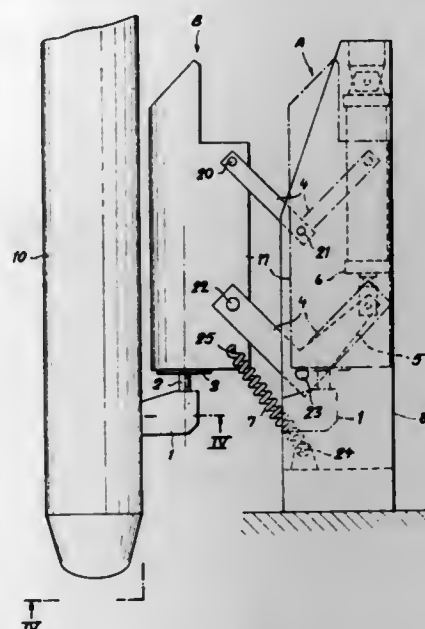
Filed Nov. 19, 1976, Ser. No. 743,520

Claims priority, application Luxembourg, Nov. 21, 1975, 73846

Int. Cl.² C21C 7/00

U.S. Cl. 266—225

22 Claims



1. A method of removing encrustations from a metallurgical lance comprising the steps of:
 relatively displacing the lance and a tool with the tool in contact with a layer of encrustation on said lance; and
 applying a repetitive movement to said tool against said layer to dislodge said layer from said lance and permit said layer to fall therefrom by its weight.

4,052,045

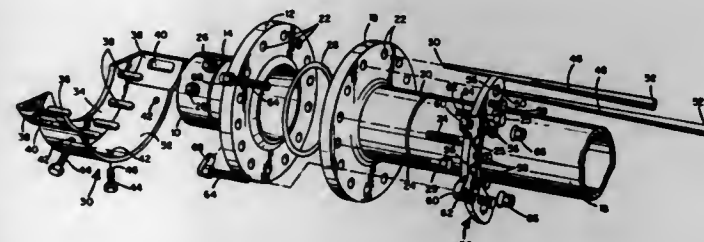
ALIGNMENT OF FLANGES

Billy Joe Shaddix, 309 Fire Thorn Drive, Gretna, La. 70053
 Filed July 29, 1976, Ser. No. 709,783

Int. Cl.² B23P 19/00

U.S. Cl. 269—43

12 Claims



1. Flange alignment apparatus for aligning first and second flanges each having a series of holes therethrough in a predetermined pattern, the pattern of holes of said second flange being a mirror-image of the pattern of holes of said first flange, the flange alignment apparatus comprising

a flange support comprising body means adapted to extend partially around the periphery of said first flange and a plurality of pins projecting from said body means, said pins being disposed in a pattern that matches a portion of said pattern of holes in said first flange and being adapted

to be received in the holes of said pattern portion, said body means including a second flange support portion disposed to engage said second flange when said pins are received in said first flange holes, thereby facilitating alignment of said second flange with said first flange.

4,052,046

JAW ADAPTER FOR A CLAMP

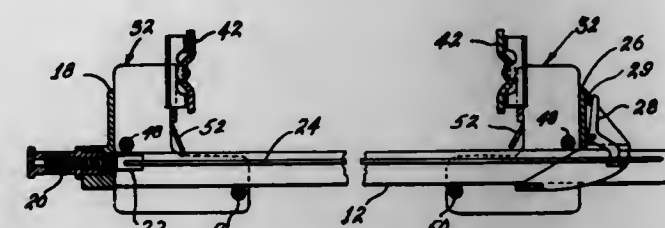
John L. Mortoly, Poughkeepsie, N.Y., assignor to James L. Taylor Mfg. Co., Poughkeepsie, N.Y.

Filed May 27, 1976, Ser. No. 690,520

Int. Cl.² B25B 1/24

U.S. Cl. 269—208

12 Claims U.S. Cl. 270—40



1. A jaw adapter to mount upon the frame of a clamp having relatively movable jaws and increase the effective height of one of the jaws during the clamping of stock between them, the jaw adapter having a front side engageable above the jaws with clamped stock and having a rear side engageable with the face of said one jaw, the jaw adapter including means to contact the frame and facilitate longitudinal movement of the jaw adapter thereon, said means including a member disposed to resist by transversely engaging the frame any tendency of the upper part of the jaw adapter to tilt against said one jaw and concentrate force at the upper portion of said one jaw during the clamping of stock.

4,052,047

CLAMP

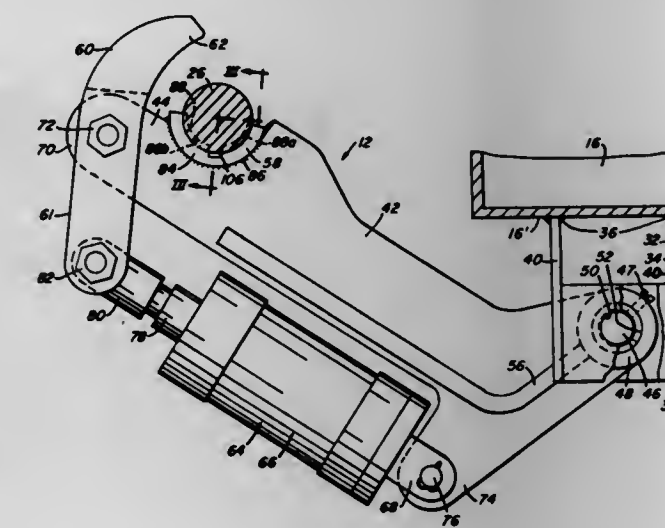
Edward A. Bailey, Newport, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Feb. 12, 1976, Ser. No. 657,508

Int. Cl.² B25B 1/24

U.S. Cl. 269—238

12 Claims



1. In an apparatus for driving an elongated drill steel a drill steel clamping means comprising: support means carried by such an apparatus; jaw means carried by said support means and engageable in clamping engagement with such drill steel; said jaw means comprising at least a pair of relatively movable jaw members with at least one of said jaw members having a formed clamping surface portion engageable with an axially extending formed peripheral portion of such a drill steel; said formed clamping surface portion being comprised of axially spaced alternate land and groove portions and intervening inclined flank portions located axially intermediate said land

and groove portions; and said clamping surface portion being engageable with such drill steel in clamping engagement constituted solely of engagement between said inclined flank portions and such formed peripheral portion.

4,052,048

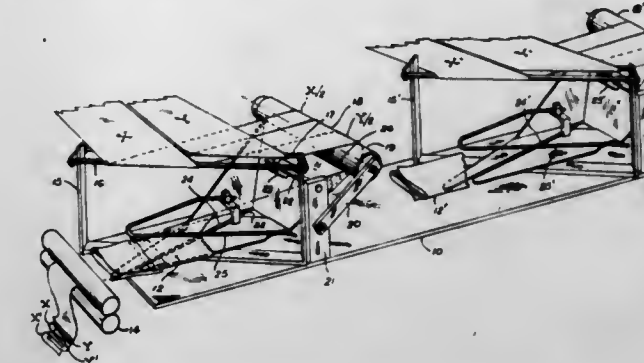
LONGITUDINALLY INTERFOLDING DEVICE AND METHOD

Fumitake Shirasaka, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Mar. 11, 1976, Ser. No. 666,224

Int. Cl.² B41L 1/30

8 Claims



1. A method of interfolding elongated webs being advanced along a linear path having longitudinally extending first and second margins, comprising:

lapping a first pair of equal width webs to provide upper and lower webs having a central lapped portion which has longitudinal edges coincident with said margins and unlapped edge portions each one-half the web width outside said margins,

pulling said first pair of webs through a folding device positioned in said path and having transversely aligned first and second folding points (30, 31) on said first and second margins respectively, said device having

a. a first folding edge (24) extending angularly forwardly in the direction of web movement in said path from said first point (30) across said path to intersect said second margin a spaced distance forwardly of said second point (31) to support thereabove said central lapped portion and to underfold the edge portion of said upper web,
 b. a second folding edge (36) extending forwardly from said second point (31) coincident with said second margin and terminating a spaced distance rearwardly of the intersection of said first folding edge (24) with said second margin to overfold the edge portion of said lower web, said first and second folding edges (24, 36) being generally co-planar,

c. a third folding edge (25) extending angularly forwardly across said path from slightly above said second point (31) to cross above said first margin a spaced distance rearwardly of the intersection of said first folding edge (24) with said second margin to complete the overfolding of the edge portion of the lower web prior to completion of the underfolding of the edge portion of said upper web,

pulling a second pair of completely folded webs beneath said device while positioning the overfolded edge portion of the lower web of said second pair in contact with the edge portion of the upper web of said first pair while the same is being folded about said first folding edge whereby the movement of the edge portion of the upper web of said first pair urges and draws the overfolded edge portion of the lower web of said second pair between the edge portion of the upper web of said first pair and the lapped central portion of the lower web of said first pair.

8. An interfolding device adapted to be positioned in the path of travel of a pair of half-lapped webs to fold the same, said path having side margins defined by the lap of said webs, comprising a frame:

said frame being equipped with a turning edge extending transversely of said path to turn said half lapped webs, said turning edge terminating in a pair of points, one on each margin,

said frame including a pair of generally co-planar plates extending forwardly in said path in the direction of web travel, one of said plates being equipped with a side edge coextensive with one of said said margins, the other of said plates being equipped with an angled side edge extending forwardly from the other of said side margins toward said one side margin, said one plate being spaced from said angled side edge to provide a threading throat, and

a folding rod on said frame spaced above said plates and extending angularly across said path from said one margin to the other and intersecting said other margin within the length of said other plate to complete web folding within the length of said device.

4,052,049

CARD INJECTING APPARATUS

Stephen J. T. Hassall, Churchville, and Neil S. White, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

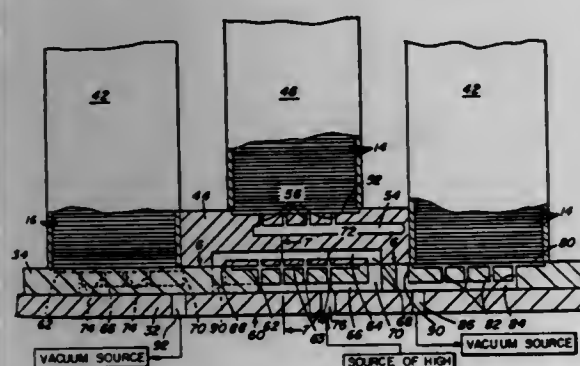
Continuation of Ser. No. 506,917, Sept. 17, 1974, abandoned.

This application Nov. 21, 1975, Ser. No. 634,203

Int. Cl.² B65H 39/02

U.S. Cl. 270—58

3 Claims



1. In a mechanism for inserting a card under a stack of flat articles, the combination comprising:

- a pocket having a support surface for supporting a stack of flat articles;
- means for holding a card adjacent said pocket, said card holding means comprising a stationary member having a flat surface in alignment with said pocket and a movable member slidably supported by said stationary member, said movable member having first and second spaced apart recesses for receiving cards and being selectively movable between a first position in which (1) said first recess is in alignment with said pocket and cooperates with said flat surface to form an enclosed first passageway having a first open end facing said stack and an opposite first closed end and (2) said second recess is in a position to receive a card, and a second position in which (1) said second recess is in alignment with said pocket and cooperates with said flat surface to form an enclosed second passageway having a second open end facing said stack and an opposite second closed end and (2) said first recess is in a position to receive a card;
- first and second air passages formed by said stationary member and having first and second air passage ends respectively communicating with a selected one of said first and second passageways in said first and second positions respectively of said movable member, one of said first and second air passage ends being positioned adjacent each of said first and second open ends and the other of said first and second air passage ends being positioned between said one of said first and second air passage ends and each of said first and second closed ends, said first and second air passages being inclined relative to a plane in which each of said first and second passageways lie for

directing air through each of said first and second open ends toward said pocket support surface; and

d. means for supporting air under pressure to said first and second air passages whereby air from said first air passage raises said stack above said pocket support surface, and air from said second air passage transports said card in a selected one of said first and second passageways along said pocket support surface to a position under said raised stack.

4,052,050

ROTARY VACUUM PICKER WITH MECHANICAL ASSIST

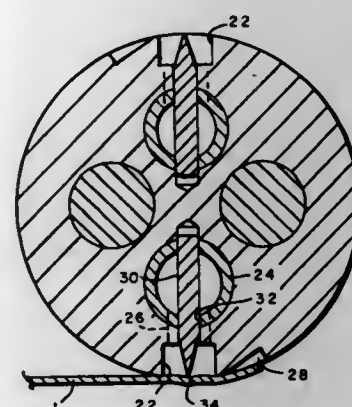
Sidney T. Carter, Shrewsbury, Mass., assignor to A-T-O Inc., Cleveland, Ohio

Filed Feb. 23, 1976, Ser. No. 660,066

Int. Cl.² B65C 9/14; B65H 3/10, 3/22

U.S. Cl. 271—18.3

1 Claim



1. Apparatus for removing labels from a stack of labels comprising a rotatable picker member having a plurality of unyielding cylindrical vacuum picking surfaces concentric with the axis of rotation of said picker member, means supporting the picker member for rotation with its axis parallel to the plane of the endmost label of the stack of labels and at such a distance therefrom that the picking surfaces have tangential engagement with the endmost label, slots in the vacuum picking surfaces of the picker member, means for rotating the picker member to periodically bring the slots into engagement with the endmost label, means for connecting the slots at the place of tangency to a vacuum to grip and hold the label at a predetermined place in its rotation and beyond the place of tangency to disconnect them from the vacuum to release the label, and pins fixed at one end within the slots with their opposite ends substantially flush with the vacuum picking surfaces of the picker member with which the label is drawn into engagement by the vacuum to resist movement of the label relative to the picker member.

4,052,051

SHEET FEEDER

Robert E. Mersereau, Stamford, and Harold Silverman, Norwalk, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Continuation of Ser. No. 594,869, July 10, 1975, abandoned.

This application Aug. 31, 1976, Ser. No. 719,300

Int. Cl.² B65H 3/12

U.S. Cl. 271—94

10 Claims

1. Sheet feeding apparatus comprising:

- means for removing successive top sheets from a stack of sheets, said removing means including feed roller means and vacuum means, the vacuum means operatively connected to the feed roller means for lifting successive top sheets off the stack and into engagement with the feed roller means for transportation thereby away from the stack;
- primary means for positioning the stack, said primary

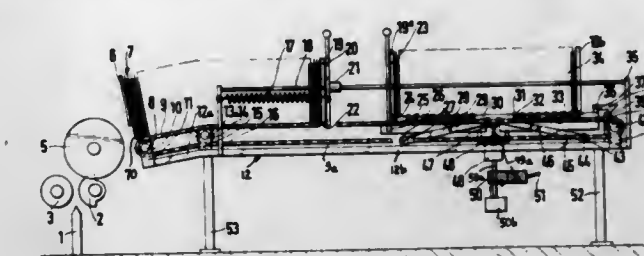
positioning means including a platform for supporting the stack thereon and means for moving said platform;

c. first top sheet sensing means for sensing successive top sheets of the stack, said first top sheet sensing means adapted to incrementally operate the platform moving means for elevating the platform to maintain a supply of top sheets of the stack in operative engageable relationship with the removing means;

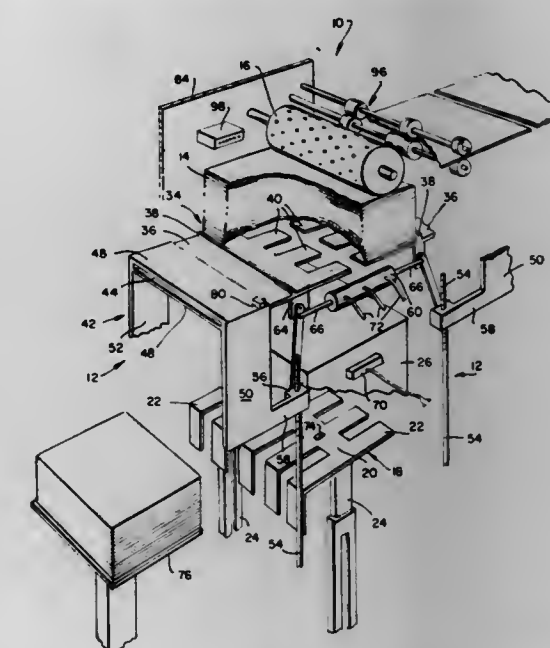
d. secondary means for positioning the stack, said secondary positioning means including at least one deck for supporting a reserve portion of the stack and means for moving said at least one deck;

e. means for sensing a first level of the platform, said first platform level sensing means adapted to operate the deck moving means for moving said at least one deck into supporting engagement with the stack reserve portion, said first platform level sensing means adapted to operate

portion; a frame; a carriage mounted in said frame in the region of said rear portion and having a substantially horizontal support arranged to carry at least one fresh stack of signatures, said carriage being movable back and forth lengthwise of said rear portion; and means for moving said support with respect to said frame between a raised position in which said support is located at a level above said rear portion and a fresh stack



which rests on said support can move with said carriage toward said front portion, and a lower position in which said support is located at a level below said rear portion whereby a fresh stack which has been placed onto said support in said raised position of said support comes to rest on said rear portion and the carriage can be moved away from said front portion.



said platform moving means for lowering the platform to a second level to permit loading thereon a replenishing supply of sheets;

f. said first top sheet sensing means adapted to incrementally operate the deck moving means for elevating said at least one deck to maintain the supply of top sheets in operative engageable relationship with the removing means;

g. means for operating said platform moving means to raise the platform from said second level after the replenishing supply has been loaded thereon;

h. second top sheet sensing means for sensing a level of the top sheet of the replenishing supply, said second top sheet sensing means adapted to operate said deck moving means for disengaging the deck from the stack reserve portion to permit engagement with the replenishing supply, whereby the stack reserve portion is combined with the replenishing supply on the platform to form therewith a new stack of sheets.

4,052,052

APPARATUS FOR FEEDING AND TRANSPORTING SIGNATURES IN BOOKBINDING MACHINES

Hans Muller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Sept. 1, 1976, Ser. No. 719,578

Claims priority, application Switzerland, Sept. 9, 1975, 11697/75

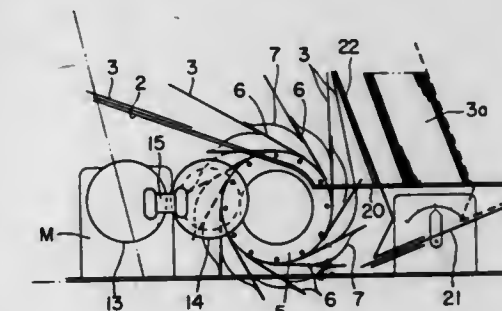
Int. Cl.² B65H 1/30

U.S. Cl. 271—157

11 Claims

1. In an apparatus for manipulating signatures in a bookbinding machine wherein successive signatures of an expiring stack of signatures are converted into a succession of discrete signatures, a combination comprising conveyor means having a front portion arranged to support and advance an expiring stack of signatures and a substantially horizontal elongated rear

1. In a sheet accumulating device having a stacker drum adapted to rotate about a horizontal axis and having at least one cylindrical drum structure provided around the cylindrical surface thereof with a plurality of blades secured at their inner root parts to the drum structure and extending tangentially in the direction opposite to the circumferential direction of rotation of the drum structure to their outer ends, each blade thereby having an outer leading surface and an opposite, inner trailing surface, sheets such as pieces of paper money fed continuously and successively along a feeding chute being fed into respective spaces between adjacent blades of the rotating stacker drum to be successively upended and accumulated into neat stack, the improvement which comprises a leaf spring secured at an outer end thereof to the outer end of each of said blades on the outer leading surface thereof and extending toward the root part of the adjacent blade in said rotational direction, said leaf spring having a convex curved surface facing, and lightly contacting the inner trailing surface of said adjacent blade, said leaf spring being adapted to reduce the degree of freedom of a sheet fed into the space between the said convex curved surface and said adjacent blade.



4,052,054

SEQUENTIAL LOAD DUAL DOCUMENT FEED

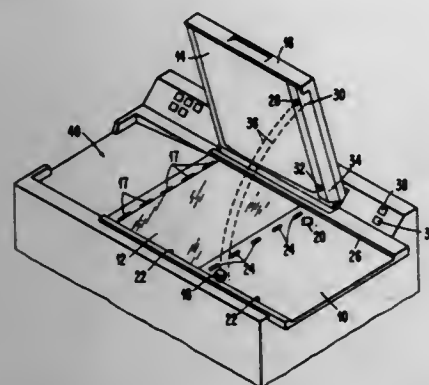
William Richard Cardwell, and Carl Alan Queener, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,546

Int. Cl.² B65H 7/02

U.S. Cl. 271-227

17 Claims



4. Method for feeding two original documents into a copying machine for simultaneous side-by-side dual document copying, said machine having two modes of operation, a single document copy mode and a dual document copying mode, said method comprising the steps of:

- signaling said dual document copy mode;
- sequentially placing dual documents on an entry station of the copying machine;
- corner registering one of the documents to the first corner in the entry station;
- corner registering the second document to a second corner spaced from said first corner such that when the second document is corner registered both documents will be in side-by-side registration relative to each other;
- feeding the documents in side-by-side registration from the entry station to a scanning station in the copying machine; and
- registering the documents at corners of the scanning station.

4,052,055

ARRANGEMENT FOR DRIVING A ROCKING INITIAL GRIPPER

Jaroslav Jirasek, Blazsko, and Josef Rozsypal, Adamov, both of Czechoslovakia, assignors to Adamovske strojaray, narodni podnik, Adamov, Czechoslovakia

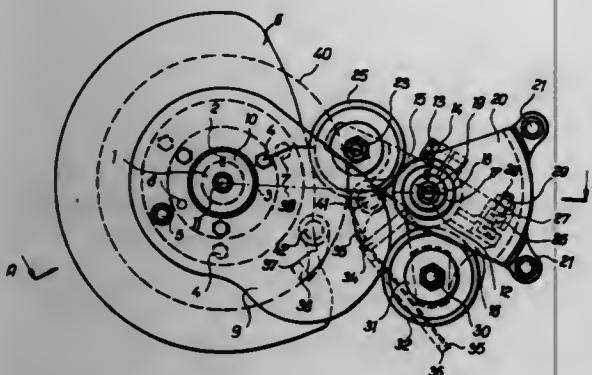
Filed May 14, 1976, Ser. No. 686,464

Claims priority, application Czechoslovakia, May 29, 1975, 3770/75

Int. Cl.² B41F 1/28; B65H 29/08

U.S. Cl. 271-268

3 Claims



1. An arrangement for driving and controlling the periodic varying motion of a rocking initial gripper relative to the rotational speed of an impression cylinder within a sheet printing machine, where the sheets are fed into the machine for printing by means of chucks of a rocking initial gripper, comprising a driving shaft for the impression cylinder and a shaft for supporting the rocking initial gripper, a control roller, a

control lever supporting the control roller fixed on the shaft of the rocking initial gripper, a control cam and a supporting cam fixed by means of a flange on the shaft of the impression cylinder, a supporting roller, a rocking lever supporting the supporting roller supported additionally on the shaft of the rocking initial gripper, the control roller bearing against the control cam and the supporting roller bearing against said supporting cam, the supporting roller maintaining the control roller against said control cam.

4,052,056

REUSABLE KARATE STRIKING BOARD

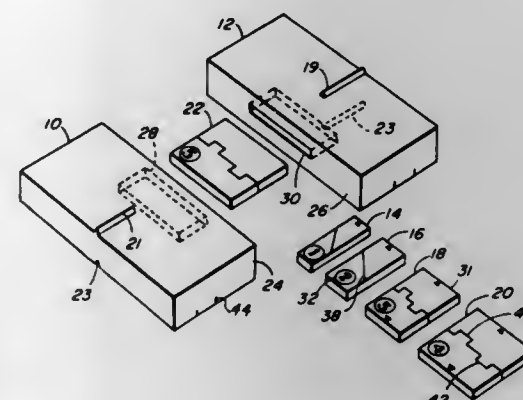
Robert Friedenthal, 43 Liberty Square Road, Boxboro, Mass. 01719

Continuation-in-part of Ser. No. 643,604, Dec. 22, 1975. This application Aug. 26, 1976, Ser. No. 717,568

Int. Cl.² A63J 5/00

U.S. Cl. 272-76

4 Claims



1. A striking board kit comprising first and second substantially rigid parts, said first part and said second part having matched edges and matched concavities in said matched edges, and a plurality of severable insert parts, each insert part having a portion thereof removably insertable in said concavities of said first and second parts to render said matched edges contiguous and temporarily joined along an elongated junction, the strength of each insert part being sufficiently great to require a strike of a predetermined force at said junction to rupture said insert part the construction of each insert part and the removable connection between said insert part and concavities being such that said strike of a predetermined force will necessarily rupture said insert part, said ruptured insert part being removed from said concavities for insertion of another of said plurality of insert parts into said concavities thereby rematching said edges of said first and second parts to once again permit rupture by a predetermined force.

4,052,057

ELECTRONIC AMUSEMENT MACHINE

Trevor William Castle, 10 Thornton St., Eltham, 3095, Australia

Filed Aug. 20, 1975, Ser. No. 606,078

Claims priority, application Australia, Aug. 20, 1974, 8591/74

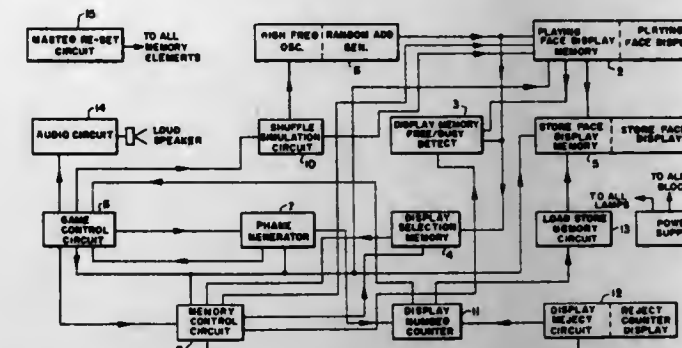
Int. Cl.² A63F 1/00

U.S. Cl. 273-1 E

8 Claims

1. An electronic amusement machine including a visual display having at least two sets of individual characters, the characters of each set corresponding to the characters of the other of said at least two sets, one of said sets being a playing set and the other of said at least two sets being a storage set, said machine including first circuit means to randomly illuminate a predetermined number of characters of said playing set

during successive plays of a game and second circuit means to transfer the result of completed plays on said playing set to said



storage set, and means for storing said results at least until the last play is completed on said playing set.

4,052,058

PISTOL DRAW TARGET

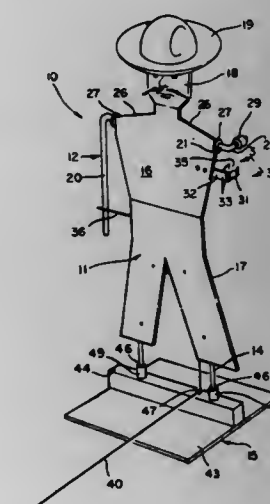
Ronald E. Hintz, Rte. 2, Box 206, Delta, Colo. 81416

Filed Apr. 8, 1976, Ser. No. 674,934

Int. Cl.² A63B 69/00

U.S. Cl. 273-1 R

6 Claims



1. A pistol draw target device intended for use by an individual to test and practice their skill in withdrawing a pistol from a holster, the pistol draw target device comprising, in combination:

- a flat frame member in a shape defining a head portion, torso portion, and leg portion of an individual, the frame member having a flat front surface and a flat back surface;
- a U-shaped leg defining member secured to the back surface of the frame member rearwardly of the leg portion thereof with its bight portion disposed nearest the torso and with its leg portions extending parallel to the frame member and outwardly of the frame member leg portions, each leg portion terminating an equidistance from the frame member;
- a base member of a substantially rectangular flat configuration having a flat bottom surface adapted to rest firmly and securely on the ground, a top surface, and opposed end and side surfaces;
- a pair of socket defining elements each affixed to the top surface of the base member a spaced distance apart from each other with their axis extending parallel to each other and normal to the plane of the base member, the spacing between the sockets being substantially equal to the spacing between the terminal ends of the U-shaped leg defining member with the sockets adapted to receive therein said ends to support said frame member on said base member in an upright vertically disposed position;
- a unitary rod member bent along its axis to define three portions thereof, namely, an arm member, a main body member, and a stub end member, the arm member disposed at a ninety degree angle to the body member and projecting outwardly in a radial direction therefrom, the

stub end member disposed at a ninety degree angle to the body member and to the arm member and projecting outwardly from the body member in a direction normal to the plane defined by the combined arm and body members;

a plurality of bracket means rotatably securing the body member to the back surface of the frame member a short distance below a shoulder defining portion of the torso portion and extending in a horizontal direction and projecting outwardly from both sides of the frame member in the general area of the shoulders thereof;

said bracket means permitting rotatable movement of the body member about its longitudinal axis along with longitudinal movement therealong;

means affixed to opposite end portions of the body member inwardly of the stub end member and arm member thereof to limit the longitudinal sliding movement of the body member relative to the frame member by bearing against opposite side edges of the frame member;

said rod member when affixed to said frame member having the arm member extending vertically downwardly in an arm like manner with the stub end member extending outwardly rearwardly of the frame member back surface; weight means secured to the stub end member to bias the stub end to seek a vertical position;

a stop member affixed to the frame member a distance vertically below the stub end member junction with the body member, the stop member having a U-shaped spring clip extending rearwardly outwardly therefrom of a size and configuration to engage and retain therein the stub end member when in the vertical position;

a rigid trigger arm having a leading end and a trailing end, the trailing end being bent into the shape of a loop;

bracket means securing the trigger arm in a horizontal position on the frame member back surface at a position disposed vertically below the waist of the torso portion, the trigger arm being slidable along its axis between an operative position where the leading end extends outwardly of the frame member a distance to engage the arm member when in the vertical position, and an in operative released position where it is free of the arm member and out of the path of movement of the arm member; and

a flexible cord having one end affixed to the loop of the trigger arm trailing end with its opposite end extending a distance outwardly and away from the frame member to the position of the individual using the pistol draw device; whereby the device is armed by placing the arm member in the vertical downward position and retaining it there by engaging the trigger arm therewith, and upon the individual pulling the cord to release the trigger arm from engagement with the arm member the weighted stub end member rotates about the axis of the horizontal body member in a downward direction driving the arm member upwardly and forwardly of the frame member in a pistol drawing gesture.

4,052,059

HOCKEY STICK WITH ADJUSTABLE KNOB

Randle L. Rigby, Rte. No. 1, Box 155, Signal Mountain, Tenn. 37377

Filed May 30, 1975, Ser. No. 582,446

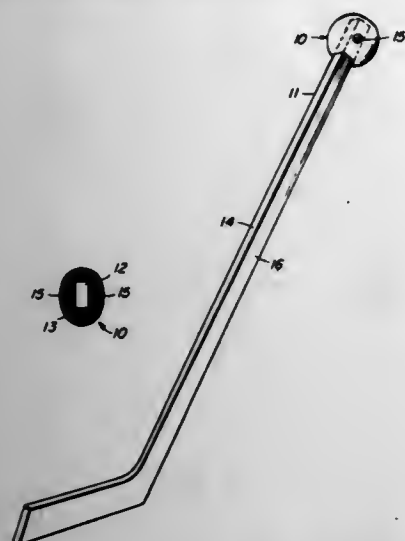
Int. Cl.² A63B 59/14

U.S. Cl. 273-67 A

1 Claim

1. An improved hockey stick, comprising in combination, a knob and a hockey stick member consisting of a straight handle which at one end is integral with a straight blade extending angularly respective thereto, said knob being unitary by comprising an undivided, integrated member of generally ovaloid shape and made of flexible plastic material, said hockey stick handle being cross-sectionally rectangular in shape, said knob having a central opening therethrough of similar cross-sectionally rectangular shape, an axially extending slit in a side wall of said opening and extending from an inner surface into the knob

wall less than the wall thickness thereof, said opening providing transverse stretching of said knob for frictional fit on said



handle, said knob being slideable along said handle, and securable fixedly thereto in a selected position by a pair of set screws on opposite sides of said knob.

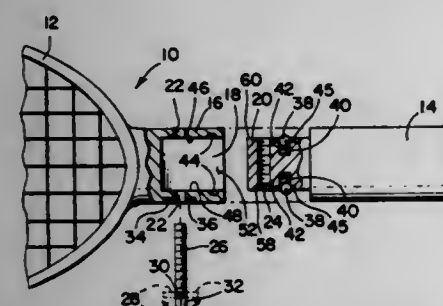
4,052,060

BREAK DOWN GAME RACKET

Robby P. Balkcom, Maywood, Ill., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Apr. 27, 1976, Ser. No. 680,852
Int. Cl.² A63B 49/02

U.S. Cl. 273-73 R

8 Claims



1. A game racket comprising racket head means, detachable handle means and handle securing section comprising:

1. handle receiving means in said head and
2. one end of said handle means detachably and overlapably securable to said handle receiving means,
3. registerable opening means in said receiving means and said handle where said handle and said receiving means overlap, the longitudinal axis of said opening means passing transversely through a plane lying in the longitudinal axis of said handle,
4. securing means in said handle comprising pin means, arm means pivotally secured to one end of said pin means to swing in a plane passing through the longitudinal axis of said pin means, recess means in said handle securing means to pivotally receive and secure said arm means.

4,052,061

RACKET WEIGHTING MEANS

Samuel F. Stewart, 1119 Fleetwood Drive, Carlisle, Pa. 17013
Division of Ser. No. 596,038, July 11, 1975, Pat. No. 4,005,864, which is a continuation-in-part of Ser. No. 521,177, Nov. 6, 1974, abandoned. This application May 24, 1976, Ser. No. 688,955
Int. Cl.² A63B 69/38, 49/04

U.S. Cl. 273-73 R

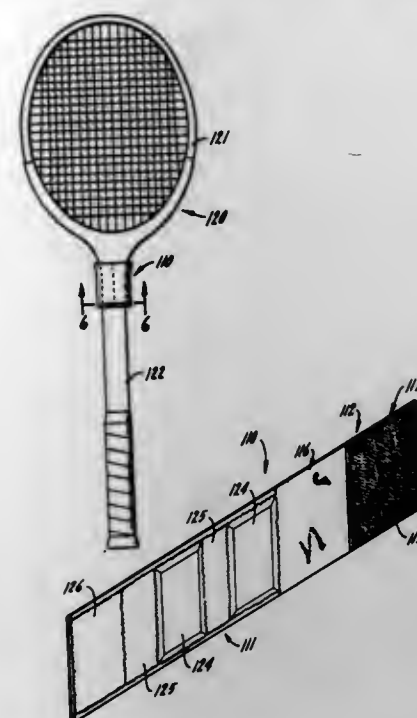
5 Claims

1. An improved racket weighting means for use with a racket having a shaft with a throat connected to a frame, comprising:

- a. a first segment consisting essentially of a non-continuous flexible, substantially inelastic elongated member having

opposed ends and adapted to be wrapped at least one time around the shaft of said racket,

- b. a supplemental weight integrally associated with said elongated member,
- c. a second segment for attaching said first segment to the racket consisting essentially of a non-continuous supple member extending from one of said opposed ends of said elongated member, said supple member being of a suffi-



cient length and sufficient suppleness to be wrapped at least one time around the shaft of said racket, with said first segment and said supplemental weight wrapped around the shaft of said racket and said supple member overlying and extending snugly about said first segment and said supplemental weight, and

- d. fastening means to affix said second segment about said first segment to immobily seat the racket weighting means about the shaft of the racket.

4,052,062

COMBINATION RACKET PRESS AND COVER

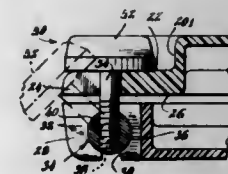
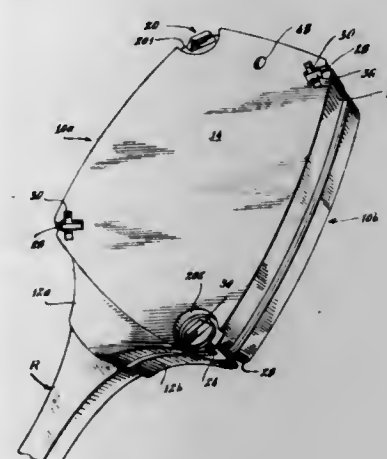
Roger M. Casavant, Winsted, Conn., assignor to Product Explorations Incorporated, Ridgefield, Conn.

Filed Mar. 29, 1976, Ser. No. 671,070

Int. Cl.² A63B 49/16, 49/18

U.S. Cl. 273-74

7 Claims



1. A combination cover and press for a stringed racket which comprises: identical first and second molded halves,

each including a major wall adapted to cover a face of said racket and a marginal wall extending from one surface thereof to encircle the edge of said racket, said marginal wall defining an opening therein for receiving the handle of said racket and including an exposed edge, at least two diametrically opposed first and second portions of said edge being configured to mate with corresponding second and first portions of the marginal wall edge of the other of said halves, and molded racket clamping ribs extending from said one surface of said major wall; and first and second latch means pivotally secured to each of said halves for selective engagement with the other of said halves for clampingly engaging said halves against opposite sides of the head of said racket.

4,052,063

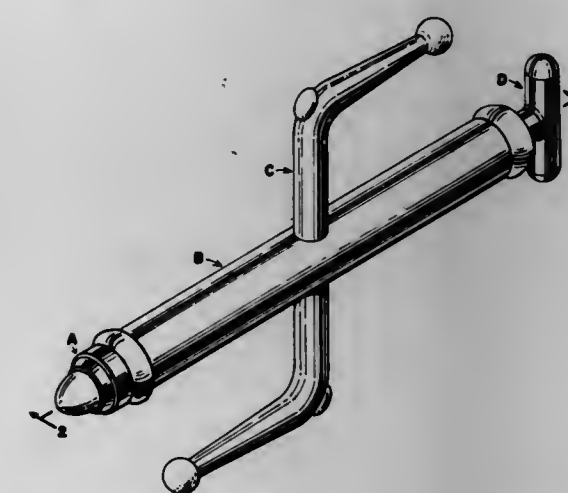
MULTI-PURPOSE PROTECTION DEVICE

Michael Wong, 1647-A Lellehua Lane, Honolulu, Hawaii 96813
Filed June 14, 1976, Ser. No. 696,066

Int. Cl.² F41B 15/00

U.S. Cl. 273-84 R

7 Claims



1. A multi-purpose protection device comprising a shaft with a point on one end and a butt on the other end and two bent prongs at the middle portion of the shaft, the prongs are bent in opposite direction from each other, each of the prongs being of such size and configuration that the last three fingers of a person's hand will fit along the base of the prong.

4,052,064

BASKETBALL GAME

John T. Kenney, 421 Horsham Road, Horsham, Pa. 19044

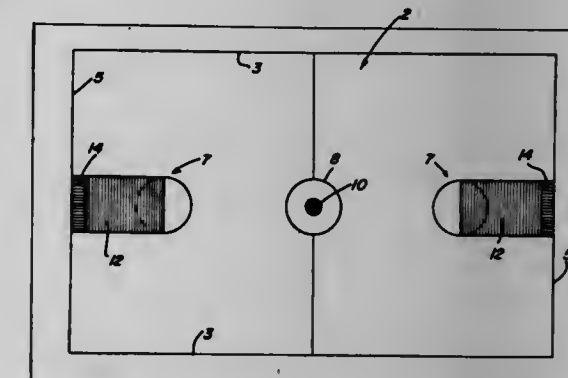
Continuation-in-part of Ser. No. 483,420, June 26, 1974,

abandoned. This application Aug. 15, 1975, Ser. No. 605,201

Int. Cl.² A63F 7/06

U.S. Cl. 273-85 R

1 Claim



1. A table-type simulated basketball game comprising, in combination, a rectangular playing board having a resilient upper surface providing a playing field of dimensions which are in general proportion to the standard athletic basketball court and defining end lines, side lines, foul circles and foul

lanes which are parallel with said side lines, said game including

- a. a vertically disposed and elevated backboard at each end of the playing field;
- b. a horizontally disposed annular ring attached to each of said backboards in simulation of a basketball basket;
- c. movable basketball simulating playing discs of the tidleywinks type;
- d. a manually-operated shooting piece for cooperation with said playing discs;
- e. said playing discs and said manually-operated shooting piece for cooperation therewith being of such size, shape and consistency as to permit the latter to be so manually activated as to propel said playing discs into said annular rings;
- f. means within said annular rings for retarding the falling movement of said playing discs through the horizontally disposed annular rings carried by said backboards;
- g. a circle at the center of the playing field;
- h. a concentric jump circle within said first-named circle and
- i. a marked area directly under each of said annular rings;
- j. said marked areas and said jump circle being of substantially the same color;
- k. said foul lanes having a color which contrasts with the color of said marked areas and said jump circle;
- l. the halves of the foul circles which are adjacent the foul lanes being of substantially the same color as that of the foul lanes;
- m. the playing discs on one side having a color which at least resembles that of the foul lanes, and on the other side of a color which at least resembles the color of the jump circle and the aforementioned marked areas.

4,052,065

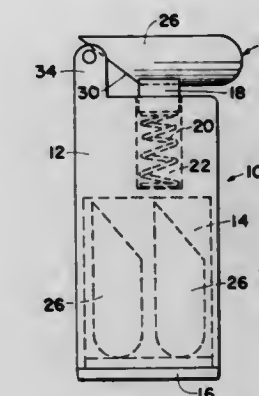
PROJECTILE CATAPULT AND BAT TOY

Jose Rodriguez, 750 E. 166th St., Apt. 10A, Bronx, N.Y. 10456
Filed Aug. 24, 1976, Ser. No. 717,237

Int. Cl.² A63B 59/06, 67/12

U.S. Cl. 273-95 F

6 Claims



1. A toy comprising:

- a stand;
- a spring-mounted plunger on said stand;
- a projectile having a cylindrical body and an inclined end surface adapted to be mounted on said plunger;
- a rotatable pin on said stand, means mounting said pin in a position to contact the inclined surface of said projectile when said projectile is mounted on said plunger; and
- a bat having at least one flat side for striking said projectile on said stand and in the air.

4,052,066
LIGHT-EMISSION GUN AMUSEMENT MACHINE FOR HOME USE

Takao Ohta, Hirakata, Japan, assignor to Nintendo Co., Ltd., Kyoto, Japan

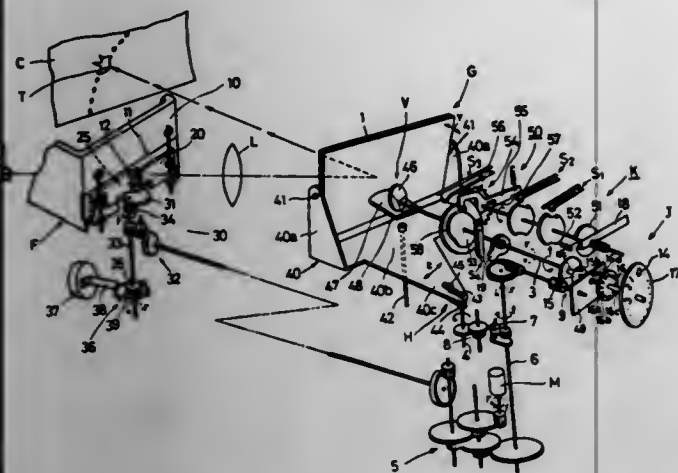
Filed Feb. 19, 1976, Ser. No. 659,553

Claims priority, application Japan, Dec. 31, 1975, 51-158430

Int. Cl.² F41J 5/02, 5/06

U.S. Cl. 273—101.1

6 Claims



1. A light-emission gun amusement machine including a light emission gun, a photosensor element, a light source, a screen, a mirror interposed therebetween to reflect the light beam from said light source onto said screen and thereby to produce a target mark thereon, which comprises a mirror drive system consisting of a mirror vertical drive mechanism including a driving shaft connected to a constantly revolving shaft connected to an electric motor in such a manner that said mirror is kept tilting back and forth throughout the rotation of said electric motor and a mirror horizontal drive mechanism including a driving shaft disconnectably associated with said constantly revolving shaft via a one-way clutch operable only in a normal direction of the motor, whereby said mirror is driven horizontally only during the rotation in normal direction of said electric motor, and a motor power supply control device including a switching mechanism for reversing the electrical connection between the motor and a power supply upon generation of an output signal by said photosensor element actuated by said light emission gun to reverse the rotational direction of said electric motor, whereby said target mark is caused to move diagonally in a composite direction made up of horizontal and vertical component directions on the screen by and during a normal rotation of the motor to simulate a flight of a prey and said mark is caused to move only vertically downwardly upon suspension of the horizontal drive of said mirror as the motor is driven in reverse in response to the generation of said output signal to thereby simulate a fall of said prey.

4,052,067
COMBINED BALL AND FLEXIBLE TRACK

Robert A. Carmo, 28886 Alton Ave., Wickliffe, Ohio 44092

Filed Oct. 12, 1976, Ser. No. 731,130

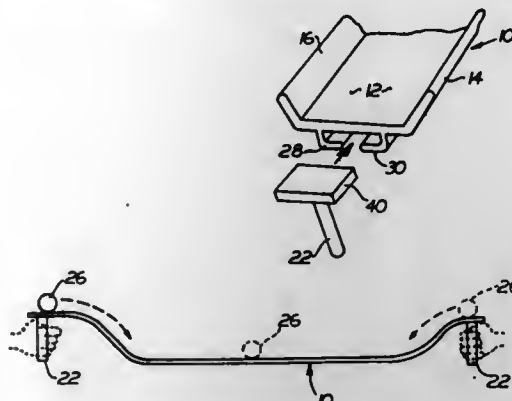
Int. Cl.² A63F 7/00

U.S. Cl. 273—109

9 Claims

1. An amusement device comprising
a. an elongated flexible trackway of generally U-shaped cross section defined by continuous side rails and a co-extensive relatively narrow bottom track portion therebetween,
b. means at each end of said flexible trackway for holding said trackway said holding means being adapted to be hand held with the open end of the U-shaped cross section upwardly directed, each of said holding means consisting of a tube and a laterally projecting rectangular flange at one end, the underside of said trackway including

c. means for holding said holding means with said flange being disposed against the underside of said trackway; and



d. a spherical ball dimensioned for rolling contact with the bottom track portion and with at least one of said side rails.

4,052,068
GAME APPARATUS

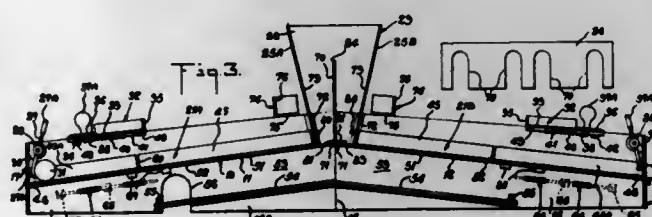
Raymond C. Piacentino, 39 Cypress Road, Dumont, N.J. 07628

Filed Oct. 21, 1976, Ser. No. 734,533

Int. Cl.² A63F 7/00

U.S. Cl. 273—122 R

14 Claims



1. Game apparatus comprising
a playing board adapted to have a player stationed at each end thereof;
a plurality of balls;
a series of alleys for said balls on said board, each of said alleys extending between the ends of said board and having an end zone at each end thereof;
vision-obstructing divider means mounted on said board and extending transversely of said alleys for dividing each of said alleys into two player-sections, said divider means having a height sufficient to prevent each player from visually observing the player alley sections of the opposing player;
player-operable ball propulsion means at each end of each of said alleys for propelling said balls along said alleys, so that each player can propel balls along selected player alley sections of the opposing player into the end zones thereof; and
player-operable ball diversion means in each player alley section adjacent the end zone thereof for diverting balls propelled along the alley section to dead ball space outside of the alley section, so that each player can divert balls propelled into his alley sections by the opposing player and prevent such balls from reaching the end zones thereof.

4,052,069
BOARD GAME APPARATUS

Shamir Singh Sandhu, 2320 Acton St., Berkeley, Calif. 94702

Filed May 7, 1976, Ser. No. 684,556

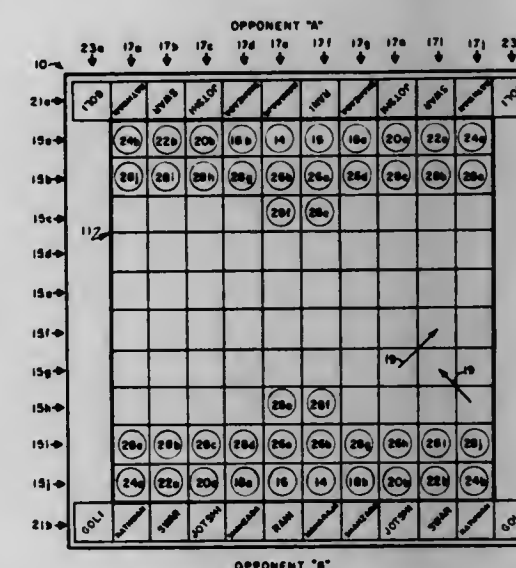
Int. Cl.² A63F 3/02

U.S. Cl. 273—131 AB

1 Claim

1. A game apparatus comprising
a playing board divided into a playing field of one hundred squares arranged in ten rows and ten columns, said board having a first opponent's side disposed parallel to said

rows, and a second opponent's side disposed opposite said first opponent's side and parallel to said rows,
a first set of playing pieces, each piece adapted to be placed on and fit within a square of said board,
a second set of playing pieces visually distinguishable from said first set of playing pieces, each piece adapted to be placed on and fit within a square of said board,
said first and said second sets of playing pieces each comprising two individual playing pieces which are visually distinguishable from each other and all other playing pieces of the set,
five pairs of playing pieces each pair visually identical to each other and visually distinguishable from all other playing pieces of said set,
ten playing pieces each visually identical to each other and visually distinguishable from all other playing pieces of said set,



a first additional row of twelve squares disposed nearest said first opponent's side, said squares containing indicia indicating placement location of particular pieces selected from said two individual and five pairs of playing pieces, the second and eleventh squares of said first additional row disposed in alignment with the rightmost and leftmost columns, respectively, of said playing field and with the first and twelfth squares of said first additional row extending beyond the lateral sides of said playing field, and
a second additional row of twelve squares disposed nearest said second opponent's side, said squares containing indicia indicating placement location of particular pieces selected from said two individual and five pairs of playing pieces, the second and eleventh squares of said second additional row disposed in alignment with said rightmost and leftmost columns, respectively, of said playing field and with the first and twelfth squares of said second additional row extending beyond the lateral sides of said playing field.

4,052,070
VARIABLE TENSION RING EXERCISER

Hyok Sang Lew, 7890 Oak St., Arvada, Colo. 80005

Filed July 16, 1973, Ser. No. 379,413

Int. Cl.² A63B 21/12

U.S. Cl. 272—120

4 Claims

1. A variable tension ring exerciser for physical training, said exerciser comprising:
a first bar including a first pulley disposed within one extremity of said first bar and a second pulley disposed within other extremity of said first bar;
a first ring secured to one end of a first rope, said first rope engaging said first pulley;
a second ring secured to one end of a second rope, said second rope engaging said second pulley;

a belt securable to the lower torso of an exercising person, said belt including:

a. a first means of adjusting the length of the front half of said belt;
b. a second means of adjusting the length of the rear half of said belt;
c. a first strap securable around one thigh of a person wearing said belt; whereby, said first strap prevents said belt from slipping upward; and
d. a second strap securable around other thigh of a person wearing said belt; whereby, said second strap prevents said belt from slipping upward;
a third rope attached to said belt intermediate said first and second means of adjusting the length of said belt;
a fourth rope attached to said belt diametrically to said third rope;
a first mechanically advantageous hoist means linking said first and third ropes; whereby, pull of said first ring hoists said belt;



a second mechanically advantageous hoist means linking said second and fourth ropes, whereby, pull of said second ring hoists said belt;
wherein said first and second hoist means providing mechanical advantage include means of varying tensions on said first and second ropes, said tensions caused by the weight attached to said belt;

wherein a plurality of sheaves disposed along said first bar constitute part of said hoist means providing mechanical advantage; and

wherein a second bar is disposed intermediate said first bar and said belt, said second bar including:

a. said third rope extending from said belt secured to one extremity of said second bar;
b. said fourth rope extending from said belt secured to other extremity of said second bar; and
c. a plurality of sheaves disposed along said second bar constituting part of said hoist means providing mechanical advantage.

4,052,071
TRAVEL GAME

Jack Siegfried, 1154 E. 82nd St., Brooklyn, N.Y. 11236

Filed Aug. 18, 1975, Ser. No. 605,679

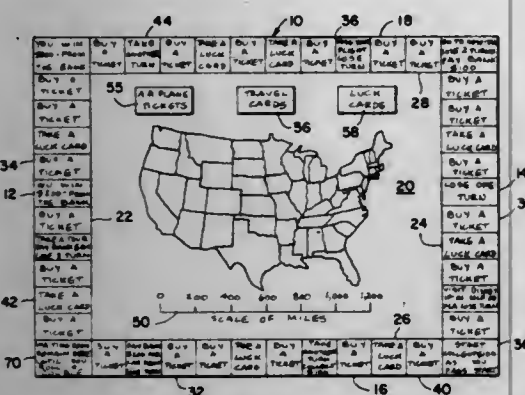
Int. Cl.² A63F 3/04

U.S. Cl. 273—134 AC

2 Claims

1. A game device comprising main game board means with opposite spaced end edges and opposite spaced front and rear edges interconnecting said end edges to delineate and define a main playing board field, an inner playing field having a map disposed thereon carried by said main game board means and spaced from said end edges and said front and rear edges, an outer playing marginal field carried by said main game board means intermediate said inner playing field and said end edges and front and rear edges of said main game board, a plurality of playing boxes carried by said outer playing marginal field, first player marker means constructed for movement sequentially about on said outer playing marginal field, and number selecting gaming means comprising a pair of six sided dice for controlling and regulating said movement of said player marker means, said first player marker means comprising a first plural-

ity of marker discs for placement upon said playing boxes as guides on casting of said dice, second player marker means comprising a second plurality of marker discs for placement upon said map, a plurality of bills of paper play money of various denominations for being played by the players in the game, a plurality of travel cards, each of said travel cards having different starting locations and ending locations locatable on said map, a plurality of different airplane ticket cards to



be purchased with the play money, and a plurality of different luck cards, each of said luck cards having a different lucky or unlucky direction for use in playing said game in accordance with the cast of the dice and the play of the game, each of said playing boxes containing directions for the selection of one of said airplane ticket, travel, or luck cards, said airplane ticket, travel, and luck cards disposed in stacks upon said inner playing field and directing the movement of said second plurality of marker discs upon said map.

4,052,072

EDUCATIONAL WORLD MAP GAME

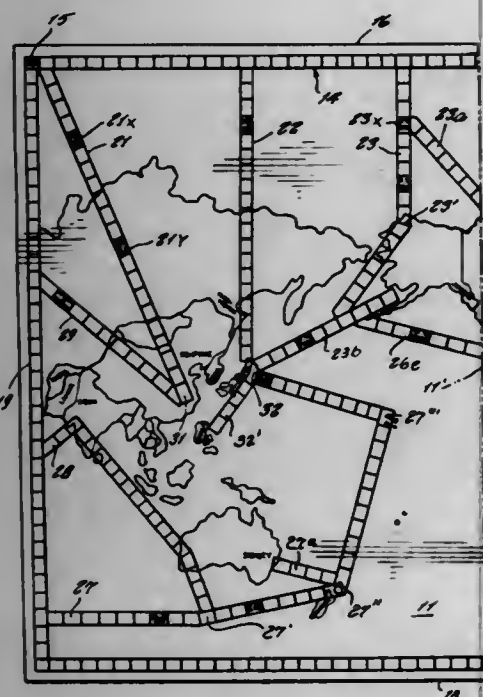
Philip E. Beal, 43 Merrill St., Portland, Maine 04101

Filed Feb. 23, 1976, Ser. No. 660,485

Int. Cl.² A63F 3/04

U.S. Cl. 273-134 AC

5 Claims



1. In an educational world map game, a game board displaying a world map with the several continental outlines thereon, each of the continental outlines having the various country areas outlined and designated therein, a line of pachisi-like playing spaces extending about the periphery of the game board, a plurality of lines of pachisi-like playing spaces respectively extending inwardly at different points along said peripheral line and terminating respectively at the respective continental outlines and at a country area outlined therein, certain of said inwardly-extending lines of spaces having branch lines of spaces and intersecting one another, thereby extending the certain inwardly-extending lines of spaces to more than one

continental outline, playing pieces adapted to be advanced along the pachisi-like playing spaces from a starting point in at least one of the lines of playing spaces in response to numbers as appearing from a set of dice thrown in turn by the players of the game and toward selective designated country areas of a continent and a plurality of jigsaw puzzle parts corresponding in number to at least the respective number of country areas of all the continental outlines and adapted to be fitted over the country areas when the playing pieces have arrived at the country area terminals and in jigsaw puzzle fashion with one another to finally fill up the continental outlines of the world map to conclude the game.

4,052,073

BLACKJACK PLAY DIRECTOR

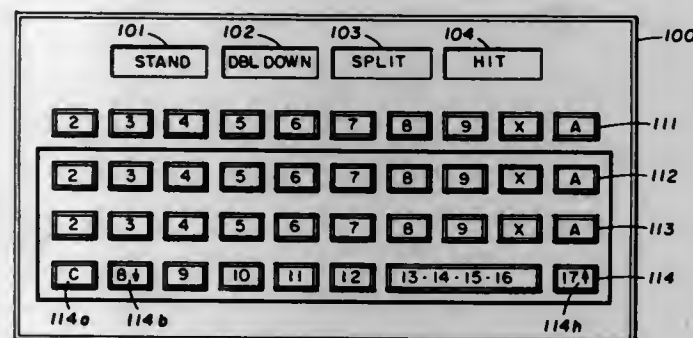
Franklin E. Miller, 6936 Rockview Lane, Dallas, Tex. 75214

Filed Nov. 6, 1975, Ser. No. 629,591

Int. Cl.² G09B 19/22

U.S. Cl. 273-148 R

9 Claims



1. A blackjack play director which comprises:

- a structure having four normally deenergized indicator means adapted to be sensed by a player, each said indicator means providing a corresponding one of four blackjack play responses when energized,
 - a plurality of input switches, and
 - circuit means interconnecting said switches and said indicator means for exclusive actuation of any one of said four indicator means
- said circuit means including means responsive to closure of a first of said switches representative of the value of a dealer's up card, and
 - means further responsive to closure of one or more additional ones of said switches to represent the status of the player's first two cards, said circuit means being constructed and arranged in dependence upon a predetermined odds criteria to signal to said player a proper response by actuation of one of said indicator means.

4,052,074

TWO-SIDE VIEWABLE KALEIDOSYMMETRIC MORPHOLOGICAL PUZZLE GAME

James Oliver Fogle, and Reiko Iwao Fogle, both of P.O. Box 325, Oceano, Calif. 93445

Filed Dec. 12, 1975, Ser. No. 640,314

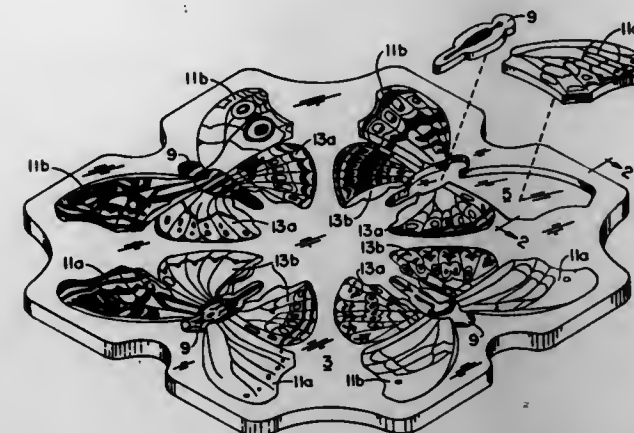
Int. Cl.² A63F 9/08, 9/10

U.S. Cl. 273-157 R

8 Claims

- Two-side viewable puzzle game apparatus comprising a tray for assembly of puzzle pieces thereon, said tray having a transparent base; and
- a plurality of interfitting puzzle pieces, said puzzle pieces adapted for interfitted arrangements on said tray base to form an assembly having top and bottom faces bearing a design on each of said top and bottom faces, the design on said bottom face being viewable through said transparent base, said designs each depicting a plurality of substantially realistic, differently variegated morphological objects having inter-object or intra-object symmetrical characteristics, said puzzle pieces having perimetric shapes conforming to natural inter-object or intra-object symmet-

ric boundaries of said morphological objects, at least some of said puzzle pieces being interchangeable with puzzle pieces in other of said morphological objects and, also,



being reversibly interchangeable with puzzle pieces in the same and other morphological objects, so that said puzzle pieces may be interchanged to produce a kaleidosymmetrical effect and demonstrate the symmetries of nature.

4,052,075

GOLF CLUB

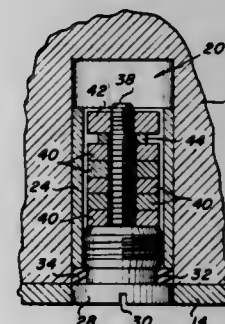
C. Robert Daly, Rte. No. 1, 75 Pasco Road, Zephyrhills, Fla. 33599

Filed Jan. 8, 1976, Ser. No. 647,408

Int. Cl.² A63B 53/08

U.S. Cl. 273-171

2 Claims



- A golf club having a recess in the head thereof for receiving a weight insert, the weight insert including:
 - a tubular sleeve having a flat annular bottom surface at one end thereof positioned in the head recess,
 - said one end thereof being internally threaded,
 - a flat headed screw member,
 - the head of said flat head screw having a diameter equal to the outside diameter of said sleeve,
 - a first threaded shank on said screw member threadedly engageable with the internally threaded end of said sleeve,
 - said flat headed screw member further including a non-threaded shoulder forming a substantial annular recess between said flat head and said first threaded shank,
 - an O-ring seated in said annular recess, the thickness of which O-ring approximates the height of said annular recess,
 - the diameter of said O-ring approximating the diameter of said flat head,
 - a second threaded shank having a cross section less than the cross section of said first shank and extending centrally and axially from said first shank,
 - weight means positioned on said second threaded shank and of a diameter less than said sleeve and positioned within said sleeve,
 - retaining means threadedly engaged in said second threaded shank for holding said weight means thereon,
 - said retaining means having a diameter less than said sleeve,
 - said retaining means, said weight means and said second

threaded shank being positioned in assembled relation within said sleeve, and

- said O-ring, when said first threaded shank is threaded in said sleeve, being compressed between said flat annular bottom of said tubular sleeve, said flat head, said annular recess and said recess in the golf club head.

4,052,076

SCREW SEAL

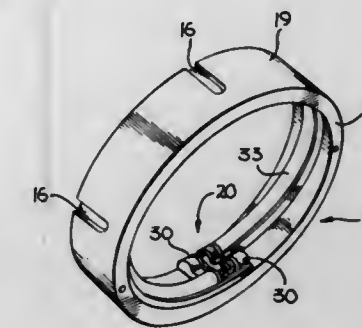
Paul V. Wysong, Sepulveda, Calif., assignor to Schrillo Company, Sepulveda, Calif.

Filed June 28, 1976, Ser. No. 700,546

Int. Cl.² F16J 15/16

U.S. Cl. 277-24

5 Claims



- A screw seal comprising:
 - a generally cylindrical carrier having an interior for engaging a screw;
 - a wiper body engaging said carrier;
 - a first, second and third spaced-apart parallel lands with arcuate radially inner sections extending radially inwardly into said interior of said carrier from said wiper body, said lands generally parallel to the axis of said carrier;
 - a wiper seal disposed between said second and third lands and facing inwardly into said interior of said carrier;
 - a drain groove defined between said first and second lands, said groove parallel to the axis of said carrier and extending radially outwardly beyond the inner most surface of said wiper seal;
- whereby when said lands engage a screw, lubricants wiped by said wiper seal flow in said drain groove generally parallel to the axis of such screw, such lubricants may thus be retained within a nut, ball screw, or the like which is coupled to said screw seal; and including a sealing member helically disposed within said interior of said carrier from opposite sides of said wiper body.

4,052,077

SHAFT SEAL WITH CLINCH-BUTT METAL CASE AND METHOD OF MAKING SAME

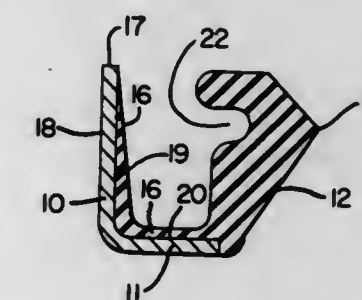
Samuel E. MacArthur, Lathrup Village, and Stanley N. Smith, Farmington, both of Mich., assignors to Federal-Mogul Corporation, Detroit, Mich.

Filed Apr. 5, 1976, Ser. No. 673,577

Int. Cl.² F16J 15/32

U.S. Cl. 277-183

3 Claims



- A radial lip shaft seal including, in combination:
 - a rigid generally cylindrical reinforcing case having a cylin-

dical portion with a free end, a flange portion extending radially from said cylindrical portion at an end thereof opposite said free end, said flange portion also having a free end,

said case being formed initially from a flat rigid rectangular strip bent along its major axis to define said cylindrical portion and said flange portion, the ends of said strip defining a continuous parting line extending throughout the axial length of said case including said cylindrical portion and said flange portion, the ends of said strip along the parting line within the area of said cylindrical portion being in abutting engagement with one another, and the ends of said strip along the remainder of said parting line within the flange portion being in spaced relation with one another, elastomeric seal means supported by said case and including a main body portion bonded to said case and a shaft engaging main lip portion integral with and extending radially inwardly from said main body portion, and preventive means for preventing egress of lubricant from said parting line, said preventive means including said main body portion completely covering at least the entire said parting line along said cylindrical portion of the case and completely covering at least one of said free ends of the case, and

said main lip portion including a continuous, inseparable, circumferential lip adapted to engage a cylindrical shaft at an uninterrupted edge defined by the intersection of two radially inwardly mutually converging surfaces of said main lip portion.

4,052,078

POWER TRANSMISSION COLLAR

Eliaser Benimetzki, c/o Brilliant Lighting Fixture Corp., 12 W. 31st St., New York, N.Y. 10001

Division of Ser. No. 481,872, June 21, 1974, Pat. No. 3,906,775.

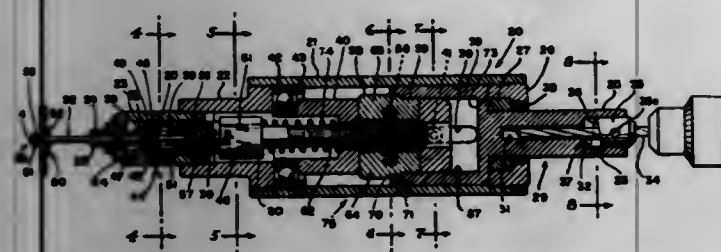
This application July 7, 1975, Ser. No. 593,745

Claims priority, application Israel, July 1, 1973, 42637

Int. Cl.² B23B 47/00; F16D 11/06

U.S. Cl. 279-93

1 Claim



1. A power transmission mechanism comprising a collar attachable to a bit, said bit being scheduled for intermittent selective use as a rotating bit, a driven member adapted to actuate a supplemental tool, said member having a well on one end thereof, said well including a single transverse pin therein said power transmission collar being scheduled for intermittent selective use for transmitting power from said rotating bit to said driven member without impairing the usefulness of the bit when dissociated from the supplemental tool, said collar having a self-guiding single spiral surface and a single power-transmission surface engageable with said single pin, said collar fitting into said well of said driven member and against said single cylindrical pin, the axis of which is directed radially inwardly toward the axis of the collar and well, the tip of said single pin being spaced from the bit, said pin having surfaces toward which said single spiral surface guides the collar to said single power-transmission surface engagement with said single pin.

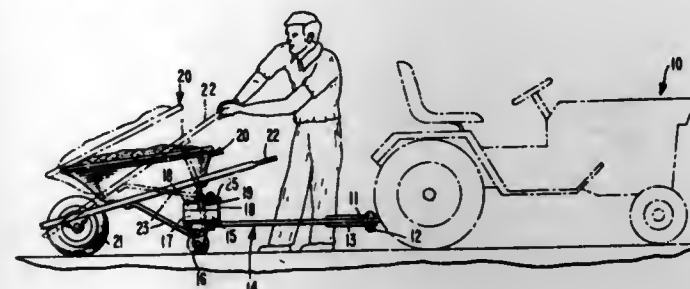
4,052,079
WHEELBARROW TRANSPORT MEANS

Maurice E. Lehman, 1960 Horseshoe Road, Lancaster, Pa. 17601

Filed June 3, 1976, Ser. No. 692,524
Int. Cl.² B62B 1/26

U.S. Cl. 280-47.2

7 Claims



1. A wheelbarrow transport apparatus comprising a dolly having a pair of laterally spaced rear end caster wheels and a generally horizontal body portion extending forwardly of said caster wheels and adapted for coupling to a towing vehicle, a wheelbarrow having a rear leg structure and handles and a single forward ground wheel, and means on said dolly forming a rigid supporting socket for said leg structure and receiving the leg structure and supporting the same on the dolly elevated from the ground with the wheelbarrow handles extending forwardly above the dolly and said ground wheel of the wheelbarrow arranged rearmost and rolling on the ground rearwardly of the dolly, said rigid supporting socket resisting turning of the wheelbarrow leg structure in a horizontal plane and having sufficient clearance relative to the wheel structure whereby the latter can articulate somewhat in a vertical plane relative to the dolly.

4,052,080

CART FOR LIVESTOCK

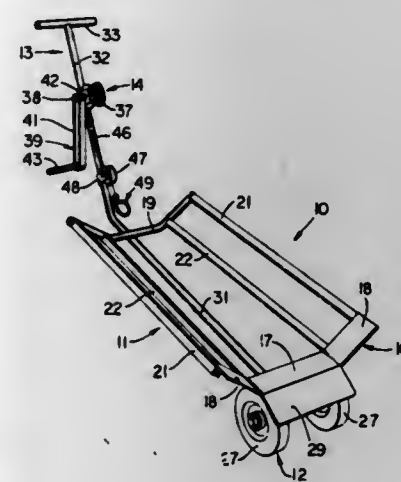
Fred L. Hedderich, P.O. Box 106, Camden, Ind. 46917, and
Curtis C. George, P.O. Box 218, R.R. No. 1, Flora, Ind. 46929

Filed June 24, 1976, Ser. No. 699,254

Int. Cl.² B62B 1/06

U.S. Cl. 280-47.26

12 Claims



1. A tiltable, handle-propelled, attendant-stabilized wheeled cart, comprising:
elongated platform means having an upwardly directed supporting surface, said platform means when in a position of use being disposed with the elongated longitudinal direction thereof extending substantially horizontally;
support roller means mounted on said platform means and adapted for rolling engagement with the ground or a floor, said support roller means being disposed below said supporting surface and rotatable about an axis which is substantially perpendicular to the longitudinal direction of said platform means, said support roller means being posi-

tioned with said axis disposed closely adjacent one end of said platform means;

guide means fixed to said platform means at said one end thereof to assist in guide a load, such as an animal, onto the supporting surface, said guide means including a platelike flange member rigidly fixed to said one end of the platform means and projecting outwardly and downwardly from said supporting surface at an angle of approximately 45°, said flange member having an upper edge thereof fixed to said platform means and substantially flush with said supporting surface;

elongated handle means fixed relative to said platform means and projecting outwardly and upwardly from the other end thereof; and

winch means mounted on said handle means to permit a load to be pulled onto said platform means, said winch means including a rotatable drum having an elongated flexible cablelike member wound therearound, said cablelike member having engaging means associated with the free end thereof for engagement with the load.

4,052,081

BUSSING CART

Frederick R. Becker, III, Dallas, Pa., assignor to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

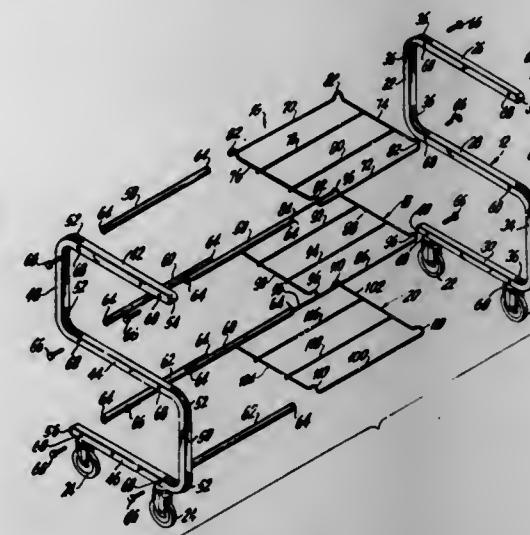
Filed Jan. 13, 1976, Ser. No. 648,726

The portion of the term of this patent subsequent to Nov. 30, 1990, has been disclaimed.

Int. Cl.² B62B 3/02

U.S. Cl. 280-79.3

14 Claims



1. A cart comprising:
a. a pair of laterally spaced apart, generally S-shaped side frame members;
b. connecting means extending between said side frame members for securing one side frame member to the other side frame member, said connecting means including a plurality of spaced apart rods of equal length and fastener means for securing said rods to said side frame members;
c. platform means for supporting articles extending between said side frame members and being supported on said connecting means;
d. each of said side frame members including vertically spaced apart upper, middle and lower sections that are disposed parallel to each other in substantially horizontal planes, a first substantially vertical section connecting said upper and middle sections, and a second substantially vertical section connecting said middle and lower sections to provide a S-shaped configuration;
e. a first pair of said rods being secured to each of said upper sections and a second pair of said rods being secured to each of said lower sections of said side frame members, and at least one of said platform means being mounted on one of said pairs of rods;
f. said at least one of said platform means including opposite end portions provided with hook-shaped engaging means

for releasably engaging each rod of said one of said pairs of rods; and

g. rollable caster means for rolling said cart being secured to said side frame members, said rollable caster means including a pair of spaced apart casters disposed on each of said lower sections of said side frame members.

4,052,082

ARTICULATED HANDLE WHEELED VEHICLE

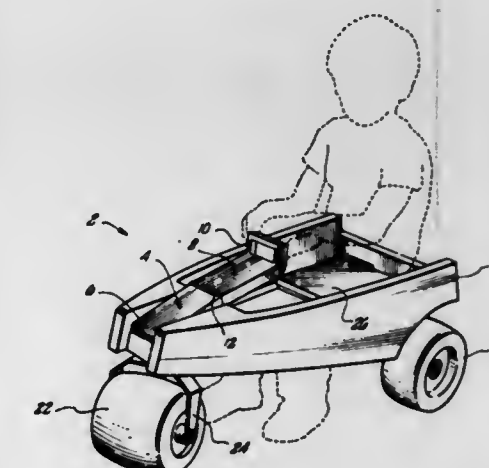
Lawrence T. Jones, Playa Del Rey, and Anson Sims, Northridge, both of Calif., assignors to California R & D Center, Calver City, Calif.

Filed July 6, 1976, Ser. No. 703,014

Int. Cl.² B62B 7/00

U.S. Cl. 280-87.02 R

9 Claims



1. A toy vehicle comprising:
a body member having a recessed channel;
a plurality of wheels rotatively connected to the body member; and
an articulated handle member connected to the body member and further having at least two parts pivotally mounted to each other and capable of retroflexion, the articulated handle member being stored within the recessed channel when in a state of retroflexion.

4,052,083

LOAD BRACING DEVICE

David Edward Lutz, 300 Washington Lane, Carlisle, Pa. 17103

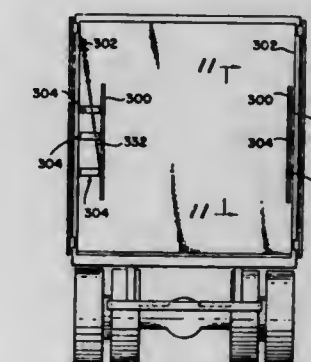
Continuation-in-part of Ser. No. 458,384, April 5, 1974,

abandoned. This application Jan. 22, 1975, Ser. No. 542,987

Int. Cl.² B60P 7/14

U.S. Cl. 280-179 R

6 Claims



1. A load-bracing device for use in a load-carrying vehicle having side walls comprising at least one means mounted on one of the side walls of said vehicle for engaging and bracing a load, said load-engaging means comprising an elongated load-engaging member, hinge means connecting said load-engaging member to said one side wall for movement toward and away from said wall in parallelogram fashion and between a collapsed position and an expanded position, means for main-

taining said load-engaging member in the expanded position, and a flexible panel connected at one end to the front end of the vehicle and at the other end to the end of the load member adjacent to said front end, said panel preventing objects from lodging between said front end and said adjacent end of said load-engaging member.

4,052,084

MATERIAL HANDLING APPARATUS

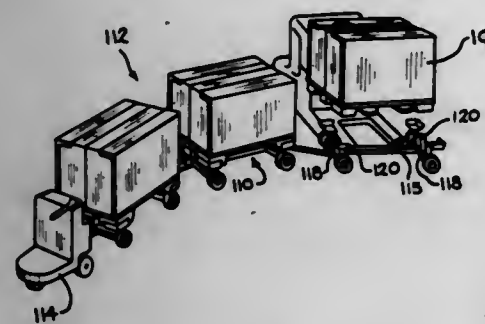
Robert L. Propst, Ann Arbor, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Apr. 1, 1976, Ser. No. 672,658

Int. Cl.² B62D 21/00

U.S. Cl. 280—408

5 Claims



1. A pallet comprising a generally rectangular base having a plurality of spaced apart support legs extending downwardly from the corners thereof and an additional pair of support legs at the ends of the base intermediate the corner legs, an upwardly extending frame mounted on said base at a position in substantially vertical alignment with said pair of support legs, and means on horizontally opposite sides of said frame for detachably hanging a plurality of containers thereon, said hanging means comprising a plurality of generally horizontally extending vertically spaced support rails, each of said rails projecting transversely of said frame so as to provide a support on which a plurality of containers can be hung, and plurality of load carrying containers having side walls and open upper ends mounted on said rails on opposite sides of said upwardly extending frame, each of said containers having an outwardly and thence downwardly extending flange at said upper end thereof, each of said containers being supported on said rails by having the flange thereon hooked over and slidably supported on one of said rails with one side wall of said container engaging the rail immediately below said one rail to enable sliding movement of said containers on said rails.

4,052,085

FLEXIBLE CONNECTORS FOR TRAILER SWAY CONTROL DEVICES

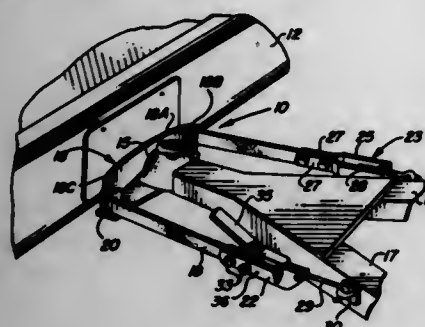
William L. Readsey, 4231 E. Rancho Drive, Phoenix, Ariz. 85018

Continuation-in-part of Ser. No. 502,058, Aug. 30, 1974, Pat. No. 3,920,266. This application Oct. 6, 1975, Ser. No. 619,842

Int. Cl.² B60D 7/00

U.S. Cl. 280—446 B

13 Claims



1. A tension controllable flexible connector means for a sway control device for trailers which passes over a friction-

ally damping surface for preventing uncontrolled lateral movement of the towed trailer comprising:

a flexible belt connector comprising first and second means and an intermediate portion, said first and second ends adapted to be securable to spaced positions on a vehicle, said intermediate portion of said connector adapted to cooperatively engage the external surfaces of a curved guiding surface of the sway control device in a taut manner to cause frictional damping thereon, and means connected to one end of said flexible connector for tightening and loosening the intermediate portion of said flexible connector from the curved surface of the sway control device,

said means comprising a toggle release having an elongated first member secured at one end to said flexible connector and having a second movable toggle member pivotally mounted at the other end of said first member, said toggle member is pivotally connectable to the vehicle at a point along its length, and when moved to an over center position along the length of said first member increasing the tension of said flexible connector on the curved surface of the sway control device and when moved to its under center position releasing tension of said flexible connector on said curved surface,

said flexible connector comprising a reinforced plastic belt.

4,052,086

SAFETY SKI BINDING

Erich Eckart, Oettingenstrasse 54, 8000 Munich 22, Germany

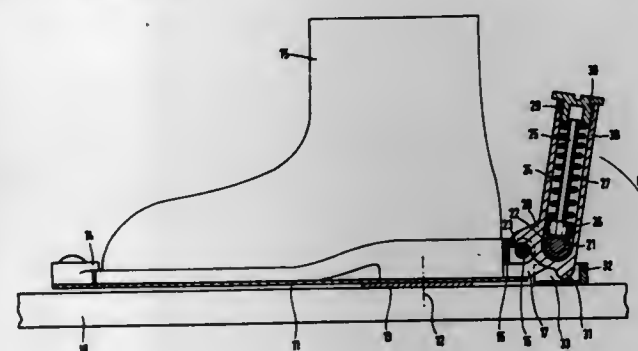
Filed Jan. 29, 1976, Ser. No. 653,391

Claims priority, application Germany, Feb. 1, 1975, 2504281

Int. Cl.² A63C 9/08

U.S. Cl. 280—618

13 Claims



1. A safety binding for attachment of a ski to the boot of a skier comprising in combination a plate coextensive with the length of the boot means for unseparably connecting said plate to said ski for pivotal movement relative to the ski at the center of rotation of the leg of said skier, to freely rotate relative to said ski, a heel holding element mounted on said plate for rotation therewith, said heel holding element having resilient securing means for releasably holding said heel under torsional and tensile loads on said plate and means for the release of said resilient securing means operable in response only to a pulling force resulting from a tensile load on said leg and a coupling system interconnecting said ski and said heel holding element for converting the rotation of said plate relative to said ski in response to a torsional movement of said leg into a pulling force to releasing said resilient securing means

4,052,087

FOLDABLE CASTER CHAIR FOR THE HANDICAPPED

Joseph A. Gagliardi, 2803 Sudberry Lane, Bowie, Md. 20715

Filed Nov. 22, 1976, Ser. No. 744,159

Int. Cl.² B62B 7/06

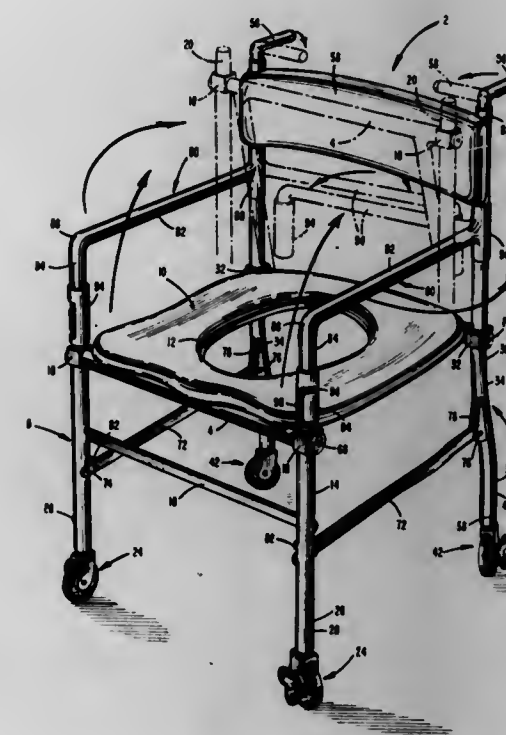
U.S. Cl. 280—650

10 Claims

1. A foldable caster chair for use by the handicapped, comprising:

a rigid, generally rectangular seat member having first bear-

ing means on each of its opposite front corners, and second bearing means on each of its opposite rear corners; a front leg assembly, including a pair of front legs each having third bearing means thereon near their upper end, said third bearing means being engaged with said first bearing means to pivotally mount said front leg assembly to the front corners of said seat member, so that said front leg assembly can be folded backwardly beneath said seat member; a rear leg assembly, including a pair of rear legs, said rear legs being substantially longer than said front legs and each having fourth bearing means centrally thereon, said fourth bearing means being engaged with said second bearing means to pivotally mount said rear leg assembly to the rear corners of said seat member, so that said seat member can be folded upwardly toward said rear leg assembly; a pair of L-shaped arms, each including a generally horizontal portion and a generally vertical portion; means pivotally mounting the outer end of the generally horizontal portion of each of said L-shaped arms on the



upper portion of one of said rear legs, said L-shaped arms being of a length so that the lower ends of the generally vertical portions thereof are alignable with said front legs when both of said front leg assembly and said rear leg assembly are in an erect position relative to said seat member, and said L-shaped arms being pivotally mounted to swing in a generally horizontal plane when said front and rear leg assemblies are in said erect position, from a position wherein said generally vertical portions of said L-shaped arms are generally aligned with their respective front legs to a position wherein said L-shaped arms present no obstacle to the sideways movement of a person entering or leaving said seat member;

first locking means on the upper ends of said front legs; second locking means on the lower ends of said generally vertical portions of said L-shaped arms, releasably engageable with said first locking means to releasably secure said rigid seat member, said front leg assembly and said rear leg assembly in said erect position; and caster wheels mounted on the lower ends of each of said front legs and said rear legs.

4,052,088

VEHICLE SUSPENSION UNITS

Lawrence George Nicholls, Tyseley, England, assignor to Girling Limited, Birmingham, England

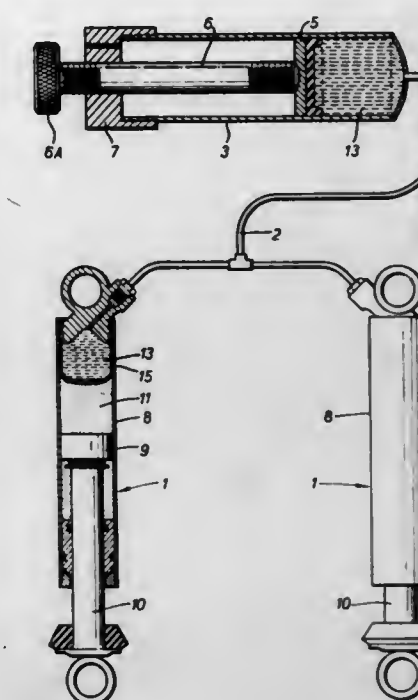
Filed Jan. 8, 1975, Ser. No. 539,605

Claims priority, application United Kingdom, July 10, 1974, 30627/74

Int. Cl.² B60G 11/30

U.S. Cl. 280—708

3 Claims



1. A suspension unit comprising a cylinder, means defining a pressure space within said cylinder filled with a dispersion of a mixture of fixed masses of gas and liquid, said means including a selectively movable end wall, a damping piston working through said dispersion in said pressure space, a piston rod fast with said damping piston and extending sealingly through one end of said cylinder, and means for selectively varying the position of said end wall to adjust the pressure in said pressure space, wherein said end wall is constituted by a diaphragm.

4,052,089

SELF-ADJUSTING SEAL ASSEMBLY

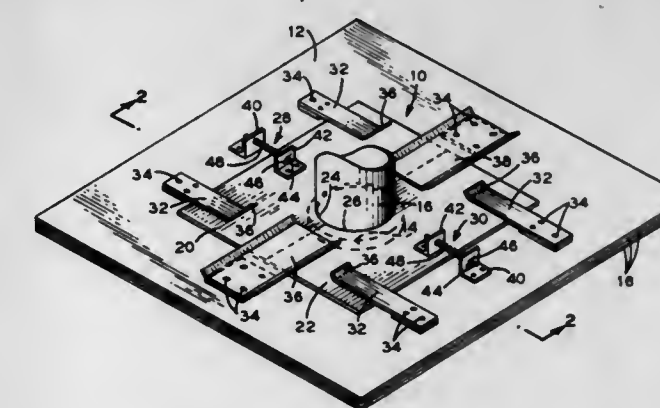
Norman Dean Weaver, Pickerington, Ohio, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio

Filed June 10, 1976, Ser. No. 694,759

Int. Cl.² F16L 59/02

U.S. Cl. 285—47

5 Claims



1. A seal assembly for structures having a member extending through thermal insulation panels which cover the structure while leaving a gap around the member comprising: a thermal insulation panel adapted to receive said extending member so as to leave a gap between said member and said thermal insulation panel; a first seal member located on the external face of said ther-

mal insulation panel adapted to abut the extending member and partially enclose the gap between said member and said thermal insulation panel;

a second seal member slidably located on the external face of said thermal insulation panel to join with the first seal member to completely enclose the gap between the member and the thermal insulation panel;

biasing means for maintaining said second seal member against said first seal member to insure the sealing of the gap while allowing expansion and contraction of the member; and

clip means for maintaining said first and second seal members in slidable contact with the external face of said insulation panel.

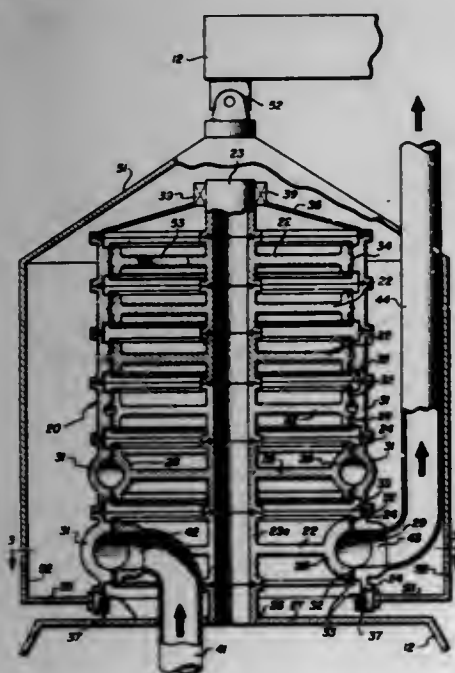
4,052,090

MULTIPORT SWIVEL JOINT

Donald Claude Stafford, Hinsdale, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.
Filed Mar. 31, 1976, Ser. No. 672,273
Int. Cl.² F16L 9/20, 39/04

U.S. Cl. 285-61

4 Claims



1. A multiport swivel joint for fluid flow comprising:

a central vertical stationary support;

a plurality of first circular semi-toroidal members of uniform diameter, each of which has an outer portion adapted to form a first section of a toroidal conduit for the flow of a fluid;

a plurality of horizontal circular support plates concentrically attached to and vertically spaced along said stationary support, each of said plates being connected at its periphery to one of said first semi-toroidal members;

a plurality of second circular semi-toroidal members, each of which includes an inner portion adapted to cooperate with said outer portion of one of said first semi-toroidal members to define said toroidal conduit;

a plurality of rotary sealing means each of which is disposed between one of said outer portions and a corresponding one of said inner portions to create a fluid-tight toroidal conduit while permitting relative rotation between said first and second members;

means for interconnecting said second semi-toroidal members, including vertical flanges attached to the periphery of each of said second members, whereby said second members form a rigid unitary structure;

a rotary bearing operatively connected to the lowermost of said second toroidal members for supporting the weight of said interconnected members and permitting rotation thereof about said central stationary support;

individual fluid inlet means connected to each of said first members; and

individual fluid outlet means connected to each of said second members.

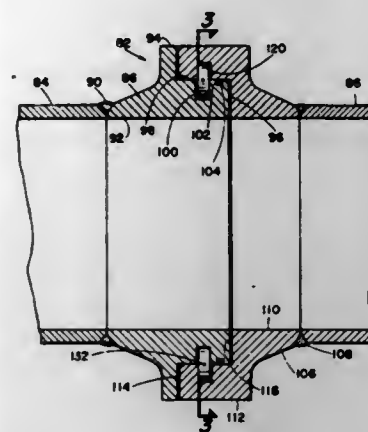
4,052,091

COUPLING DEVICE

Billy W. Bowden, Hammond, La., assignor to T K Valve & Manufacturing, Inc., Hammond, La.
Filed Feb. 10, 1975, Ser. No. 548,223
Int. Cl.² F16L 21/02

U.S. Cl. 285-305

6 Claims



1. In a coupling device for cylindrical segments and the like having an end segment slidably disposed within a sleeve member, locking means comprising a first annular groove having parallel flat sidewalls provided around the outer periphery of the end segment, a second annular groove having parallel flat sidewalls provided around the inner periphery of the sleeve member corresponding to the first annular groove and disposed directly in alignment therewith when said end segment is fully inserted into the sleeve member, a port provided through the sleeve member in open communication with the second annular groove, a plurality of circular disc members having thickness substantially equal to the width of said first and second annular grooves and having a diameter greater than the depth of either the first or second annular groove and less than the size of the sleeve member port, said disc members being removably disposed within the aligned first and second annular grooves thereby locking said end segment in place in the sleeve member, retainer means removably inserted within said port for retaining the disc members within said annular groove and including means engaging each disc for connecting the plurality of circular disc members in an edge-to-edge relationship, said retainer means cooperating with said connecting means to keep the edges of adjacent disc members in contact with each other when installed within the annular grooves.

4,052,092

LATCH OPERATING DEVICE INCLUDING OPERATING AND LATCH CONNECTION IMPROVEMENTS

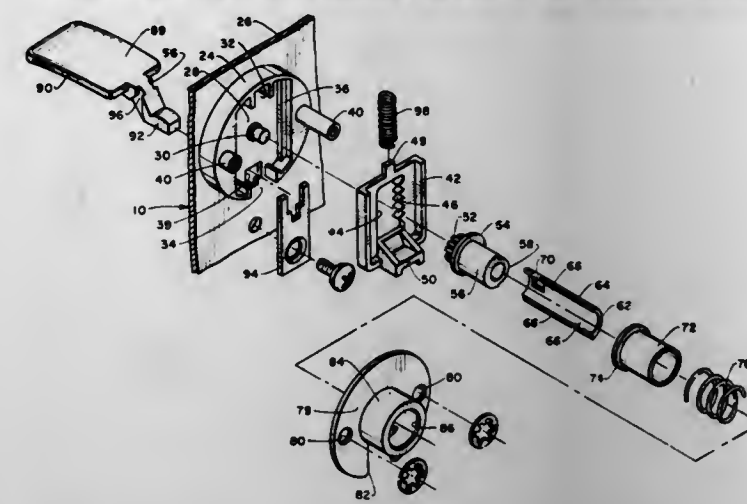
Gary Richard Berges, Yorba Linda, Calif., assignor to Embart Industries, Inc., Farmington, Conn.
Filed Nov. 19, 1976, Ser. No. 743,284
Int. Cl.² E05C 1/14

U.S. Cl. 292-172

14 Claims

1. In a latch operating device of the type imparting motion of an operating mechanism into partial rotation of a transversely extending spindle operably engaged with a longitudinally reciprocal latch, said spindle being half-round and having a semi-circular outer surface over a portion thereof, the operable connection between said spindle and latch operationally requiring said spindle semi-circular outer surface in non-operating position to always face in only a particular one of generally longitudinally forwardly and rearwardly direction regardless of the transverse side of said latch at which said operating mechanism is positioned; the improvements comprising: spindle mounting means operably connected to said operating mechanism so as to be positively partially rotatable about a transverse axis by said operating mechanism when in a normal

engaged position with said operating mechanism and freely rotatable about said transverse axis when disengaged from said operating mechanism in a temporary disengaged position; said spindle being secured to said spindle mounting means rotatable therewith about said transverse axis, free rotation of said spindle with said spindle mounting means in said spindle mounting



means temporary disengaged position permitting selective positioning of said spindle with said spindle semi-circular outer surface always facing in said particular one longitudinal direction for said spindle mounting means normal engaged position regardless of the transverse side positioning of said operating mechanism relative to said latch.

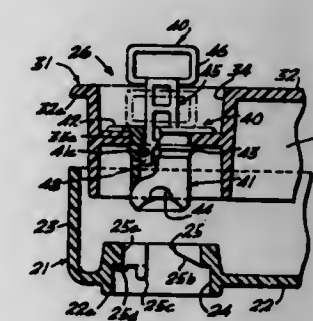
4,052,093

TELESCOPING ROTARY LATCH AND MANUFACTURE THEREOF

Lazzaro A. Fattori, 64 Rose Ave., Woodcliff Lake, N.J. 07680
Filed July 15, 1976, Ser. No. 705,520
Int. Cl.² E05C 3/10

U.S. Cl. 292-218

12 Claims



1. In a latching device for fastening a first component having a surface and a well recessed therefrom to a second component having a slot with a center enlargement in registered alignment with said well, a two-piece rotary latch for securing for rotation in the bottom of said well and having means for projecting through said bottom and through said slot and center enlargement adapted to engage borders of said center enlargement on rotation of the rotary latch to fasten said components together, said rotary latch comprising an inner member mounted to turn with and telescope into an axial bore of an outer member, said border engaging means being integrally formed on said outer member as radially projecting latching elements said inner member terminating in a finger grip for rotating said latch, said finger grip normally being recessed from said surface when in fully retracted position and projecting above said surface for accessibility when in extended position, and snap-in means having elements integrally formed with said members coacting between the outer member bore and said inner member retaining the latter in said fully retracted position against accidental extension of the inner member and projection of said finger grip above said surface when the finger grip is not in use.

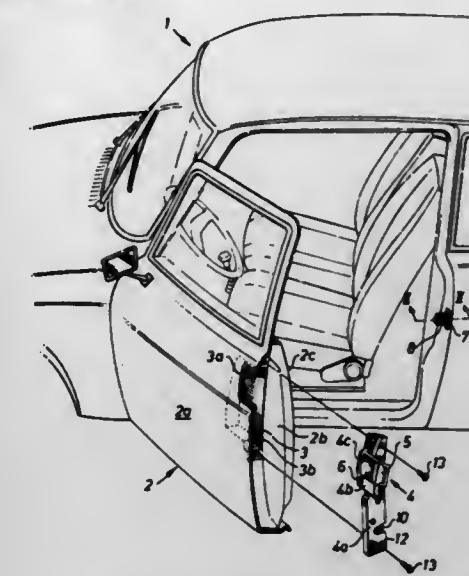
4,052,094

SANDWICH-TYPE MOTOR VEHICLE DOOR AND FLUSH MOUNTED LOCK CASSETTE

Bo Gustaf Widen, Torshälla, Sweden, assignor to GKN-Stenman AB, Eskilstuna, Sweden
Filed Jan. 13, 1976, Ser. No. 648,704
Claims priority, application Sweden, Jan. 17, 1975, 7500512
Int. Cl.² E05C 3/26

U.S. Cl. 292-336.3

5 Claims



1. In combination, an automotive vehicle door of sandwich construction comprising spaced inner and outer sidewalls separated by a reinforcing layer and having an end wall joined at right angles to said sidewalls and extending along one end thereof, said end wall being recessed to form a cassette receiving compartment which extends between said sidewalls, said door outer sidewall being recessed inwardly from its edge adjacent said end wall and opening to said compartment, a cassette comprising a lock house part and a control part connected thereto, said cassette being mounted to said door and within said compartment with said lock house part mounted to said door end wall with its exterior face lying flush therewith, and said control part projecting through said outer sidewall recess opening and lying flush with and forming part of said outer sidewall surface.

4,052,095

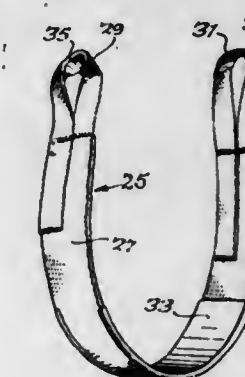
SYNTHETIC ORGANIC POLYMERIC SLING PROTECTED BY VULCANIZED OR CURED ELASTOMERIC LAMINATE AT LOAD CONTACTING AREA THEREOF

Charles E. Johnson, Kenmore, N.Y., assignor to Buffalo Weaving and Belting Co., Buffalo, N.Y.

Filed Nov. 5, 1975, Ser. No. 628,958
Int. Cl.² B66C 1/12

U.S. Cl. 294-74

18 Claims



1. A sling which comprises a web of woven synthetic organic polymeric strands of a nylon or polyester filament with a lamina of elastomeric polychloroprene rubber material vulcanized or cured onto a load contacting surface thereof and filling surface openings between the polymeric strands.

4,052,096

HYDRAULICALLY OPERATED GRAPPLE OR TIMBER FORK

Karl Erik Wallberg, Lulea, Sweden, assignor to Kewaco AB, Lulea, Sweden

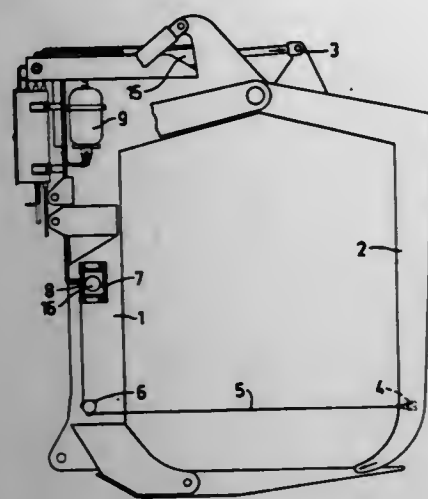
Filed Mar. 30, 1976, Ser. No. 671,816

Claims priority, application Sweden, Apr. 3, 1975, 7503830

Int. Cl.² B66C 1/00

U.S. Cl. 294—88

6 Claims



1. A hydraulically operated grapple comprising an openable and closable fork, a hydraulic cylinder for operating said fork, a wire connected to said fork, a hydraulically operated wire stretcher coupled to said wire to stretch the same such that the wire can contact a load carried by the fork and prevent the load from disarranging and/or falling out of the fork, a hydraulic circuit connecting a hydraulic pressure source, said hydraulically operated wire stretcher and said hydraulic cylinder to effect operation of said stretcher conjointly with said cylinder, and pressure accumulator means in said circuit between said hydraulic pressure source and said hydraulically operated wire stretcher for being pressurized during operation of said cylinder for supplying the wire stretcher temporarily with pressure fluid if said pressure source is cut off.

4,052,097

CART FOR HIGH DECK AMBULANCES

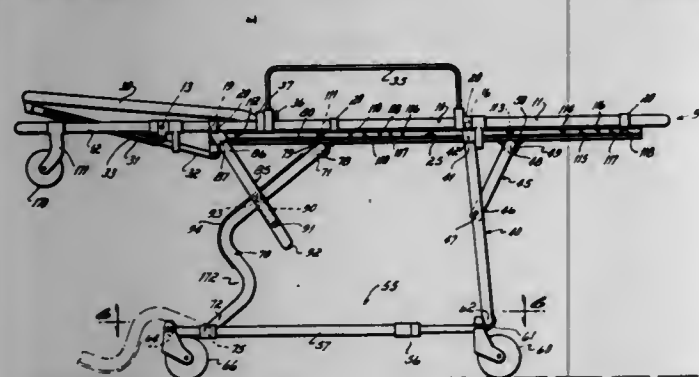
Burt Well, Cincinnati, and Richard H. Ferneau, Washington Court House, both of Ohio, assignors to Burt Well, Cincinnati, Ohio

Filed Apr. 19, 1976, Ser. No. 678,223

Int. Cl.² B62H 3/02

U.S. Cl. 296—20

2 Claims



1. A cart comprising, a normally horizontal bed having front and rear ends, auxiliary wheels on the front end of said bed, rear legs pivotally mounted on rear portion of said bed and extending downwardly from said bed, front legs pivotally mounted on the front portion of said bed and extending downwardly from said bed, means connecting said legs to ground engaging casters, releasable means normally bracing said legs with respect to said bed and being releasable to permit said legs to swing

rearwardly and upwardly while said front end of said bed is in a raised attitude, the upper ends of said front legs being pivotally and slidably connected to said bed at a location which is normally rearward of the lower ends of said front legs, the upper ends of said front legs being slidable forwardly on said bed to raise the front end of said bed, a front brace pivoted at its upper end to said bed forward of the upper ends of said front legs and extending downwardly to said front legs, and links pivoted at one end to said front legs intermediate upper and lower ends of said front legs and pivoted at the other end to the lower end of said brace, whereby when the upper ends of front legs are slid forwardly to raise the front end of said bed and said front legs are swung rearwardly in thrusting the cart into a vehicle, the upper ends of said brace and front legs, respectively, remain in a longitudinally fixed position with respect to said bed, said link permitting said legs and brace to swing rearwardly without binding.

4,052,098

ADJUSTABLE END GATE ASSEMBLY FOR PICK-UP TRUCK OR OTHER VEHICLE

Lloyd E. Metz, Box 43, R.R. No. 2, Fairbury, Ill. 61739

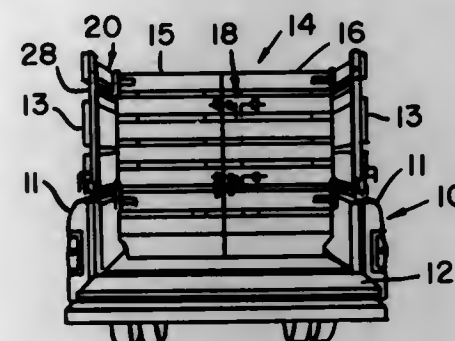
Continuation-in-part of Ser. No. 499,326, Aug. 21, 1974,

abandoned. This application Apr. 26, 1976, Ser. No. 680,390

Int. Cl.² B62D 33/00

U.S. Cl. 296—50

6 Claims



1. In combination with a vehicle such as a pick-up truck or the like having a load box and a floor and upright sides partially defining said load box, an improved adjustable end-gate assembly comprising:

first and second gates, each approximately one-half the vehicle opening width, a pair of sliding hinge assemblies mounting each of said end gates to a respective side of said vehicle, each hinge assembly including a horizontally elongated stringer secured at forward and rear positions to an associated side of said vehicle, a sleeve slidably mounted on said stringer for movement between a forward position intermediate the ends of a side of said vehicle and a rear position adjacent the end of said vehicle, and hinge means carried by said sleeve for mounting an associated gate for pivotal motion about a vertical axis, each pair of said hinge assemblies permitting their associated gate to lower and rest on the floor of said truck box, whereby a livestock chute may be placed against the rear of said vehicle and said gates may be independently positioned along their associated stringers and rotated to contact an adjacent side of said chute to close off the side openings between said chute and said vehicle sides, said gates resting on the floor of said box in all adjusted positions.

4,052,099

ONCOMING AIR SPOILERS FOR VEHICLES, MOUNTED NEAR THE HOOD TO DEFLECT AIR CARRIED BUGS, RAIN, ROAD SPRAY, SNOW, AND LIGHTWEIGHT DEBRIS UP AND AWAY FROM THE WINDSHIELD

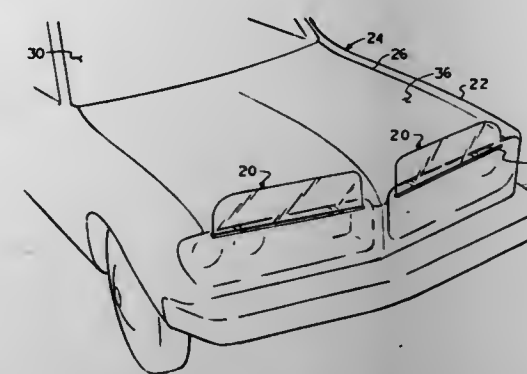
Dennis J. Lowery; Robert E. Merchant, and Milton A. Walls, all of Grand Junction, Colo., assignors to Dixon, Inc., Grand Junction, Colo.

Filed May 7, 1976, Ser. No. 684,142

Int. Cl.² B60J 1/20

U.S. Cl. 296—91

1 Claim



1. A universally adaptable oncoming air spoiler arranged in two sub assemblies for mounting on wide, medium and narrow width vehicles near or on their extended hoods to deflect air carried bugs, rain, road spray, snow, and lightweight debris up and away from their respective windshields, comprising:

- a. two alike air deflector planar panels having their top corners formed on a radius;
- b. two alike channel supports to respectively co-extensively receive the bottom uniform edges of the two alike air deflector planar panels;
- c. four mounting brackets to hold the universally adaptable oncoming air spoiler on a vehicle, as a pair of these mounting brackets are secured both to a channel support and to the vehicle, and each of the four mounting brackets is a strip of bendable material, scored at selected places along its length for subsequent intentional breaking at a score, drilled and countersunk between the scores, and bent at right angles near one end, independently of any score, thereby providing a choice of having either a long leg of selectable variable bracket length or a short leg positioned vertically, upon installing this universally adaptable oncoming air spoiler to the vehicle; and
- d. selected multiple fastening assemblies used throughout the universally adaptable oncoming air spoiler, used at three different types of location either to secure the two air deflector planar panels to the respective channel supports, or to secure the respective channel supports to the respective mounting brackets, or to secure the respective mounting brackets to the vehicle.

4,052,100

COMBINED FOLDING TABLE AND SEAT ASSEMBLY
Edwin Nikitits, Lachine, and Jean Guy Demers, Outremont, both of Canada, assignors to Franklyn M. Markus, Cote St. Luc, Canada

Continuation-in-part of Ser. No. 625,695, Oct. 24, 1975, and Ser. No. 683,327, May 5, 1976. This application June 7, 1976, Ser. No. 693,341

Int. Cl.² A47B 83/02

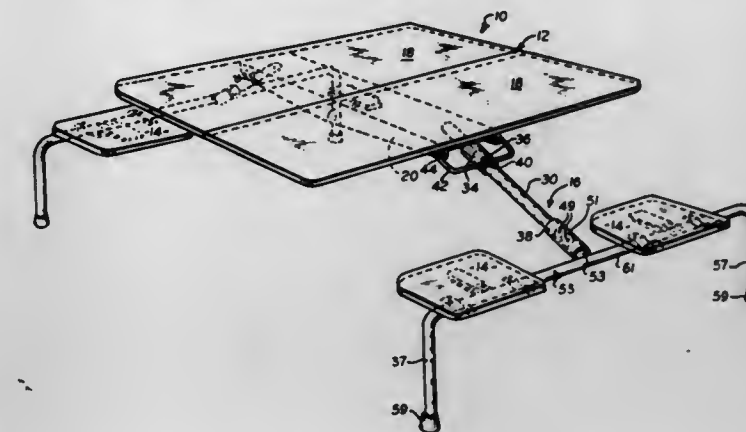
U.S. Cl. 297—159

19 Claims

1. In a collapsible combined table and seat of the type wherein said seat and table are relatively pivotally movable between an open position wherein said table and seat are horizontal and the front edge of said seat is disposed adjacent and below one end of said table and a folded position wherein said seat is in confronting substantially parallel relation with said table, an improved collapsible linkage for supporting said table

and seat in said open position and for permitting said pivotal movement to said folded position, said linkage comprising:

- a support member, a pivot for connected one end of said support member to said table adjacent said one end of said table for movement between an open position in which said support member extends downwardly from said table and a closed position in which said support member is in confronting parallel relation with the bottom surface of said table;
- a leg, another pivot for connecting said leg to the end of said support member opposite said one end thereof for movement between an open position in which said leg extends downwardly from said support member and a closed position in which said support member and said leg are in confronting substantially parallel relation;



said seat being pivotally mounted on said leg for movement between an open position in which said seat extends horizontally from said leg when said leg and said support member are in their open position and a closed position in which leg and said seat are in confronting substantially parallel relation; means for holding said seat in said open position; and

- a longitudinally extending sleeve slidably mounted on said support member for movement between an unlocking position wherein said sleeve is out of overlapping relation with said other pivot to permit pivotal movement between said support member and said leg and a locking position wherein said sleeve overlies said other pivot to prevent movement thereabout.

4,052,101

STADIUM RISER INDIVIDUAL SEAT, SUPPORT AND ARMREST WITH COMMON SEAT-ROW BACKREST
David C. DeLong, 1221 Broad St., Grinnell, Iowa 50112

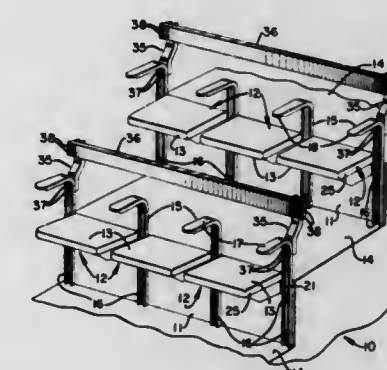
Continuation-in-part of Ser. No. 593,767, July 7, 1975, Pat. No. 3,989,299. This application Nov. 1, 1976, Ser. No. 737,681

The portion of the term of this patent subsequent to Dec. 2, 1993, has been disclaimed.

Int. Cl.² A47C 7/54, 1/12

U.S. Cl. 297—243

7 Claims



1. In step riser mounted seating: a plurality of rowed individual seat means including, first structural members adapted to be mounted, in space-separated paralleled relationship, to the

upright face of a step riser at each side of a seat; individual seat bottom means adapted for being mounted between and by pairs of successive adjacent ones of said first structural members; said first structural members being extended transversely above and below said individual seat bottom means mounted thereby; with the upper longitudinally extending portions of said structural members formed over by substantially ninety degrees, so as to coextend with, and be substantially parallel to, said seat bottom means, to provide armrest sections above and to each side of said individual seat bottom means; each of said first structural members being a continuous expanse of U-shaped channel, with the exterior surface of the channel web adapted to be juxtaposed with, and mounted to, the upright vertical face of a step riser; with such channel web exterior surface presenting upward facing armrest surfacing; a plurality of seat back support structural members, individual ones of which are affixed to and extended upwardly from the transversely extended portions of predetermined ones of said first structural members; and, a continuously extending seat backrest member extending transversely of and affixed to each of said back support structural members.

4,052,102

FOLDING SEAT ASSEMBLY

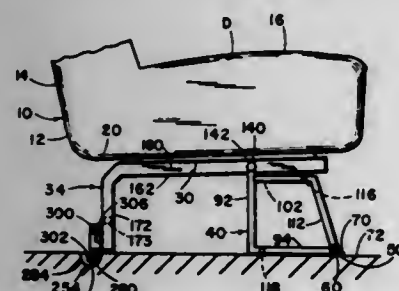
Lester P. Rosenthal, 7719 Lake St., Omaha, Nebr. 68164

Filed May 24, 1976, Ser. No. 689,195

Int. Cl.² B60N 1/04

U.S. Cl. 297-334

6 Claims



1. A foldaway base for a seat comprising a pivoting support unit disposable above a floor, an attachment assembly for pivotally attaching said support unit to a floor and having portions attachable to said floor and said attachment assembly permitting said support unit to pivot about a horizontal first axis, an upper frame extending rearwardly from the top of said support unit, means pivotally attaching said upper frame to said support unit for rotation about a second axis parallel to said first axis and disposed upwardly and rearwardly therefrom and disposed adjacent the upper rearward portion of said support unit, and rearward leg means extending downwardly from said upper frame at a rearward part of said upper frame and adapted to engage said floor, a stop means on said support unit means on said attachment assembly in position for engaging said stop means when the rearward end of said attachment assembly is lifted vertically so that said engagement with said stop means stops rotation of said attachment assembly about said second axis in a direction upwardly rearwardly of said second axis whereby further lifting of the rearward end of said attachment assembly after said engagement with said stop means will cause said support unit to rotate about said first axis in a direction such that said second axis will be caused to first shift laterally of itself first upwardly and forwardly to define a first shifting, and said support unit being constructed for permitting said second axis to move forwardly and downwardly after said first shifting and in response to an urging forward of said attachment assembly with respect to said first axis so that said attachment assembly reaches a desired certain storage position.

4,052,103

CENTRAL ARM REST FOR A COMPLEX OF AT LEAST TWO SEATS

Pierre T. Steinthal, Masey, France, assignor to Compagnie Nationale Air France, France

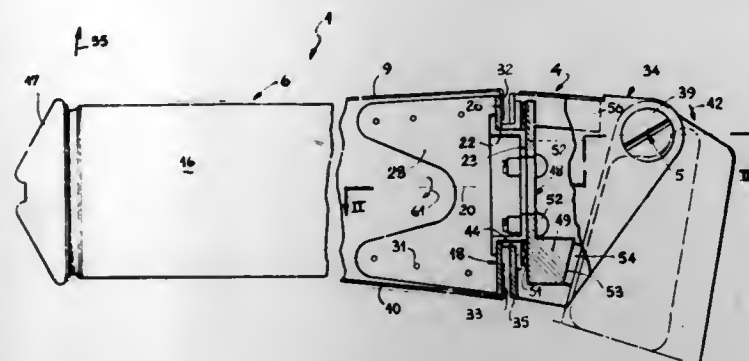
Filed May 14, 1976, Ser. No. 686,371

Claims priority, application France, July 22, 1975, 75.22763

Int. Cl.² A47C 7/54

U.S. Cl. 297-417

12 Claims



1. A seat structure useful for transportation vehicles and embodying at least two, side-by-side seats with back rests, and an arm rest pivotally mounted on said seat structure between said side-by-side seats for pivotal movement in a vertical plane between a normal, horizontal orientation of said arm rest and a retracted position with said arm rest disposed in a space between said side-by-side seats, said seat structure being characterized by an arm rest having a rear element and a forward element which is a prolongation of said rear element, said rear element having a width such that it will fit in the space between said seats and said forward element having an arm support surface of a width wider than said rear element and wider than said space between said seats and a depth such that said forward element will fit in said space between said seats, means pivotally mounting would rear element on said seat structure to effect said pivotal movement of said elements in unison between said normal, horizontal orientation of said arm rest and said retracted position in the space between said seats, and means for rotating said forward element with respect to said rear element through an angle of 90° about an axis extending longitudinally of said forward element between a first orientation of said arm support part wherein its width is in a horizontal plane and said arm support part can serve comfortably as an arm rest for both seats and a second orientation wherein said arm support surface is in a substantially vertical plane, whereby said forward element will fit in the space between said seats upon pivoting said arm rest to said retracted position.

4,052,104

SEATING UNIT

William H. Noss, 524 S. Muhlenberg St., Allentown, Pa. 18104

Filed July 28, 1976, Ser. No. 709,455

Int. Cl.² A47C 7/02

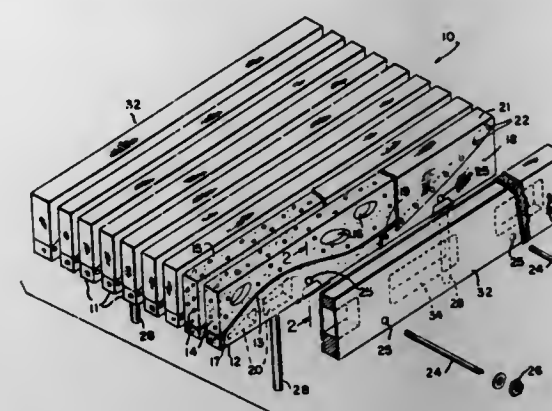
U.S. Cl. 297-456

7 Claims

1. A seating unit, comprising:
a support structure including a contoured seat and back support, said support structure being comprised of a plurality of separate and independent sub-units, each contoured to include a portion of the seat and back support; a plurality of separate and independent pieces of resilient foam covering the seat and back support portions of each of said sub-units, said resilient foam having a non-seat and back shaped outer seating surface which is in non-conformity with the contour of the sub-unit, said resilient foam including a plurality of apertures shaped and arranged to provide the foam with sufficient flexibility whereby the foam upon being deformed by an occupant assumes a seat and back support shape corresponding to the contoured seat and back support of the support structure.

ture and the occupant is supported by the support structure; fabric covering each foam covered sub-unit; and means for supporting the individual fabric and foam covered sub-units in a spaced relationship to each other to form the seating unit of a plurality of individual spaced

depending second position, an actuating arm connected to said position control arm for controlling the position of said position control arm, and positioning means carried by said support and coupled to said actuating arm for selectively permitting



fabric and foam covered sub-units having spaces therebetween, whereby the unoccupied seating unit has a dismembered non-seating unit visual appearance, which provides a pre-determined seating contour when occupied.

4,052,105

TRUCK HOIST

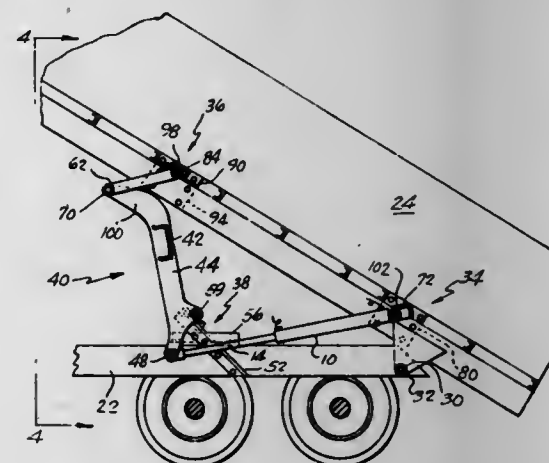
Walter Moe, 502 S. 12th St., Montevideo, Minn. 56265

Filed Apr. 9, 1976, Ser. No. 675,509

Int. Cl.² B60P 1/20

U.S. Cl. 298-22 J

14 Claims



1. A truck hoist assembly for use in combination with a dump vehicle having a chassis and dump bed pivotally mounted to said chassis, which comprises:
linkage means pivotally connected to said dump bed;
elongated lever means having one end pivotally connected to said linkage means and a fulcrum pivotally connected intermediate the ends of said lower means to said chassis; and
actuation means pivotally connected to the other end of said elongated lever means and to said dump bed for selectively pivoting said lever means about said fulcrum.

4,052,106

LIFT MECHANISM FOR TRUCK SIDEBOARDS

George D. Louderback, Sr., 108 Sugar Mill Road, Sterling, Colo. 80751

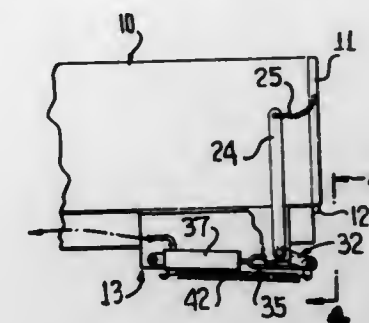
Filed Jan. 27, 1976, Ser. No. 652,775

Int. Cl.² B60P 1/26

U.S. Cl. 298-23 MD

16 Claims

1. A lift mechanism for use in positioning box sideboards and the like, said lift mechanism comprising a support, a position control arm, means mounting said position control arm on said support for pivotal movement about a generally horizontal axis for movement between a generally upright first position and a



movement of said position control arm from said first position to said second position independent of movement of said positioning means and for moving said position control arm towards said first position.

4,052,107

HYDRAULIC HAMMERS HYDRAULICALLY DRIVEN IMPACTOR

Andrew George Hay, Hamilton, Scotland, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

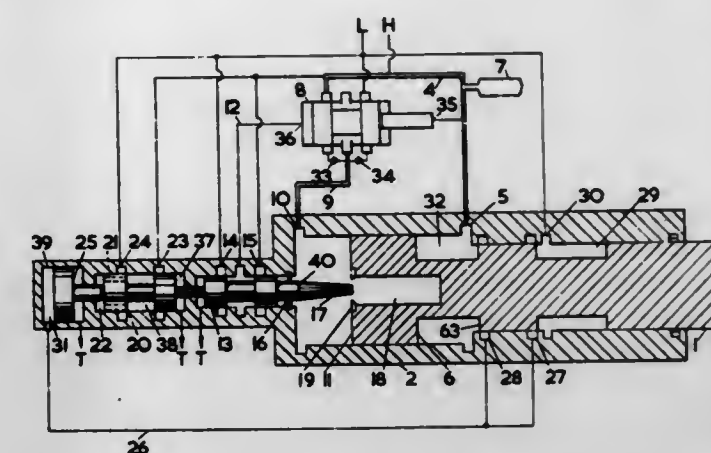
Filed Apr. 7, 1976, Ser. No. 674,410

Claims priority, application United Kingdom, Apr. 8, 1975, 14438/75

Int. Cl.² E21D 9/10

U.S. Cl. 299-62

4 Claims



1. A hydraulically operable impactor comprising: a main piston reciprocable within a cylinder, said piston having opposing transverse faces and said cylinder having fluid transfer means for admitting pressurised hydraulic fluid to the said faces to advance and retract said main piston within said cylinder; a switch valve for controlling admission of said pressurised hydraulic fluid to at least one of said faces; and control means for actuating said switch valve, hydraulically arranged to initiate advancement of said main piston via said switch valve in response to a fluid pressure increase generated by said main piston during retraction thereof at an axial displacement of said main piston which is dependent upon the velocity thereof.

4,052,108

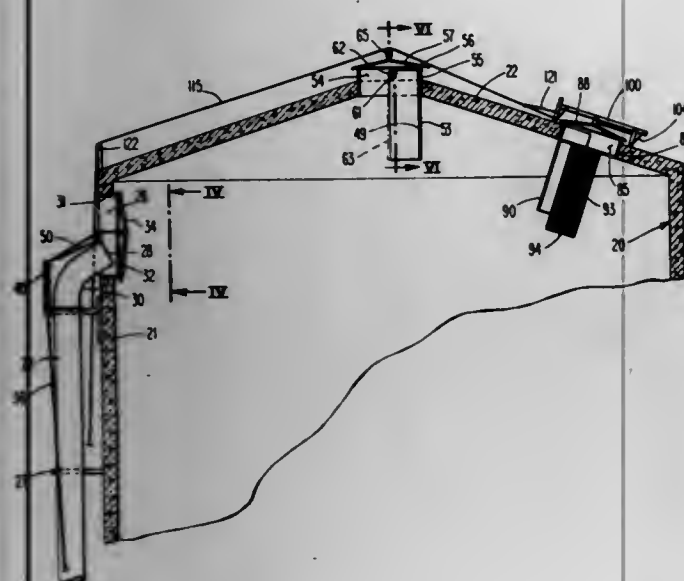
FILLING SYSTEM FOR A SILO

Richard L. Weaver, R.D. No. 1, Myerstown, Pa. 17067; John Stoltzfus, 543 Strasburg Pike, Lancaster, Pa. 17602, and Henry Stoltzfus, 618 Donegal Spring Road, Mount Joy, Pa. 17552

Filed Oct. 9, 1975, Ser. No. 621,154
Int. Cl.² B65G 53/40

U.S. Cl. 302—60

19 Claims



1. A filling system for a silo, wherein the silo is of the type having side and top walls, said filling system comprising:

- a. a fill opening located at an upper end of a sidewall and communicating with the interior of the silo,
- b. a normally closed openable fill opening closure operably associated with the fill opening,
- c. a delivery duct disposed outwardly of the silo and extending therealong for delivery of fill material to said fill opening,
- d. deflector means mounted inside the silo at a generally central location at an upper portion thereof,
- e. vent means for relieving gaseous pressure in the silo during the filling thereof, the vent means consisting of a vent opening in an upper portion of said silo and a baffle-type deflector for deflecting dust particles away from said vent opening,
- f. a normally closed openable vent closure operably associated with the vent opening,
- g. means operably associated with both said fill opening closure and said vent opening closure for simultaneous remote opening of both said fill opening closure and said vent opening closure from a location at the bottom of the silo outside thereof, the remote means comprising,
1. a cable-like tension means having spring assist means operably associated with both said fill opening closure and said vent opening closure to facilitate opening of said fill opening closure and said vent opening closure against gravity forces induced by said tension means and that would otherwise urge said closures toward a closed position, and
2. spring-biased latch means mounted at a location at the bottom of the silo outside thereof and operably associated with said cable-like tension means for controlling the tension in said cable-like tension means thereby simultaneously controlling the operation of both said fill opening closure and said vent opening closure.

4,052,109

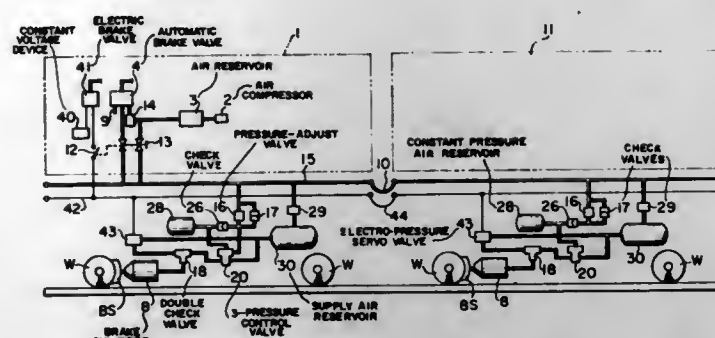
AIR BRAKE SYSTEM EMPLOYING COMBINED AUTOMATIC AND DIRECT BRAKING

Kazuhiko Nagase, Tokyo, and Michihiko Takakubo, Yono, both of Japan, assignors to Japanese National Railways, Tokyo, Japan

Filed May 19, 1976, Ser. No. 688,075
Claims priority, application Japan, June 4, 1975, 50-66571
Int. Cl.² B60T 13/62

U.S. Cl. 303—25

4 Claims



1. In an air brake system for plural coupled vehicles such as trains, said system being of the type wherein each said vehicle has a brake applying cylinder movable between a brake applying position and a released position, said system further being of the type including both an automatic braking means for achieving a brake applying position in response to a decrease in air pressure and a direct braking means for achieving a brake applying position in response to a direct braking order, the improvement comprising:

- an air reservoir;
- a single air pipe extending longitudinally of said vehicles, said single air pipe comprising both a brake pipe for said automatic braking means and a main air reservoir pipe for said direct braking means;
- first air passage means for supplying air from said air reservoir directly to said single air pipe;
- second air passage means for supplying air from said air reservoir to said single air pipe, separately from said first air passage means, said second air passage means including an automatic braking valve for selectively increasing or decreasing the air pressure in said single air pipe, said second air passage means further including pressure-adjust valve means for regulating the pressure of air passing through said automatic braking valve to a predetermined value;
- said first and second air passages being alternately operable to communicate said air reservoir with said single air pipe;
- an electric brake valve;
- each vehicle having storage reservoir means, connected to said single air pipe, to supply air to the respective said braking cylinder to move said braking cylinder to the brake applying position thereof;
- each vehicle having an automatic braking control valve means, connected to said single air pipe, for supplying air from the respective said storage reservoir means to the respective said braking cylinder in response to a decrease in pressure in said single air pipe, to thereby initiate an automatic braking operation;
- each vehicle having an electro-pneumatic servo valve means, electrically coupled to said electric brake valve and pneumatically coupled to the respective said braking cylinder and the respective said storage reservoir means, for supplying air from the respective said storage reservoir means to the respective said braking cylinder in response to a command from said electric brake valve, to thereby initiate a direct braking operation;
- an electric switch connected between said electric brake valve and each said servo valve for interrupting connection therebetween; and
- a double valve means for selectively opening said first passage means and closing said second passage means or

alternatively closing said first passage means and opening said second passage means, said electric switch being coupled to said double valve means to be closed when said first passage means is open and to be opened when said first passage means is closed;

whereby automatic braking will occur upon separation of said vehicles and opening of said single air pipe, even if the system is operating under the direct braking mode.

4,052,110

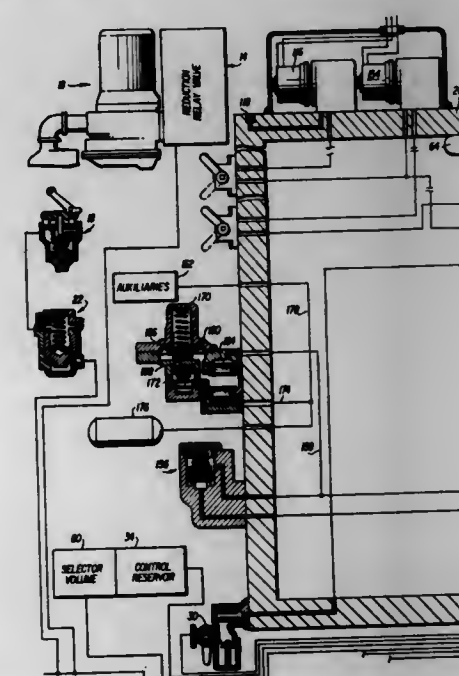
FLUID PRESSURE BRAKE SYSTEM WITH ELECTRONICALLY ASSISTED APPLICATION AND RELEASE

William W. Banker, Watertown, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,057
Int. Cl.² B60T 15/32, 15/52

U.S. Cl. 303—36

3 Claims



1. A fluid pressure brake system for a rail vehicle, comprising:

- a brake pipe for conveying pressure signals for brake application and release through said vehicle;
- a supply reservoir located in said rail vehicle;
- a brake cylinder pipe located in said rail vehicle for conveying pressurized fluid to friction brakes in said vehicle;
- a control valve responsive to the pressure in said brake pipe for directing pressurized fluid from said supply reservoir to said brake cylinder pipe to apply said friction brakes and for releasing pressurized fluid from said brake cylinder pipe to release said friction brakes; and
- electrically operable release valve means interconnecting said brake pipe and said supply reservoir for repressurizing said brake pipe during release of said friction brakes, whereby accelerated brake release is achieved.

4,052,111

BOGIE-WHEEL SHAFT LUBRICATION SYSTEM

Harry L. Baker, 7087 4th St., Lakeport, Mich. 48060

Filed Nov. 20, 1975, Ser. No. 633,635
Int. Cl.² B62D 55/10

U.S. Cl. 305—14

2 Claims

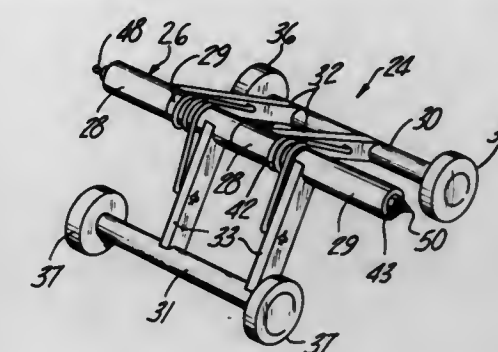
1. A suspension assembly for the resiliently biased rolling support of an endless track on a vehicle chassis, said suspension assembly comprising:
- first and second trailing frame assemblies, each having a pair of axially spaced tubular sleeves at one end; said frame assemblies being positioned such that said tubular sleeves are axially aligned and alternately positioned;
- a cylindrically spaced bearing shaft positioned through said axially aligned tubular sleeves;
- bolts extending through said chassis and axially into

threaded engagement with the opposite ends of said shaft to secure said shaft to said chassis and for pivotally attaching said trailing frame assemblies to said chassis, said bolts having longitudinal through bores;

spaced supports rotatably carried by the other end of each of said trailing frame assemblies such that said supports are capable of free rotating movement with respect to its associated trailing frame assembly;

means which cooperate with said trailing frame assemblies to resiliently urge said supports downwardly with respect to said vehicle against the inner surface of said track;

said bearing shaft having first and second noncommunicating axial passageways opening respectively at the opposite



ends of said bearing shaft and communicating with the inner ends of said bolt bores; and

grease fittings carried at the outer ends of said bolt bores and communicating with said shaft first and second axial passageways, each of said axial passageways extending from its associated grease fitting into said shaft to intersect with a plurality of axially spaced diametrically extending passages opening at one side of said shaft at locations corresponding to the locations of said axially spaced tubular sleeves for communicating grease stored within said axial passages to the outer surface of said shaft for providing lubrication of the interface between the outer surface of said shaft and the inner surface of said tubular sleeves.

4,052,112

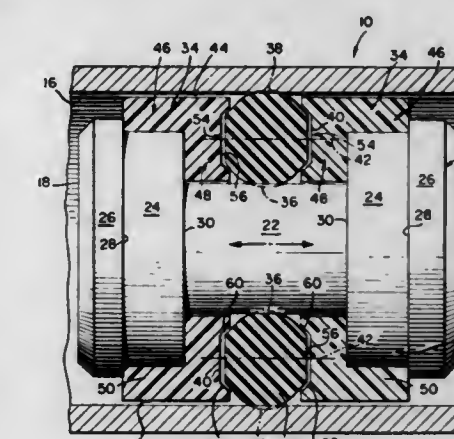
PISTON SEAL

Klaus Faber, Manchester, N.H., assignor to Disogrin Industries, Inc., Manchester, N.H.

Filed May 14, 1976, Ser. No. 687,387
Int. Cl.² F16J 15/24

U.S. Cl. 308—3.5

12 Claims



1. A seal assembly for use on a piston having a piston seal groove with spaced shoulders formed therein comprising a deformable sealing ring adapted to be maintained in the groove and having inner and outer peripheral sealing portions, and side surfaces, said sealing ring being comprised of a homogeneous thermosetting elastomeric material having a relatively high shear modulus and being wear, tear, and abrasion resistant; and a pair of unitary bearing means, each of which is juxtaposed opposite said side surfaces of said sealing ring and

being made of a wear-resistant material which is harder than said material of said sealing ring, each of said bearing means includes bearing section means, and support section means, said bearing section means being adapted to be seated on a corresponding shoulder formed in the piston groove for providing a bearing support for said seal assembly, and said support section means contacting said sealing ring and including generally concave surface means which generally conform to at least portions of said side surfaces of said sealing ring for preventing extrusion and twisting of said sealing ring.

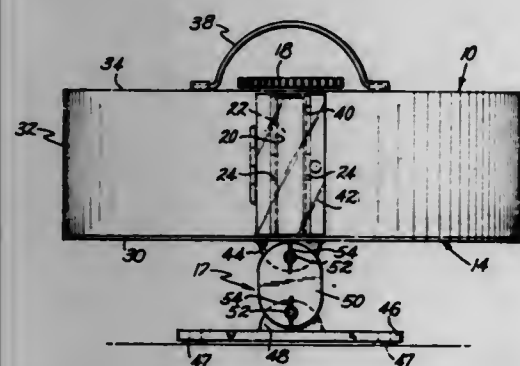
4,052,113

TAPE CASSETTE HOLDER FOR VEHICULAR USE
Larkey Wilburn Broome, P.O. Box 288B, Rte. 2, Sumrall, Miss.
39482

Filed Apr. 15, 1975, Ser. No. 568,329
Int. Cl.² A47B 81/06, 91/00, 81/06

U.S. Cl. 312-11

8 Claims



1. A tape cassette holder comprising:
 - a. a housing having top, bottom and side walls;
 - b. a cassette loading opening in at least one of said walls;
 - c. an array of elastomeric material mounted for rotation as a unit within said housing, said array being disposed to form the entire and sole sidewalls of a plurality of radially extending tape cassette receiving cavities within said housing, the minimum transverse width of each of said cavities being smaller than the maximum thickness of a cassette intended to be received therein and the elastomeric material forming the sole structure between cassette receiving cavities;
 - d. a generally planar turntable means mounted within said housing;
 - e. said array of elastomeric material being secured to a surface of said turntable means for rotation therewith as a unit;
 - f. means connected to said turntable from a position externally of said housing for rotating said turntable means and said array of elastomeric material.

4,052,114

JALOPY SHELF FOR BOTTLES

Hsu Yun Tung, and Tzong Ren Wu, both of Taipei, China /Taiwan, assignors to Hsu Yun-Tung, Taipei, China /Taiwan

Filed Jan. 20, 1976, Ser. No. 650,773

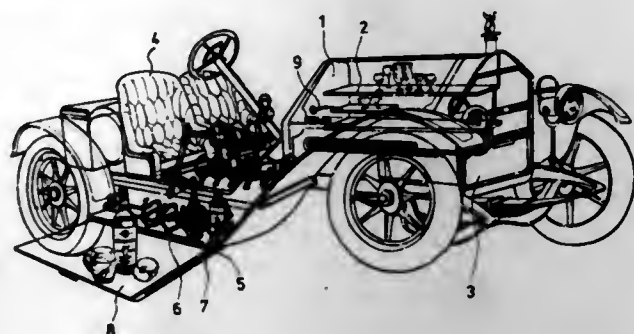
Int. Cl.² A47B 95/02; A47F 5/08; A47B 17/04, 97/00

U.S. Cl. 312-245

1 Claim

1. A decorative shelf for storing wine bottles and the like which resembles an automobile and comprises:
 - a. a frame formed to resemble a vehicle body with seats, runningboard, and engine compartment;
 - a. hood pivotably connected to said frame for closing said compartment;
 - a. plurality of shelves mounted within said compartment;
 - a. track connected to said frame;
 - a. drawer engaging said tracks for sliding movement below said compartment between a closed and open position;
 - a. plurality of racks mounted on said frame between said seats and compartment and on said runningboard for supporting a plurality of bottles;

a second shelf movably mounted beneath said running board; and
at least one shelf hanging means including a first hanger plate fixed to said frame and including a bar, a second hanger plate adapted to be fastened to a wall at one end,



formed as a hook at the other end with a recessed groove formed in the hook end and having an aperture in the middle thereof, a bending link having a ball at one end extending through said aperture for permitting pivoting movement of said link, and means for engaging the other end of said link for holding said bar in said hook.

4,052,115

DEVICE FOR MANUFACTURING ELECTRON TUBE HAVING A RADIATION-SENSITIVE LAYER

Bernard Louis Pierre Jean, Fresnes, France, assignor to U.S. Philips Corporation, New York, N.Y.

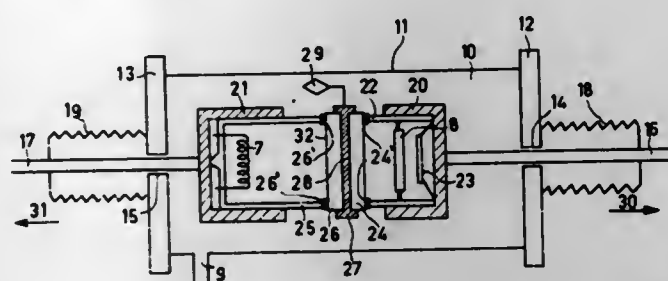
Continuation of Ser. No. 596,660, July 17, 1975, abandoned.

This application July 22, 1976, Ser. No. 707,496

Claims priority, application France, Aug. 2, 1974, 72.26925
Int. Cl.² H01J 9/34

U.S. Cl. 316-31

1 Claim



1. A device for manufacturing an electron tube having an envelope assembled of a tubular portion and a window portion hermetically sealed together, a system of electrodes within said envelope and a radiation sensitive layer provided on said window portion, said device comprising: a common container in which a first and a second evacuated container are accommodated, means operable to maintain said common container evacuated said first container including means to construct the radiation sensitive layer on the window portion and being temporarily closed by that window portion using a first vacuum seal of a gallium containing material in the liquid state, said second container consisting of the tubular portion including the system of electrodes and being temporarily closed by an auxiliary closing member using a second vacuum seal of the gallium containing material in the liquid state, said device having two shafts extending collinearly through respective apertures in opposed walls of the common container, the shafts having at their ends which are within the container holders holding said first and second containers respectively, the device further comprising a third holder disposed between the holders at the ends of said shafts and which is operable to hold the window portion of the tube envelope and to hold said auxiliary closing member, means operable to move said first and second shafts longitudinally whereby the first and second vacuum seals are broken by moving the shafts longitudinally apart while leaving the window portion and the auxiliary closing member in the third holder, means operable to rotate

the third holder about an axis perpendicular to the shafts whereby the window portion having the radiation sensitive layer constructed thereon is rotated to face the then open end of the tubular portion of the tube envelope, and means creating a final vacuum seal consisting of the gallium containing material in the liquid state by moving the shaft holding the tubular portion towards the third holder effecting pressured contact between the window portion and the opened end of the tubular portion.

4,052,116

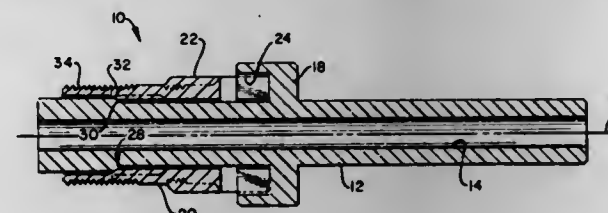
SWIVEL CONNECTOR FOR AN ARC GOUGING TORCH
Harold D. Sanders, and Thomas C. Landreth, both of Houston, Tex., assignors to Central Welding Supply Co., Inc., South Houston, Tex.

Filed Oct. 27, 1976, Ser. No. 736,075

Int. Cl.² H01R 39/00

U.S. Cl. 339-8 R

13 Claims



1. A swivel connector comprising:
 - a shaft having an axis therethrough;
 - a collar attached to said shaft; and
 - a sleeve mounted on said shaft and moveable from a first to a second position relative to said axis, said sleeve having a first and a second axial end thereon;
 - said collar having a first and a second axial end thereon, said second axial end of said sleeve being adjacent to said first axial end of said collar;
 - said sleeve in said first axial position being rotatable relative to said shaft, said sleeve in said second axial position being engaged with said collar and non-rotatable relative to said shaft;
 - said collar having an opening provided in said first axial end, said sleeve having a key member disposed on said second axial end, said key member being sized to fit with said opening in said collar, said key being disposed within and received by said opening in said collar when said sleeve is in said second axial position.

4,052,117

INTEGRATED CIRCUIT SOCKET

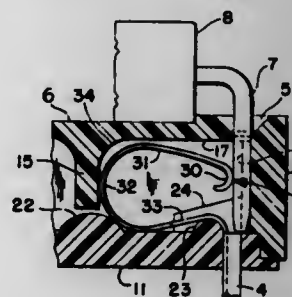
John N. Tengler, Chardon; Stephen A. Mesaros, Mentor, and John T. Venaleck, Painesville, all of Ohio, assignors to A P Products Incorporated, Painesville, Ohio

Filed Oct. 20, 1975, Ser. No. 623,672

Int. Cl.² H01R 11/22, 23/02

U.S. Cl. 339-17 CF

6 Claims



1. An electrical connector, comprising:
 - an electrically non-conductive housing having an interior compartment, and opening means in the former for access to the latter;

electrical contact means in said compartment for engaging a member inserted through said opening means;
said electrical contact means including a curved connecting portion in said compartment for movement by and wiping engagement with such member upon insertion thereof and for binding engagement with the latter to resist withdrawal thereof, and means for movably supporting said connecting portion relative to said opening means for such engagement with such inserted member, said means for movably supporting comprising a curved resilient support portion coupled by a relatively straight lateral arm portion to said connecting portion, said means for movably supporting being resiliently deformable by force applied thereto via said connecting portion by insertion of such member, and wherein movement of said connecting portion by such inserted member effects a bending in said curved resilient support portion with travel of said connecting portion in a direction substantially parallel to the insertion direction of such member, and said means for movably supporting being cooperable with said connecting portion for urging the latter to engagement with such inserted member so that upon partial removal of such inserted member friction forces between the latter and said connecting portion urge said lateral arm to a position of increased mechanical advantage relative to such inserted member thus increasing the effective binding force exerted on such inserted member and resistance to withdrawal thereof; and
ramp surfaces in said housing for limiting the extent of such bending and travel.

4,052,118

CONTACT CARRYING SPRING MEMBER

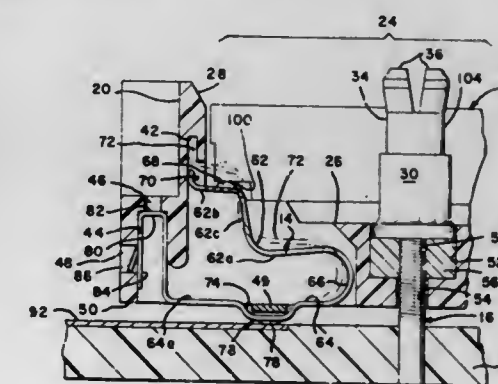
William Samuel Scheingold, Palmyra, and Frank Christian Youngfleish, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 582,315, May 30, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,547

Int. Cl.² H05K 1/12

U.S. Cl. 339-17 CF

3 Claims



1. A contact-carrying spring member to be positioned in an insulating housing for providing an electrical path between an integrated circuit package to a printed circuit board or the like, which comprises, a length of conductive material formed into a generally C-shaped configuration and having an upper and lower flexible beams connected to each other by an arcuate bight with the full extent of the upper beam overlying the lower beam, the lower beam being horizontal with a downwardly projecting jog positioned intermediate the ends, said jog having on its outside surface a contact adapted to engage a circuit on a printed circuit board, the upper beam comprising first and second horizontal sections, said first section being displaced upwardly from said second and integrally joined thereto by a vertical section, said first section having a free end thereon, a contact positioned on the outside surface of the first section adapted to engage a circuit pad on an integrated circuit package which may be positioned on the housing, further, said free end on the first section being rounded so that as a package is loaded into the housing, said upper beam may be deflected

downwardly with the rounded free end sliding down a vertical sidewall of the housing.

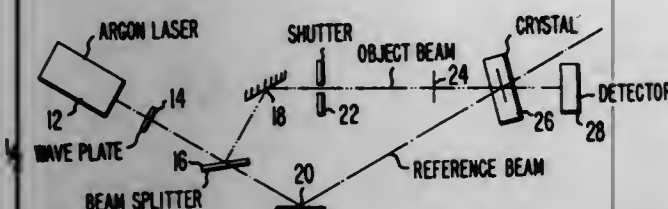
4,052,119

CRYSTALS FOR RECORDING PHASE HOLOGRAMS
Brown F. Williams, Princeton; William Joseph Burke, Princeton Junction; William Phillips, Princeton, and David Lloyd Staebler, Lawrenceville, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,598
Int. Cl.² G03H 1/02; G03C 1/00; G11B 7/24

U.S. Cl. 350-3.5

4 Claims



1. A single crystal useful for recording phase holograms which comprises a crystal selected from the group consisting of lithium niobate and lithium tantalate, said crystal prepared by doping with iron and from 50 to 300 parts per million of silicon wherein said crystal contains from 0.005 to 0.25 mole percent of iron.

4,052,120

OPTICAL APPARATUS FOR PRODUCING A LIGHT CURTAIN

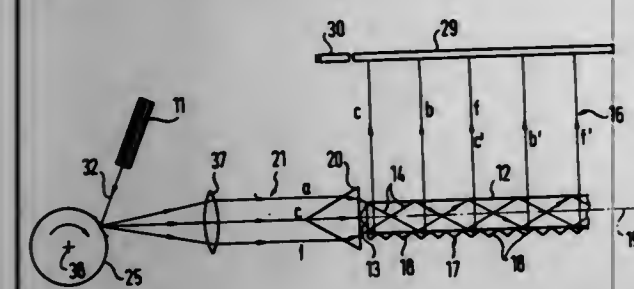
Erwin Sick, Icking, and Klaus Hartman, Munich, both of Germany, assignors to Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed Dec. 29, 1975, Ser. No. 644,910

Claims priority, application Germany, Feb. 26, 1975, 2508366
Int. Cl.² G02B 27/17

U.S. Cl. 350-6

36 Claims



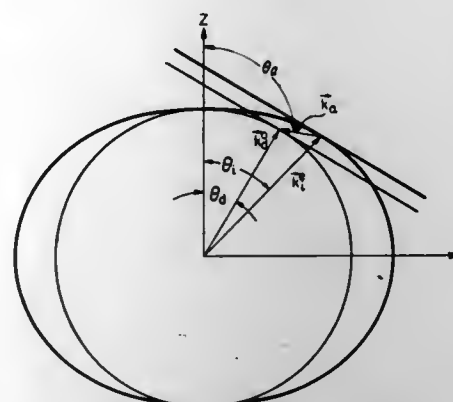
36. An optical apparatus for producing a light curtain, having a light source emitting a collimated beam of light, and a light distribution system, guiding the light beam over the curtain area, comprising a transmitting fiber optic rod having two end faces, one of said end faces receiving at least one light beam entering at an angle to the axis of the rod, means for introducing said light beam at said angle, a system of adjacent inclined mirrors, said mirrors inclined at an angle to the rod axis such that said light beam striking them is deflected towards the curtain area with said system located on the surface of the rod remote from the curtain area, a receiving fibre optic rod, disposed on the same side of the curtain area as the transmitting fiber optic rod, parallel to and beside the latter, and an elongated retro-reflecting region located on the other side of the curtain area, said retro-reflecting region having a scattering range adequate for illumination of the receiving fiber optic rod.

4,052,121
NONCOLLINEAR TUNABLE ACOUSTO-OPTIC FILTER
I-Cheng Chang, Sunnyvale, Calif., assignor to Ittek Corporation, Lexington, Mass.

Filed Sept. 10, 1975, Ser. No. 612,055
Int. Cl.² G02F 1/33; G02B 5/20

U.S. Cl. 350-149

20 Claims



1. A method for diffracting an incident light beam with a first polarization to a deflected light beam of second polarization that is orthogonal to the first polarization, said method comprising the steps of exciting an acoustic wave in an optically birefringent crystal; passing the light beam through said crystal in a direction that is noncollinear with the group velocity of the acoustic wave; and selecting the direction of the acoustic wave such that the acoustic wavevector is in the same azimuth plane as the wavevector of the incident light, and in the said azimuth plane, the tangents to the locus of the wavevectors for the incident and diffracted light are parallel.

4,052,122

CORRECTING LENSES UTILIZED IN THE MANUFACTURE OF FLUORESCENT SCREEN OF COLOR PICTURE TUBES

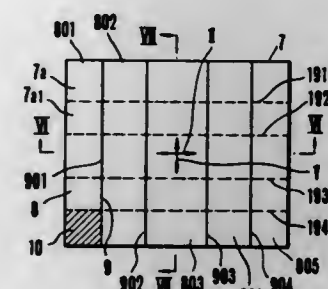
Eiichi Yamazaki, Ichihara; Iwao Ogura, Kurume; Toshio Ueda, Mobara; Koichi Maruyama, Mobara, and Kenji Shimizu, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 29, 1972, Ser. No. 310,477
Claims priority, application Japan, Nov. 29, 1971, 46-95333; Oct. 19, 1972, 47-6963

U.S. Cl. 350-189

Int. Cl.² G02B 3/02

10 Claims



1. A correcting lens of an exposure device utilized to form a fluorescent screen of a colour picture tube, the correcting lens having effective surfaces on opposite sides thereof, each effective surface comprising a plurality of regions divided by a plurality of border lines and each having a specified refractive characteristic to exposure light, said border lines on the respective sides dividing one effective surface of the correcting lens in a direction different from another direction in which the opposite effective surface of the correcting lens is divided, and being discontinuous in only one direction the regions on said opposite sides being inclined in substantially different directions to provide said specified refractive characteristic such that the exposure light path through the correcting lens ap-

proximates the ultimate electron beam locus by cooperation of the regions on one side of the correcting lens with those on the opposite side thereof.

4,052,123
CORRECTING LENSES UTILIZED IN THE MANUFACTURE OF FLUORESCENT SCREEN OF COLOR PICTURE TUBES

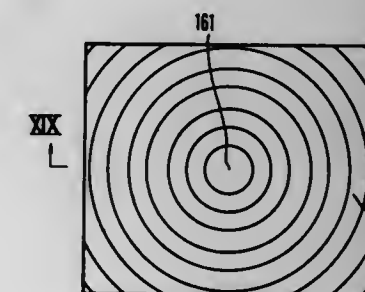
Eiichi Yamazaki, Ichihara; Toshio Ueda, and Koichi Maruyama, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 310,477, Nov. 29, 1972. This application
Sept. 29, 1975, Ser. No. 617,939
Claims priority, application Japan, Jan. 19, 1972, 47-6963; Nov. 29, 1971, 46-95333

U.S. Cl. 350-189

Int. Cl.² G02B 3/02

7 Claims



1. A correcting lens of an exposure device utilized to form a fluorescent screen of a colour picture tube, the correcting lens having effective surfaces on opposite sides thereof, each effective surface comprising a plurality of regions divided by a plurality of border lines and each having a specified refractive characteristic to exposure light, said border lines on the respective sides dividing one effective surface of the correcting lens in a direction different from another direction in which the opposite effective surface of the correcting lens is divided, and being discontinuous in only one direction, the regions on said opposite sides being inclined in substantially different directions to provide said specified refractive characteristic such that the exposure light path through the correcting lens approximates the ultimate electron beam locus by cooperation of the regions on one side of the correcting lens with those on the opposite side thereof, and wherein said correcting lens comprises a plurality of regions, at least one portion of the effective surface on one side of said correcting lens having a plurality of concentric border lines which are discontinuous in the radial direction for dividing said regions.

4,052,124

REARVIEW MIRROR ASSEMBLY WITH PLURALITY OF SIMULTANEOUSLY MOVABLE MIRRORS

Konrad H. Marcus, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

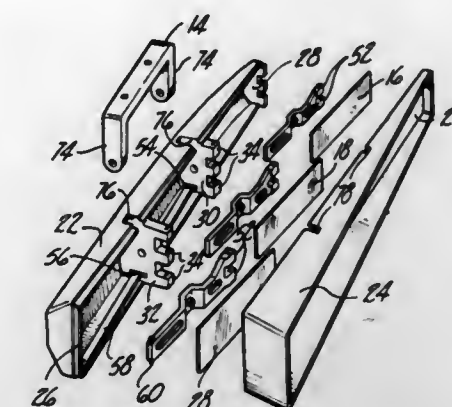
Filed Feb. 6, 1976, Ser. No. 655,688

U.S. Cl. 350-304

Int. Cl.² G02B 5/08

5 Claims

1. A rearview mirror assembly comprising; a support member, a plurality of mirrors, a plurality of mounting means connecting said plurality of mirrors, respectively, to said support member for movement relative thereto about separate pivot axes disposed generally vertically, the pivot axes of said mirrors being disposed in spaced parallel relation to each other, and means connecting said mirrors to each other so that movement of one mirror relative to said support member results in simultaneous movement of the remaining mirrors in the same direction about their respective axes, and a bracket member



support member relative to said bracket member about a generally horizontal axis.

4,052,125

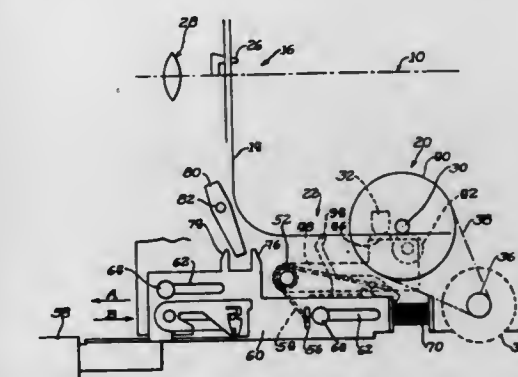
STARTING AND STOPPING DEVICE FOR SOUND MOTION PICTURE CAMERA

Takao Ishibashi, Higashiyama, Japan, assignor to Nihon Beru-Haneru Kabushiki Kaisha, Higashimurayama, Japan
Continuation of Ser. No. 488,870, July 15, 1974. This application
Apr. 19, 1976, Ser. No. 678,275

Claims priority, application Japan, July 31, 1973, 48-90966
Int. Cl.² G03B 31/02

U.S. Cl. 352-29

1 Claim



1. In a motion picture camera having an exposure station and a sound station through which a sound film is transported for simultaneous recording thereon of pictures at the exposure station and sound at the sound station; a film loop being defined by the film in a path between the stations; a film transport mechanism for intermittently moving film through said exposure station and a film transport mechanism displaceable into and out of film engagement for constantly moving the film through said sound station by respective motor means; and a starting and stopping device for controlling said film transport mechanisms comprising;

camera actuating means movable between a first position for camera operation and a second position for camera inoperation; a pivotable start lever displaceable from a first orientation to a second orientation responsive to displacement of said camera actuating means from said first position to said second position; slide plate means driven by said movable camera actuating means and including means for engaging and positioning said start lever from one of said orientations to the other of said orientations after initial movement of said camera actuating means from a corresponding one of said positions toward the other of said positions; biasing means coupled to an end of said start lever opposite said slide plate means engaged end for causing complete movement of said start lever upon at least partial movement of said camera actuating means from one position to another position.

toward another following initial displacement by said slide plate means; and means connected to said camera actuating means for causing said displaceable film transport mechanism to be moved into film engagement prior to complete actuation of said start lever and actuation of said intermittent film transport mechanism and to be moved from film engagement prior to de-actuation of said start lever and said latter film transport mechanism; whereby the film loop between the exposure and sound stations is maintained substantially constant upon starting and stopping of the camera.

4,052,126

MOTION PICTURE CAMERA

Otto Freudenschuss, and Gerd Klitzig, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

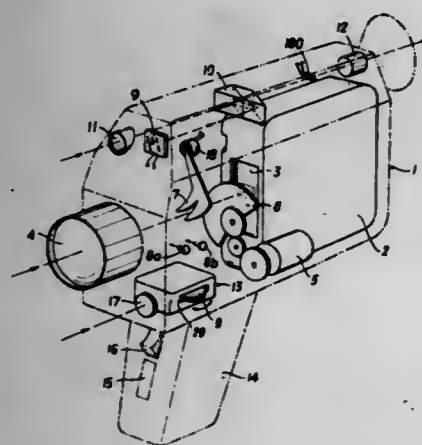
Filed Jan. 23, 1976, Ser. No. 651,823

Claims priority, application Austria, Jan. 24, 1975, 522/75

Int. Cl.² G03B 41/00

U.S. Cl. 352-84

17 Claims



1. A motion picture camera comprising, in combination, a film transport mechanism, an electric motor for driving said film transport mechanism, an automatic aperture control circuit, an electronic speed control circuit for said motor, a first actuable adjusting element which during actuation conditions said electrical speed control to increase continuously the speed of said motor to a first selected speed level, a second actuable adjusting element which during actuation conditions said electrical speed control to decrease continuously the speed of said motor to a second selected speed level, means in said speed control circuit for resetting said motor speed to said normal film transport speed when the operation of said camera is terminated, and a picture frequency indicator for displaying the selected picture frequency accessible to the camera operator at least during the operation of the camera.

4,052,127

DEVELOPING SYSTEM

Shoji Kuroishi, Yokohama; Tsuguo Kimura, Zushi; Masami Emoto, Yokohama, and Shiro Yamamoto, Tokyo, all of Japan, assignors to Ricoh Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 435,270, Jan. 21, 1974, abandoned. This application July 7, 1975, Ser. No. 593,293

Claims priority, application Japan, Jan. 24, 1973, 48-10033; May 7, 1973, 48-51007

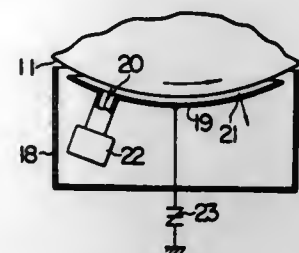
Int. Cl.² G03G 15/06

U.S. Cl. 355-3 DD

10 Claims

1. A developing system for electrophotographic copying apparatus for the type comprising: a member having a surface of photosensitive material; and means for forming an electrostatic latent image on said photosensitive surface by successive charging and exposure steps; wherein the improvement comprises: developing means for supplying a developer to said member

to develop the latent image, said developing means comprising an electrode disposed in opposing relationship with the surface of said member with the developer interposed therebetween; and



means for permitting the induced potential on the electrode from said electrostatic latent image to float below a given value, said permitting means comprising constant voltage means connected between said electrode and ground for preventing said induced potential from exceeding said given value.

4,052,128

METHOD OF MOVING A DOCUMENT FOR STATIONARILY EXHIBITING BOTH SIDES THEREOF

John S. Burton, Los Angeles, and Ronald L. Whitney, San Fernando, both of Calif., assignors to Terminal Data Corporation, Woodland Hills, Calif.

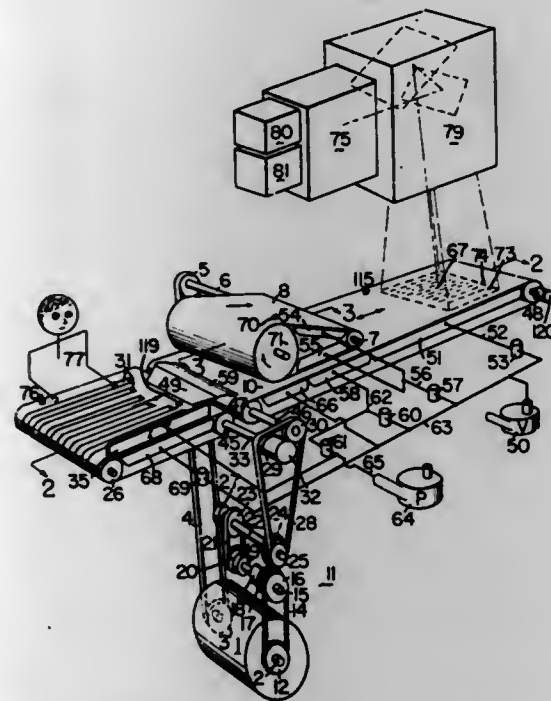
Continuation of Ser. No. 405,354, Oct. 11, 1973, abandoned.

This application Nov. 25, 1974, Ser. No. 526,491

Int. Cl.² G03B 27/32; B65H 29/66

U.S. Cl. 355-77

3 Claims



1. The method of moving a document for stationarily exhibiting both sides thereof, which includes, in order, the steps of: a. planarily translating said document while flat forward over a path to an exhibiting position (67), and stopping it, b. planarily translating said document while flat backward from said exhibiting position over substantially the same said path, c. curvilinearly turning said document over while it is completing the backward translation, d. returning said document to said path at an inclination thereto, and e. again planarily translating said document while flat forward over said path to the exhibiting position, and again stopping it.

4,052,129

METHOD OF AND APPARATUS FOR MEASURING THE WAVELENGTH OF A SOURCE OF RADIANT ENERGY

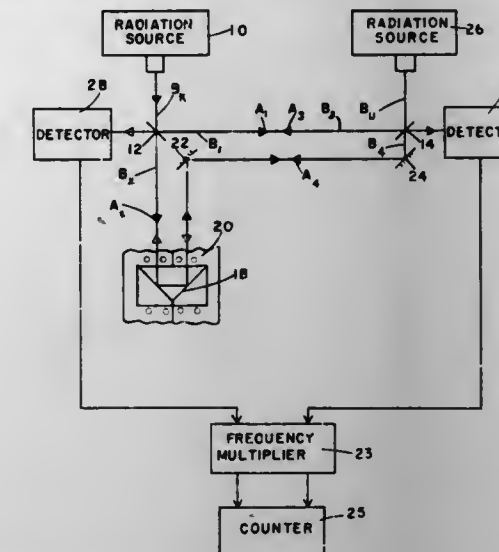
Arthur L. Schawlow, and Frank V. Kowalski, both of Stanford, Calif., assignors to Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Aug. 9, 1976, Ser. No. 712,934

Int. Cl.² G01B 9/02

U.S. Cl. 356-106 R

10 Claims



1. The method of measuring the wavelength of radiant energy which comprises the steps of generating a first beam of energy from a source of known frequency, splitting said first beam to form two beams following two different paths, varying the length of one of said paths, recombining said two split beams from said known source, detecting the number of fringes generated by the interference of said two beams as the one path length is varied, generating a second beam from a source of unknown frequency, splitting said second beam to form two beams following two different paths, varying the length of one of said second beam paths an amount corresponding to the variance of the path length of said beam from said known source, recombining said two beams from said unknown source, detecting the number of fringes generated by interference of said two beams from said unknown source as the path lengths are varied, and comparing the number of fringes from the known source and unknown source beams.

4,052,130

WAX APPLICATION DEVICE

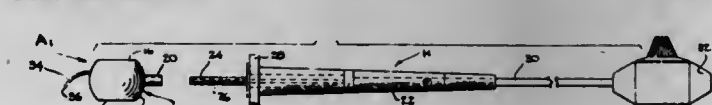
Bruce Jan Forman, 1101 Palms Blvd., Venice, Calif. 90291

Filed Dec. 1, 1975, Ser. No. 636,694

Int. Cl.² A46B 11/08; A47L 13/02; B43M 1/02

U.S. Cl. 401-2

27 Claims



1. An article for depositing a hot wax substance on a substrate in a desired pattern and which utilizes no external source of pressure for moving the substance, said article comprising: a. a housing having a side wall and a bottom wall forming a reservoir therein for retaining a wax substance in a relatively liquid state, b. handle means located on said housing, c. spout means extending outwardly from said housing and extending downwardly therefrom and having an outer end terminating in an aperture capable of depositing said wax substance on said substrate, d. a collecting tube communicating with said spout means

and extending downwardly in essentially a vertical direction in said reservoir when said bottom wall is in an essentially horizontal plane and below the surface of a wax substance located in said reservoir and having a lower end terminating in an inlet opening somewhat in close proximity to said bottom wall,

e. said collecting tube having a central duct of sufficiently small diameter to cause a type of capillary action therein to cause a capillary rise of the wax substance therein without an external source of pressure such that the level of the wax substance in said collecting tube will always be at least slightly above the level of the wax substance in said reservoir when the level of wax substance in said reservoir is essentially horizontal, and f. arcuate connecting means connecting said collecting tube and said spout means such that the level of the wax substance in the collecting tube is below said arcuate connecting means but capable of entering the connecting means and spout means on tipping of the housing and without an external source of pressure, said spout means having a relatively small interior diameter approximating that of the collecting tube, so that when said housing is tilted downwardly in the direction of the end of said spout means and the outer end of the spout means is below the lower end of said collecting tube, the wax substance will flow evenly and smoothly in a controlled manner from said collecting tube through said connecting means and spout means to said substrate by a siphoning type action and which siphoning action and the flow of wax substance through said spout means will substantially immediately close upon tilting of the housing to its initial upright position.

4,052,131
PAVING STONE

Paul E. Lowrigkeit, Gruner Jagerweg 11, 3146 Adendorf, Germany

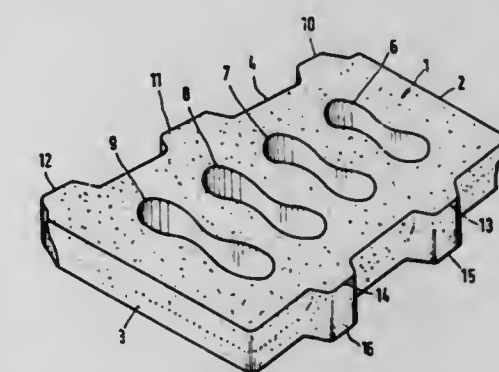
Filed Apr. 23, 1976, Ser. No. 679,855

Claims priority, application Germany, Apr. 30, 1975, 2519225

Int. Cl.² E01C 5/00

U.S. Cl. 404-34

10 Claims



1. A paving stone for stabilizing soils with natural plant growth, the paving stone comprising a slab of substantially even thickness and having substantially flat upper and lower surfaces, a pair of oppositely disposed side walls and a pair of oppositely disposed end walls, and a plurality of elongate apertures extending from the upper surface to the lower surface, the cross-section of the apertures increasing in size from the upper toward the lower surface, the side and end walls being withdrawn inwardly in downward direction toward the lower surface, said paving stone being characterized in that said slab including webs defined between adjacent apertures and the side and end walls each include an upper curved roof-type projecting edge, the walls of the apertures, as seen in cross-section, being arcuately bent inwardly toward their upper ends, and the side surfaces being curved outwardly toward their upper ends whereby the radius of curvature decreases toward the upper surface of the stone, one of said

end walls is shorter than the other so that the body of the stone is of a substantially trapezoidal configuration, the end walls are parallel to each other and the elongate direction of the apertures extends parallel to the end walls so that when arranging several paving stones side wall to side wall with the shorter end walls of all stones on one side, and the longer end walls of all stones on the opposite side, the assembly of paving stones covers an arcuate area, and when arranging several paving stones side wall to side wall with the shorter end walls of the stones alternately disposed on one side and on the opposite side with respect to the longitudinal extension of the stone assembly, the paving stones cover a substantially straight-line area.

4,052,132

METHOD AND APPARATUS FOR DRILLING FINE HOLES IN FRANGIBLE WORKPIECES

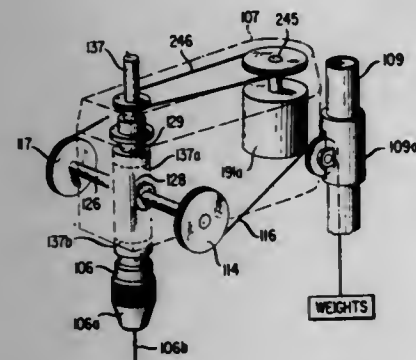
William L. Oates, Mount Harmony Road, Bernardsville, N.J. 07924

Filed Nov. 10, 1975, Ser. No. 630,189

Int. Cl.² B23B 35/00

U.S. Cl. 408—1 R

16 Claims



1. A method of drilling holes or indentations in a frangible workpiece in accordance with a preselected program which comprises the steps of:

clamping said frangible workpiece on a work surface beneath a drill having a rotatable drill bit, driving said drill bit to rotate about its axis, operating dual controls to impose a pecking motion in said drill bit in relation to said work surface, wherein one of said dual controls raises and lowers said drill bit in vertical motion applying pressure in relation to said work surface by a combination of gravity and the addition and subtraction of weights, and the other of said dual controls drives a master cam to rotate in mechanically coupled relation to modulate the vertical motion of said drill bit, the rotation of said cam and the excursions of said drill bit initiating relay operations to perform one or more functions in accordance with said program, wherein the said relay operations include the following functions:

- shifting the speed of rotation of said drill bit about its axis from an initial low rate to a high rate,
- in synchronism with (a), subtracting weights in said one dual control to lessen pressure on the drill bit for its final descent into said workpiece,
- at a point in the final descent of said drill bit just prior to contact with said workpiece, shifting the speed of rotation of said master cam from a brisk initial rate to a relatively low rate for the critical breakthrough period at the end of said program, and
- returning said drill including said drill bit to condition for reoperation.

4,052,133

CORROSION AND ABRASION RESISTANT CENTRIFUGAL PUMP

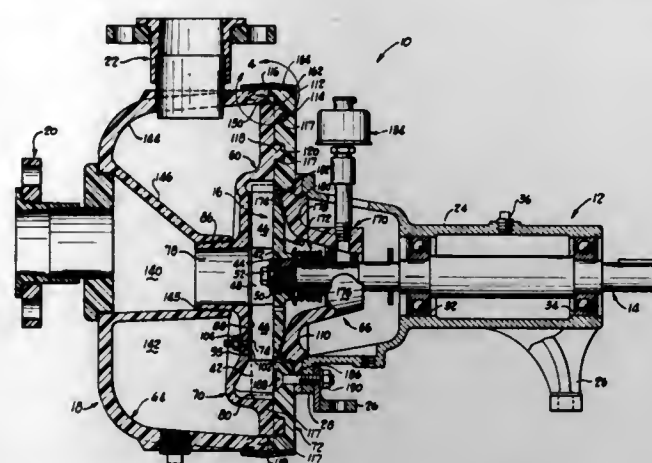
Tommy W. Yeater, Mansfield, Ohio, assignor to The Gorman-Rupp Company, Mansfield, Ohio

Filed Nov. 12, 1975, Ser. No. 631,216

Int. Cl.² F04D 7/06

U.S. Cl. 415—200

16 Claims



- A centrifugal pump comprising:
 - an impeller;
 - first and second molded nonmetallic, corrosion resistant, pumping chamber defining members;
 - one of said first and second members defining a volute wall portion bounding said chamber;
 - said impeller supported for rotation about an axis extending through said members and disposed in the chamber defined by said first and second members;
 - a cutwater between said first and second members and extending from said volute wall portion, said cutwater composed, at least in part, of a corrosion and wear resistant material; and,
 - means for connecting said cutwater to one of said first and second members, said connecting means comprising a bonding material between said cutwater and said one member;
 - one of said cutwater and one of said members including a projecting land portion and the other of said cutwater and said one member defining a groove conforming to and receiving said land portion, said bonding material disposed at least in part between said projecting land portion and said groove.

4,052,134

VERTICAL AXIS WIND TURBINE MOTOR

Rollin Douglas Rumsey, 148 Summer St., Buffalo, N.Y. 14222

Filed Jan. 15, 1976, Ser. No. 649,257

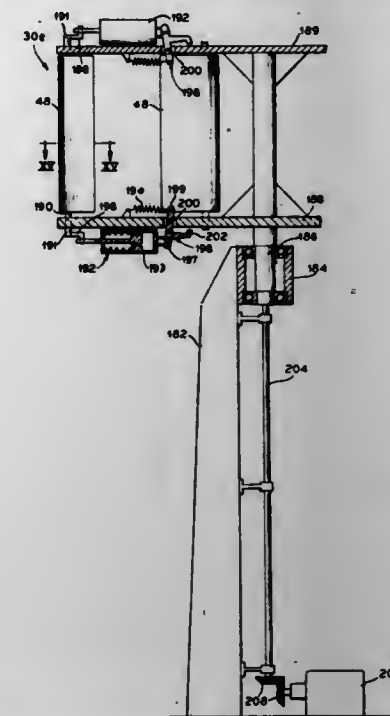
Int. Cl.² F03D 7/06

U.S. Cl. 416—119

28 Claims

- A wind power conversion turbine comprising:
 - a rotary body;
 - means supporting said body for rotation about a vertical axis;
 - a plurality of substantially upright propulsion vanes swingably carried by said body on individual axes substantially spaced from said vertical axis and circumferentially spaced from one another about an open space;
 - said vanes having first generally radially outwardly facing surfaces and second generally radially inwardly facing surfaces, whereby the first surfaces propulsively intercept thrusting air on the windward side of said body and air passing between the spaced vanes and sweeping across the open space propulsively thrusts against said second surfaces of the vanes on the leeward side of the body, thereby converting wind energy into torsional force to drive the turbine rotatably about said vertical axis;
 - feathering means urging the propulsion vanes into tangential position relative to the circumference of the turbine while allowing deflection of the propulsion vanes to the leeward under wind loads to limit torque developed by said vanes

to limit rotational speed of the turbine and to protect against damaging wind loads; and
a shock absorbing means having one end thereof secured to said body and having a second end connected to a pivot means, said pivot means comprising the individual axis for



said propulsion vanes, wherein said shock absorbing means is arranged to retard wind induced swinging movements of the vanes away from their tangential position as relative wind direction shifts through each revolution of the rotary body.

4,052,135

CONTROL SYSTEM FOR HELICAL SCREW COMPRESSOR

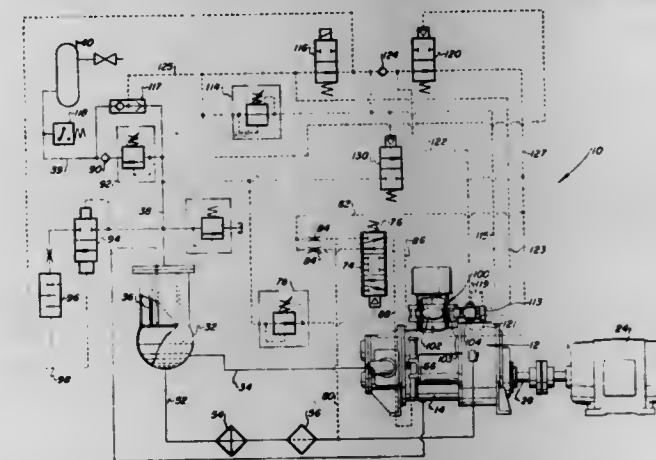
John C. Shoop; Roger L. Post, and Michael G. Herschler, all of Quincy, Ill., assignors to Gardner-Denver Company, Dallas, Tex.

Filed May 11, 1976, Ser. No. 685,229

Int. Cl.² F04B 49/02, 49/08

U.S. Cl. 417—295

9 Claims



1. A helical screw compressor and control system comprising in combination:

- a helical screw gas compressor operably connected to deliver compressed gas to a service line and characterized by a casing having a pair of parallel intersecting bores, a gas inlet port, and a gas discharge port, a pair of intermeshing screw rotors disposed in said bores, auxiliary ports opening into said casing for bypassing a portion of the gas throughput of said compressor, and a rotary valve for opening and closing said ports to regulate the gas throughput capacity of said compressor;
- a pressure fluid operated actuator for rotary said rotary valve;
- an inlet throttling valve including pressure fluid operated actuator means for controlling the movement of said

throttling valve to modulate the flow of inlet gas to said compressor;

control means responsive to a first pressure condition in said service line and including valve means for controlling the flow of pressure fluid to said actuator to cause said rotary valve to regulate the gas throughput of said compressor to maintain a substantially constant predetermined pressure in said service line from a full capacity operating condition to a first reduced capacity operating condition when the demand for compressed gas is less than the full capacity of said compressor;

a first pressure control valve for sensing the pressure condition in said service line and for providing a pressure signal to said valve means to effect the movement of said rotary valve when the pressure condition in said service line tends to vary from said predetermined pressure; and, further control means including a second pressure control valve responsive to a pressure condition in said service line greater than the pressure condition required to effect movement of said rotary valve for providing a pressure signal to said actuator means to effect the throttling of inlet gas flow to said compressor by said throttling valve to further reduce the gas throughput of said compressor.

4,052,136

MARINE STOVE SAFETY CONTROLS

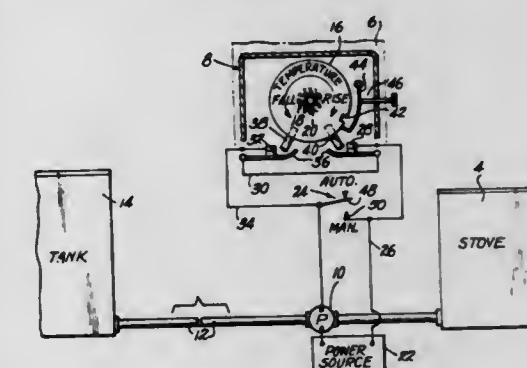
Ralph L. Ulrickson, Box 418, Sitka, Alaska 99835

Filed Mar. 22, 1976, Ser. No. 669,023

Int. Cl.² F23N 5/00; G05D 23/00

U.S. Cl. 431—77

1 Claim



1. In a safety control system for an oil burning heater having an oil supply conduit and control means therein for controlling flow of oil therethrough, the improvement comprising:

electrically operated means for actuating said control means; temperature responsive thermostatic means positioned to sense a temperature that is indicative of the heat produced by said heater, said thermostatic means including a movable member;

means responsive to movement of said member to actuate said electrical means to stop flow of oil in said conduit when the sensed temperature reaches a predetermined low temperature or a predetermined high temperature; manually releasable means engageable with said movable member to lock it in its position at said predetermined high temperature;

said member being mounted for rotation about an axis with pin means extending radially therefrom; said means responsive to movement of said member being switch means arranged in the path of movement of said pin means; and said member being provided with a peripheral notch, said manually releasable means comprising a movable arm adjacent said member and having a portion projectable into said notch when said member is in said high temperature position, means biasing said arm toward said member, and means for manually retracting said arm from said notch.

4,052,137

CORE MOLDING MACHINE

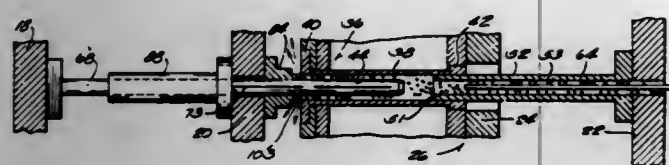
Jürgen R. Pietzner, Sheboygan Falls, Wis., assignor to Kohler General, Inc., Sheboygan Falls, Wis.

Filed Nov. 4, 1975, Ser. No. 628,636

Int. Cl.² B29F 1/06

U.S. Cl. 425-577

19 Claims



1. Core molding apparatus comprising a female die having a mold cavity therein which has two open portions positioned opposite each other, an end probe movably mounted adjacent to one open portion and movable into and out of said cavity through said open portion, the portion of said end probe which enters said cavity comprising a core end boundary surface, said end probe having a duct therein which communicates into said cavity when said end probe is within said cavity, means operable to move said end probe into and out of said cavity, means operable to feed plastic material into said duct when said end probe is within said cavity to fill said cavity with plastic material, a center probe movably mounted adjacent to the other open portion of said cavity and movable into and out of said cavity through said other open portion far enough to abut against the innermost end of said end probe, the portion of said center probe which enters said cavity comprising a core boundary surface, the end of said center probe comprising a plug coacting with the open end of said duct in said end probe to thereby close said open end, and means operable to move said center probe into and out of said other open portion of said cavity.

4,052,138

METHOD OF FIRING COAL BOILER TO PRODUCE SECONDARY FUEL GAS

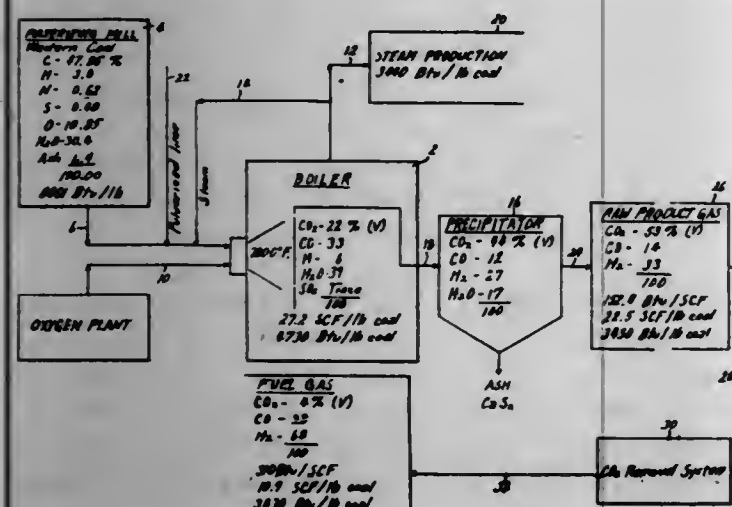
Joseph F. Gieck, 645 W. 59th Terrace, Kansas City, Mo. 64113

Filed Mar. 8, 1976, Ser. No. 664,563

Int. Cl.² F23L 7/00

U.S. Cl. 431-4

5 Claims



1. A method of firing a coal-fired boiler as used in the production of steam comprising:

- introducing coal in pulverized form into the firebox of said boiler in an amount greater than would be required to enable said boiler to produce steam at its rated capacity if an amount of oxygen were introduced sufficient to produce full combustion of said coal, and
- introducing oxygen into said firebox, and burning said coal in the presence thereof, in quantities insufficient to produce full combustion of said coal, whereby the proportion of the total heat content of said coal released as heat

by the resulting partial combustion of said coal is reduced, and the gaseous products of said partial combustion contain quantities of carbon monoxide which are combustible and may be utilized as fuel gas, and selecting proper coal-oxygen proportions, such that the amount of heat released by said partial combustion is sufficient to enable the boiler to produce steam at its rated capacity while still producing gases containing useful quantities of combustible carbon monoxide.

4,052,139

METHOD AND APPARATUS FOR IMPROVING THE ENERGY YIELD OF A REACTION

Pierre Paillaud, 14930 Eterville par Maltot (Calvados), and Joel Raymond, 177, rue de Bretagne, 14760 Brettville sur Odon (Calvados), both of France

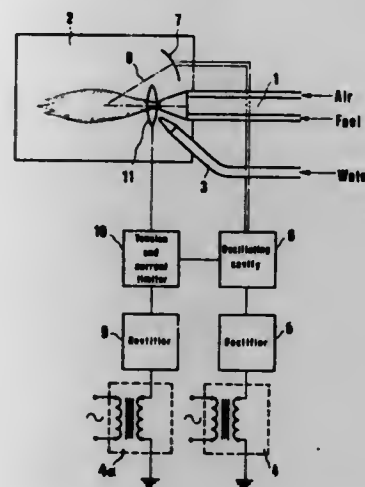
Filed Nov. 12, 1975, Ser. No. 631,226

Claims priority, application France, Nov. 12, 1974, 74.37320

Int. Cl.² F23B 7/00

U.S. Cl. 431-2

17 Claims



1. A method of improving the energy yield of a reaction between reactants, comprising providing electromagnetic radiation the frequency of which substantially corresponds to the maximum thermal or ionic motion of the molecules of said reactants, and directing said electromagnetic radiation towards said reactants while allowing the reaction to proceed.

4,052,140

METHOD OF AND APPARATUS FOR GENERATING A HOT GAS

John Highley, Cheltenham, England, assignor to Coal Industry (Patents) Limited, London, England

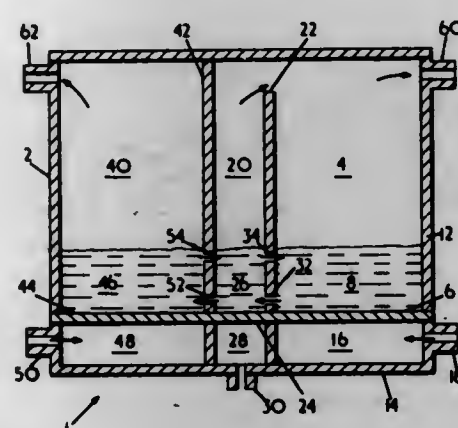
Filed Apr. 19, 1976, Ser. No. 677,869

Claims priority, application United Kingdom, May 28, 1975, 23356/75

Int. Cl.² F23D 3/40

U.S. Cl. 431-7

8 Claims



1. A method of generating a hot gas including the steps of forming a first fluidized bed of particulate material, introducing

a fuel into the first bed, burning the fuel in the first bed to generate heat, forming a second fluidized bed of particulate material, passing a gas to be heated through the second bed, and circulating heat conductive particulate material between the first and second beds to heat the second bed to transfer heat to the gas passing therethrough thereby to generate a hot gas.

4,052,141

ATMOSPHERIC BURNER FOR HEATING FURNACES

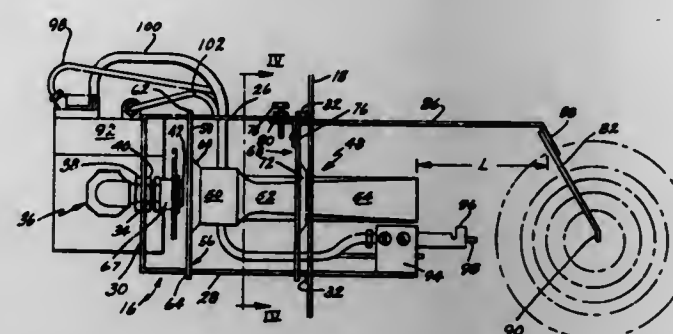
Jay Dudbeker, Holland, and Charles E. Isaacson, Hamilton, both of Mich., assignors to Lear Siegler, Inc., Holland, Mich.

Filed Aug. 21, 1975, Ser. No. 606,703

Int. Cl.² F23D 11/02; F23C 5/02

U.S. Cl. 431-167

11 Claims



1. An inshot atmospheric gas burner assembly, comprising: an orifice holder; an open sided burner frame positioned on said orifice holder; a venturi assembly having an inlet and an outlet supported by said burner frame in front of said orifice holder, the centerline of said venturi assembly being coincident with the centerline of said orifice holder; a primary air shutter assembly adjustably disposed on said orifice holder for movement towards and away from said venturi assembly inlet to thereby define an adjustable primary air passage; an annular collar positioned around and attached to said burner frame and adapted to attach the burner frame to a furnace; a secondary air shutter assembly adjustably supported on said burner frame between said venturi assembly inlet and said annular collar and including an annular ring concentrically positioned around said venturi assembly adjacent said annular collar to thereby define an adjustable secondary air passage with said annular collar; and a target assembly supported by said burner frame in line with and spaced from the outlet of said venturi assembly and adapted to be impinged upon by the flame from the burner assembly.

4,052,142

AIR VELOCITY BURNER

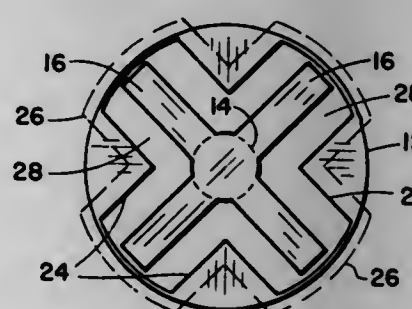
Robert D. Reed, and Robert E. Schwartz, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed May 17, 1976, Ser. No. 686,750

Int. Cl.² F23D 15/00

U.S. Cl. 431-202

10 Claims



1. In a flare stack for the atmospheric combustion without

smoke of waste combustible gases, said stack comprising an outer vertical cylindrical conduit, an inner smaller vertical conduit for the upward flow of combustible gases, and a burner connected to the top of the inner conduit, near the top of the outer conduit, the flow of primary combustion air being through the annular space between said outer and inner conduits;

the improvement comprising an air velocity burner comprising:

- said burner comprising a plurality of radial arms, attached to said inner vertical conduit;
- each of said radial arms including ports along its length, said ports directed upwardly of said arms;
- a plurality of baffles equal in number to said plurality of radial arms; each baffle of the shape of a triangle with its base attached to the top edge of said outer cylindrical conduit; the peak angle of said triangle being substantially equal to the angle between adjacent radial arms of said burner, said baffles positioned symmetrically in the spaces between said arms;
- each of said baffles including at least a triangular metal sheet substantially in the plane of said radial arms; whereby the upward flow of primary combustion air is restricted to flow through the narrow V-shaped spaced between the edges of said baffles and the sides of said arms; whereby, because of the restriction in flow area, the flow of velocity of said primary combustion air is increased and there is turbulent mixing of said primary air and said fuel flowing from said ports; and whereby the flow velocity of said primary air over the edges of said baffles causes secondary air to be induced and turbulently mixed with said fuel and primary air.

4,052,143

GAS COMBUSTION PLANT

Jan Sandviknes, Oslo, Norway, assignor to Saxlund A/S, Akland, Norway

Continuation of Ser. No. 506,537, Sept. 16, 1974, abandoned.

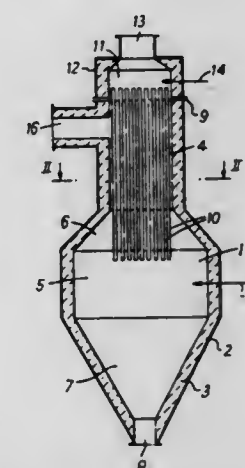
This application Apr. 6, 1976, Ser. No. 674,119

Claims priority, application Norway, Oct. 9, 1973, 733913

Int. Cl.² F23D 11/44

U.S. Cl. 431-215

5 Claims



1. Gas combustion plant comprising a combustion chamber, a plate closing one end of said combustion chamber, a hood being mounted on said plate defining a mixing chamber having a gas inlet opening, a plurality of tubes each having an inlet end within said mixing chamber and extending through said plate into and longitudinally of a portion of said combustion chamber adjacent said plate and ending in an axially facing mouth orifice opening into said combustion chamber, said tubes being spaced apart from one another defining a space outside of said tubes within said combustion chamber with said space opening into the portion of said combustion chamber into which said tubes open to provide an open gas exchanging communication between said space and said portion of said combustion chamber.

ber, said combustion chamber having an outlet for the hot combustion gases from said combustion chamber, positioned alongside said tubes whereby said gas will flow through said tubes into said combustion chamber and the hot combustion gases will flow through said space outside of said tubes pre-heating the gas therein, to said outlet, said combustion chamber having a cylindrical portion merging into a flaring portion having flared walls and thus gradually increasing cross-section, said tubes being uniformly distributed over the cross-section of said cylindrical portion and extending into said flaring portion.

4,052,144

FUEL COMBUSTOR

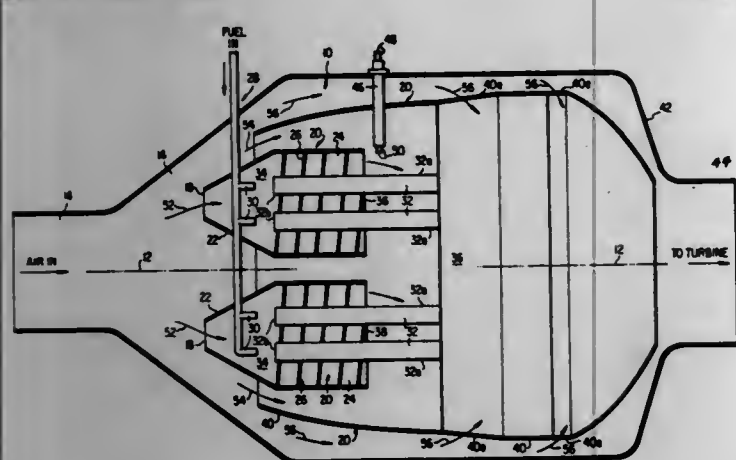
Cecil J. Marek, Shaker Heights, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 31, 1976, Ser. No. 672,210

Int. Cl.² F34D 15/02; F23R 1/00

U.S. Cl. 431—352

3 Claims



1. A combustor comprising an air flow inlet and an outlet, a fuel supply, a plurality of mixing chambers disposed in said combustor, a fuel inlet manifold for providing fuel at respective inlets of said mixing chambers, said chambers being in the path of air from said air flow inlet, a portion of the air from said air flow inlet bypassing said mixing chambers, a plurality of heat pipes each having one portion in the path of the fuel and air as it is mixed in a respective one of said mixing chambers and another portion downstream of said mixed air fuel adjacent the zone of combustion during operation, thereby in operation to transfer heat of combustion upstream of enhance fuel vaporization and complete combustion.

4,052,145

APPARATUS FOR MANUFACTURING SLIDE FASTENER FILAMENT

Turo Stenhall, 32740 Acton, Finland

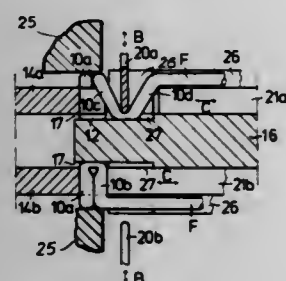
Filed Mar. 1, 1976, Ser. No. 662,415

Claims priority, application Finland, Mar. 5, 1975, 750640

Int. Cl.² B29D 5/00

U.S. Cl. 425—392

7 Claims



1. In an apparatus for manufacturing part of a slide fastener, a rotary setting gear wheel having a central axis and a pair of opposed side surfaces, a filament-deforming means for deforming an initially substantially straight filament portion into a portion of substantially V-shaped configuration, and a pusher

means for pushing together, into side-by-side relation, legs of the V-shaped filament portion deformed by said deforming means, said deforming and pusher means both being situated in a radial plane which contains said axis and being substantially perpendicular with respect to each other, and moving means operatively connected on the one hand with said deforming means and on the other hand with said pusher means for moving said deforming means during deforming of a filament portion, substantially parallel to said axis at a location adjacent a peripheral edge of the gear wheel through one plane containing one of said side surfaces of the gear wheel toward another plane containing the other of the side surfaces of the gear wheel until an end of said deforming means is situated at the region of the latter plane, and for moving said pusher means substantially radially toward and away from said axis.

4,052,146

EXTRUSION PACK FOR SHEATH-CORE FILAMENTS

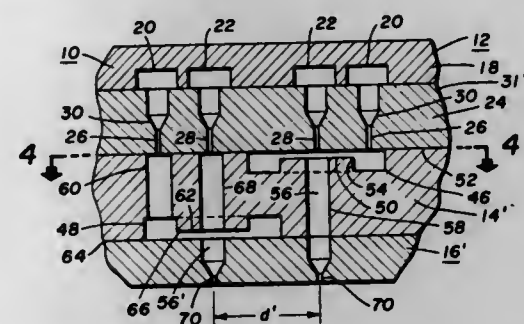
Ernest M. Sternberg, Chapel Hill, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 26, 1976, Ser. No. 745,333

Int. Cl.² D01D 3/00

U.S. Cl. 425—463

8 Claims



1. An extrusion pack for production of sheath-core filaments comprising:

a stacked assemblage of a stream proportioning means, a stream conjugating means, and a spinneret means; said stream proportioning means having first supply channels for receiving and discharging a first polymer to form sheaths and second supply channels for receiving and discharging a second polymer to form cores; said stream conjugating means positioned adjacent said stream proportioning means has means defining upper and lower chambers, said upper chambers are connected to certain of said first supply channels, contained within said upper chambers are upper sheath forming channels defined by the juncture of said stream conjugating means and said stream proportioning means, said upper sheath forming channels are connected to certain of said second supply channels so that sheath polymer can flow and encapsulate said core polymer, stream discharge passages essentially vertically aligned with said certain of said second supply channels and connected to said upper sheath forming channels, said lower chambers have sheath passages connected to certain other of said first supply channels, contained within said lower chambers are lower sheath forming channels defined by the juncture of said stream conjugating means and said spinneret means, said lower sheath forming channels are connected to core passages essentially vertically aligned with certain other of said second supply channels for receiving core polymer so that sheath polymer can flow and encapsulate said core polymer; and positioned adjacent said stream conjugating means is spinneret means having capillaries in communication and essentially vertically aligned with respective stream discharge passages and core passages.

4,052,147

BURNER HEAD IN AN OIL BURNER

Jens Nyegaard, Larviksveien 20, 3290 Stavern, Norway

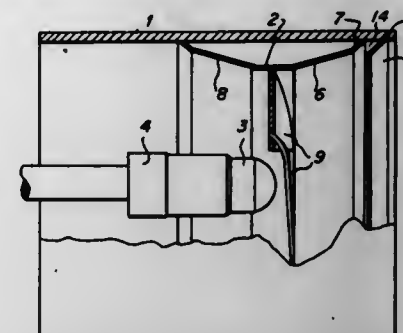
Filed July 14, 1975, Ser. No. 595,433

Claims priority, application Norway, July 15, 1974, 742576

Int. Cl.² F23D 13/40

U.S. Cl. 431—354

5 Claims



1. A burner head in a burner, which head comprises an air supply tube, a turbulator mounted in the said tube and having an oil nozzle arranged in the center line of the burner, wherein a ring element is arranged in the forward part of the air supply tube at a distance from the forward end of the turbulator, said ring element being conical and converging against the flow direction in the burner head and forming with the adjacent inner peripheral wall of the burner head a chamber which is closed in the direction of air flow along said peripheral wall, whereby air that flows along said peripheral wall is pressed into said chamber and turns and by means of said ring element is directed into the burner flame.

4,052,148

INTEGRATED REACTION PROCESS

Anthony Robin Pennell, Gravesend; Peter Leslie Dover, Rochester, and William Martin Davies, London, all of England, assignors to The Associated Portland Cement Manufacturers Limited, England

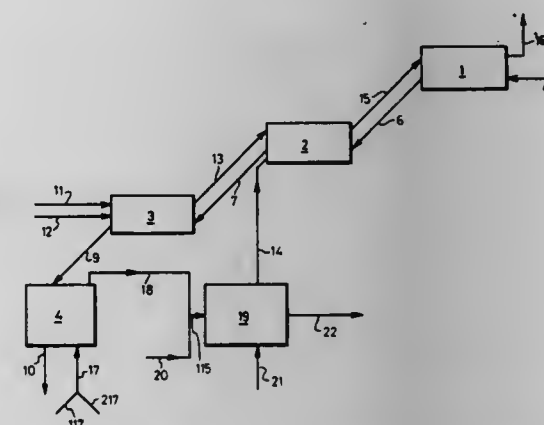
Filed Mar. 4, 1976, Ser. No. 663,753

Claims priority, application United Kingdom, Mar. 12, 1975, 10303/75

Int. Cl.² F24J 1/00; F27B 19/00

U.S. Cl. 432—1

17 Claims



1. A thermal calcination process comprising the steps of:

- passing raw material through at least one heating zone wherein heat energy is applied to produce endothermic change in the material;
- passing the hot material treated in step (a) into a reaction zone wherein further heat energy is separately applied to produce exothermic change in the material;
- passing the still hotter material treated in step (b) through a cooling zone and recovering a cooled reaction product therefrom;
- supplying to said reaction zone a first source of heat energy in sufficient quantity and at a sufficiently high temperature to support said exothermic change; the said endothermic change of step (a) being all dependent upon

at least one source of heat energy other than said first source;

- supplying a second source of heat energy to a boiler and applying said heat energy for raising steam and thereafter for producing at least part of the endothermic change in said material in step (a);
- augmenting said second source of heat energy by adding thereto heat recovered from at least one process zone including heat derived from the reaction zone; and
- employing steam raised in the boiler for the generation of power.

4,052,149

CONTINUOUS CALCINER

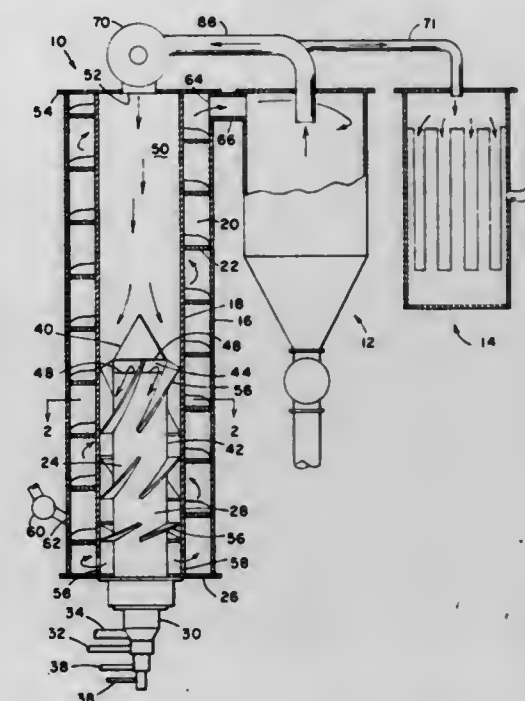
Rodney A. Stilling, Snyder, N.Y., assignor to National Gypsum Company, Buffalo, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,935

Int. Cl.² F27B 15/00; F26B 17/00

U.S. Cl. 432—58

5 Claims



1. Apparatus for uniformly heating a continuous supply of fine particles comprising an elongate cylindrical outer wall, a substantially coaxial elongate cylindrical inner wall within said outer wall, means for directing a flow of material spirally through the elongate space between said inner wall and said outer wall in a direction from a first end of said apparatus to a second end of said apparatus, means for supplying air to within the cylindrical inner wall and conveying said air within said inner wall from said inlet to said first end, means within said inner wall for heating said air within said inner wall, means at said first end for conducting said heated air from within said inner wall to between said inner wall and said outer wall, and means at said first end for continuously feeding said fine particles to be heated into said heated air whereby said heated air conveys said fine particles spirally through the length of said elongate space between said inner wall and said outer wall from said first end to said second end and uniformly heats all of said fine particles, means for removing said heated fine particles from said apparatus, means for separating said fine particles from conveying air and means for returning a substantial portion of said air to be reheated by said heating means.

4,052,150

OIL WETTED FUSER ROLL STRIPPING APPARATUS
Eugene Behun, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1976, Ser. No. 750,790

Int. Cl.² B05C 11/00

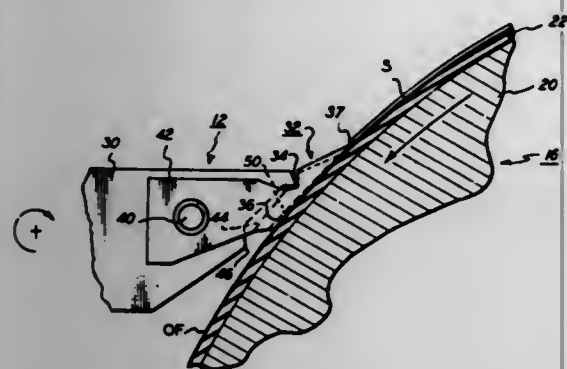
U.S. Cl. 432—60

5 Claims

1. In an apparatus for contact fusing toner particles to paper

support material wherein said apparatus comprises a fusing roll for applying heat and pressure to the particles and paper support material at a nip through which they are passed and which roll is coated with an oil film to prevent toner offset, an improved stripping apparatus for stripping sheets from the wetted fuser roll surface comprising:

stripper finger pad means positioned in close proximity to a moving oil wetted fuser roll surface at the nip exit from which copy sheets are to be stripped,



means for pivotally loading said stripper finger pad means against said oil wetted fuser roll surface, said stripper finger means having a bottom curved pad surface being formed with a channel therein which channel tapers in depth with the maximum depth at the rear thereof to effect hydrodynamic forces being generated by the difference of pressures of the moving oil film within said channel and outside said channel to support said stripper finger pad means.

4,052,151

ORE-PROCESSING SYSTEMS INCLUDING ROTARY KILNS

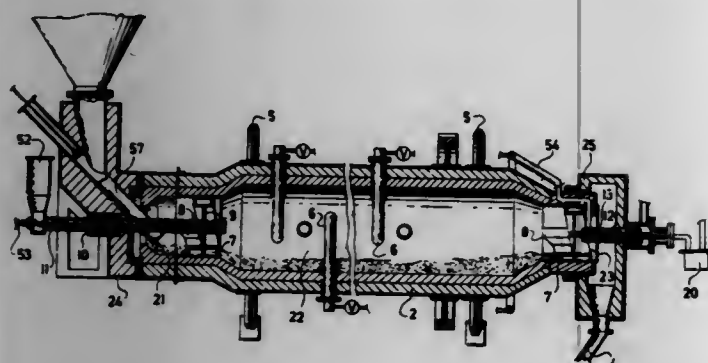
Václav Reichrt; Josef Smálek; Miroslav Pedlík, and Miloslav Alexa, all of Prague, Czechoslovakia, assignors to Vyzkumny ústav kovů, Pánske Brezany, Czechoslovakia
Filed Mar. 4, 1976, Ser. No. 663,712

Claims priority, application Czechoslovakia, Mar. 6, 1975, 1503/75

Int. Cl.² F27B 7/24, 7/08

U.S. Cl. 432—115

15 Claims



1. In a charge processing system including a rotary kiln for heat-treating the charge in a controlled atmosphere, the kiln comprising a main cylindrical processing section in which the charge may be reacted with suitable reagents under elevated temperature and pressure, an inlet zone including a charge-receiving port disposed upstream of the main processing section, an outlet zone including a charge-withdrawal port disposed downstream of the main processing section, means for heating the interior of the main processing zone, first conduit means for introducing reagents into the main processing zone, second conduit means for withdrawing spent reaction gases from the main processing zone, and means for rotating the kiln, the improvement in which the upstream and downstream ends of the main processing section respectively comprise first and second self-contained hollow spiral ducts, the inner ends of the

hollow interior of each of the first and second ducts communicating in gas-tight fashion with the interior of the main processing section, the outer ends of the hollow interior of the first and second spiral ducts individually communicating with the charge-receiving port and the charge-withdrawal port whereby charge introduced into the inlet zone enters the main processing section via the hollow interior of the first spiral duct and charge exiting from the main processing section is conducted to the outlet zone via the hollow interior of the second spiral duct, the charge passing through the hollow interior of the respective first and second spiral ducts completely filling such hollow interior to augment the gas-tight seal between the interior of the main processing section and the respective inlet and outlet zone.

4,052,152

DIRECT FLAME DRYING APPARATUS

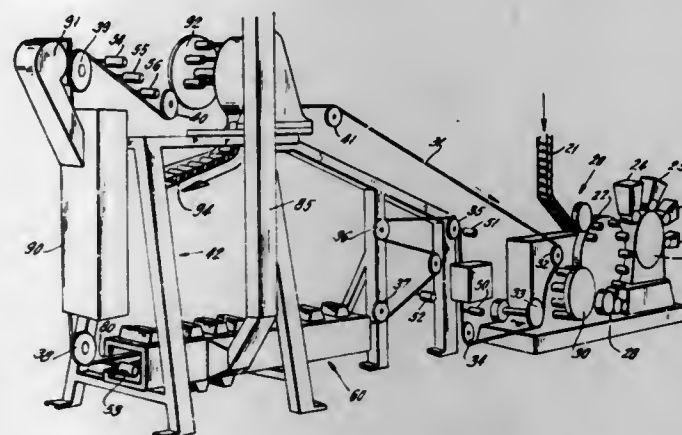
Edward J. Whelan, Hasbrouck Heights, and William L. Douma, West Paterson, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Feb. 18, 1976, Ser. No. 658,902

Int. Cl.² F27B 9/14

U.S. Cl. 432—122

28 Claims



1. A system for decorating hollow cylindrical objects comprising, in combination:

a supply system for continuously supplying hollow cylindrical objects to a discharge region, decorating means receiving hollow cylindrical objects from said discharge region and containing hollow cylindrical object moving means for moving said hollow cylindrical objects from said discharge region, a source of thermally settable decorating medium, and means disposed along the path of movement of said hollow cylindrical objects for applying thermally settable decorating medium from said source of thermally settable decorating medium to at least portions of the outer surface of said hollow cylindrical objects,

a continuously moving conveyor pin chain for conveying hollow cylindrical objects with said decorating medium thereon away from said decorating means; said continuously moving conveyor pin chain comprising a generally closed chain disposed in a generally vertical plane, and having spaced pins extending therefrom in a generally horizontal direction; each of said pins being adapted to receive a hollow cylindrical object thereon and to suspend and move said hollow cylindrical object in the direction of movement of said pin and said chain,

a hollow cylindrical object transfer means for transferring cans from said decorating means to said conveyor pin chain after said hollow cylindrical objects have decorating medium applied thereto,

and a flame drying oven for thermally curing the decorating medium on said hollow cylindrical objects; said flame drying oven comprising an elongated chamber having gas fired burner head means disposed therein and operable to produce an open gas flame jet; said continuously moving conveyor pin chain being disposed to have a travel region

which is parallel to said elongated chamber, with said pins on said chain being disposed within said chamber and moving relative to said burner head means so that said open gas flame jet is applied directly to the decorating medium on the hollow cylindrical objects on said pins for a length of time sufficient to thermally cure said decorating medium;

said oven being spaced from said decorating means by a length of conveyor chain at least sufficient to permit the decorating medium on said hollow cylindrical objects to flow to an evenly distributed condition free of thickened ridges, the rate of movement of said chain, and the length of said burner head means in the direction of movement of said chain being such that said decorating medium on said hollow cylindrical objects is exposed to said open gas flame jet for a time less than about three seconds, and for a time long enough to thermally cure said decorating medium.

4,052,153

HEAT RESISTANT CRUCIBLE

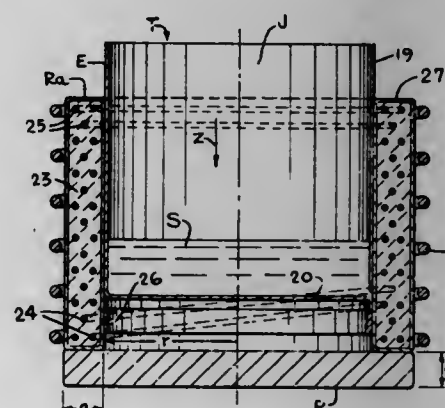
Werner J. Borer, Heggart; Tibor Kugler, Thayngen; Walter Schmidt, and Walter Stahli, both of Schaffhausen, all of Switzerland, assignors to Prolizenz AG, Chur, Switzerland
Filed Feb. 26, 1976, Ser. No. 661,434

Claims priority, application Switzerland, Mar. 6, 1975, 2844/75

Int. Cl.² F27B 14/00, 14/10

U.S. Cl. 432—156

15 Claims



1. A crucible, for use in heating and/or retaining melts at elevated temperatures, comprising in combination:

a holding member composed of a heat-resistant material open at the bottom;
a fire-proof base-plate removably positioned below said holding member and operable to close said bottom; and
a thin-walled insert cup composed of a substance chemically resistant to oxygen and oxidizing substances and being removably supported in said holding member above said base-plate.

4,052,154

APPARATUS FOR HEAT SEALING OF CONTAINER BODIES

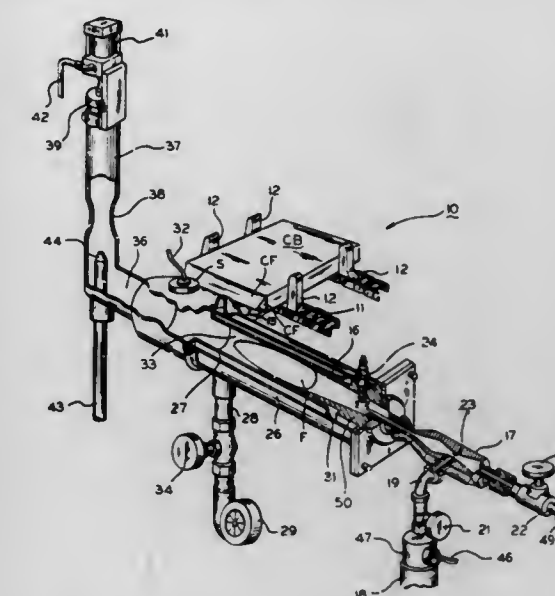
William J. Karpinsky, Audubon, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed May 28, 1976, Ser. No. 690,993

Int. Cl.² F24H 1/00; F24J 3/00

U.S. Cl. 432—222

17 Claims



1. In a machine for bonding selected surfaces of moving container bodies by the application of heat thereto:

a. Nozzle means for directing heated air against the selected surfaces of said moving bodies;
b. a tube for providing a supply of heated air connected to said nozzle means;
c. other means for introducing a temperature modulating source of air remote from the point where heated air is supplied to said tube to control the temperature of the air within said tube and at said nozzle means.

CHEMICAL

4,052,155

ASYMMETRIC SKEIN DYEING

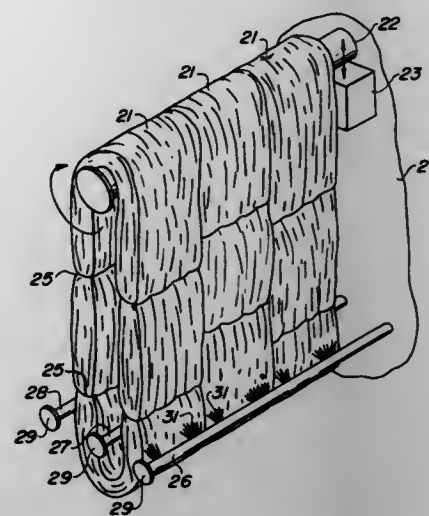
Isadore Rosenthal, Levittown; Lawrence J. Exner, Ambler; Gregory J. Niksa, Collegeville; Warren I. Weiss, Southampton, all of Pa., and Maurice G. Young, Cinnaminson, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 17, 1975, Ser. No. 641,405

Int. Cl.² D06B 1/02, 11/00

U.S. Cl. 8-14

17 Claims



1. A method for asymmetric dyeing of yarn, comprising positioning a skein of yarn for rotation in a vertical plane and while said skein is stationary, applying at least one color contrast dyestuff to at least one discrete location on said skein but to less than the number of locations effective for dyeing across the full width of said skein, said dyestuff being applied simultaneously to at least one discrete exterior location and to at least one discrete interior location on said skein corresponding to said exterior location, and repeating the application of the same or other contrast dyestuff after rotating the skein to one or more other stationary positions, whereby irregular dyeing along the lengths of yarn in the skein is obtained.

4,052,156

PROCESS FOR THE CONTINUOUS DYEING OF WOOL WITH METHYL TAURINO-ETHYLSULFONE DYES

Hans-Ulrich von der Eltz, Frankfurt am Main, and Joachim Walter Lehmann, Kelkheim/Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 6, 1974, Ser. No. 495,295

Claims priority, application Germany, Aug. 8, 1973, 2340044

Int. Cl.² D06P 5/17, 3/10, 1/38, 3/82

U.S. Cl. 8-22

3 Claims

1. A process for the continuous dyeing of textile materials consisting of or containing wool with a reactive dyestuff according to a steam fixation method which comprises impregnating the fibrous material at pH values of from 6.5 to 7.5 with an aqueous liquor containing a reactive dyestuff which contains a methyltaurino-ethylsulphone group, and fixing the dyestuff without intermediate drying of the material by treating with saturated steam at temperatures of from 110° to 120° C.

4,052,157

USE OF WATER-SOLUBLE DISAZO DYESTUFFS FOR DYEING OR PRINTING SYNTHETIC TEXTILE MATERIAL OF POLYAMIDE OR POLYURETHANE FIBERS

Hermann Fuchs, Kelkheim, Taunus, and Klaus Filzinger, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 8, 1975, Ser. No. 638,647

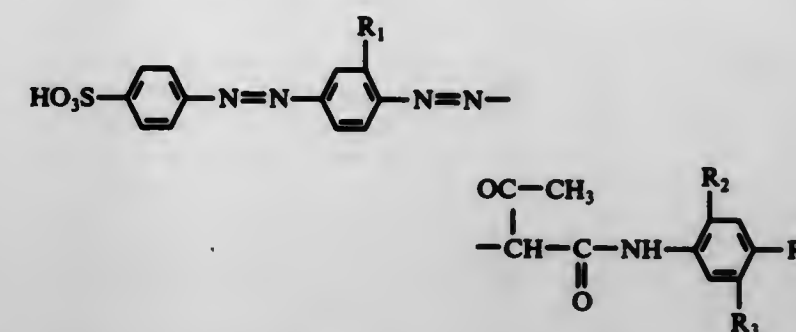
Claims priority, application Germany, Dec. 9, 1974, 2458196

Int. Cl.² C09B 27/00; D06P 1/02

U.S. Cl. 8-41 R

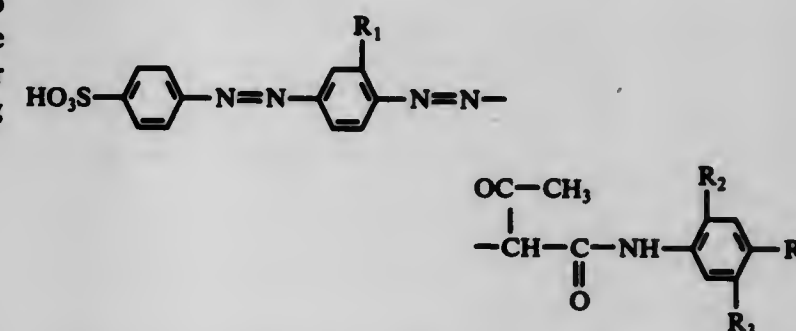
5 Claims

1. A process for the dyeing or printing of a synthetic textile material consisting of or containing polyamide or polyurethane fibers, which comprises coloring the said textile material with a dyestuff of the formula



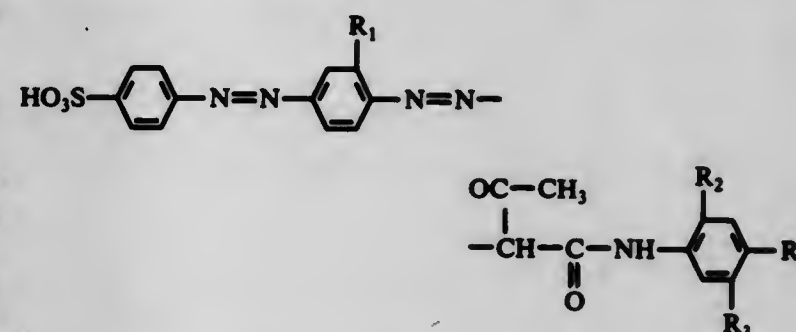
in which R₁ is hydrogen or —SO₃H, R₂ is chlorine or methoxy, and R₃ and R₄ each is hydrogen or methoxy.

4. An aqueous dyebath for the dyeing of synthetic textile material consisting of or containing polyamide or polyurethane fibers, 1000 parts of which consisting of 0.01 to 20 parts of a dyestuff of the formula



in which R₁ represents hydrogen or the sulfonic acid group, R₂ represents chlorine or methoxy, and R₃ and R₄ each represents hydrogen or methoxy, 0.05 to 10 parts of a usual dyeing auxiliary and 0.05 to 10 parts of a usual dispersing agent and, for adjusting the pH, 0.01 to 20 parts of an organic or mineral acid, and the pH value of the dyebath being from strongly acid to neutral.

5. An aqueous printing paste for the printing of synthetic textile material consisting of or containing polyamide or polyurethane fibers, 1000 parts of which consisting of 1 to 50 parts of a dyestuff of the formula



in which R₁ represents hydrogen or the sulfonic acid group, R₂ represents chlorine or methoxy, and R₃ and R₄ each represents hydrogen or methoxy, 250 to 650 parts of a usual thickening agent, 1 to 50 parts of a usual printing auxiliary, 1 to 50

parts of a usual dispersing agent and, for adjusting the pH, 5 to 50 parts of a salt of a weak base and a strong mineral acid or an organic acid, the deficit to 1000 parts being made up by water or thickening agent, and the pH value of the printing paste being from strongly acid to neutral.

4,052,158

TEXTILE FINISHING PROCESS

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 410,643, Nov. 12, 1973, abandoned.

This application Sept. 10, 1976, Ser. No. 722,854

Int. Cl.² D06M 1/00

U.S. Cl. 8-116 P

11 Claims

1. A process for producing a washdurable finish on a textile which comprises applying to the textile an effective amount of:
 - a. at least one free radical polymerizable monomer selected from the group consisting of acrylamide, methacrylamide, N-methylolacrylamide, N-methylolmethacrylamide, N-(alkoxymethyl) acrylamide, diacetone-acrylamide, the methylolated products of diacetoneacrylamide, 2-hydroxyethylacrylate and 2-hydroxyethyl methacrylate;
 - b. at least one co-reactant having a reactive, hydroxy, alkoxy or amino group capable of undergoing acid-catalyzed condensation with a reactive group on said free radical polymerizable monomer (a) provided that said co-reactant is not the same as said free radical polymerizable monomer;
 - c. at least one free radical generating catalyst and at least one acid catalyst, or at least one catalyst having free radical generating and acidic characteristics, and
 - d. subjecting said textile to curing conditions to conjointly effect free radical polymerization and acid-catalyzed condensation reactions.

4,052,159

DYEING PROCESS USING QUATERNARY AMMONIUM SALT AS RETARDER

Ernst Fuerst; Jozsef Gereadas, both of Neustadt; Rudolf Rohlf; Rolf Fikentacher, both of Ludwigshafen, all of Germany, and Herbert Helfert, Trenton, Mich., assignors to BASF Aktiengesellschaft, Rhineland-Pfalz, Germany

Division of Ser. No. 456,907, April 1, 1974, abandoned. This application July 6, 1976, Ser. No. 702,956

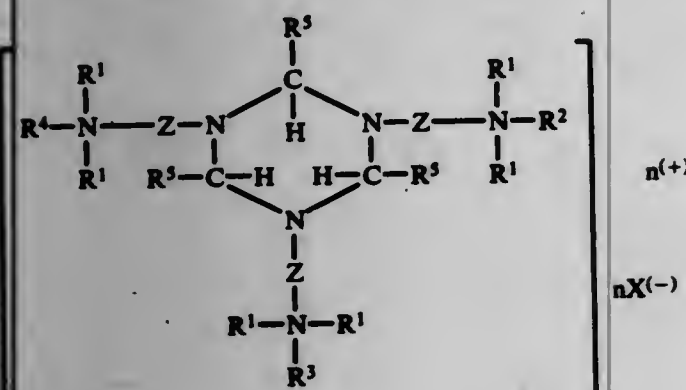
Claims priority, application Germany, Apr. 4, 1973, 2316725; Jan. 31, 1974, 2404511

Int. Cl.² D06P 5/06

U.S. Cl. 8-169

6 Claims

1. In a process for dyeing an anionic polyacrylonitrile fibrous material with a basic dye in the presence of a retarder, the improvement which comprises using as the retarder in said dyeing process a salt containing quaternary ammonium groups and having the formula



in which each radical R¹ is a linear or branched and unsubstituted or hydroxyl-substituted alkyl of one to six carbon atoms or in which two radicals R¹ joined to a common nitrogen atom form therewith a heterocyclic radical of four to seven carbon atoms; R², R³ and R⁴, respectively, are a cyclic, linear or

branched, saturated or olefinically unsaturated and unsubstituted or hydroxyl-substituted alkyl of one to 30 carbon atoms or said alkyl is interrupted by one or more ether bridges, or an unsubstituted, chloro-substituted or alkyl-substitute phenyl or benzyl group of one to twelve carbon atoms in the alkyl substituents, and R³ and R⁴ may also be hydrogen or a free electron pair; R² is hydrogen or alkyl of one to four carbon atoms; Z is an unsubstituted or hydroxyl-substituted alkylene of two to six carbon atoms or said alkylene radical which is interrupted by ether groups; X⁽⁻⁾ is the organic or inorganic anion of an alkylating agent; and n is a number of from 1 to 3.

4,052,160

CORROSION INHIBITORS

Barry Cook, Manchester; John Grey Dingwall, Sale, and Brian Martin Thomas, Stockport, all of England, assignors to Ciba-Geigy Corporation, New York, N.Y.

Filed July 20, 1976, Ser. No. 707,127

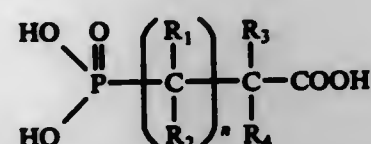
Claims priority, application United Kingdom, July 23, 1975, 30719/75; Apr. 13, 1976, 14966/76

Int. Cl.² C23F 11/16

U.S. Cl. 21-2.7 A

14 Claims

1. A method of treating an aqueous system to inhibit the corrosion of metals in contact therewith and to inhibit the deposition of scale therefrom which comprises adding to the aqueous system a minor proportion of a compound of the formula



wherein n is 0 or 1, and when n is 0, R₃ and R₄ are each hydrogen; or when n is 1, R₁, R₂, R₃ and R₄ are each hydrogen; or when n is 1, R₁, R₂ and R₃ are hydrogen, and R₄ is methyl.

4,052,161

KINETIC ANALYZER

John G. Atwood, Redding; Hamilton W. Marshall, Jr., Ridgefield, and Peter H. Heinz, Trumbull, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

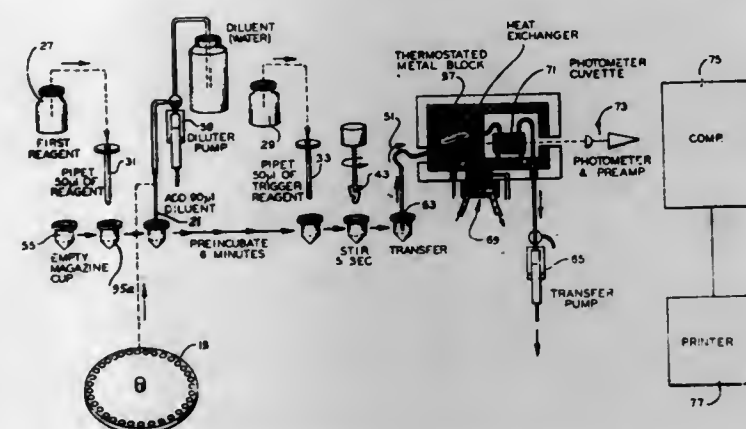
Continuation of Ser. No. 499,602, Aug. 22, 1974, abandoned.

This application July 10, 1975, Ser. No. 594,951

Int. Cl.² G01N 33/16, 21/24, 21/26

U.S. Cl. 23-230 R

49 Claims



1. A method of performing a kinetic analysis in automatic analyzer apparatus comprising automatically carrying out steps comprising in the order stated:

- a. pipetting a first reagent into a reaction cup;
- b. diluting a sample to be analyzed into the cup;
- c. preincubating the sample and first reagent together;
- d. pipetting a second reagent into the cup;

- e. stirring the mixture to start a desired reaction;
- f. transferring the reaction mixture to a photometer system;
- g. continuously observing the absorbance of the reaction mixture for a predetermined observation period during continuance of the reaction;
- h. computing the rate of change of absorbance over the full observation period; and
- i. providing an output indication of the computed rate of change.

4,052,162

MONITORING DEVICE

John Robin Paul Clarke, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

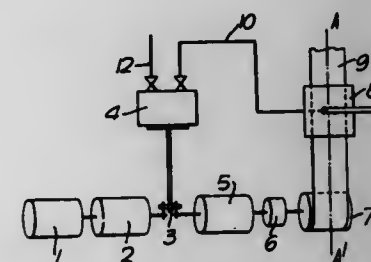
Filed Mar. 31, 1976, Ser. No. 672,627

Claims priority, application United Kingdom, Apr. 8, 1975, 14317/75

Int. Cl.² G01N 21/12, 31/22

U.S. Cl. 23-253 R

4 Claims



1. A monitor for fluids comprising: a casing; a porous indicator tape within the casing; a diaphragm pump within said casing, said pump having an inlet for drawing a fluid sample from outside the casing through a portion of the tape and into the pump and having a discharge outlet for discharging the fluid sample into the interior of the casing; a transport mechanism within the casing for advancing the tape so as to expose a fresh portion of the tape to the fluid sample; and a single electric motor within the casing for driving both the pump and the tape-transport mechanism.

4,052,163

PLASTIC VACUUM SUCTION FUNNEL

Alfred Patzner, Schwalbach, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

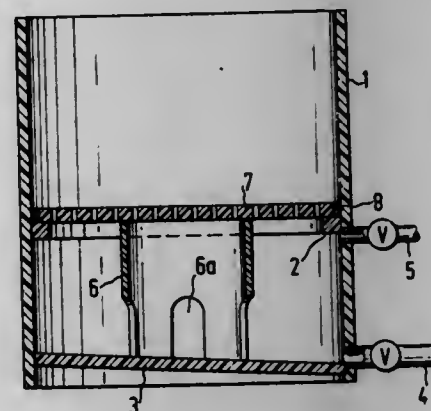
Filed June 10, 1976, Ser. No. 694,826

Claims priority, application Germany, June 12, 1975, 2526295

Int. Cl.² B01D 23/28, 35/00

U.S. Cl. 23-259

3 Claims



1. A vacuum suction filter comprising a generally cylindrical tube, a thrust ring mounted within said tube and tightly engaged therewith, a bottom wall mounted in one end of said tube and closing off said one end of the tube, a sieve plate support member seated on said bottom wall and extending therefrom to the level of said ring in said tube, and a perforated sieve plate seated on said thrust ring and said support member in spaced relation to said bottom wall to define a vacuum

chamber in said tube, a first conduit connected in communication with said chamber through said tube adjacent said thrust ring for applying a vacuum to said chamber, and a second conduit connected in communication with said chamber through said tube and near said bottom wall to permit filtrate from said chamber, said bottom wall being inclined towards said second conduit; said tube, bottom wall, sieve plate and sieve plate support member all being formed of plastic materials.

4,052,164

APPARATUS FOR CENTRIFUGAL SEPARATION AND MEASUREMENT OF SAMPLES

Wolfgang König, Munich, Germany, assignor to Compur-Electronic Gesellschaft mit beschränkter Haftung, Munich, Germany

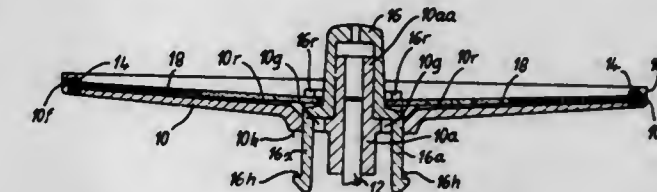
Filed Oct. 14, 1976, Ser. No. 732,218

Claims priority, application Germany, Nov. 26, 1972, 2553044

Int. Cl.² G01N 33/16; B04B 5/00

U.S. Cl. 23-259

7 Claims



1. Apparatus for centrifugal separation of test samples in containers of tubular form open at both ends, said apparatus comprising a rotor of plate-like form having a plurality of radially extending recesses each being adapted to accommodate one of said tubular containers, resilient abutment means on said rotor at the outer end of each recess in position to serve as an abutment for the outer end of a tubular container laid in such recess, clamping means mounted centrally on said rotor and movable axially from a loading position to a clamping position, said clamping means forming a movable abutment for the inner ends of the tubular containers, said axial movement of said clamping means carrying the inner ends of the tubular containers from a position on one side of a transverse plane perpendicular to the axis of rotation of said rotor and containing the outer ends of said containers to a position on the opposite side of said plane, and said axial movement of said clamping means serving to displace a tubular container radially outwardly into tight sealing and clamping engagement with said resilient abutment means.

4,052,165

APPARATUS FOR CENTRIFUGAL SEPARATION OF TEST SAMPLES

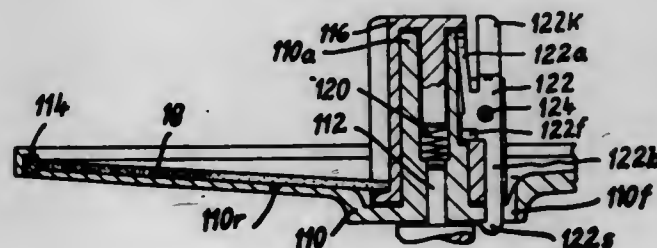
Otto Wienchol, Pullach, and Franz Muhlbock, Munich, both of Germany, assignors to Compur-Electronic Gesellschaft mit beschränkter Haftung, Munich, Germany

Filed Oct. 14, 1976, Ser. No. 732,219

Int. Cl.² G01N 33/16; B04B 5/00

U.S. Cl. 23-259

9 Claims



1. Apparatus for centrifugal separation of test samples in containers of tubular form open at both ends, said apparatus comprising a rotor of plate-like form having a plurality of

radially extending recesses each being adapted to accommodate one of said tubular containers, resilient abutment means on said rotor at the outer end of each recess in position to serve as an abutment for the outer end of a tubular container laid in such recess, clamping means mounted centrally on said rotor and movable axially from a loading position to a clamping position, said clamping means forming a movable abutment for the inner ends of the tubular containers, said axial movement of said clamping means carrying the inner ends of the tubular containers from a position on one side of a transverse plane perpendicular to the axis of rotation of said rotor and containing the outer ends of said containers to a position on the opposite side of said plane, and said axial movement of said clamping means serving to displace a tubular container radially outwardly into tight sealing and clamping engagement with said resilient abutment means, characterized by the provision of a spring tending to maintain said clamping means in its loading position, and a latch for holding said clamping means in its clamping position against the force of said spring.

4,052,166

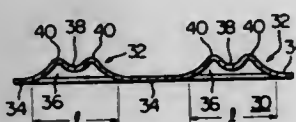
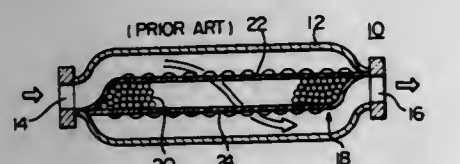
CONVERTER WITH CATALYST PELLETS

Yasuhiko Mita, Higashi-yamato; Takayuki Yamazaki, Tokyo, and Takahisa Izumi, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
Filed Oct. 29, 1976, Ser. No. 737,155

Claims priority, application Japan, Oct. 30, 1975, 50-148390[U]

Int. Cl. B01V 8/02

U.S. Cl. 23—288 F



1. A converter with catalyst pellets for catalytically treating the exhaust gases emitted from an internal combustion engine, comprising a container, an exhaust gas inlet at one end of said container, an exhaust gas outlet at the other end of said container, a catalyst pellet holding casing supported within said container so that the exhaust gases emitted from said engine through said inlet pass through said catalyst pellet holding casing before reaching said outlet, the catalytic pellet holding casing being provided at its walls with a plurality of louvers extending outwardly away from said casing, each of said louvers being formed with at least one channel shaped corrugation in substantially the top portion thereof, said channel shaped corrugation extending longitudinally with said louver so that the louver has a generally corrugated cross section.

4,052,167

HEATING UNIT AND FERTILIZER PREPARATION

David C. Goff, 3000 NE. 48 St., Fort Lauderdale, Fla. 33308

Filed July 24, 1972, Ser. No. 274,266

Int. Cl. C10L 5/00; A01G 13/00

U.S. Cl. 44—1 R

19 Claims

1. A combination outdoor heating unit and plant nutrient producing unit comprising:
a combustible mixture of a compressed mass providing a surface fire burning area,
said mass including a mixture of,
at least one compacted organic solid material, said organic

material including a fuel that supports surface fire burning, and
at least one inorganic material, said inorganic material includes an automatic built-in force means dispersed throughout said mass to rid the surface of the mass of the oxidized surface layer material, and to remove small surface particles from said compressed mass as the surface of the mass burns to provide a plant nutrient by-product after the combination unit is burned.

4,052,168

PROCESS FOR UPGRADING LIGNITIC-TYPE COAL AS A FUEL

Edward Koppelman, 4424 Bergamo Drive, Encino, Calif. 91316

Filed Jan. 12, 1976, Ser. No. 648,170

Int. Cl. C10L 9/00, 9/10

U.S. Cl. 44—1 G

15 Claims

1. A process for upgrading lignitic-type coals which comprises the steps of charging a moist lignitic-type coal into an autoclave, heating said lignitic-type coal to an elevated temperature of at least about 750° F up to about 1250° F and under a pressure of at least about 1000 psi for a period of time sufficient to convert the moisture and some of the volatile organic constituents therein into a gaseous phase and to effect a partial thermal restructuring of the chemical structure thereof and a change in its chemical composition, and thereafter cooling the lignitic-type coal charge and recovering the upgraded coal product.

2. The process as defined in claim 1, including the further step of contacting the lignitic-type coal charge with said gaseous phase during the cooling step to effect a deposition of the condensable organic constituents therein on the surface of said upgraded coal product.

13. The process as defined in claim 1, in which the step of heating said lignitic-type coal to an elevated temperature and pressure for a period of time is performed in a manner to effect a reduction in the sulfur content of said upgraded coal product.

4,052,169

TREATMENT OF SOLID FUELS

Edward L. Cole, Flahkell; Howard V. Hess, Glenham, and William F. Franz, Gardiner, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 20, 1975, Ser. No. 551,484

Int. Cl. B02C 1/00; C10L 9/10; C10B 57/00

U.S. Cl. 44—1 R

9 Claims

1. A process for beneficiating and grinding solid fuel which comprises forming a mixture of particulate solid fuel having a majority of particles larger than U.S. Standard screen opening No. 20 and water, passing the mixture under conditions of turbulent flow through a heating zone to raise its temperature to between about 400 and 700° F. at a pressure sufficient to maintain substantially all of the water in liquid state, passing the heated mixture at substantially the same temperature and pressure as it left the heating zone under conditions of turbulent flow through an elongated attrition zone for a period of time between about 5 seconds and 1 hour to form a mixture having a majority of particles smaller than U.S. Standard screen opening No. 20 and then cooling the mixture.

4,052,170

MAGNETIC DESULFURIZATION OF AIRBORNE PULVERIZED COAL

Tsoun-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 9, 1976, Ser. No. 703,717

Int. Cl. C10L 9/10; C10B 57/00

U.S. Cl. 44—1 R

19 Claims

1. A method for producing a rapidly burning fuel for large-scale electrical and steam generation by:

A. preheating a coal, having a high content of inorganic sulfur and 35–50 percent by weight of volatile matter on a

moisture-free basis, to a temperature high enough to enhance the magnetic susceptibility of said inorganic sulfur, while preventing agglomeration of said coal and while selectively retaining said volatile matter as a portion of said rapidly burning fuel, by:

1. disintegrating said coal to about 200 mesh to form pulverized coal while passing a stream of heated gas therethrough at sufficient velocity to entrain and fluidize said pulverized coal,
2. drying said pulverized coal and separating the dried coal from said heated gas within a fluidized stage to form dried pulverized coal, and
3. successively entraining said dried pulverized coal with a stream of hot oxygen-containing gas in sequential fluidized stages having successively higher temperatures, while passing said oxygen-containing gas countercurrently thereto, so that said dried pulverized coal is subjected to a final temperature of about 480°–600° C. and said inorganic sulfur has enhanced magnetic susceptibility;

B. magnetically removing at least a portion of said inorganic sulfur having enhanced magnetic susceptibility by passing said dried pulverized coal through a magnetic separator means to produce a beneficiated coal; and

C. entraining said beneficiated coal with a mixed oxygen-containing gas, which selectively contains all evolved volatile matter from said sequential fluidized stages, and controllably feeding said beneficiated coal, said evolved volatile matter, and said mixed oxygen-containing gas, as said rapidly burning fuel, to the combustion zone of a furnace used for said large-scale electrical and steam generation.

4,052,171

FUEL COMPOSITIONS AND ADDITIVE MIXTURES CONTAINING METHANETRICARBOXYLATES FOR REDUCING EXHAUST GAS CATALYST PLUGGING

Leonard M. Niebylki, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 584,141, June 5, 1975, Pat. No. 3,950,145. This application Dec. 22, 1975, Ser. No. 643,090

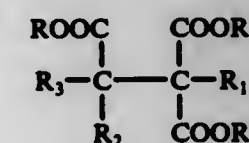
Int. Cl. C10L 1/16

U.S. Cl. 44—68

40 Claims

1. A gasoline composition for a spark ignited internal combustion engine comprising

- i. an antiknock amount of a cyclopentadienyl manganese tricarbonyl antiknock, and
- ii. an amount effective to reduce the plugging of an exhaust gas catalyst of a compound having the general formula



wherein R, R₁, R₂ and R₃ are independently selected from hydrogen, hydrocarbyl and substituted hydrocarbyl radicals.

4,052,172

PROCESS FOR GASIFYING COAL OR OTHER CARBON CONTAINING MATERIAL

Selichi Shirakawa; Koji Iwahashi; Akio Nishi; Keisuke Honda, all of Nagasaki, Japan, and Kiyomichi Taoda, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 1, 1975, Ser. No. 592,199

Claims priority, application Japan, July 3, 1974, 49-76010

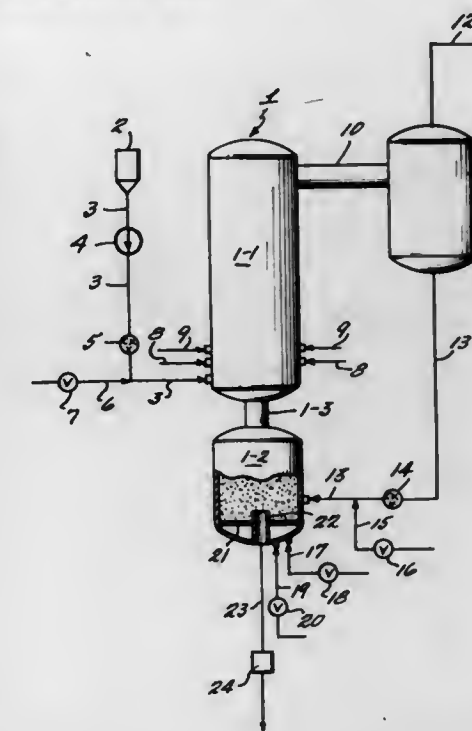
Int. Cl. C10J 3/46

U.S. Cl. 48—197 R

5 Claims

1. A process for gasifying coal or other carbon containing material in which a gas stream communicates, comprising: providing a fluidizing bed reactor chamber (1-2) disposed

upstream and a jet-system reaction chamber (1-1) disposed downstream with respect to said gas stream, providing means for supplying coal or other carbon containing material divided to 100–200 mesh (ASTM) and a gasifying agent selected from the group consisting of air and mixtures of air and steam (8,9) in said jet-system reaction chamber (1-1), and



providing a dust removing device (11) at the exit flue (10) of said jet-system reaction chamber (1-1), said fluidizing bed reaction chamber (1-2) having a pipe means (13) for supplying collected solid of said dust removing device (11), means for supplying said gasifying agent (17), and means for taking out ashes (23).

4,052,173

SIMULTANEOUS GASIFICATION OF COAL AND PYROLYSIS OF ORGANIC SOLID WASTE MATERIALS

Helmut W. Schulz, Harrison, N.Y., assignor to Dynecology Incorporated, Harrison, N.Y.

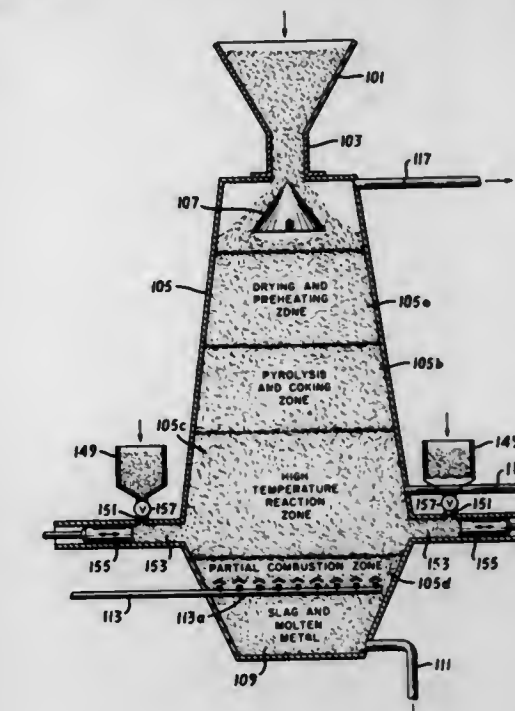
Continuation of Ser. No. 492,496, July 29, 1974, abandoned.

This application Apr. 12, 1976, Ser. No. 675,918

Int. Cl. C10J 3/08, 3/16

U.S. Cl. 48—202

9 Claims



1. A process for the production of gaseous effluent rich in

hydrogen and carbon monoxide from a feed mixture of coal-like material and organic solid waste, which process is carried out in a vertical reaction zone comprising, successively, a preheating and drying zone in the top portion thereof, a pyrolysis and coking zone, a high temperature reaction zone, and a partial combustion zone, which process comprises the steps of:

- thoroughly blending said coal-like material and said organic solid waste in a ratio of 0.25 to about 2.5 parts of coal-like material to one part of organic solid waste;
- introducing said thoroughly blended mixture of coal-like material and organic solid waste to the top section of said vertical reaction zone and allowing said mixture to flow downwardly through said preheating and drying zone while maintaining said preheating and drying zone at a temperature of from about 200° F. to about 500° F. at the upper end thereof and a temperature of from about 600° F. to about 900° F. at the lower end thereof;
- allowing the preheated and dried mixture of said coal-like material and said organic solid waste to flow downwardly into said pyrolysis and coking zone wherein said mixture is directly contacted with hot gaseous products comprising hydrogen and carbon monoxide rising from the partial combustion zone through the high temperature reaction zone thereby causing the destructive distillation of said coal-like material and the simultaneous pyrolysis of said organic solid waste to carbonaceous products comprising coke and char, said pyrolysis and coking zone being maintained at a temperature of from about 600° F. to about 900° F. at the upper end thereof and a temperature of about 1600° F. to about 2000° F. at the lower end thereof;
- allowing said carbonaceous products from said pyrolysis and coking zone to flow successively downward through said high temperature reaction zone and said partial combustion zone;
- maintaining said high temperature reaction zone at a temperature of from about 2000° F. to about 2800° F.;
- introducing into said partial combustion zone an oxidant gas containing at least about 75 percent by volume of oxygen to effect the partial combustion of a portion of said carbonaceous products thereby producing carbon monoxide and minimum amounts of carbon dioxide, the total quantity of said oxidant gas utilized in said vertical reaction zone being introduced into said partial combustion zone; g. introducing steam to said partial combustion zone to react with a remaining portion of said carbonaceous products thereby producing hydrogen and carbon monoxide;
- controlling the amounts of steam and oxidant gas introduced into said partial combustion zone to balance the exothermic heat of reaction of said oxygen and said carbonaceous products with the endothermic heat of reaction of said steam and said carbonaceous products while maintaining said partial combustion zone at a temperature of about 2800° F. to about 3200° F.;
- removing from the upper portion of the vertical reaction zone gaseous effluent containing hydrogen and carbon monoxide in a ratio enriched by introducing controlled amounts of additional steam into the high temperature reaction zone while maintaining the temperature of said zone in the range of from about 2000° F. to about 2800° F.; and
- withdrawing fused slag from the lower portion of the vertical reaction zone.

4,052,174

APPARATUS FOR SHARPENING BLADE EDGES

Felix R. Grat, Lake Hiawatha, N.J., assignor to Hacker Instruments, Inc., Fairfield, N.J.

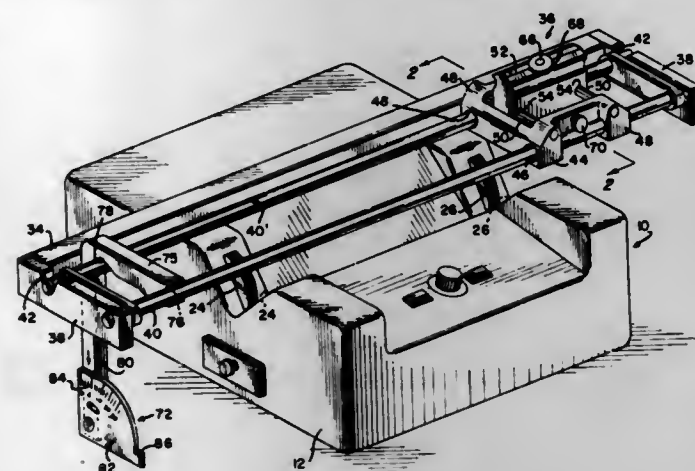
Filed Mar. 8, 1976, Ser. No. 664,828
Int. Cl.² B24B 3/36, 3/50

U.S. Cl. 51—81 BS

13 Claims

- Apparatus for sharpening blade edges, comprising: a base;

a pair of honing wheels supported on said base for rotation in parallel axes on a common plane; said wheels being spaced apart to define a given void therebetween; means coupled to said wheels for driving the latter in rotation; and means coupled to said base for replaceably supporting a blade only perpendicular to said common plane; wherein said blade supporting means includes means for moving a blade supported thereby in directions parallel to said axes, and in directions transverse to said axes and through said given void, to cause such a supported blade to sweep contactingly, and independently, across one of said wheels



to effect honing of one blade-edge side, and across the other of said wheels to effect honing of an opposite blade-edge side; said blade supporting means comprising means for replaceably clamping and securing a blade thereto, said latter means having ways formed therein which extend longitudinally parallel with said axes, and guides also extending longitudinally parallel with said axes, said ways being slidably engaged with said guides; and said guides are resilient, and are supported only at opposite longitudinal ends thereof, and yield under manual pressure applied to said blade supporting means transverse to said axes to move a blade supported thereby into greater contact with said wheels.

4,052,175

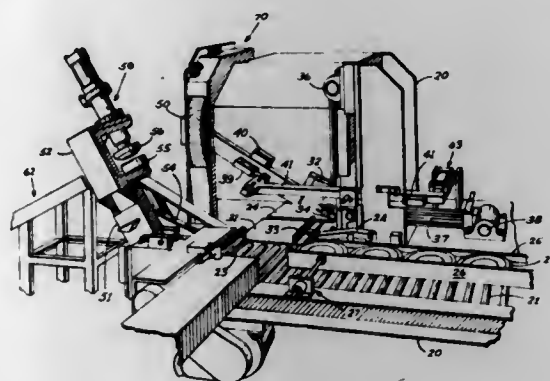
AUTOMATIC SNAG GRINDER

George T. Lott, and Harold J. Kiewert, both of Cincinnati, Ohio, assignors to Lott Tool Corporation, Cincinnati, Ohio

Filed May 3, 1976, Ser. No. 682,496
Int. Cl.² B24B 3/04, 9/06

U.S. Cl. 51—96

16 Claims



- An automatic snag grinder comprising a grinding wheel, first power means for actuating said grinding wheel, a platen to receive a workpiece thereon, centering-clamping means to hold said workpiece on said platen, second power means for rotating said platen at a selected speed and selected rotational torque, and positioning means to move said workpiece into grinding contact with said grinding wheel while said platen is

rotating on a center line approximately 90° to the axis of the grinding wheel, the relationship among said first power means, said centering-clamping means and said second power means being such that said platen will slow down to a predetermined torque load while said workpiece is clamped on said platen in contact with said grinding wheel and while said grinding wheel remains operative, said second power means returning in said platen to its selected speed of rotation when said workpiece moves out of substantial contact with said grinding wheel.

4,052,176

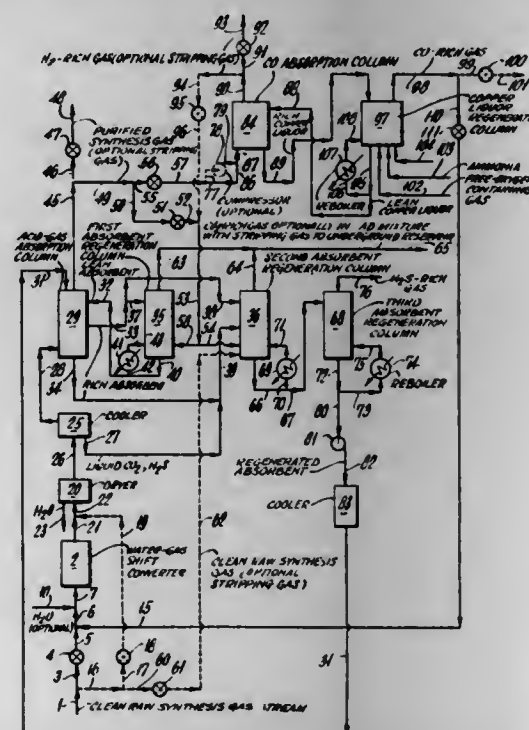
PRODUCTION OF PURIFIED SYNTHESIS GAS H₂-RICH GAS, AND BY-PRODUCT CO₂-RICH GAS

Edward T. Child, Tarrytown, N.Y.; Warren G. Schlinger, Pasadena, and George N. Richter, San Marino, both of Calif., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,630
Int. Cl.² B01D 53/04, 53/14

U.S. Cl. 55—32

19 Claims



- A process of purifying a raw synthesis gas stream comprising H₂, CO, H₂O, CO₂, H₂S, COS, particulate carbon, and optionally CH₄, N₂ and A and producing a by-product stream of CO₂-rich gas for injection into an underground oil reservoir to effect secondary or tertiary recovery of oil comprising:

- cooling said raw synthesis gas stream and removing said particulate carbon therefrom by contacting with water;
- introducing the clean gas stream from (1) into a water-gas shift conversion zone in admixture with supplemental H₂O and reacting together a portion of the CO and H₂O in said shift conversion zone to produce additional H₂ and CO₂;
- drying the process gas stream, cooling, and separating from said process gas stream about 0 to 70 volume % of the CO₂, H₂S, and COS;
- contacting the process gas stream from (3) in an acid-gas absorption zone with a first liquid solvent absorbent to produce a rich first liquid solvent absorbent containing substantially all of the remaining CO₂, H₂S, and COS, and a product stream of purified synthesis gas comprising H₂, CO, and optionally CH₄, N₂ and A;
- regenerating said rich first liquid solvent absorbent in a first absorbent regeneration zone by removing a CO₂-rich gas stream by the combination of stripping with a stripping gas selected from the group consisting of: (a) a portion of said raw synthesis gas, (b) a portion of the product stream of purified synthesis gas from (4), (c) a portion of a H₂-rich gas stream, and (d) mixtures of (a), (b) and (c); and at least one of the following: flashing, heating;
- introducing at least a portion of said CO₂-rich gas stream

in admixture with said stripping gas from (5) into a subterranean formation to effect secondary or tertiary recovery of oil.

- In a process for producing synthesis gas, hydrogen-rich gas, and by-product CO₂-rich gas by reacting a hydrocarbonaceous feed by partial oxidation with a free-oxygen containing gas optionally in the presence of a temperature moderator in the reaction zone of a free-flow gas generator at a temperature in the range of about 1300° to 3500° F. and a pressure in the range of about 1 to 250 atmospheres to produce an effluent gas stream; cooling said effluent gas stream and removing particulate carbon therefrom thereby producing a clean process gas stream comprising H₂, CO, CO₂, H₂O, H₂S, COS and optionally CH₄, N₂, and A; introducing said clean, feed gas stream containing supplemental water into a water-gas shift reaction zone and reacting CO and H₂O to produce H₂ and CO₂; and removing CO₂, H₂S and COS in an acid-gas absorption zone with a first liquid solvent absorbent, thereby producing a rich first liquid solvent absorbent and a dry product gas stream free from acid gas; the improvement comprising:

- contacting at least a portion of said dry acid gas-free product gas in a CO-absorption zone with a second solvent absorbent which absorbs substantially all of the remaining CO in said process gas stream, and thereby producing said H₂-rich product gas stream;
- regenerating said second liquid solvent absorbent to produce a lean solution of said second liquid solvent absorbent and a by-product CO-rich gas stream;
- recycling said CO-rich gas stream to said water-gas shift conversion zone to produce additional hydrogen;
- recycling at least a portion of said lean solution of second liquid solvent absorbent to the CO absorption zone in (1);
- regenerating a portion of said first liquid solvent absorbent in a regeneration zone by flashing, boiling, and stripping with a stripping gas obtained from within the process and selected from the group consisting of a portion of said clean process gas stream, a portion of said dry product gas stream free from acid gas, and a portion of said H₂-rich product gas stream, thereby producing a gaseous by-product stream comprising CO₂-rich gas in admixture with said stripping gas, and a first liquid absorbent containing H₂S and optionally COS;
- boiling the first liquid solvent absorbent leaving (5) to produce an H₂S-rich stream and a lean first liquid solvent absorbent stream;
- recycling said lean first liquid solvent stream to said acid-gas absorption zone; and introducing said H₂S-rich stream into a sulfur recovery zone;
- introducing said gaseous by-product stream comprising CO₂-rich gas in admixture with stripping gas from (5) into a subterranean formation to facilitate the recovery of oil; and
- introducing a portion of said recovered oil into the reaction zone of said gas generator as at least a portion of said hydrocarbonaceous feed.

4,052,177

ELECTROSTATIC PRECIPITATOR ARRANGEMENTS
Leif Kide, Gothenburg, Sweden, assignor to Nea-Lindberg A/S, Denmark

Filed Mar. 1, 1976, Ser. No. 662,416

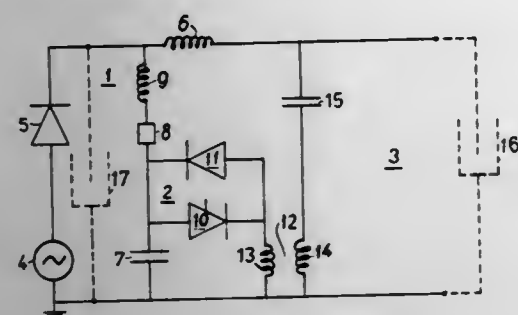
Claims priority, application Denmark, Mar. 3, 1975, 845/75
Int. Cl.² B03C 3/02

U.S. Cl. 55—139

7 Claims

- An electrostatic precipitator circuit, comprising: a voltage source for generating a unidirectional voltage; precipitator electrodes constituting a capacitor and responsive to said inidirectional voltage; a pulse generator including a storage capacitor for generating pulses; inductance means intercoupled between said storage capacitor and said precipitator electrode capacitor for transfer-

ring said pulses to said precipitator electrodes in superimposed relationship to said unidirectional voltage; said storage capacitor, inductance means and said precipitator electrode capacitor forming a controllable LC oscillating circuit; and



non-linear electric means for controlling said LC oscillating circuit to enable the energy stored in said precipitator electrode capacitor during each pulse transferred thereto to return to said storage capacitor for renewed storage therein.

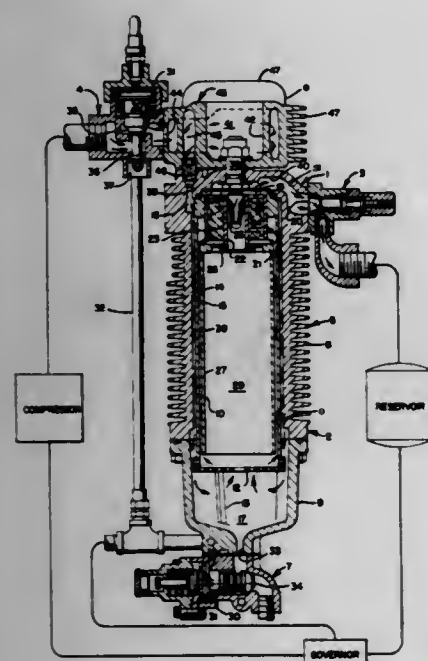
4,052,178 COMPRESSED AIR FILTER ASSEMBLY

Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corporation, Salem, Va.

Filed Sept. 2, 1975, Ser. No. 609,392
Int. Cl.² B01D 45/16

U.S. Cl. 55—212

15 Claims



1. A filter assembly for a compressed air system having a reservoir and a compressor responding in pumping and idling cycles respectively to minimum and maximum predetermined pressures in the reservoir, said assembly comprising filter unit means connected between the compressor and reservoir for filtering air received from the compressor during the pumping cycle, outlet valve means for passing filtered air from said filter unit means to the reservoir only when said air is at a pressure above said maximum reservoir pressure, and means for reducing to saturation at the pressure in said filter unit means the moisture content of air passed therefrom.

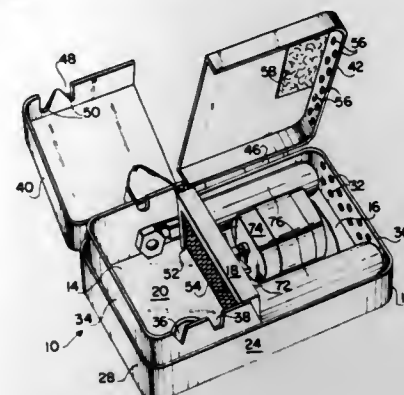
4,052,179 PORTABLE, POCKET SIZE ASH TRAY

Norbert A. Kirk, 2970 Sheridan Rd., Chicago, Ill. 60657
Filed Aug. 11, 1976, Ser. No. 713,506

Int. Cl.² B01D 50/00

U.S. Cl. 55—385 G

6 Claims



1. A portable, powered air purifying ash tray for use with smoker items comprising:
 - a. an approximately pocket size, box-type housing having a first internal compartment including means for supporting a smokers item for receiving ashes from the smoker item, an enclosed second internal compartment having a covered top and bottom and means for placing said second compartment in fluid communication with the environment surrounding said ash tray, said second compartment located alongside said first internal compartment substantially in-line therewith, and a partition separating said first compartment and said second compartment and permitting fluid communication therebetween;
 - b. a first cover on said housing positionable between a first closed position covering said first compartment and a second, open position uncovering said first compartment;
 - c. a filter mounted to said partition such that substantially all of the fluid communication between said first compartment and said second compartment is through said filter;
 - d. a fan mounted in said second compartment for exhausting air from said first compartment through said filter into said second compartment and thence out of said compartment into the environment surrounding said ash tray through said means provided therefor;
 - e. a portable electrical power supply mounted in said second compartment being for energizing said motor; and
 - f. a control circuit for selectively coupling said power supply to said motor for the energizing thereof.

4,052,180

SOFT ICE CREAM MACHINE

V. Robert Erickson, 8015 SW. Oleson Road, Portland, Oreg. 97223

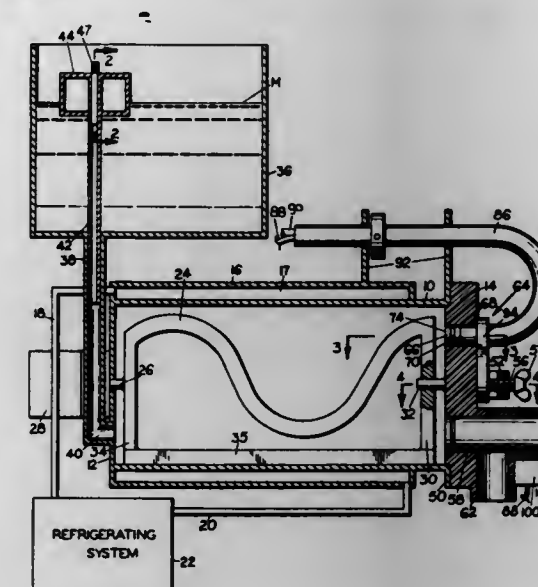
Continuation-in-part of Ser. No. 587,266, June 16, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,699
Int. Cl.² A23G 9/20

U.S. Cl. 62—188

3 Claims

1. An ice cream machine for making and dispensing soft ice cream comprising:
 - a. a freezing barrel having an outlet valve,
 - b. means in said freezing barrel for mixing ice cream at a selected capacity,
 - c. refrigerating means associated with said freezing barrel for cooling said barrel at a selected capacity,
 - d. a reservoir for ice cream mix,
 - e. upright tubular means establishing communication between said reservoir and a lower portion of said freezing barrel,
 - f. float means in said reservoir having buoyant support on the mix in said reservoir to follow the level of mix in the latter,
 - g. a hollow open-ended depending stem integral with said

float projecting down through said reservoir and therebelow into sliding engagement in said upright tubular means, h. and means defining an opening in said stem for admitting ice cream mix to the stem for gravity flow into said tubular means and said freezing chamber as ice cream is drawn off through said outlet valve, i. said opening being disposed in said stem below the level of mix in the reservoir and maintained at a constant height relative to the surface of the mix whereby a constant head pressure is maintained in said tubular means to said freezing barrel,



- j. said opening being of a selected size such that the rate of flow therethrough is approximately equal to or slightly greater than the freezing and mixing capacity of said freezing barrel,
- k. the open upper end of said stem being open to atmosphere to admit air into said mix.
- l. an adjustable valve means which includes an open ended hollow tube mounted within said stem maintaining the upper end of said stem open to the atmosphere.

4,052,181

ACOUSTIC ENERGY SHAPING

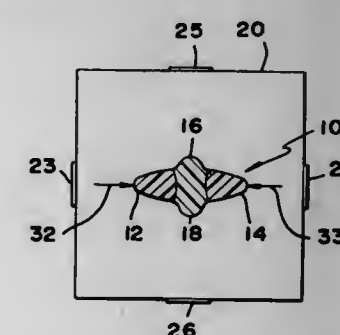
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Taylor G. Wang, Glendale, and Daniel D. Elleman, San Marino, both of Calif.

Filed Feb. 13, 1976, Ser. No. 658,133

Int. Cl.² C03B 37/00, 15/14

U.S. Cl. 65—2

2 Claims



1. A method for shaping a mass of material comprising:
 - suspending said mass in a gaseous atmosphere capable of transmitting acoustic energy;
 - applying heat to only a middle portion of said mass to melt only said middle portion;
 - applying acoustic energy to unmelted opposite sides of said mass to squeeze said melted middle mass portion between them; and
 - allowing said middle mass portion to solidify.
2. A method for shaping a mass of material, comprising:

suspending said mass in a gaseous atmosphere capable of transmitting acoustic energy; heating at least a portion of said mass to a substantially molten state; continually drawing a thread of said material from a substantially molten portion of said mass; and applying acoustic energy to opposite sides of said drawn thread to flatten said thread into a ribbon while allowing it to cool.

4,052,182

PROCESS FOR PRODUCING AIR BLOWN GLASS FIBER STRAND MAT

Joseph P. Stalego, and William H. Rigby, Jr., both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 337,246, March 1, 1973, abandoned.

This application Apr. 8, 1974, Ser. No. 459,135

Int. Cl.² C03C 25/02

U.S. Cl. 65—3 C

11 Claims

1. In the process of making mats of glass fiber strands, comprising the steps of attenuating molten streams of glass into fibers, gathering the fibers into strands, passing the strands over respective revolving wheels which wheels attenuate the glass fibers and deliver the strands downwardly to a moving foraminous collection surface, causing the strands to be traversed back and forth across the moving foraminous collection surface at a rate that is a fraction of the rate of the delivery downwardly by the revolving wheel, and depositing the strands upon the collection surface by air flow downwardly through the conveyor to form a mat, the improvement comprising contacting the fibers with an aqueous solution consisting essentially of water, an organosilane, a polyhydric alcohol adduct and an inorganic acidic salt, said acidic salt being present in said solution in an amount sufficient to improve the processibility of said fibers during attenuation.

10. A composition consisting essentially of
 - a. at least one glass fiber;
 - b. an organosilane;
 - c. a polyhydric alcohol adduct; and,
 - d. an acidic salt.

4,052,183

METHOD AND APPARATUS FOR SUPPRESSION OF POLLUTION IN TREATMENT OF GLASS FIBERS

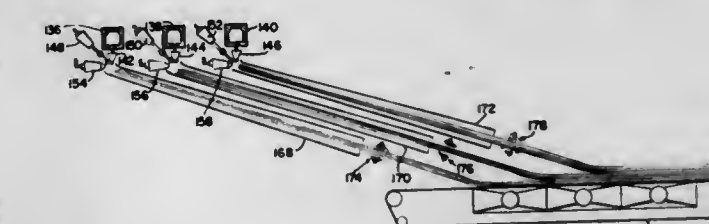
Marcel Leveque, Saint-Gratien, and Jean A. Battigelli, Rantigny, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 353,983, April 24, 1973, Pat. No. 3,874,886, which is a continuation-in-part of Ser. No. 456,878, April 1, 1974. This application Mar. 11, 1975, Ser. No. 557,281

Claims priority, application France, June 14, 1976, 75-04039
Int. Cl.² C03B 37/06; C03C 25/02

U.S. Cl. 65—3 C

28 Claims



1. Equipment for making resin bonded glass fiber blanket comprising a substantially closed fiber receiving chamber, a perforated fiber collecting conveyor defining at least a large part of a wall of said chamber, means for developing a gaseous blast in said chamber, means for developing a gaseous jet of smaller cross section than the blast, directed at an angle to the blast and penetrating the blast to produce a zone of interaction

of the blast and jet, means for introducing molten attenuable material into said zone of interaction and thereby effect fiberization thereof in the receiving chamber, suction means behind the fiber collecting conveyor developing gaseous currents through the fiber collecting conveyor and thereby form a fibrous blanket on the conveyor, means for spraying water and curable resin binder material on the fibers, means for separating water with resinous material carried thereby from said gaseous currents, and means for recirculating the gases to and through the receiving chamber and the conveyor.

4,052,184

CONTOURING GLASS SEAL EDGE

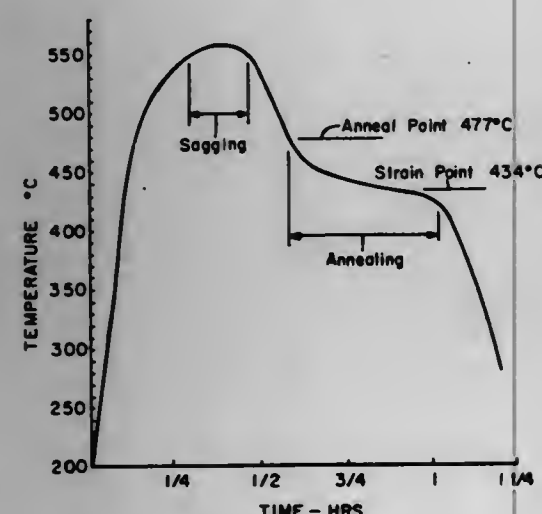
Joseph W. Anderson, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,479

Int. Cl.² C03B 21/00

U.S. Cl. 65-102

8 Claims



1. A method of conforming the seal edge of a one-piece glass article to a desired surface contour which comprises, providing a glass-ceramic sagging mold with a surface contour equivalent to the desired contour of said seal edge, positioning said one-piece glass article upon the contoured surface of such sagging mold, rapidly heating said mold and said glass article to a sagging temperature between the annealing point temperature and softening point temperature of the glass composition from which said article is formed, maintaining such temperature for a time sufficient to gravitationally conform said seal edge of said article to the contoured surface of said sagging mold, rapidly cooling said article to its annealing point temperature, maintaining said article in the transformation range between its annealing point temperature and strain point temperature for a time sufficient to inhibit the generation of internal surface stress on said article, and then rapidly cooling said article to handling temperature.

4,052,185

METHOD AND APPARATUS FOR PRESS BENDING GLASS SHEETS HAVING RABBETED EDGES

Anthony Kolakowski, Crestline, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 28, 1977, Ser. No. 772,893

Int. Cl.² C03B 23/02

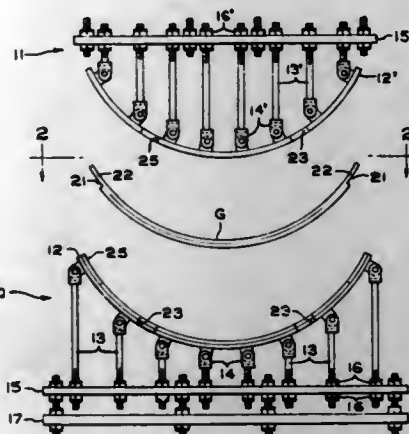
U.S. Cl. 65-106

4 Claims

1. A method of shaping a glass sheet having rabbeted edges, comprising: heating said glass sheet to a heat-softened condition suitable for bending, positioning the heat-softened glass sheet between opposed pairs of press bending members having shaping surfaces which face the glass sheet and are of complementary convex and concave curvature corresponding to the desired curvature for the glass sheets, moving said shaping surfaces together to apply bending forces to the heat-softened glass sheet, wherein the initial bending force applied to the rabbeted marginal edge portions of the glass sheet is through a

compressible filler strip on the concave shaping surface aligned with the rabbeted marginal edge portions of the glass sheet, so that edge portions of the glass sheet initially compress the filler strip and thereby substantially avoid over-bending the rabbeted marginal edge portions of the glass sheet, continuing bringing the shaping surfaces together until brought to bear against substantially all of the non-rabbeted portions of the glass sheet and said filler strip fills a substantial portion of the rabbet in the glass sheet, separating the shaping surfaces, and conveying the bent glass sheet from between the shaping surfaces.

2. An apparatus for press bending heat-softened glass sheets having rabbeted edges, comprising: a pair of opposed glass-fac-



ing shaping surfaces of complementary convex and concave curvatures corresponding to the desired curvature for the glass sheets, said shaping surfaces having sufficient rigidity to resist deformation during pressurized engagement with a heat-softened glass sheet, a compressible filler strip affixed to the concave shaping surface in a configuration adapted to fall into alignment with the rabbeted marginal edge portions of the glass sheets, said filler strip having sufficient compressibility to be slightly compressed by initial bending force exerted through edge portions of the glass sheets and having sufficient firmness to support the rabbeted marginal edge portions of the glass sheets in the final stage of bending, and means for moving said shaping surfaces into a glass engaging position and a retracted position.

4,052,186

METHOD AND APPARATUS FOR CONDITIONING MOLTEN GLASS

William Jackson Rhodes, Prescott, England, assignor to Pilkington Brothers Limited, St. Helena, England

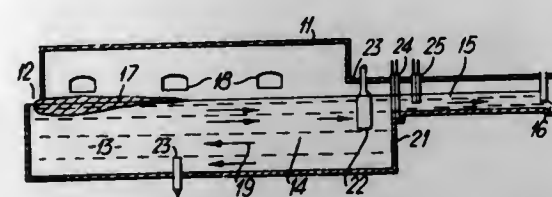
Continuation of Ser. No. 653,826, Jan. 30, 1976, abandoned. This application Oct. 15, 1976, Ser. No. 733,005

Claims priority, application United Kingdom, Jan. 31, 1975, 4359/75

Int. Cl.² C03B 5/22

U.S. Cl. 65-137

27 Claims



1. A method of conditioning molten glass to achieve a desired thermal distribution in the glass suitable for feeding to a forming process, which method comprises feeding molten glass to the inlet end of an elongate conditioning zone in a container adapted to contain molten glass, establishing a flow of the molten glass through the conditioning zone in a direction from the inlet end of the zone towards a remote outlet from the zone at the opposite end thereof, with substantially no return flow, selectively cooling the molten glass adjacent the

inlet to the conditioning zone to reduce its temperature and achieve a desired temperature profile through the depth and width of a transverse cross-section of the glass adjacent the conditioning zone inlet such that on flowing through the remainder of the conditioning zone the further conditioning completes the transformation of the glass to a thermal condition suitable for feeding to a forming process, said cooling being effected, at a position selected in dependence on the temperature distribution within the glass and the required temperature profile, by passing cooling fluid through means located in the forward flowing body of the glass, said means, including at least one fluid cooled pipe comprising portions immersed in the molten glass and extending transversely along the bottom of said conditioning zone and upwardly through the depth of said conditioning zone.

12. A glass melting tank comprising an elongated tank for containing molten glass, said tank having a melting region into which glass forming material is fed, means for heating and thereby melting the contents of the tank in the melting region, a refining region downstream of the melting region in which the molten glass is refined, and a conditioning region having an inlet adjacent the refining region and an outlet at a working end of the tank from which the molten glass is removed, the conditioning region being shallower than the refining region whereby all the molten glass flowing through the conditioning region may flow in a downstream direction towards the working end, and cooling means for cooling the glass in the conditioning region, the cooling means comprising at least one fluid cooled pipe extending across the base of the inlet to the conditioning region and at least one additional fluid cooled pipe at or near the inlet to the conditioning region and located in the body of the forward flowing glass at an adjustable position so as to achieve a desired temperature profile at or near the inlet to the conditioning region.

4,052,187

APPARATUS FOR PRODUCING GLASS PARISON BY THE PRESS-AND-BLOW PROCESS

Claus Spaeth, Wadgassen; Gunter Wilhelm, Boua, and Ingeborg Hammel, Schaffhausen, all of Germany, assignors to Villeroy & Boch Keramische Werke KG, Germany

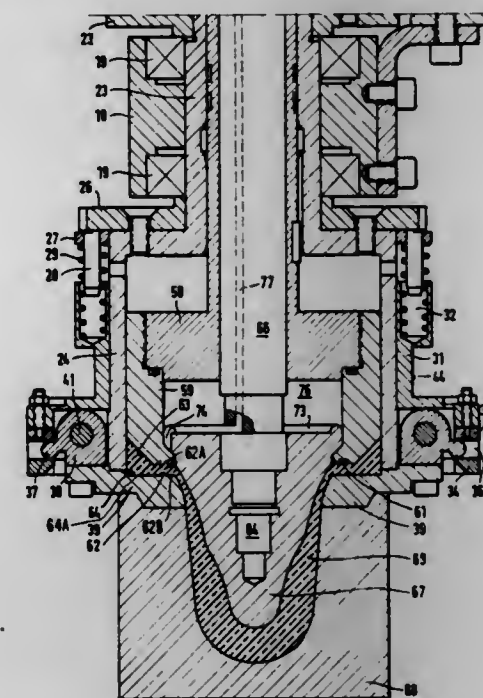
Filed Dec. 8, 1975, Ser. No. 638,545

Claims priority, application Germany, Dec. 9, 1974, 2458233

Int. Cl.² C03B 9/00, 9/14, 11/00

U.S. Cl. 65-160

21 Claims



1. An apparatus to be used in the production of a glass parison by a press-and-blow process in which a press mould and an annular gap surrounding said mould are to be filled with a change of glass melt, said apparatus comprising:
a plunger ring having a chamber therein;
a plunger movable in said plunger ring chamber for axial

displacement relative to the press mould, said plunger when moved into said press mould defining therewith a shaping cavity; and

neck retaining ring means mounted to enclose a parison and tightly abut against said press mould in a sealing manner during pressing;

said plunger ring including a first surface portion on an axially outwardly facing end thereof and said retaining ring means including a first surface portion on an axially inwardly facing end thereof, when said plunger is in a molding position in said pressing mould said first surface portion of said plunger ring is spaced from said first surface portion of said retaining means to cooperatively define therewith said annular gap such that said annular gap surrounds the plunger and communicates with said press mould to receive glass melt forced from said mould by said plunger;

said plunger ring including a second surface portion laterally spaced adjacent its associated first surface portion and said retaining ring means including a second surface portion laterally spaced adjacent its associated first surface portion, said second surface portion of said plunger ring being spaced from said second surface portion of said retaining ring means and at least one of said second surface portions extending at an angle relative to its associated first surface portion so that when said plunger is in a moulding position in said press mould, said second surface portions are cooperatively arranged to define an enlarged, annular compensating chamber located radially outwardly of said annular gap and communicating therewith to compensate for the presence of an amount of charge which is in excess of that filling said shaping cavity and said annular gap, by receiving such excess.

15. Apparatus according to claim 1 further including a photoelectric cell disposed a predetermined distance beneath said plunger for actuating a switch for movement of a blow mould in response to the parison sagging to said predetermined distance.

4,052,188

PRESS BENDING FIXTURE WITH IMPROVED ADJUSTING MEANS

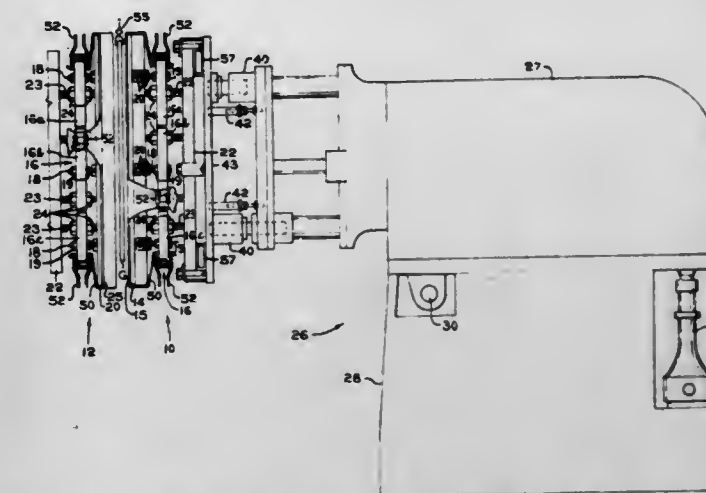
Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 29, 1976, Ser. No. 745,909

Int. Cl.² C03B 23/02

U.S. Cl. 65-273

4 Claims



1. An apparatus for bending a heat-softened glass sheet by sandwiching said glass sheet in pressurized engagement between glass facing surfaces of a pair of glass shaping members having complementary shaping surfaces conforming substantially to the shape desired for the bent glass and relatively movable between a retracted position and a glass engaging position, each glass shaping member comprising:
a relatively flexible shaping plate having a major surface

whose shape and areal extent approximates that of the shape and areal extent desired for the glass sheet after bending and having sufficient rigidity to resist deformation during pressurized engagement against a heat-softened glass sheet;

- adjusting plate means including at least two relatively rigid plate segments which together occupy an area substantially coextensive with that of said shaping plate and are located in spaced relation behind and in facing relation to said shaping plate;
- a relatively rigid back plate having an area substantially coextensive with that of said shaping plate and located in spaced relation behind and in facing relation to said adjusting plate segments;
- a plurality of first connecting members fastened to each of said adjusting plate segments and to said relatively flexible shaping plate, each of said first connecting members including individual means for adjusting the distance between said shaping plate and the respective adjusting plate segment to thereby alter the shape of said shaping plate;
- a plurality of second connecting members fastened to each of said adjusting plate segments and to said relatively rigid back plate, each of said second connecting members including individual means for adjusting the distance between the respective adjusting plate segment and said back plate.

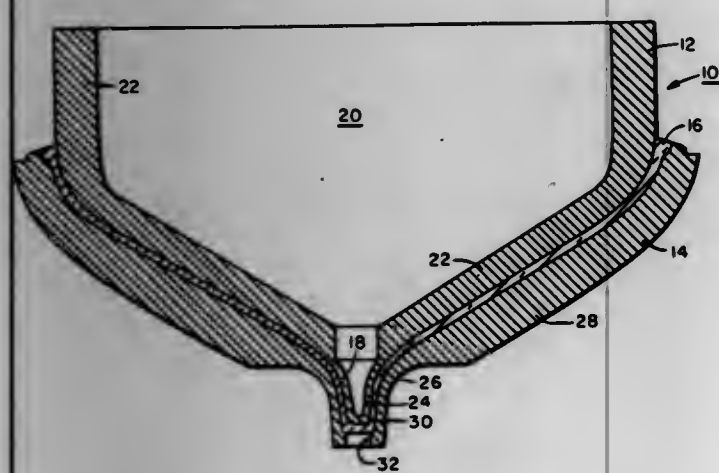
4,052,189

APPARATUS FOR INHIBITING CHECKS AND CRACKS IN THE MOIL OR YOKE AREA OF TV FUNNELS
Stuart M. Dockerty, deceased, late of Corning, N.Y., by Robert C. Dockerty, executor, Poughkeepsie, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 5, 1976, Ser. No. 711,730
Int. Cl.² C03B 11/12, 9/38, 11/06

U.S. Cl. 65—319

5 Claims



1. Molding apparatus for forming funnel-shaped articles from molten glass having an open upper wide mouth portion and a lower narrow yoke portion while inhibiting the formation of cracks and checks in such yoke area of said articles by minimizing the extraction of heat therefrom during forming to promote the fluidity of the molten glass in such area, said molding apparatus having standard wall portions of conventional thickness extending from about said yoke portion up to said wide mouth portion, said molding apparatus having means adjacent said yoke portion for reducing heat transfer from molten glass supplied to such portion to thereby facilitate glass flow in the area of such yoke portion, said means including relatively thin-wall portions adjacent said yoke portion compared with the thickness of the remaining standard wall portions, and said thin-wall portions being of the same material as that of the remaining wall portions whereby said thin-wall portions extract less heat from the molten glass in contact therewith than the remaining wall portions extract from the molten glass in contact therewith and thereby facilitating the fluidity of the molten glass in the yoke area so as to inhibit the

formation of cracks or checks in the yoke portion of the formed funnel-shaped articles.

4,052,190

SUSTAINED-RELEASE PLANT FOOD

Julius F. T. Berliner, Chicago, Ill., assignor to Burnishine Products Inc., Skokie, Ill.

Filed Apr. 26, 1976, Ser. No. 680,453

Int. Cl.² C05G 3/04

U.S. Cl. 71—11

8 Claims

1. A solid substantially anhydrous controlled-release fertilizer composition adapted to release water-soluble constituents at a rate substantially proportional to the amount of water applied thereto comprising a physically bound mixture of:
- water soluble nutrient fertilizer constituents;
- a colloidal resinous material having the property of reversibly swelling into a water-insoluble permeable gel surface layer in the presence of water;
- a gel promoting and sustaining agent therefore; and
- a sufficient amount of a sequestering agent to solubilize and promote the migration of said trace elements through said permeable surface layer in the presence of water.

4,052,191

1-THIADIAZOLYL-5-ALKYL- AND ARYLAMINOIMIDAZOLIDINONES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

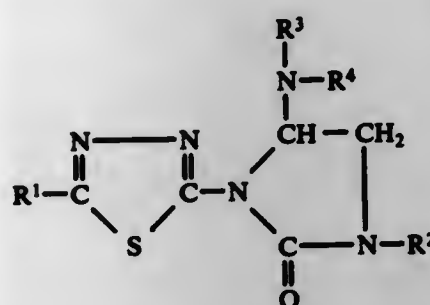
Filed Mar. 12, 1976, Ser. No. 666,285

Int. Cl.² A01N 9/12; C07D 285/12

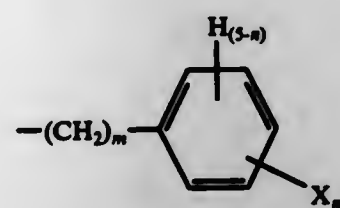
U.S. Cl. 71—90

10 Claims

1. A Compound of the formula



wherein R¹ is selected from the group consisting of alkyl of up to 18 carbon atoms, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower chloroalkyl, lower bromoalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R² is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl and R³ and R⁴ are each selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower haloalkyl, lower hydroxyalkyl, lower alkoxyalkyl, cycloalkyl of from 3 to 7 carbon atoms and



wherein X is selected from the group consisting of lower alkyl, lower alkoxy, halogen, lower haloalkyl, lower alkylthio, nitro and cyano; n is an integer from 0 to 3; and m is the integer 0 or 1, provided that a maximum of one of R³ and R⁴ is an aromatic moiety.

10. A method of controlling weeds which comprises contacting said weeds with a herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of claim 1.

4,052,192

1-(5-t-BUTYL-1,3,4-THIADIAZOL-2-yl)-3-METHYL-5-NONANOYLOXY-1,3-IMIDAZOLIDIN-2-ONE HERBICIDE

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 18, 1976, Ser. No. 668,014

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.² A01N 9/12; C07D 285/12

U.S. Cl. 71—90

3 Claims

1. The compound 1-(5-t-butyl-1,3,4-thiadiazol-2-yl)-3-methyl-5-nonanoyloxy-1,3-imidazolidin-2-one.
3. A method of controlling weeds which comprises contacting the weeds with a herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, the compound of claim 1.

4,052,193

1-(5-t-BUTYL-1,3,4-THIADIAZOL-2-yl)-3-METHYL-5-OCTANOYLOXY-1,3-IMIDAZOLIDIN-2-ONE HERBICIDE

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 18, 1976, Ser. No. 668,015

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.

Int. Cl.² A01N 9/12; C07D 285/12

U.S. Cl. 71—90

3 Claims

1. The compound 1-(5-t-butyl-1,3,4-thiadiazol-2-yl)-3-methyl-5-octanoyloxy-1,3-imidazolidin-2-one.
3. A method of controlling weeds which comprises contacting the weeds with a herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, the compound of claim 1.

4,052,194

OXIME ABSCISSION AGENTS

Merrill Wilcox, 2911 NW 30th Terrace, Gainesville, Fla. 32601
Continuation of Ser. No. 436,297, Jan. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 275,657, July 27, 1972, abandoned. This application Sept. 16, 1975, Ser. No. 618,880

Int. Cl.² A01N 9/20

U.S. Cl. 71—121

3 Claims

1. A process of aiding in the harvesting of fruit particularly for the promotion of the facilitation of fruit abscission, which process comprises applying to the fruit-bearing plant or to the fruit itself an effective amount of an oxime compound selected from the group consisting of glyoxime, dichloroglyoxime and the alkali metal, alkaline-earth metal, copper and aluminum salts thereof.

4,052,195

METHOD FOR MELTING IRON-CONTAINING MATERIAL

Gunter Meyer; Dietrich Radke, Essen, and Gunter Reimann, Essen-Bredeney, all of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Germany

Filed June 29, 1976, Ser. No. 701,032

Claims priority, application Germany, July 2, 1975, 2529391
Int. Cl.² C21C 5/52; H05B 7/18

U.S. Cl. 75—10 R

8 Claims

1. In a method for melting iron-containing material by introducing such material into an electric furnace containing a mass of molten metal and a mass of molten slag floating on the metal and provided with electrodes connected to an electrical power source establishing a potential difference between the electrodes, the improvement wherein the electrodes are immersed in the molten slag so that a flow of electrical current occurs between the electrodes and is converted into heat by the resistance of the slag, and said method comprises adjusting the concentration of free charge carriers in the slag in order to

impart a selected electrical conductivity to the slag of between 500 and 1,500 millimhos/cm, thereby to impart a selected value to the ratio of the amplitude of the current flowing exclusively through the molten slag to the amplitude of the current flowing through the molten metal, and the electrodes are immersed into the molten slag such that the distance between the molten metal and the electrodes is between about 1 and 100 cm.

4,052,196

METHOD AND APPARATUS OF MOISTENING CHARGE MATERIAL FOR AN ORE-DRESSING PLANT

Gerald Namy, 13, Cours Fauriel, Saint Etienne (Lorie), France; August Becker, Stummstrasse 33, and Klaus Trappe, Merzigerstrasse 83, both of Dillingen, Germany

Filed Jan. 27, 1970, Ser. No. 6,193

Int. Cl.² C21B 3/04; B01F 15/02

U.S. Cl. 75—25

10 Claims

1. A method of precluding the disposal of dirty water generated in steel production into rivers and the like by using such dirty water to moisten charge material for an ore-dressing plant consisting of the steps of introducing the dirty water, which is an iron oxide containing dust-water dispersion obtained by spray-precipitation of the waste gases from an oxygen-blowing steel production plant, into a thickener; removing the dispersion from the thickener by at least one pump and conveying the dispersion through conduits directly to a mixing device; introducing charge material for the ore-dressing plant into the mixing device to mix the dispersion and charge material; controlling the amount of dispersion dependent upon the water requirements of the charge material for the ore-dressing plant, by altering the amount of dispersion conveyed in the conduits between the thickener and the mixing device; recycling a portion of the water in the thickener back to the spray precipitation apparatus; and introducing water into the thickener to maintain a desired level, the thickener acting as a reservoir for the solids of the dust-water dispersion.

4,052,197

PROCESS FOR MAKING STEEL FROM PIG IRON

Karl Brotzmann; Helmut Knuppel, both of Sulzbach-Rosenberg; Paul Rheinlander, and Gustav Mahn, both of Wolfenbittel, all of Germany, assignors to Stahlwerke Peine-Salzgitter AG, Peine, Germany

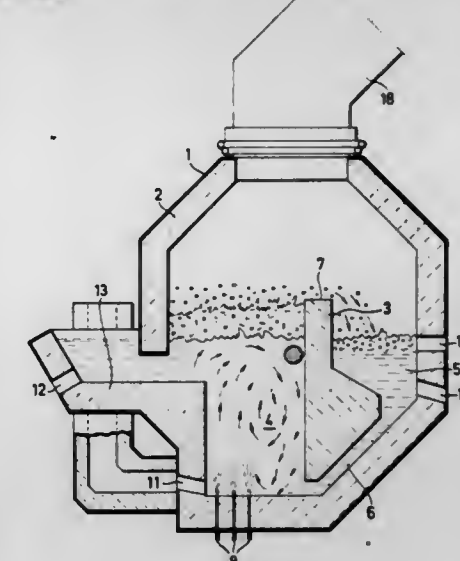
Filed Feb. 24, 1976, Ser. No. 661,061

Claims priority, application Germany, Feb. 25, 1975, 2507961

Int. Cl.² C21C 5/34

U.S. Cl. 75—60

25 Claims



1. A process for producing steel from unrefined molten pig iron in a refining vessel which is characterized by a regular largely ejection-free refining behavior and also by high yield and by low iron losses, which process comprises: providing a bath of partially refined pig iron in said vessel

introducing a refining gas into said bath beneath the top surface of said bath by means of tuyeres mounted in the refractory masonry of the refining vessel, each such tuyere blowing a stream of refining gas surrounded by a protective medium into said bath and said gas stream rising upwardly in said bath and agitating said bath; and concurrently with the introduction of said refining gas beneath the top surface of said bath, feeding unrefined molten pig iron to be converted into steel, into said bath adjacent to the zone into which said refining gas is fed into said vessel whereby said refining gas and protective medium agitate said unrefined molten pig iron and mix the said pig iron into said bath and the kinetic energy of the refining means contributes to increasing the agitation of the bath.

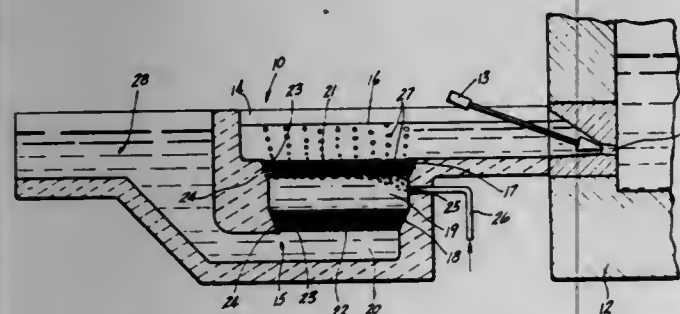
4,052,196

METHOD FOR IN-LINE DEGASSING AND FILTRATION OF MOLTEN METAL

John C. Yarwood, Madison, Conn.; James E. Dore, Ballwin, Mo., and Robert K. Preuss, Middletown, Conn., assignors to Swiss Aluminium Limited, Chippis, Switzerland
Division of Ser. No. 654,724, Feb. 2, 1976, Pat. No. 3,947,363, and a continuation-in-part of Ser. No. 563,213, March 28, 1975, Pat. No. 3,947,363, and a continuation-in-part of Ser. No. 597,963, July 21, 1975, Pat. No. 4,024,056. This application Dec. 6, 1976, Ser. No. 747,571
Int. Cl.² C22B 21/00

U.S. Cl. 75-68 R

12 Claims



1. A method for the degassing and filtration of molten metal which comprises passing said molten metal through a chamber wherein said metal travels through at least two sequentially placed, spaced-apart filter-type media and is brought into counter-current contact with a fluxing gas while traveling through the first of said filter-type media, and wherein said fluxing gas issues from an inlet provided within said chamber between the first and second of said filter-type media and percolates through the first of said media to contact said molten metal.

4,052,199

GAS INJECTION METHOD

Mahesh C. Mangalick, Solon, Ohio, assignor to The Carborundum Company, Niagara Falls, N.Y.
Filed July 21, 1975, Ser. No. 597,806
Int. Cl.² C22B 21/00

U.S. Cl. 75-68 R

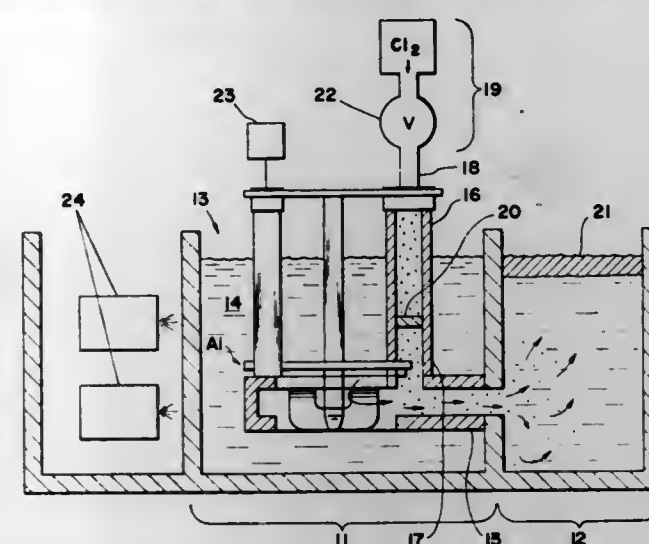
14 Claims

1. A process for introducing gas into molten metal in an apparatus comprising
a. a first metallic bath chamber;
b. a second metallic bath chamber;
c. means for flowing metal from the first metallic bath chamber to the second metallic bath chamber, through a metal transfer conduit, said metal transfer conduit being at least partially submerged in the first metallic bath chamber;
d. a two-ended gas injection conduit having one end submerged within the first metallic bath chamber, the submerged end of the gas injection conduit being connected to the metal transfer conduit, the gas injection conduit being so constructed and arranged that the metal of the first metallic bath chamber is flowable past the submerged

end of the gas injection conduit so as to contact the gas within the gas injection conduit and permit passage of the gas from the gas injection conduit to the metal transfer conduit, the gas injection conduit having an unsubmerged end opposite the submerged end of the gas injection conduit; and

e. means for providing gas to be introduced into the molten metal into the unsubmerged end of the gas injection conduit, comprising the steps of:

1. introducing a gas to be injected into the molten metal, into the two-ended gas injection conduit, one end of which is submerged within the first metallic bath chamber and



connected to the metal transfer conduit between the first and second metallic bath chambers; while

2. flowing the molten metal from the first metallic bath chamber through the metal transfer conduit to the second metallic bath chamber, past the submerged end of the gas injection conduit connected so as to connect the gas within the gas injection conduit and permit passage of the gas from the gas injection conduit to the metal transfer conduit; and

3. passing the gas from the gas injection conduit into the metal transfer conduit and into the flowing molten metal in the metal transfer conduit.

4,052,200

PROCESS FOR DEBISMUTHIZING LEAD

Denby Harcourt Ward, and James Dixon Iley, both of Port Pirie, Australia, assignors to The Broken Hill Associated Smelters Proprietary Limited, Melbourne, Australia
Filed Aug. 18, 1976, Ser. No. 715,297

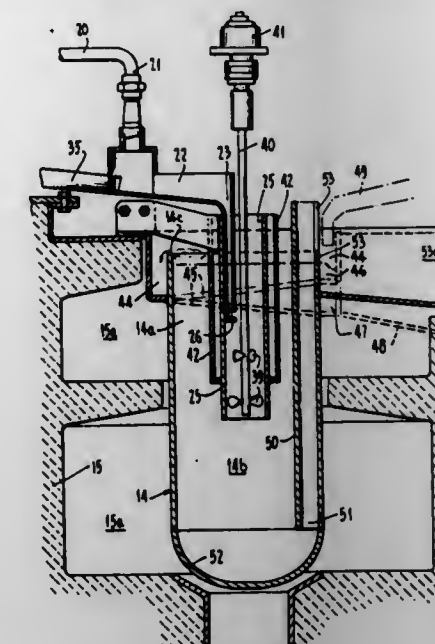
Claims priority, application Australia, Aug. 19, 1975, 2844/75
Int. Cl.² C22B 13/06

U.S. Cl. 75-78

20 Claims

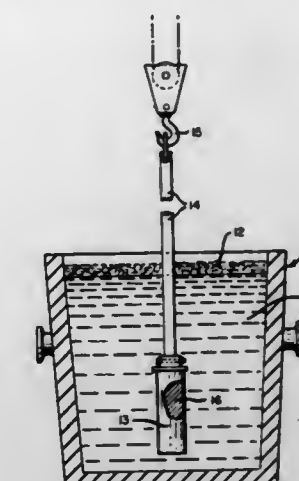
1. A continuous process for debismuthizing lead containing one or more alkaline earth metals or alloys thereof, which comprises continuously adding thereto a reagent selected from the group consisting of antimony, arsenic and alloys containing antimony and/or arsenic, so as to form a crust/bullion mixture, continuously introducing the crust/bullion mixture into the lower separation zone of a separation vessel having an upper liquation zone and a lower separation zone, maintaining the temperature in the upper liquation zone between 330° and 480° C and maintaining the temperature in the lower separation zone between the freezing point of lead and 350° C, the average temperature in the upper liquation zone being at least 15° C higher than the average temperature in the lower separation zone, separating crust particles from the bullion in the lower separation zone, causing the crust particles to move upwardly in the vessel and the bullion to move downwardly in the vessel, separating entrained lead from the crust particles in the upper liquation zone so as to form enriched crusts, removing the

enriched crusts continuously or intermittently from the upper surface of the material in the vessel, and withdrawing debismuthized product lead continuously from at or near the lower end of the lower separation zone.



thized product lead continuously from at or near the lower end of the lower separation zone.

4,052,202
ZIRCONIUM ALLOY ADDITIVE AND METHOD FOR MAKING ZIRCONIUM ADDITIONS TO STEELS
Leon Luyckx, New Castle, Pa., assignor to Reactive Metals & Alloys Corporation, West Pittsburg, Pa.
Filed Sept. 25, 1975, Ser. No. 616,647
Int. Cl.² C22C 1/02, 16/00
U.S. Cl. 75-129 11 Claims



1. An additive for making zirconium additions to steel comprising generally uniformly sized pieces of an alloy consisting essentially of about 70% to 90% zirconium and the balance iron with residual impurities.

4,052,203

CRUSHABLE LOW REACTIVITY NICKEL-BASE MAGNESIUM ADDITIVE

Floyd Gotthard Larson, Jr., Ringwood, N.J., and John Joseph deBarbadillo, II, Warwick, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Sept. 11, 1975, Ser. No. 612,367

Int. Cl.² C22C 33/08

U.S. Cl. 75-130 B

9 Claims

1. In a continuous treatment process for producing ductile cast iron in which a nickel-magnesium addition agent is added to a molten stream of cast iron passing through a treatment zone, the improvement comprising utilizing as the addition agent an alloy having a composition consisting generally of, by weight, from about 3% to about 6% magnesium, from above 20% to about 40% iron, from about 2% to about 12% silicon, and the balance apart from incidental elements and impurities, essentially nickel, said nickel content of the alloy being at least about 50% and said alloy being characterized in that it is crushable without the formation of excessive fines.

4,052,201

AMORPHOUS ALLOYS WITH IMPROVED RESISTANCE TO EMBRITTLEMENT UPON HEAT TREATMENT

Donald E. Polk, Boston, Mass.; Ranjan Ray, and Lance A. Davis, both of Morristown, N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed June 26, 1975, Ser. No. 590,656

Int. Cl.² C22C 19/00, 38/06, 38/32

U.S. Cl. 75-124

5 Claims

2. An amorphous metal alloy that is at least 50% amorphous, characterized in that the alloy consists essentially of the composition M'_2B_3 , where M' is at least three elements selected from the group consisting of iron, nickel, cobalt and chromium, the amount of each of iron, nickel and cobalt ranging from about 20 to 35 atom percent and the amount of chromium ranging from about 5 to 20 atom percent and B is boron and where a ranges from about 75 to 85 atom percent and b ranges from about 15 to 25 atom percent, said alloy being resistant to embrittlement upon heat treatment in the temperature range of about 200° to 325° C for at least 5 minutes.

4,052,204

QUATERNARY SPINODAL COPPER ALLOYS

John Travis Plewes, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1976, Ser. No. 685,263

Int. Cl.² C22C 9/02; C21D 1/00

U.S. Cl. 75-154

5 Claims

1. Cold worked and aged spinodal copper alloys consisting essentially of nickel in an amount of from 2-20%, tin in an amount of from 2-8%, an additional element selected from the group consisting of Fe in an amount of from 2 to 15%, Zn in an amount of from 2 to 10%, and Mn in an amount of from 2 to 15%, and remainder copper.

4,052,205

**PHOTOCONDUCTIVE IMAGING MEMBER WITH
SUBSTITUTED ANTHRACENE PLASTICIZER**

Milan Stotka, Fairport, and John F. Yanus, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 24, 1975, Ser. No. 616,464

Int. Cl.² G03G 5/04, 5/06, 5/08

U.S. Cl. 96—1 PC

14 Claims

9. A method of imaging which comprises:
- providing an imaging member consisting essentially of a layer of photoconductive material and a contiguous layer of an electrically active organic material with the ratio of the thickness of the active layer to the photoconductive layer being maintained from about 2:1 to 200:1, said photoconductive layer exhibiting the capability of photo-excited hole generation and injection, said active organic material being capable of receiving and transporting the photo-excited holes from said photoconductive layer, wherein said active layer consists essentially of poly(N-vinylcarbazole) containing a plasticizing amount of a plasticizer selected from the group consisting of 1-isopropyl anthracene and 1,5-diisopropyl anthracene;
 - then uniformly negatively electrostatically charging the free surface of the active layer; and
 - exposing said charged layer to a source of activating radiation to which the photoconductive layer is absorbing and to which the active layer is substantially transparent and non-absorbing, the exposure being in the form of a pattern of light and shadow optically projected toward said layer, whereby photo-excited holes generated by said photoconductive layer are injected into and transported through said active layer to form a latent electrostatic image on the free surface of the active layer.

4,052,206

ELECTROPHOTOGRAPHY

Masayasu Aizai, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 3, 1975, Ser. No. 628,492

Claims priority, application Japan, Nov. 7, 1974, 49-128418

Int. Cl.² G03Q 13/22

U.S. Cl. 96—1 R

10 Claims

1. An electrophotographic process for forming a latent charge image on the surface of a transparent electrical organic insulator layer in a recording medium having a photoconductor layer sandwiched between a conductive support and said organic insulator layer, comprising the steps of
- uniformly applying a D.C. corona charge of one polarity to said surface of said organic insulator layer of said recording medium in the dark;
 - exposing areas of said uniformly D.C. corona charged surface of said organic insulator layer to light reflected from an original image while applying simultaneously a D.C. corona charge of the same polarity as that used in said uniform charging of said surface of said organic insulator layer of step (a);
 - applying a charge of polarity opposite to that used in said steps (a) and (b) to the surface of said organic insulator layer in the dark until an electric potential on the unexposed surface of said organic insulator layer has a charge of polarity opposite to that of steps (a) and (b); and then
 - uniformly exposing said charged surface of said organic insulator layer of step (c) to light.

4,052,207

ELECTROSTATOGRAPHIC IMAGING PROCESS

Joseph Mammino, Penfield, and Franklin Jossel, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

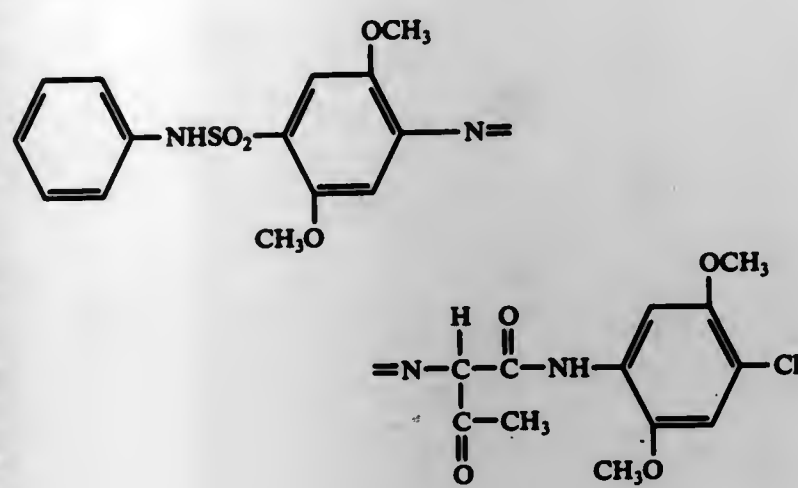
Division of Ser. No. 599,800, July 28, 1975. This application Dec. 1, 1976, Ser. No. 746,359

Int. Cl.² G03G 5/12, 13/01

U.S. Cl. 96—1.2

19 Claims

1. An electrostatographic imaging process comprising establishing an electrostatic latent image on a surface and contacting said surface with an electrostatographic material comprising a resin material and a colorant, said colorant satisfying the formula.



4,052,208

**IMAGE RECORDING MEDIUM EMPLOYING
PHOTOCONDUCTIVE GRANULES AND A HEAT
DISINTEGRABLE LAYER**

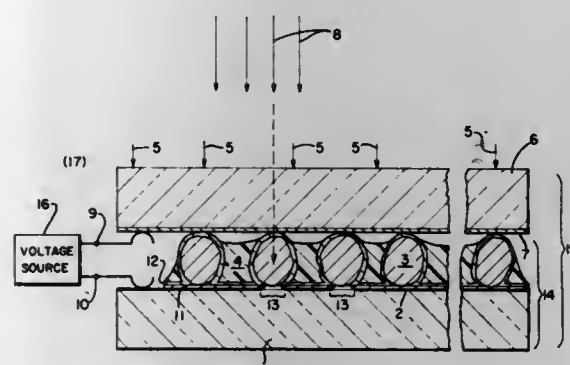
Michael A. Martinelli, 58 Wedgemere Ave., Winchester, Mass. 01890

Continuation-in-part of Ser. No. 357,107, May 4, 1973, abandoned. This application June 5, 1975, Ser. No. 584,108

Int. Cl.² G03G 5/00, 5/12, 17/00

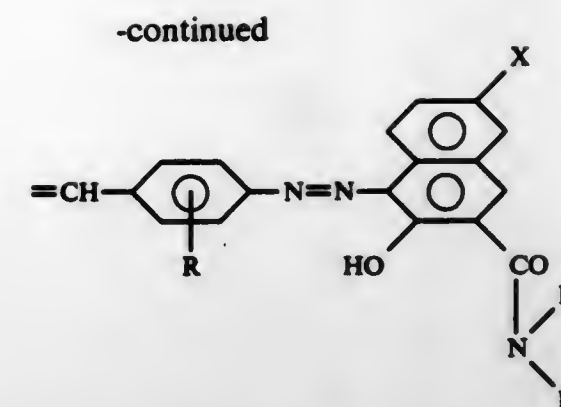
U.S. Cl. 96—1.5 R

32 Claims



1. A positive transparent radiation image recording medium for use in conjunction with a voltage source comprising:
- a radiation transparent electrically conductive layer,
 - a thin opaque electrically conductive metallic layer of heat disintegrable material,
 - said layers being adapted for connection to said voltage source,
 - a mono-granular layer of photoconductive material comprising photoconductive granules of substantially the same size contained in a quenching binder,
 - said binder also permanently fixing the physical positions of the granules,
 - said layer of photoconductive material is between the electrically conductive layers which make electrical contact to the granules through the portion of the quenching binder between the granules and the conductive layers,
 - said opaque layer is sufficiently thin so that localized holes

are produced in it corresponding in location with the radiation image applied through the transparent layer to the photoconductive material because of the heat produced by the current from a voltage applied to the layers, in combination with the radiation, whereby the distribution of said holes over the area of the opaque layer provides a transparency which is a replica of the distribution of the radiation upon said transparent layer.

**4,052,209
SEMICONDUCTIVE AND SENSITIZED
PHOTOCONDUCTIVE COMPOSITIONS**

William A. Huffman, Minneapolis; Stephen P. Birkeland, White Bear Lake, and Kevin P. O'Leary, Roseville, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 7, 1975, Ser. No. 556,400

Int. Cl.² G03G 5/04, 5/09

U.S. Cl. 96—1.5 R

19 Claims



1. A photoconductive composition comprising an organic, photoconductive, polymeric binder layer and a dye comprising at least two quinoid benzene rings linked through a bridging moiety selected from the group consisting of cyclopropane, cyclobutane and $\text{C}=\text{C}$, wherein n is 1 or 2, and wherein any ring carbons of the cyclopropane and cyclobutane bridging moieties not directly bonded to quinoid benzene rings are bonded to oxygen atoms to complete a carbonyl group, wherein said dye is present in a ratio of at least 0.5×10^{-6} moles of dye per mole of said organic, photoconductive, polymeric binder.

4,052,210

**ELECTROPHOTOGRAPHIC COPYING PROCESS AND
REPRODUCTION ELEMENT**

Adrianus M. P. Hectors, Tegelen, Netherlands, assignor to Océ-van der Grinten N.V., Venlo, Netherlands

Filed June 30, 1976, Ser. No. 701,206

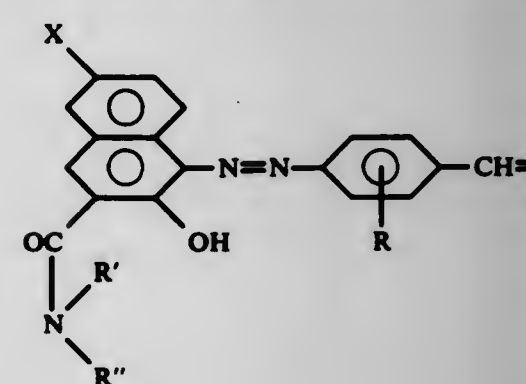
Claims priority, application Netherlands, July 4, 1975, 7507972

Int. Cl.² G03G 5/04, 5/09; G03C 1/10

U.S. Cl. 96—1.5 R

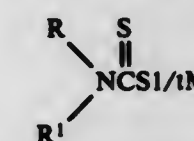
24 Claims

11. Electrophotographic reproduction element comprising a conductive support having thereon a photoconductive layer containing a bisazo naphthol compound, characterized in that said layer contains in dispersion in a binder a bisazo naphthol compound having the general formula



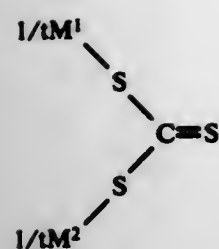
1. A process for forming an image on a multilayer image-forming material which consists of imagewise irradiating with electromagnetic radiation a multilayer image-forming material which comprises a layer of an organic sulfur compound and a layer of a metal capable of forming an interreaction product with said sulfur compound upon said irradiation with electromagnetic radiation, said sulfur compound being selected from the group consisting of:

A. dithiocarbamate having the general formula:



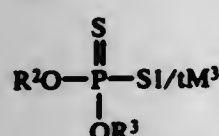
wherein R and R' each is a hydrogen atom, an alkyl group, or an aryl group, and R and R' may combine to form a 5- or 6-membered ring, and M is a hydrogen atom, a meta ion or group;

B. trithiocarbonate having the general formula:



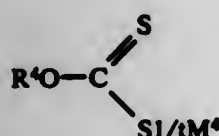
wherein M^1 and M^2 each is a hydrogen atom, a metal ion or group;

C. dithiophosphate having the general formula:



wherein R^2 and R^3 each is a hydrogen atom, an alkyl group or an aryl group, wherein M^3 is a hydrogen atom, a metal ion or group;

D. dithioxanthate having the general formula:



wherein R^4 is an alkyl group and M^4 is a hydrogen atom, a metal ion or group; and

E. bismuthiol-II; said metal capable of forming said interreaction product being selected from the group consisting of copper, silver, tin, nickel, cadmium, magnesium, tellurium, gallium, aluminum and gold; in the above formulas (i) represents the valency of the metal ion or group.

4,052,212

PHOTOGRAPHIC SILVER HALIDE EMULSION CONTAINING 2-EQUIVALENT CYAN COUPLER

Hidetaka Deguchi; Hajime Wada; Takaya Endo; Shoji Kikuchi, and Haruo Hori, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

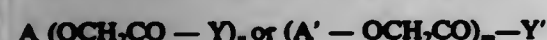
Filed Feb. 5, 1975, Ser. No. 547,405

Claims priority, application Japan, Feb. 8, 1974, 49-16057
Int. Cl.² G03C 7/00

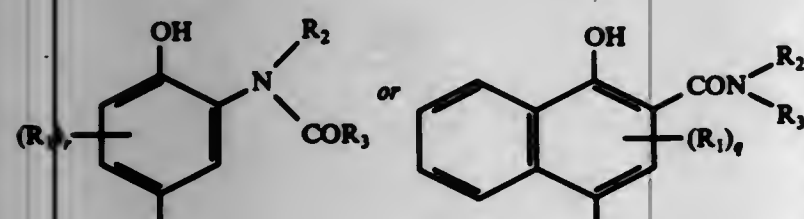
U.S. Cl. 96-56.2

5 Claims

1. A process for forming a cyan dye image, which comprises bringing a 2-equivalent type cyan coupler into contact with exposed silver halide crystals in the presence of a phenylenediamine type developing agent for said silver halide crystals, said 2-equivalent cyan coupler having the general formula:



wherein A and A' each represent, at the active point of the cyan coupler, a cyan coupler residue, which has the general formula:



wherein R_1 represents a hydrogen atom, a halogen atom, a saturated or unsaturated, aliphatic or cycloaliphatic hydrocarbon group, $-O-R_4$ or $-S-R_4$ (where R_4 represents a said hydrocarbon group), r is 1 to 3 and q is 1 to 5 and if r or q is more than 1 the R_1 groups may be the same or different; and

each of R_2 and R_3 independently represents a saturated or unsaturated, aliphatic or cycloaliphatic hydrocarbon group, an aryl group, a heterocyclic group or hydrogen atom or R_2 and R_3 together with the nitrogen atom to which they are attached form a heterocyclic group; Y represents a heterocyclic group, an alkoxy group, a phenoxy group, a naphthoxy group, an aliphatic hydrocarbon amino group, a heterocyclic amino group and a mercapto group, which groups also include those having substituents which are selected from halogen, nitro, hydroxyl, carboxyl, amino, sulfo, alkyl, alkenyl, aryl, heterocyclic, alkoxy, aryloxy, arylthio, arylazo, acylamino, carbamoyl, ester, acyl, acyloxy, sulfonamide, sulfamoyl, sulfonyl, morpholino, piperazyl and imidazolyl groups; Y' is an m-valent group selected from the group consisting of a heterocyclic group, an alkylenedioxy group, an arylenedioxy group, an alkylenediamino group, an arylenediamino group and a heterocyclic diamino group; wherein said Y' groups also include those having substituents which are selected from halogen, nitro, hydroxyl, carboxyl, amino, sulfo, alkyl, alkenyl, aryl, heterocyclic, alkoxy, aryloxy, arylthio, arylazo, acylamino, carbamoyl, ester, acyl, acyloxy, sulfonamide, sulfamoyl, sulfonyl, morpholino, piperazyl and imidazolyl groups; and n is 1 or 2 and m is 2.

4,052,213

LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL

Hans Heinrich Credner, Hohenschaeflarn; Wolfgang Lüssig; Ernst Meier, both of Munich; Erwin Ranz, Leverkusen; Siegfried Schlegel, Munich, and Karl-Wilhelm Schranz, Odenthal-Hahnenberg, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

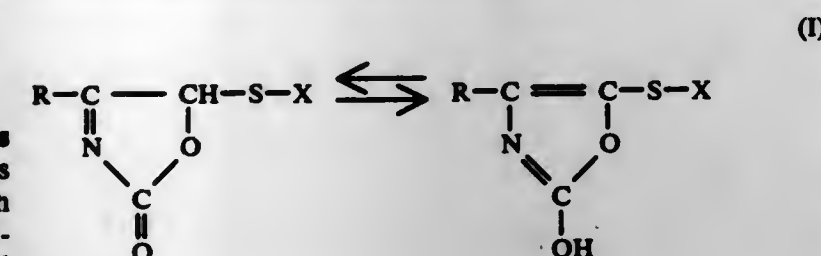
Filed Sept. 7, 1976, Ser. No. 721,086

Claims priority, application Germany, Sept. 13, 1975, 2540959
Int. Cl.² G03C 5/30, 1/06

U.S. Cl. 96-66.3

7 Claims

1. Light-sensitive photographic material having at least one silver halide emulsion layer containing a thioether compound which on reaction with the oxidation product of a color developer substance containing primary aromatic amino groups releases a diffusible mercaptan which inhibits development of the silver halide, wherein the improvement comprises the thioether compound is an oxazolinone-2 compound of the following formula or its tautomeric form:



in which

X represents an alkyl group with 1 to 10 carbon atoms, which may be substituted by carboxyl and/or amino groups, a phenyl group or a 5- or 6-membered heteroaromatic group having at least one nitrogen atom,

R represents

an alkyl group having from 1 to 18 carbon atoms which may be straight or branched chain or cyclic, and may be substituted by alkoxy, aroxy, aryl, halogen, carboxy or sulfo group, or phenyl or naphthyl groups which may be substituted by one or more substituents selected from the group consisting of alkyl, alkoxy, alkylamino or alkylthio groups, in any of which groups the alkyl portion may contain from 1 to 20 carbon atoms; nitro groups; halogen; carboxyl or sulfo groups; acyl or acylamino groups in either of which the acyl portion may be derived from carboxylic or sulphonic acids such as heptadecyl carbonamido; dimethylaminosulphonylphenyl; octadecylaminosulphonyl; methyloctadecylaminocarbonyl; phenylaminocarbonyl; benzoylaminophenoxy carbonyl or ethoxycarbonyl;

or a 5- or 6-membered heterocyclic group having at least one nitrogen atom
whereby a mercapto group is splittable from the 5-position of the oxazolinone-2 compound.

4,052,214

COLOR DIFFUSION TRANSFER PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL FOR FORMING BOTH POSITIVE TRANSFER DYE IMAGES AND NEGATIVE DYE IMAGES

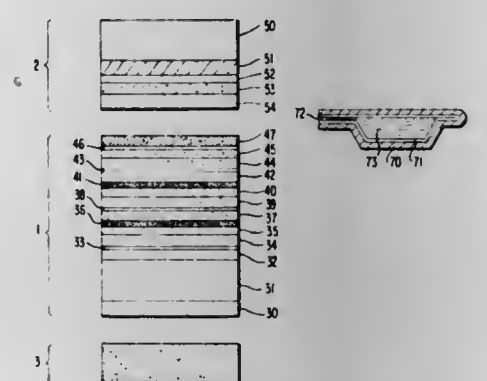
Yasushi Oishi, and Yoshinobu Yoshida, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 26, 1975, Ser. No. 607,967

Claims priority, application Japan, Aug. 26, 1974, 49-97640
Int. Cl.² G03C 1/76, 1/40, 7/00, 5/24

U.S. Cl. 96-74

70 Claims



1. A color photographic light-sensitive material which comprises a transparent support having thereon at least three silver halide emulsion layer units, each of which is sensitive to a different wavelength region of light and capable of simultaneously providing, as a result of exposure and development, both a diffusible dye with a positive image distribution and non-diffusible dye with a negative image distribution, these units including

I. a blue sensitive emulsion layer unit comprising (1) a hydrophilic colloidal layer containing a ballasted yellow coupler capable of reacting with an oxidation product of an aromatic primary amine color developing agent to form a diffusible yellow dye, and a spontaneously developable, slightly soluble silver salt dispersion, (2) a first negative type blue-sensitive silver halide emulsion layer provided adjacent said colloidal layer (1) and containing a ballasted compound capable of reacting with an oxidation product of an aromatic primary amine color developing agent to release a diffusible development inhibitor inhibiting the development of said silver salt in the above described colloidal layer (1), and (3) a second negative type blue-sensitive silver halide emulsion layer containing a ballasted yellow coupler capable of reacting with an oxidation product of an aromatic primary amine color developing agent to release a nondiffusible yellow dye image having a negative gradation suitable as an original for color printing in cooperation with said silver halide emulsion layer (2);

II. a green-sensitive emulsion layer unit comprising (1) a hydrophilic colloidal layer containing a ballasted magenta coupler capable of reacting with an oxidation product of an aromatic primary amine color developing agent to form a diffusible dye, and a spontaneously developable, slightly soluble silver salt dispersion, (2) a first negative type green-sensitive silver halide emulsion layer provided adjacent said colloidal layer (1) and containing a ballasted compound capable of reacting with an oxidation product of an aromatic primary amine color developing agent to release a diffusible development inhibitor inhibiting the development of said silver salt in the above described colloidal layer (1), and (3) a second negative type green-sensitive silver halide emulsion layer containing a ballasted magenta coupler capable of reacting with an oxida-

tion product of an aromatic primary amine color developing agent to release a non-diffusible magenta dye and providing a dye image having a negative gradation suitable as an original for color printing in cooperation with said silver halide emulsion layer (2); and

III. a red-sensitive emulsion layer unit comprising (1) a hydrophilic colloidal layer containing a ballasted cyan coupler capable of reacting with an oxidation product of an aromatic primary amine color developing agent to form a diffusible dye, and a spontaneously developable, slightly soluble silver salt dispersion, (2) a first negative type red-sensitive silver halide emulsion layer provided adjacent said colloidal layer (1) and containing a ballasted compound capable of reacting with an oxidation product of an aromatic primary amine color developing agent to release a diffusible development inhibitor inhibiting the development of said silver salt in the above described colloidal layer (1), and (3) a second negative type red-sensitive silver halide emulsion layer containing a ballasted cyan coupler capable of reacting with an oxidation product of an aromatic primary amine color developing agent to release a non-diffusible cyan dye and providing a cyan image having a negative gradation suitable as an original for color printing in cooperation with said silver halide emulsion layer (2).

4,052,215

COLOR PHOTOGRAPHIC MULTILAYERED MATERIAL WITH IMPROVED COLOR DENSITY

Franz Moll, Leverkusen, and Lothar Rosenhahn, Cologne, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Nov. 8, 1976, Ser. No. 739,581

Claims priority, application Germany, Nov. 11, 1975, 2550552
Int. Cl.² G03C 1/84, 1/06, 1/48

U.S. Cl. 96-84 R

3 Claims

1. In a color photographic material comprising at least one light-sensitive silver halide emulsion layer and at least one light-insensitive layer of binder containing a colloidal silver dispersion the improvement according to which the light-insensitive layer of binder containing the colloidal silver dispersion or a light-insensitive layer of binder adjacent thereto contains an alkali metal iodide or ammonium iodide.

4,052,216

COLOR PHOTOGRAPHIC MATERIAL CONTAINING A HYDROXYINDANE

Johannes Sobel, Leverkusen; Alfons Klein, Düsseldorf; Fritz Nittel, Leverkusen, and Karlfried Wedemeyer, Cologne, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

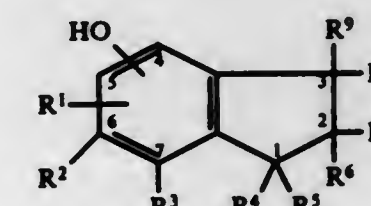
Filed June 8, 1976, Ser. No. 693,942

Claims priority, application Germany, June 13, 1975, 2526468
Int. Cl.² G03C 1/84, 1/40, 1/02

U.S. Cl. 96-84 UV

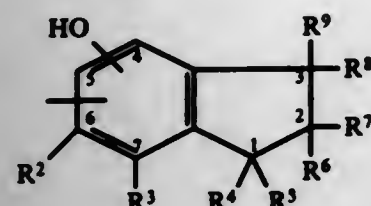
3 Claims

1. A light sensitive color photographic material capable of providing dye images upon exposure and development in a conventional liquid color developer and having improved resistance to bleaching of the dye image containing a silver halide emulsion and at least one hydrophilic binder layer containing a color coupler for the production of a dye image and in said binder layer in an amount to effectively reduce the bleaching of the produced dye image a hydroxy indane of the following formula:



in which

R^1 = hydrogen, alkyl, cycloalkyl, aralkyl or a further hydroxy indane radical bonded by $-S-$, $-SO_2-$, $-O-$, or a straight or branched chain alkylene bridge, of the formula:



R^2 and R^3 = hydrogen, halogen, $-NO_2$, carboxyl, alkyl, cycloalkyl, aralkyl, aryl, where the stated alkyl, cycloalkyl, aralkyl and aryl groups can contain further substituents; R^2 and R^3 together can represent the radical necessary for completing a condensed carbocyclic ring;

R^2 and R^3 = hydrogen, alkyl, cycloalkyl, aryl, or R^4 and R^5 together can represent the radical necessary for completing a 5- or 6-membered cycloaliphatic ring;

R^6 and R^7 = hydrogen, alkyl, cycloalkyl, aralkyl or phenyl; R^6 and R^7 together can represent the radical necessary for completing a 5- or 6-membered cycloaliphatic ring;

R^8 and R^9 = as R^6 and R^7 ; when R^8 and R^9 together represent the radical necessary for completing a 5- or 6-membered carbocyclic ring which may contain an annulated ring, this radical when annulated can contain a hydroxyl substituted benzo ring, capable of forming a dihydroxyspiro-bis-indane.

4,052,217

BIMETALLIC LITHOGRAPHIC PRINTING PLATES
Leonard James Watkinson, Leeds, England, assignor to Howson-Algraphy Limited, London, England

Continuation of Ser. No. 519,050, Oct. 29, 1974, abandoned, which is a division of Ser. No. 304,978, Nov. 9, 1972, Pat. No. 3,865,595. This application May 11, 1976, Ser. No. 685,146

Claims priority, application United Kingdom, Nov. 9, 1971, 52084/71; May 12, 1972, 22493/72

Int. Cl.² G03C 1/94; G03F 7/02

U.S. Cl. 96—86 R

11 Claims

1. A sheet material suitable for the production of a bimetallic lithographic printing plate, which sheet material comprises a self-supporting film or sheet of inert electrically insulating plastics material,

b. a base metal layer laminated to one surface of the film or sheet, and

c. a bimetallic layer laminated to the other surface of the film or sheet, one metal of the bimetallic layer being an ink-receptive metal and the other metal of the bimetallic layer being a water-receptive metal, said film or sheet forming a continuous electrically insulating spacing barrier layer between the base metal layer and the bimetallic layer whereby said lithographic sheet material is characterized by improved resistance to electrochemical corrosion during storage.

4,052,218 NOVEL SPIRO-HETEROCYCLIC COMPOUNDS, THEIR PREPARATION, AND USE THEREOF IN A THERMOGRAPHIC RECORDING MATERIAL

André Samat; Robert Guglielmetti, both of Brest, and Jacques Metzger, Marseille, all of France, assignors to Laboratoires de Physicochimie Appliquée I S S E C, Ferney Voltaire, France

Filed May 19, 1975, Ser. No. 579,119

Claims priority, application France, May 24, 1974, 74.18078

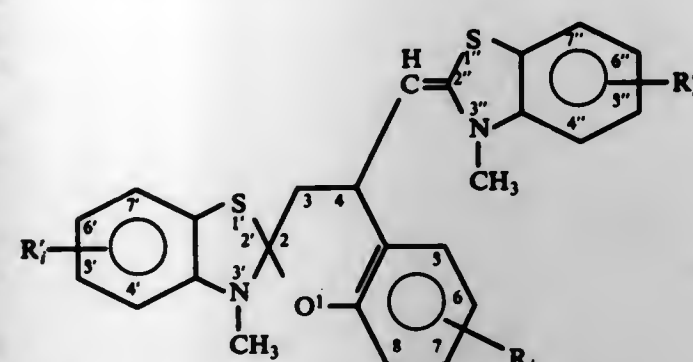
Int. Cl.² G03C 1/02

U.S. Cl. 96—114.1

7 Claims

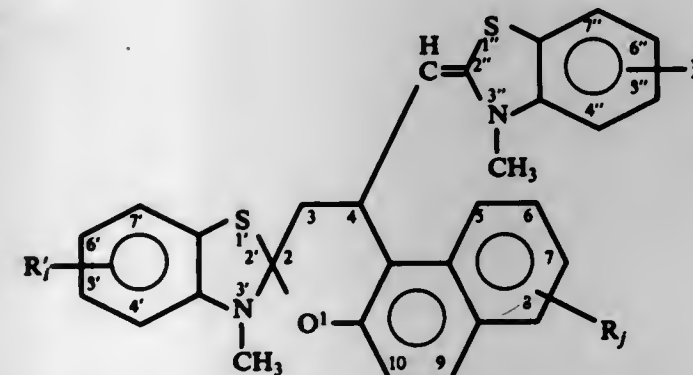
1. Thermochromic spiro heterocyclic compounds, selected from the group consisting of the following formulae;

(1)



and

(2)



where R_1 is a substituent in positions 5, 6, 7 and 8 in formula (1); R_2 is a substituent in positions 4', 5', 6' and 7' and 4'', 5'', 6'' and 7'' in formulae (1) and (2); and R_3 is a substituent in positions 5, 6, 7, 8, 9 and 10 in formula (2); wherein R_1 and R_2 are selected from the group consisting of hydrogen, alkyl, OH, OR, NH_2 , NR_1R_2 and $NHCOR$, where R_1 and R_2 each denotes an alkyl radical; and wherein R_3 is selected from the group consisting of hydrogen, alkyl, OH, OR, NH_2 , NR_1R_2 , $NHCOR$, NO_2 , $C=N$, HSO_3 , CHO , COR , $COOH$, $COOR$, and halogen, where R_1 , R_2 and R_3 each denotes an alkyl radical.

4,052,219

PIPE COATING COMPOSITION

Oren L. Marrs; Robert E. Reusser, and Dale O. Tieszen, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 28, 1976, Ser. No. 680,836

Int. Cl.² C09D 5/08

U.S. Cl. 106—14

5 Claims

1. A composition of matter consisting essentially of a mixture of about 50 to 70 wt. % of a mineral aggregate, about 5 to 20 wt. % of asphalt, about 15 to 35 wt. % of a finely divided mineral filler, and about 0.05 to 0.5 wt. % of a synthetic organic fiber selected from the group consisting of polyester fibers, polyamide fibers, polyfluorocarbon fibers and poly(arylene sulfide) fibers.

4,052,220

METHOD OF MAKING AN IMPROVED CONCRETE

Raymond C. Turpin, Jr., Atlanta, Ga., assignor to The Partners Limited, Atlanta, Ga., a part interest

Filed Sept. 10, 1975, Ser. No. 612,138

Int. Cl.² C04B 7/35

U.S. Cl. 106—90

20 Claims

1. A process for the preparation of ready-mix concrete comprising the following ingredients, water, cement, fine aggregate, a pozzolan material, and a chemical admix selected from the group consisting of derivatives of lignosulfonic acid and its salts and polymer derivatives of sugar, comprising:

preparing a pozzolan-admix slurry comprising a substantial portion of said chemical admix, pozzolan material, and water;

mixing said pozzolan-admix slurry for a period of time between five seconds and one minute;

adding said pozzolan-admix slurry to a mixture comprising one or more of the ingredients of said ready-mix concrete;

adding the remaining ingredients of said ready-mix concrete; and

mixing said ready-mix concrete.

4,052,221

ARTICLE MOUNTING ADHESIVE

Edwin J. Pritchard, Coopersburg, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

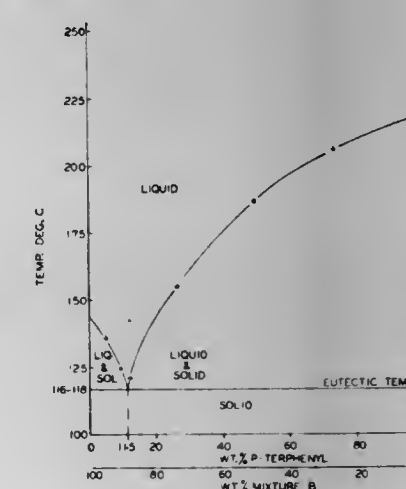
Division of Ser. No. 569,529, April 18, 1975, Pat. No. 3,970,494.

This application May 4, 1976, Ser. No. 683,151

Int. Cl.² C08L 91/06

U.S. Cl. 106—270

7 Claims



1. An evaporable thermoplastic adhesive for mounting articles which comprises:

- at least one isomer of chlorinated naphthalene; and
- p-terphenyl.

4,052,222

TREATMENT OF PIGMENT

Peter Barry Howard, Yarm, England, assignor to Tioxide Group Limited, Billingham, England

Filed June 4, 1976, Ser. No. 692,904

Int. Cl.² C09C 1/36

U.S. Cl. 106—300

17 Claims

1. A process for the treatment of titanium dioxide pigment comprising

- forming an aqueous dispersion of pigmentary titanium dioxide containing a first water-soluble compound of silicon in an amount of from 1 to 2% by weight expressed as SiO_2 ,

- adding to the dispersion

a first acidic water-soluble compound of aluminum in an amount of from 1.5 to 2.5% by weight expressed as Al_2O_3 ,

an acidic water-soluble compound of zirconium in an

amount of from 0.5 to 1.5% by weight expressed as ZrO_2 , and

an acidic water-soluble compound of titanium in an amount of from 1.0 to 2.0% by weight expressed as TiO_2 ,

c. changing the pH of the dispersion to a value in the range 7.5 to 8.5, and then

d. adding to the dispersion a second water-soluble compound of silicon in an amount of from 1 to 2% by weight expressed as SiO_2 , then

a second acidic water-soluble compound of aluminum in an amount of from 1 to 2% by weight expressed as Al_2O_3 , and then

an alkaline water-soluble compound of aluminum in an amount of from 0 to 1.5% by weight expressed as Al_2O_3 , all the percentages by weight being based on the weight of TiO_2 in the pigment and recovering the so treated pigment.

4,052,223

TREATMENT OF PIGMENT

Peter Barry Howard, Yarm, England, assignor to Tioxide Group Limited, Billingham, England

Filed Aug. 3, 1976, Ser. No. 711,151

Claims priority, application United Kingdom, Aug. 14, 1975, 33826/75

Int. Cl.² C09C 1/36

U.S. Cl. 106—300

13 Claims

1. A process for the treatment of titanium dioxide pigment which comprises forming an aqueous dispersion of titanium dioxide containing as a dispersant 0.1% to 0.3% by weight of monoisopropanolamine, a water-soluble phosphate in an amount of 0.05% to 0.5% by weight expressed as P_2O_5 or a mixture thereof, or a water-soluble silicate in an amount of 0.1% to 0.5% by weight expressed as SiO_2 used alone or together with monoisopropanolamine and/or the phosphate, adding to the aqueous dispersion a water-soluble phosphate in an amount of 0.05% to 1.0% by weight expressed as P_2O_5 when the dispersing agent is not solely a phosphate, a water-soluble hydrolysable acidic compound of zirconium in an amount of from 0.2% to 2.5% by weight expressed as ZrO_2 , a water-soluble hydrolysable acidic compound of aluminum in an amount of from 0.2% to 2.5% by weight expressed as Al_2O_3 , a water-soluble compound of silicon in an amount of from 0% to 1% by weight expressed as SiO_2 , and a water-soluble hydrolysable alkaline compound of aluminum in an amount of 0.5% to 2.5% by weight expressed as Al_2O_3 , and adjusting the pH of the dispersion, if necessary, to a value of pH 6.5 to 8.5 prior to recovering the treated pigment from the dispersion will all the percentages by weight being based on the weight of titanium dioxide in the aqueous dispersion.

4,052,224

TREATMENT OF PIGMENT

Peter Barry Howard, Yarm, England, assignor to Tioxide Group Limited, Billingham, England

Filed June 4, 1976, Ser. No. 692,905

Claims priority, application United Kingdom, July 17, 1975, 30049/75

Int. Cl.² C09C 1/36

U.S. Cl. 106—300

20 Claims

1. A process for the treatment of titanium dioxide pigment which comprises forming an aqueous dispersion of pigmentary titanium dioxide containing a water-soluble compound of phosphorus in an amount of from 0.2 to 1.0% by weight expressed as P_2O_5 , adding to the dispersion so formed an acidic water-soluble compound of aluminum in an amount of from 2.5 to 3.5% by weight expressed as Al_2O_3 , a water-soluble acidic compound of zirconium in an amount of from 0.5 to 1.5% by weight expressed as ZrO_2 , an acidic water-soluble compound of titanium in an amount of from 1.5 to 3% by weight expressed as TiO_2 and a water-soluble compound of

silicon in an amount of from 0.2 to 2.0% by weight expressed as SiO_2 , adjusting the pH of the dispersion to a value of from 3.5 to 4.5 and then adding to the dispersion a water-soluble compound of phosphorus in an amount of from 0.2 to 1.0% by weight expressed as P_2O_5 and an alkaline reacting water-soluble compound of aluminum in an amount of from 0.5 to 1.5% by weight expressed as Al_2O_3 , with all the percentages by weight being based on the weight of TiO_2 in the pigment, and adding to the dispersion a mineral acid to adjust the pH to a value of 6.5 to 8 and recovering the treated pigment.

4,052,225

PRODUCTION OF LOW-SULFUR CHROMIUM (III) OXIDE PIGMENT

Manfred Mansmann, Krefeld, and Karl Brandle, Schldgen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 559,454, March 18, 1975, abandoned.

This application Aug. 27, 1976, Ser. No. 718,296

Claims priority, application Germany, Apr. 3, 1974, 2416203

Int. Cl.² C09C 1/34; C01G 37/02

U.S. Cl. 106—302

11 Claims

1. In the continuous production of low-sulfur chromium-(III)oxide pigment comprising the steps of reducing a finely divided alkali metal chromate in a heated hydrogen-containing reaction zone at a temperature of about 900° to 1600° C, and precipitating the resulting chromium(III)oxide in the form of an aqueous dispersion, the improvement which comprises introducing into said reaction zone a solid alkali metal chromate containing about 0.1 to 2% by weight of finely divided silicon dioxide, passing the reduction products from the reaction zone along with the silicon dioxide to a dwell zone, and generating heat within said dwell zone to maintain the temperature therein in the range of about 900° to 1600° C.

4,052,226

DIRECTED ENZYMOLOGYSIS OF STARCH

Frank Verbanac, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Sept. 25, 1975, Ser. No. 616,785

Int. Cl.² C12D 13/02; C13F 3/00; C13L 3/00

U.S. Cl. 127—29

14 Claims

1. A method for controlling the saccharide distribution for starch hydrolyzate obtained by the hydrolysis of starch ester with amylase, comprising:

- hydrolyzing a starch ester having a degree of ester substitution from about 0.05 to about 0.5 with an amylase to a starch ester hydrolyzate,
- saponifying the starch ester groups of the starch ester hydrolyzate to the hydroxyl form and thereby provide a saccharide product essentially free from ester groups, and
- recovering the saponified saccharide product therefrom.

4,052,227

PARTS WASHER

William A. Delo, Wyoming, and Raymond J. Nielsen, Saranac, both of Mich., assignors to 4 - Share, Inc., Grand Rapids, Mich.

Filed Sept. 22, 1975, Ser. No. 615,224

Int. Cl.² B08B 3/02

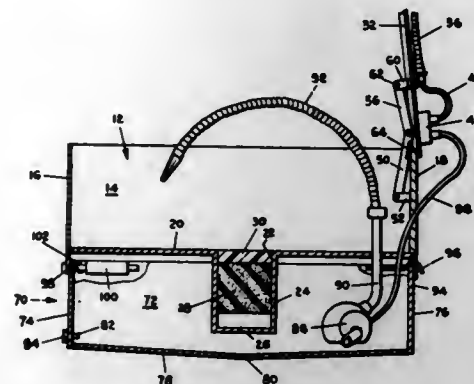
U.S. Cl. 134—56 R

14 Claims

1. In a parts washer having a tub, a drain in the tub and a cover hinged to the tub so as to seal the tub when the cover is down, and means for restraining the cover in an open position and for releasing the cover to the sealing position, the improvement in the retaining means comprising:

an overcenter toggle linkage having one end mounted within the tub and another end mounted on the cover, said overcenter linkage having one toggle position bracing the cover in a raised position but slightly tilted forward over the tub and another toggle position permitting closing of the cover over the tub;

said overcenter linkage having at least one fusible link which melts at a relatively low temperature such as that caused



by a fire within the tub so that the cover will quickly seal the tub in the event of fire in the tub.

4,052,228

OPTICAL CONCENTRATOR AND COOLING SYSTEM FOR PHOTOVOLTAIC CELLS

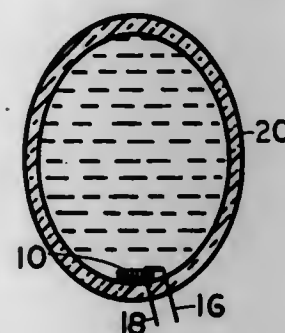
Charles R. Russell, 3071 Marilyn Way, Santa Barbara, Calif. 93105

Filed July 12, 1976, Ser. No. 704,328

Int. Cl.² H01L 31/04

U.S. Cl. 136—89 PC

5 Claims



1. Apparatus for converting solar radiation to electrical energy comprising:

- a plurality of solar cells;
- a tube elliptical cross section, comprising a transparent wall section having elliptical inner and outer wall surfaces, said solar cells being secured to an inner wall of said tube near one end of the major axis of the elliptical transparent wall section;
- a liquid surrounding said cells and substantially filling said tube whereby radiation impinging on said transparent wall section is concentrated on said cells through the curved surface of said liquid.

4,052,229

PROCESS FOR PREPARING A SUBSTRATE FOR MOS DEVICES OF DIFFERENT THRESHOLDS

Richard D. Pashley, Mountain View, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed June 25, 1976, Ser. No. 700,043

Int. Cl.² H01L 21/265, 29/78

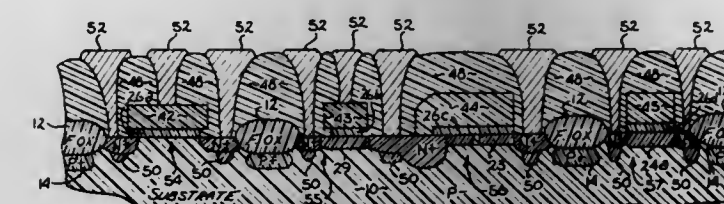
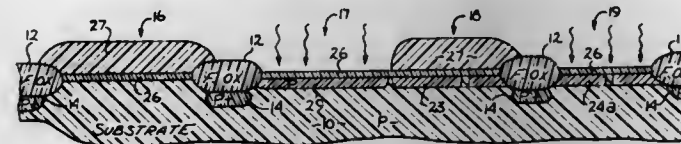
U.S. Cl. 148—1.5

13 Claims

1. In the fabrication of MOS devices, a process for preparing a silicon substrate comprising the steps of:

- forming a first masking means over a first area of said substrate;
- subjecting said substrate to a first dopant such that portions thereof other than said first area of said substrate are doped with said first dopant;
- forming a second masking means over a second area of said substrate, said second area being coextensive with a portion of said first area;
- subjecting said substrate to a second dopant such that

portions thereof other than said second area of said substrate are doped with said second dopant; said steps (a) through (d) resulting in four host regions in said substrate each having a different doping level such



that when a field-effect transistor is formed in each of said host regions each such transistor may have a different threshold voltage; fabricating MOS devices in said host regions, each having a different threshold voltage.

4,052,230

DEEP HARDENING MACHINABLE ALUMINUM KILLED HIGH SULFUR TOOL STEEL

Paul T. Aylward, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 633,343, Nov. 19, 1975, Pat. No. 4,019,930.

This application Nov. 15, 1976, Ser. No. 742,396

Int. Cl.² C21D 9/48

U.S. Cl. 148—2

3 Claims

1. A method of producing a low alloy, aluminum killed, water-quenched, resulfurized, martensitic deep hardening steel, highly machinable in the hardened condition comprising:

- providing an ingot of a composition consisting essentially of by weight:
- | | |
|------------|-------------------|
| Carbon | — 0.33 to 0.42% |
| Manganese | — 0.70 to 1.25% |
| Phosphorus | — 0.025% maximum |
| Sulfur | — 0.03 to 0.110% |
| Silicon | — 0.15 to 0.45% |
| Aluminum | — 0.019 to 0.077% |
| Chromium | — 0.90 to 1.85% |
| Molybdenum | — 0.10 to 0.50% |

boron and titanium in amounts to effect hardening of said steel, said boron and titanium being present in amounts of at least 0.0005 and 0.010 weight percent, respectively and the balance iron with residual impurities;

- hot working said ingot to form a hot worked product;
- water-quenching said hot worked product from an austenitizing temperature; and
- tempering said water-quenched hot worked product to a desired hardness.

4,052,231

STABLE COLLOID SOLUTION AND METHOD OF MAKING SAME

Walter H. Gunn, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 504,383, Sept. 9, 1974, Pat. No. 3,970,482, which is a continuation-in-part of Ser. No. 298,646, Oct. 18, 1972, abandoned. This application Feb. 13, 1976, Ser. No. 657,766

Int. Cl.² C23F 7/26; C08B 37/00

U.S. Cl. 148—6.2

5 Claims

1. A stabilized aqueous composition containing solubilized xanthan gum hydrophilic colloid, which colloid in solution will otherwise support microbial growth, said composition

being resistant to microbial growth while exhibiting suppressed gel formation, said composition comprising, in aqueous solution, xanthan gum hydrophilic colloid and chromic acid, said solution being at a pH above 3 and having reduced forms of chromium, if such exist, at substantially below 5 percent of the solution hexavalent chromium.

4,052,232

PHOSPHATING PROCESS

Michael Brock, Reading, and Brian Alfred Cooke, Knotty Green, both of England, assignors to Imperial Chemical Industries Limited, Great Britain

Filed June 18, 1976, Ser. No. 697,740

Claims priority, application United Kingdom, June 20, 1975, 26351/75

Int. Cl.² C23F 7/10

U.S. Cl. 148—6.15 Z

5 Claims

1. A process of applying a phosphate coating to a ferrous metal substrate by treating the substrate with an acidic zinc phosphate solution and a depolarizing oxidant in the presence of 1 - 100 parts of a water soluble polymer per million parts of the phosphate solution, wherein the polymer is a polyacrylic acid or a polyacrylamide of molecular weight between 150 and 5×10^5 .

4,052,233

METHOD FOR GAS-AND FLUID-TIGHT SEALING OF BOREHOLES WHICH ARE THREADLESS AND UNDER PRESSURE, AND ARE MOUNTED IN A HARDENABLE RAW MATERIAL

Gunther Strauff, Kaarst, Germany, assignor to Langen & Co., Dusseldorf, Germany

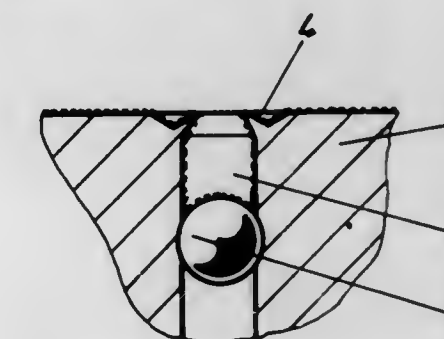
Filed Feb. 26, 1976, Ser. No. 661,826

Claims priority, application Germany, Feb. 26, 1975, 2508269

Int. Cl.² C21D 1/74, 7/02

U.S. Cl. 148—12.1

4 Claims



1. A method for gas- and fluid-tight sealing of non-threaded boreholes in a nitridation hardenable raw material comprising the steps of:

press fitting a hardened sealing member into a borehole in an unhardened raw material hardenable by nitridation; and hardening said raw material by nitridation at a temperature in which the initial stress which is developed by the pressing is partially retained.

4,052,234

METHOD FOR CONTINUOUSLY QUENCHING ELECTROLYTIC TIN-PLATED STEEL STRIP

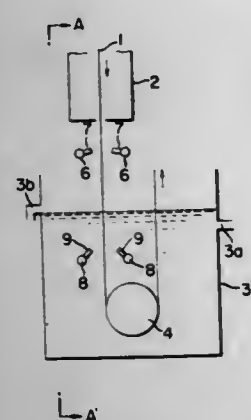
Hidehisa Yamaguchi; Mizuo Tanaka, and Riichi Shiono, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 517,449, Oct. 24, 1974, abandoned. This application Oct. 7, 1975, Ser. No. 620,310
Claims priority, application Japan, Nov. 5, 1973, 48-123361; Nov. 6, 1973, 48-124020

Int. Cl.² C21D 9/52; C25D 5/50

U.S. Cl. 148—156

10 Claims



1. A method of continuously quenching a continuously moving electrolytic tin-plated steel strip, comprising:
 1. maintaining a relatively low quenching rate of from 500° to 900° C. per second by spraying a quenching liquid mist onto a continuously moving tin-plated steel strip with its tin-plated layer fused thereto with heat, in the air above the surface of a quenching liquid maintained in a quenching tank, with a quantity of said quenching liquid of from 0.002 to 0.08 liter per square meter per minute, followed by
 2. passing said strip into said quenching tank containing said quenching liquid, and
 3. maintaining a relatively higher quenching rate of from 1,100° to 1,300° C. per second by spraying a larger quantity of quenching liquid of at least 1.2 liters per square meter per minute under a high pressure onto said strip beneath said surface in said quenching tank.

4,052,235

METHOD OF PREVENTING OXIDATION DURING WATER QUENCHING OF STEEL STRIP

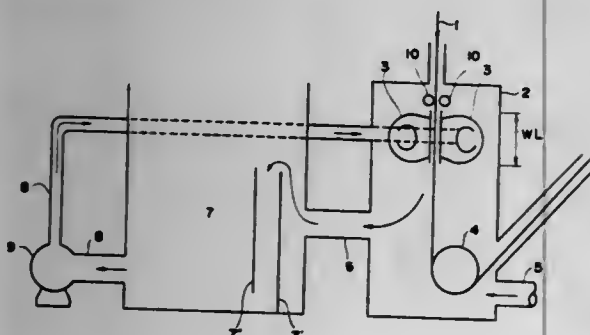
Kenshido Nakagaki; Kenji Araki; Yoshikazu Takada, all of Yokohama; Shinobu Osaka, and Kazuhiko Hirogami, both of Fukuoka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 29, 1975, Ser. No. 617,578

Claims priority, application Japan, Dec. 24, 1974, 49-147548
Int. Cl.² C21D 9/52

U.S. Cl. 148—156

3 Claims



1. A method of reducing oxidation during water quenching as part of continuous annealing of a cold-rolled steel strip, comprising the steps of quenching the steel strip from an ele-

vated temperature between 500° to 800° C by rapidly cooling said strip by directing uniform flow cooling water sprays against each surface of said steel strip with a spray impact pressure between 40 to 170 mm Hg from a pair of symmetrical cooling-water spray units to restrain the generation of water vapor, and to thereby reduce the amount of oxidation of the strip during the water quenching to such an extent that no supplementary pickling operation is required and then subjecting said steel strip to reducing gas over-aging treatment in a shelf treating furnace.

4,052,236

METHOD OF PREPARING IMITATION SHEET MATERIAL

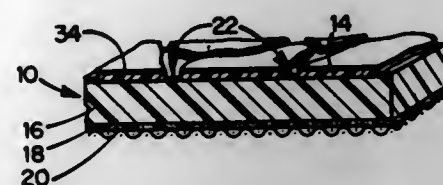
Vikram C. Kapasi, Chelmsford; Henry R. Lasman, Andover, both of Mass.; Robert J. Levenson, Northampton, N.H., and Reuben Wisotzky, Lexington, Mass., assignors to Pandel-Bradford, Inc., Lowell, Mass.

Division of Ser. No. 460,127, April 11, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,169

Int. Cl.² B29C 5/12; B29D 27/04

U.S. Cl. 156—85

13 Claims



1. A process of preparing a polymeric sheet material with a three-dimensional surface design thereon, which process comprises:
 - a. applying to depressed areas of an embossed release sheet having a design effect thereon a first polymer characterized by a high modulus of elongation in psi. at 100% elongation of about 2000 to 8000 psi;
 - b. applying a continuous layer of a second polymer characterized by a low modulus of elongation in psi. at 100% elongation over the first polymer in the depressed areas, the difference in the modulus of elongation between the first and second polymers being no less than 800 psi;
 - c. removing the release sheet to provide a polymeric sheet material composed of a continuous layer of a low modulus polymer, with raised areas composed of a high modulus polymer secured thereto; and
 - d. flexing the low modulus polymer in the intervening low areas between the raised high polymer areas to the polymeric sheet to form a weak-hinge effect, thereby providing a sheet material with an accentuated design effect thereon.

4,052,237

CLOSED TORUS TIRE

Paul E. Appleby, Cuyahoga Falls; Stanley J. Houck, Akron, and Richard B. Nash, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,716

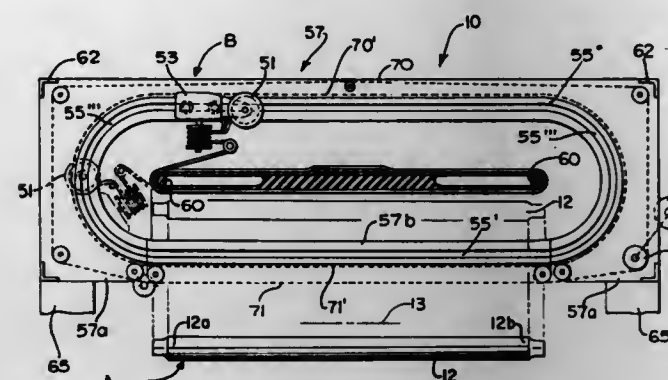
Int. Cl.² B29H 15/00, 17/14

U.S. Cl. 156—117

6 Claims

1. The method of making a closed torus tire having continuously wound cord reinforcement and comprising disposing an endless flattened empty tube coaxially about a cylindrical support to form an inflatable liner; locating a pair of inextensible endless bead cores coaxially about said support each adjacent to a respective axial end of said tube, said cores being spaced axially apart a distance effective to determine the peripheral length of each single turn of cord wound continuously around said pair of cores; winding said cord continuously about said bead cores in a flattened oval path wherein said cord extends in substantially straight parallel lines respectively

inwardly and outwardly adjacent to said cores thereof while rotating said cores about the axis of said support in timed relation with said winding; then shifting each of said bead cores axially toward the other thereby relocating said cores



relative to the periphery of the torus of cords therearound inflating said tube; and applying a breaker belt and tread circumferentially about the cord wound liner tube and said bead cores and curing the tire.

4,052,238

METHOD OF MAKING A SCOURING PAD OR THE LIKE

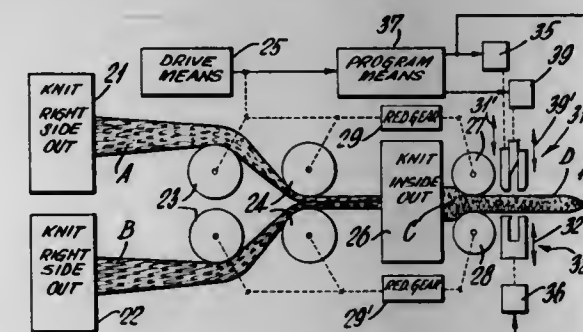
George B. Botvin, Cumberland, R.I., assignor to ACS Industries, Inc., Woonsocket, R.I.

Division of Ser. No. 590,102, June 25, 1975, which is a continuation-in-part of Ser. No. 553,509, Feb. 27, 1975, Pat. No. 4,017,949. This application Apr. 2, 1976, Ser. No. 666,328

Int. Cl.² B32B 1/10

U.S. Cl. 156—148

14 Claims



1. The method of making a scouring pad or the like which comprises loosely knitting an elongate plant outer tube around a loosely knitted elongate plant inner tube of stuffing material, one of said tubes being inside-out knitted with respect to the other, whereby the grain of adjacent surfaces of said tubes may be in essentially the same predominant direction, the knitted material of the outer tube including a filamentary thermoplastic element, locally compressing the outer tube upon the stuffing material at longitudinally spaced locations which include said thermoplastic element, thereby defining first and second transversely extending end alignments of a pad, locally securing the compressed materials at said alignments, such securing including the step of local heating of the thermoplastic element along said end alignments, and severing individual pads thus end-secured.

4,052,239

METHOD AND APPARATUS FOR MAKING FIBER REINFORCED TAPE

Henry T. Chen, 5212 N. Yvonne Ave., San Gabriel, Calif. 91776
Filed Jan. 23, 1976, Ser. No. 651,737

Int. Cl.² B32B 5/08

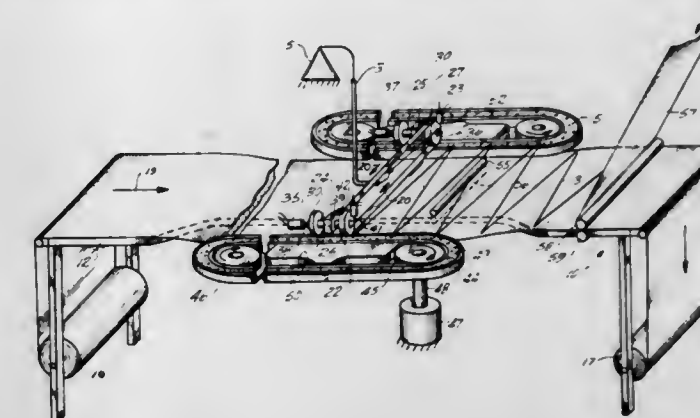
U.S. Cl. 156—177

12 Claims

1. A method of manufacturing a fiber reinforced tape comprising the steps of:
 - moving a strip of tape through a first area, looping a thread on one side of the strip of tape in a plane transverse to the direction of movement of the strip of tape in the first area

with each end of the loop near the edge of the strip of tape, supporting each end of the loop as it is formed, moving each end of a single loop at a right angle to the plane of the tape in the first area into the plane of the strip of tape to deposit the thread against the strip of tape, and securing the thread to the strip of tape.

6. An apparatus for manufacturing a fiber reinforced tape comprising:
 - means for moving a strip of tape through a first area,



means for looping a thread on one side of the strip of tape in a plane transverse to the direction of movement of the strip of tape in the first area with each end of the loop being near the edge of the strip of tape, means for supporting each end of the loop as it is formed, means for moving each end of a single loop at a right angle to the plane of the tape in the first area into the plane of the strip of tape to deposit the thread against the strip of tape, and means for securing the thread to the strip of tape.

4,052,240

TAPING DEVICE AND METHOD OF TAPING

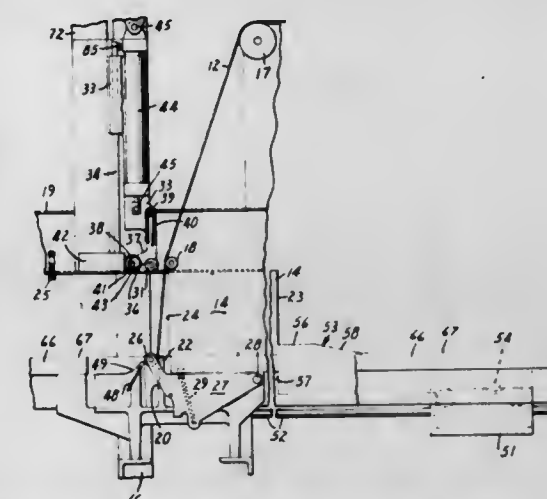
Robert A. Luhman, Cylon Township, St. Croix County, Wis., and John R. Ward, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 30, 1976, Ser. No. 682,100

Int. Cl.² B31B 1/72

U.S. Cl. 156—212

4 Claims



1. A method for applying a length of tape coated on one side with pressure sensitive adhesive from a supply length of the tape to a box along a meeting line defined by adjacent portions of the box and extending longitudinally along one side surface of the box, said method comprising:
 - defining a box path adapted to afford movement of the box endwise in a first direction with the meeting line of the box along a first side of the path;
 - positioning an end portion of the supply length of tape transverse of the path at a first position along the box path between means on the first side of the box path for sup-

porting the supply length of the tape from which the tape may be withdrawn against a predetermined tension and means on the opposite side of the box path for releasably holding a terminal end portion of the tape, the tape being positioned with its adhesive surface facing to engage the leading surface of the box moving in the first direction along the path and to bridge the meeting line of the box; propelling the box along the path in the first direction past the first position and to a position with the trailing surface of the box at a predetermined second position along the box path, the second position being spaced in the first direction from the first position;

pressing the tape being withdrawn from the tape supply into engagement with the box over the meeting line adjacent the first position upon movement of the box past the second position;

providing an assembly including an arm, a first tape guide member, means mounting the first tape guide member on the arm for movement between a retracted position adjacent the arm and an extended position spaced from the arm, means for biasing the first guide member toward its extended position, and a second tape guide member mounted on the arm in spaced relationship with the first guide member;

moving the arm assembly transversely across the path after the trailing surface of the box reaches the second position with the tape guided around the first and second tape guide members to extend a generally U-shaped length of the tape along the trailing surface of the box, and with the first tape guide member biased against the trailing surface to bias tape around the first tape guide member into engagement therewith and with the surface of the box along the second side of the path;

severing the tape between the first and second tape guide members at the second side of the path; and engaging the newly severed end portion of the supply length of tape extending around the second guide member with the means for releasably holding a terminal end portion of the tape by movement of the second guide member adjacent to the means for releasably holding.

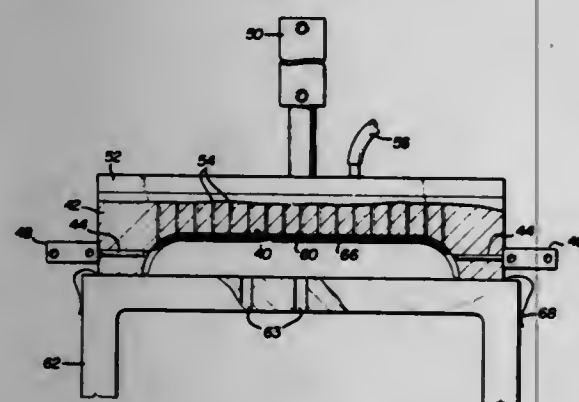
4,052,241

METHOD OF FORMING A CONTOURED LAMINATE
William J. Walter, Algonac, Mich., assignor to Detroit Gasket and Manufacturing Company, Detroit, Mich.

Filed Nov. 13, 1975, Ser. No. 631,794
Int. Cl.² B29C 17/04

U.S. Cl. 156—245

7 Claims



6. A method of adhesively bonding a flexible perforated finish sheet over the concave face of a contoured pervious, concavo-convex automotive headliner substrate, comprising the steps of:

- releasably supporting said headliner substrate in a downwardly facing cavity of a contoured female die, said die cavity having a peripheral sealing surface and a concave face conforming to and receiving the convex face of said substrate;
- positioning said perforated flexible sheet beneath said substrate on a flexible impervious sealing sheet, said seal-

ing sheet supported and retained at its periphery on a generally planar support having a plurality of perforations therethrough;

- applying an adhesive to one of the confronting faces of said perforated contoured substrate and said flexible sheet; closing the die to provide a sealed chamber defined by said die cavity and said sealing sheet interiorly of said peripheral sealing surface, with the chamber containing said finish sheet and said headliner substrate;
- releasing said contoured substrate within a sealed chamber defined by said die cavity and said flexible seal, permitting the substrate to drop slightly within the cavity, yet restraining lateral deflection of the substrate by the die cavity;
- drawing a vacuum through said die cavity and substrate, thereby drawing said sealing sheet into said cavity and said flexible sheet into face-to-face contact with said convex face of said substrate and bonding said flexible sheet to said substrate; and
- releasing said headliner substrate and the bonded flexible finish sheet.

4,052,242

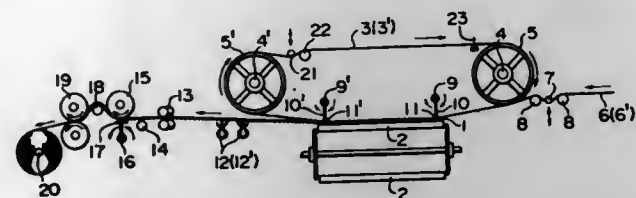
METHOD FOR PRODUCING A PRODUCT COMPRISING WEFT WEBS OF LARGE WIDTH CONTINUED IN THE WARP DIRECTION

Masahide Yazawa; Haruhisa Tani; Masaki Matsumoto, and Yasuo Sasaki, all of Tokyo, Japan, assignors to Polymer Processing Research Institute Ltd., Tokyo and Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, both of Japan

Filed Jan. 21, 1976, Ser. No. 651,106
Claims priority, application Japan, Jan. 28, 1975, 50-11653
Int. Cl.² B32B 31/00

U.S. Cl. 156—263

2 Claims



1. A method for producing a product comprising weft webs of a large width continued side-by-side in the warp direction, which comprises:

- horizontally circulating two heated belts in parallel having a hot-melt type adhesive in a tacky state on the outer peripheral surfaces thereof and spaced by the length of one of cut webs for wefts, said horizontally circulating belts having upper and lower side routes;
- adhering right and left selvedge materials which constitute the right and left selvages of final product onto the respective sides of the lower surfaces of the belts on the lower side circulating route thereof, and running said selvedge materials together with the belts;
- successively loading cut webs for wefts obtained by cutting a web of a large width to a given length which corresponds to the distance between the two belts, one-by-one and at a given gap onto the surface of a conveyor horizontally circulating below the belts and in a direction perpendicular thereto;
- at each time when the front and rear ends of each one of the cut webs for wefts come to the position just overlapped with the corresponding right and left selvedge materials running crosswise above the cut weft webs, causing the two belts having the selvedge materials adhered thereon to suddenly drop over the whole of the length corresponding to the width of the cut webs for wefts, on the lower side route of the belts down onto the surface of one of the cut webs for wefts loaded on the conveyor, thereby to adhere the front and rear ends of the cut web for

wefts onto the corresponding lower surfaces of the selvedge materials having said adhesive thereon, and thereafter causing the belts having both the selvedge materials and the cut web for wefts adhered thereonto to suddenly rise, whereby the cut web for wefts is stripped from the conveyor, pulled up and transferred by the belts in the warp direction; repeating the above-mentioned dropping and rising of the belts whenever the belts with both the selvedge materials and the cut webs adhered thereon advance by the distance corresponding to the width of the cut weft webs at a speed so controlled that the cut weft webs are picked up one-by-one in a row without leaving any gaps between each other; and thereafter stripping the selvedge materials and the cut webs for wefts adhered onto the lower surfaces thereof from the surfaces of the belts, to thereby give a novel product of cut webs for wefts continued in the warp direction by selvages adhered onto both the margins of the cut webs for wefts.

4,052,243

METHOD FOR PRODUCING A CROSS-LAMINATED CLOTH-LIKE PRODUCT FROM WIDE WARP AND WEFT WEBS

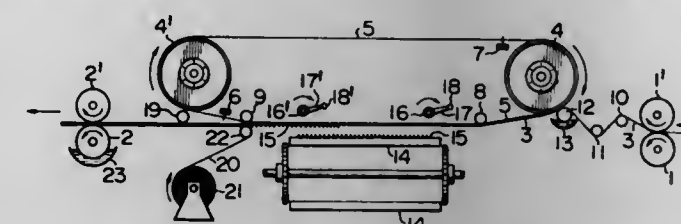
Masahide Yazawa; Haruhisa Tani; Masaki Matsumoto, and Yasuo Sasaki, all of Tokyo, Japan, assignors to Polymer Processing Research Institute Ltd., Tokyo and Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, both of Japan
Continuation-in-part of Ser. No. 651,106, Jan. 21, 1976. This application July 27, 1976, Ser. No. 709,045

Claims priority, application Japan, Apr. 5, 1976, 51-38413; Jan. 28, 1975, 50-11653

Int. Cl.² B32B 31/00

U.S. Cl. 156—265

4 Claims



1. In the method for forming a crosswise structure of wide warp and weft webs without leaving any gaps between each of the weft webs in the production of a cross-laminated cloth-like product, where a warp web is continuously fed to travel in the warp direction of the product to be prepared and weft webs cut to a length corresponding to the width of the product to be prepared, are fed horizontally one by one along the line crosswise to that of production of the product and after cross-overlaid, the resulting structure of warp and wefts is fixed by a binder,

an improved method for temporarily forming a continuous row of cut weft webs arranged in side by side relationship before fixing said warp and weft structure, which comprises:

- causing a warp material to travel horizontally along the line of production of product, while intersecting the feeding line of cut weft webs carried on a conveyor and travelling horizontally and crosswise thereto and vertically apart therefrom, said warp material being wetted on the surface thereof to be opposed to the cut weft webs, with a liquid having adhesion property, and having a sufficient width for covering the width of the warp web and a sufficient effective surface area for picking up the whole of one of the cut weft webs in the flat state, when wetted with said liquid;
- at each time when one of the cut weft webs comes to the position wholly overlapped with the travelling warp material, subjecting at least the part of the warp material facing the one of the cut weft webs to a sudden

reciprocating vertical motion so as to touch and pick up the cut weft web by temporary adhesion to the warp material due to the action of said liquid having adhesion property; and

repeating the above-mentioned reciprocating motions of the warp material successively, whenever the warp material advances by the distance corresponding to the width of the cut weft web at a speed so controlled that the cut weft webs are picked up one by one in a row without leaving any gaps between each other, and thereby effecting temporary forming of a continuous row of cut weft webs arranged in side by side relationship on the warp material.

4,052,244

RAPID CURING TWO PART ADHESIVE

Martin M. Skoultsch, Somerset, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 18, 1976, Ser. No. 715,529

Int. Cl.² B32B 7/00; C09J 5/04

U.S. Cl. 156—310

10 Claims

- A process for bonding surfaces comprising the steps of: applying to at least one of such surfaces an adhesive base consisting essentially of an acrylic monomer and a saccharin component selected from the group consisting of saccharin, the copper salt of saccharin and mixture thereof, said saccharin component being present in an amount of 0.01 to 10% by weight of the monomer;
- applying to at least one of such surfaces an activator comprising the copper salt of p-toluenesulfonic acid when only saccharin is used in the adhesive base and a salt of p-toluenesulfonic acid when the copper salt of saccharin is present in the adhesive base; and
- placing the surfaces so treated in abutting relation until the adhesive composition polymerizes and bonds the surfaces together.

4,052,245

CENTERING DEVICE

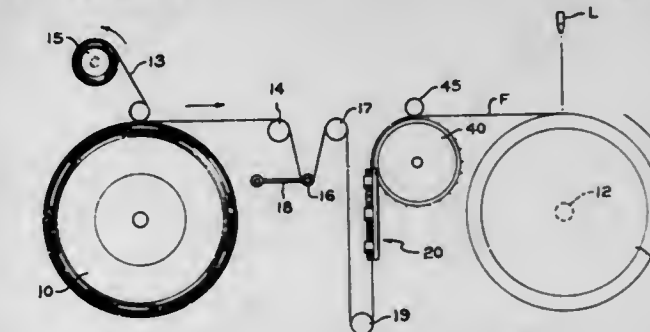
Mathew Kutz, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 3, 1975, Ser. No. 619,686

Int. Cl.² B29H 17/10, 17/28

U.S. Cl. 156—405 R

6 Claims



1. A fabric delivering device for servicing a tire building drum comprising a tire building drum, support means, roll supply means mounted on said support means for supplying fabric to said tire building drum, feed means for advancing fabric from said roll supply means to said tire building drum, said feed means including carrier means operative to captively engage and move fabric material to said tire building drum, said carrier means includes a plurality of radially extending needles operative to pierce and engage such fabric material, a centering means located on said support means closely adjacent to said carrier means and operative to center the fabric center with the vertical median plane of said tire building drum prior to delivery of fabric to said carrier means, said centering means having a plurality of opposed rollers operative to contact the laterally spaced side edges of a fabric material passing therethrough, and said opposed rollers increasing in

diameter progressively in the direction of feed toward said centering means to define a narrowing of the dimension between said opposed rollers.

4,052,246

STITCHER FOR TIRE BUILDING

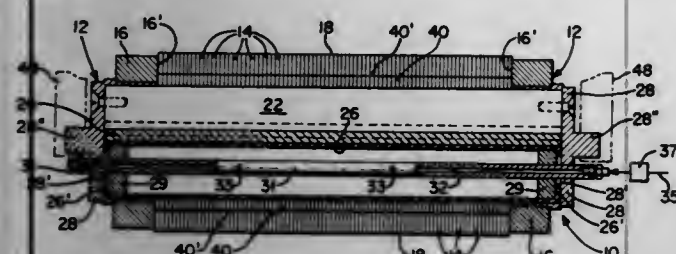
Angel Ramon Terrado Albareda, Mersch, and Joseph Schoellen, Estelbruck, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 30, 1976, Ser. No. 671,795

Int. Cl.² B29H 17/08

U.S. Cl. 156—412

11 Claims



1. A multiple disc stitcher for use in building tires comprising a pair of end assemblies spaced apart and disposed in parallel opposed relation to each other, a multiplicity of outer discs of equal exterior diameter and of concentric annular form and small thickness disposed in side-by-side array between the end members, each disc being slidable relative to the respectively adjacent disc, support means providing single continuous beam support for said discs disposed within the discs and extending normal to the discs between the end assemblies, a resilient fluid pressure containing cushion member juxtaposed to the support means and extending through the discs between the end assemblies and cooperable with the support means to control the displacement of the outer discs relative to the support means, a multiplicity of inner plate members each having an arcuate outer surface slidably engageable with respectively associated one of said outer discs and small thickness corresponding to the thickness of the associated outer disc, said plate members each having an opening therethrough accommodating said fluid pressure containing member, said outer discs being freely rotatable relative to the support means and relative to said plate members.

4,052,247

APPARATUS FOR SPLICING MOTION PICTURE SOUND FILM

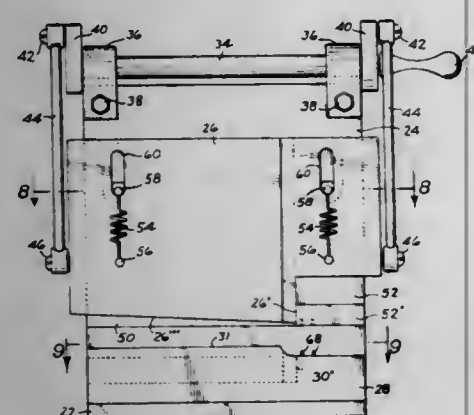
Arthur A. Rothrock, 8112 N. Druid St., Portland, Oreg. 97203

Filed Dec. 13, 1976, Ser. No. 749,746

Int. Cl.² G03D 15/04

U.S. Cl. 156—506

10 Claims



1. Apparatus for splicing motion picture sound film wherein the sound recorded on the sound stripe is displaced longitudinally of the related picture frame, the apparatus comprising:

- a cutter arranged to cut motion picture sound film transversely between adjacent picture frames but not across the sound stripe, thence longitudinally from said transverse cut between the picture frames and the sound stripe to a

point at which the sound relates to the first picture frame adjacent said transverse cut, thence transversely across said sound stripe, and

- a splicer arranged to retain mating end portions of film cut by the cutter with the confronting edges of said mating end portions in mutual abutment, for subsequent interconnection of said mating end portions.

4,052,248

PAPER DISPENSING APPARATUS FOR ROLLS OF PAPER

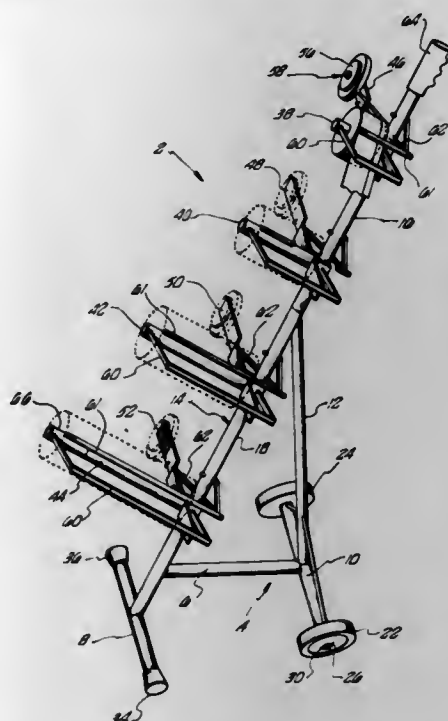
Travis Lowell Hunter, La Verne, Calif., assignor to Travis Hunter, Montclair, Calif.

Filed Oct. 29, 1975, Ser. No. 626,966

Int. Cl.² B31F 5/08; B32B 31/18

U.S. Cl. 156—511

10 Claims



10. A paper dispensing apparatus for a plurality of rolls of paper comprising:

- a base member having a front and rear support member;
- wheel means attached to only the rear support member;
- a support member attached to the base member and extending upward from the base member;
- a plurality of shafts of different lengths cantilevered outward from the support member to support respective different widths of paper rolls;
- a plurality of pivotally mounted pressure bars extending adjacent each shaft to bear against their respective paper rolls and relatively movable transverse to each respective shaft;
- means for applying an adhesive tape to the edge of each paper roll, including a pressure bar forcing a tape against the edge of a paper, and
- handle means attached to the support member for rotating the base member about the wheel means to transport the paper dispensing apparatus supported only by the wheel means.

4,052,249

FACE SEALING VALVE APPLICATOR

Roger K. Bruce, Mission Viejo, and Werner Marhold, Huntington Beach, both of Calif., assignors to Sterigard Corporation, Santa Ana, Calif.

Filed July 23, 1975, Ser. No. 598,253

Int. Cl.² B26D 9/00; B65H 5/08

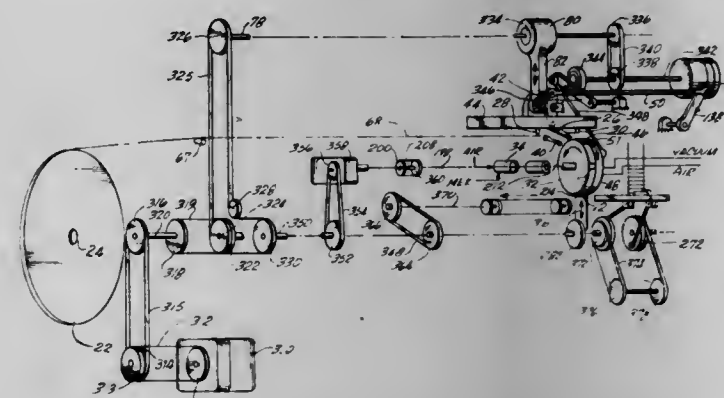
U.S. Cl. 156—513

12 Claims

1. An apparatus for forming and applying flap-type gassing valves to closure ends of pressurized dispensers, each valve being formed from tape stock advanced along a tape path of

the apparatus and having a backing of resilient material, a vent slot, and a layer of adhesive coextensive with the backing, the apparatus comprising:

- means for forming successive vent slots in the tape stock, the vent slot forming means including a head, means for reciprocating the head towards and away from the tape path, and a punch carried by the head to form the vent slot when the head moves towards the tape path;
- means for advancing the tape stock along the tape path during a first interval of a cycle and in steps so that in the cycle tape stock alternately advances along the path during the first interval and is at rest on the path during a second interval of the cycle, the tape stock advancing means including a reciprocating stepping dog engageable successively with each of the vent slots during the first interval of the cycle to advance the tape stock along the path one valve length, and means to reciprocate the stepping dog along the path over a distance greater than the one valve length advance;
- means for holding the tape stock at rest on the path during the second interval, the holding means including a stop index dog engageable successively with each of the vent slots on the path between the vent slot forming means and



the tape stock advancing means, the stop index dog holding the tape stock at rest after the stepping dog advances the tape stock one valve length and during the time the stepping dog continues along the path in the advancing direction during its reciprocation;

- lost motion means in the tape stock advancing means operable when the stop index dog engages a vent slot in the tape to stop stepping dog advance while the tape stock advancing means tends to advance the stepping dog;
- means for cutting the tape stock to valve length to form individual valves at a position along the path after vent slot formation, holding of the tape by the stop index dog, and tape advance by the stepping dog, the cutting means including a shear blade carried by the head, the shear blade and the punch acting on the tape while the tape is at rest during the second interval;
- receiver means for receiving the individual valves and advancing each in turn to an activation station and a transfer station;
- means at the activation station for activating solvent on each valve in a preselected area thereof on one side of the venting slot; and
- means at the transfer station for bonding the valve to an end closure at the preselected area.

4,052,250

CONE LABELING, SEPARATING AND RESTACKING APPARATUS

Robert G. Potts, 3007 Dodson Ave., Chattanooga, Tenn. 37406

Division of Ser. No. 497,554, Aug. 15, 1974, Pat. No. 3,981,407.

This application Mar. 22, 1976, Ser. No. 669,250

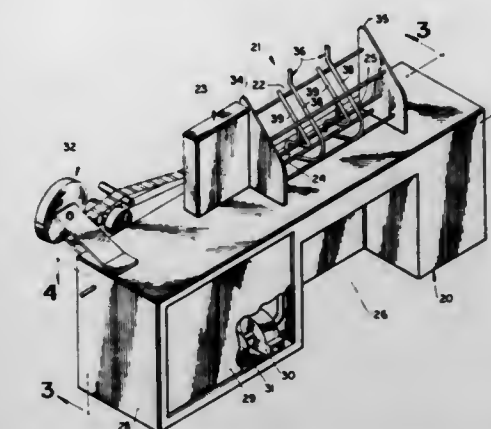
Int. Cl.² B65G 59/00; B65H 3/08

U.S. Cl. 156—556

3 Claims

1. A cone labeling, separating and re-stacking apparatus comprising a magazine for storing a plurality of stalks of cones parallel to one another, said magazine having a sloped dis-

charge area for gravity feed of stalks of cones from said magazine, a loader ram disposed adjacent to said discharge area for retaining said stalks of cones in said magazine, and means for causing reciprocal motion of said loader ram for moving a first stalk of cones and allowing a second stalk of cones to be released from said magazine, a tray for receiving said first stalk of cones, cone nose receiving means for receiving the nose end of said first stalk of cones in said tray means, said cone nose receiving means being axially aligned with said stalk of cones in said tray means, cone base receiving means axially aligned with said cone nose receiving means, labeling means for plac-



ing a label into the cone base end of said first stalk of cones, and cone separating means for separating the cone at the cone base end of said stalk of cones and moving said cone to said cone base receiving means, said cone separating means including a nozzle having a fluid passageway therein for admitting fluid under pressure between contiguous cone noses, and traverse means for moving said tray means in a direction parallel to the axis of said stalk of cones on said tray, said traverse means including index means for disposing said fluid passageway of said nozzle between successive contiguous cones of said stalk of cones.

4,052,251

METHOD OF ETCHING SAPPHIRE UTILIZING SULFUR HEXAFLUORIDE

Charles Edward Weltzel, Dayton, N.J., assignor to RCA Corporation, New York, N.Y.

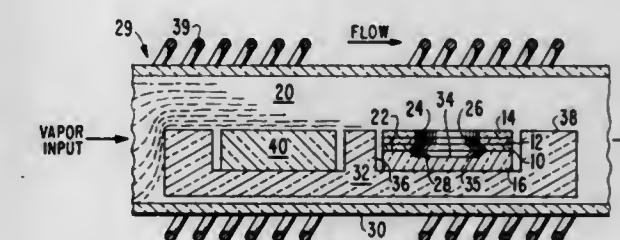
Filed Oct. 29, 1976, Ser. No. 736,882

Claims priority, application United Kingdom, Mar. 2, 1976, 08317/76

Int. Cl.² H01L 21/38

U.S. Cl. 156—612

13 Claims



9. A process for forming blind holes in a sapphire substrate comprising:

- depositing a first layer of silicon dioxide having a first thickness adjacent a surface of the sapphire substrate;
- depositing a layer of silicon nitride having a second thickness, adjacent the first layer of silicon dioxide;
- depositing a second layer of silicon dioxide, having a third thickness, adjacent the layer of silicon nitride;
- defining a preselected pattern having at least one aperture in a mask comprised of the first layer of silicon dioxide, the layer of silicon nitride, and the second layer of silicon dioxide; and
- exposing the mask and portions of the sapphire substrate unprotected by the mask to a vapor comprised of sulfur

hexafluoride and a carrier gas at a temperature no greater than 1,050° C for a time period sufficient to form said blind holes.

4,052,252

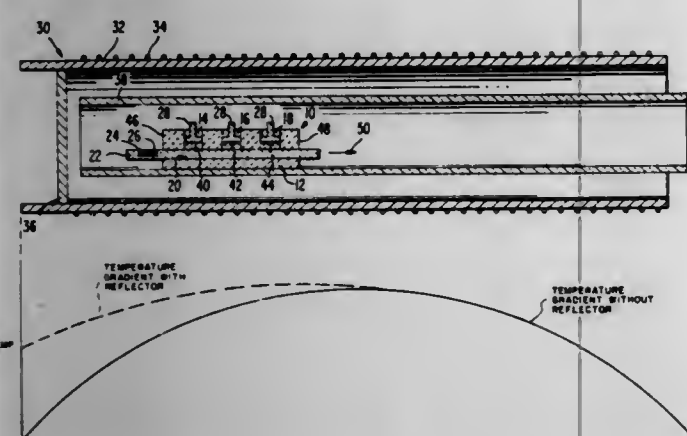
LIQUID PHASE EPITAXIAL GROWTH WITH INTERFACIAL TEMPERATURE DIFFERENCE

Harry Francis Lockwood, New York, N.Y., and Michael Ettenberg, Freehold, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 4, 1975, Ser. No. 565,092
Int. Cl.² B01J 17/04; H01L 21/208

U.S. Cl. 156—622

6 Claims



1. A method for growing a layer of crystalline semiconductor material by liquid phase epitaxy comprising the steps of: heating a charge composed of a semiconductor material and a solvent to melt the charge and form a solution of the semiconductor material in the solvent; heating a substrate to a lower temperature than the solution where the temperature difference is less than 1° C; bringing the substrate into contact with the solution; cooling the solution and substrate at the same rate to deposit a layer of semiconductor material onto the substrate; and removing the substrate from contact with the solution after a predetermined interval.

4,052,253

SEMICONDUCTOR-OXIDE ETCHANT

Thomas J. Kingzett, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 27, 1976, Ser. No. 726,883
Int. Cl.² H01L 21/316

U.S. Cl. 156—657

2 Claims

1. In a process wherein an emitter is formed in a silicon semiconductor through a diffusion window and an oxide formed thereover whereafter the emitter opening is cleaned out by immersing the silicon semiconductor in an etch solution the improvement comprising an etch consisting essentially of hydrochloric acid; hydrofluoric acid and water having a PH of less than 1.

4,052,254

STRIPPING OF ELECTROPLATED NICKEL-IRON ALLOYS FROM FERROUS SUBSTRATES

Edward P. Harbulak, Allen Park, and Ronald J. Lash, Warren, both of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 602,140, Aug. 5, 1975, and Ser. No. 602,141, Aug. 5, 1975. This application Feb. 2, 1976, Ser. No. 654,403

Int. Cl.² C23F 1/00

U.S. Cl. 156—664

55 Claims

1. A process for selectively removing nickel-iron alloys from

the surface of a ferrous metal substrate which comprises contacting said metal surface with an aqueous bath containing in the absence of any inhibitor to prevent corrosive attack on the substrate:

- at least one nitro substituted organic compound containing at least one solubilizing group;
- at least one organic amine or polyamine or substituted amine or polyamine;
- at least one aliphatic carboxylic acid or salt thereof, or a compound which will yield said carboxylic acid or salt thereof in solution, further characterized in that additionally said aliphatic carboxylic acid or salt thereof contains at least one substituent group selected from —NH₂, or quaternary amine salts thereof, or —OH; and
- at least one phosphorus oxo acid or organic phosphorus oxo acid or salts thereof or alkyl phosphonate substituted amines.

4,052,255

SPRAY DRYER DISCHARGE SYSTEM

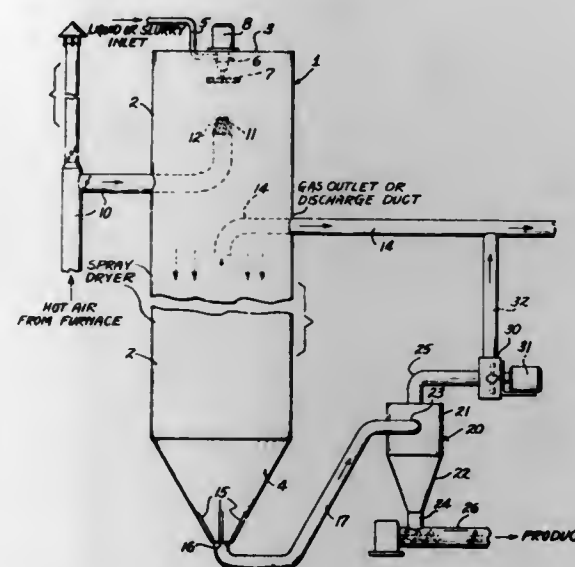
Lowell E. Hackbarth, Bel Air; Sterling W. Pyle, Aberdeen, and Paul W. Brandon, Havre de Grace, all of Md., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 187,470, Oct. 7, 1971, abandoned. This application Oct. 7, 1975, Ser. No. 620,463

Int. Cl.² B01D 1/18

U.S. Cl. 159—4 B

2 Claims



1. In a spray drying apparatus having a cylindrical drying chamber, said chamber having an upper portion and a second lower, inverted, conically-shaped, solids discharge portion; spray means for dispersing a liquid into the form of a mist of fine droplets in said upper portion of said drying chamber; conduit means for introducing a stream of hot gas into said chamber and into direct contact with said liquid droplets; exhaust conduit means for withdrawing said hot gas from said drying chamber; and a discharge outlet positioned at the apex of said inverted conically-shaped solids discharge portion for removal of particulate solids, the improved apparatus comprising the combination of:

- a high velocity rotating disc for dispersing said liquid in the form of fine droplets in the upper portion of said drying chamber;
- conduit means for introducing said stream of hot gas, comprising a gas distribution head provided with a series of intermittently spaced vanes which cause said stream of hot gas to be distributed radially and into direct contact with said mist of fine droplets for vaporizing said droplets, a downward flow of dry solids thereby being established within said chamber;
- exhaust conduit means within the upper portion of said drying chamber for drawing said hot gas from the downward flow of dry solids;
- a series of apertures cut into said conically-shaped discharge portion immediately above said discharge outlet;

4,052,256

DIBROMONITROMETHYL METHYL SULFONE SLIMICIDE

Christian T. Goralaki; Thomas C. Klingler, both of Midland, Mich., and Paul A. Wolf, Augusta, Ga., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 24, 1976, Ser. No. 699,547
Int. Cl.² D21D 3/00; D21H 5/22

U.S. Cl. 162—161

3 Claims

1. A method for controlling slime-forming organisms by applying to them and to their habitats a cidal amount of a solution containing at least 50 parts per million of dibromonitromethyl methyl sulfone.

4,052,259

MANUFACTURE AND USE OF WATER-SOLUBLE AUXILIARY AGENTS BASED ON POLYAMINOAMIDES FOR THE PRODUCTION OF PAPER

Lutz Hoppe, and Rudolf Behn, both of Walsrode, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Division of Ser. No. 517,785, Oct. 24, 1974. This application Oct. 24, 1975, Ser. No. 625,720

Claims priority, application Germany, Oct. 25, 1973, 2353430
Int. Cl.² D21D 3/00

U.S. Cl. 162—164 EP

4 Claims

1. In a paper making process wherein a suspension of paper pulp fibers, pigment, and filler is formed into a web on a traveling screen, the improvement which comprises incorporating into the suspension, in an amount sufficient to produce an improved drainage, sedimentation, and floatation of paper pulp fibers, modified basic polyaminoamide results from:

- reacting substantially equimolar portions of a polyfunctional compound selected from the group consisting of epichlorohydrin, dichlorohydrin, or mixtures thereof with a tertiary amine selected from the group consisting of trimethylamine, triethylamine, tripropylamine, tributylamine, dimethylaniline, dimethylcyclohexylamine or mixtures of any of said amines to form an ammonium compound;
- reacting 0.2–1.8 mols of said ammonium compound with each mol of secondary amine group in a water soluble basic polyaminoamide which is a condensation product of:
 - a dicarboxylic acid,
 - a polyalkylenepolyamine, and
 - an aminocarboxylic acid or a lactam; and
- said basic polyaminoamide being reacted with 0.15–0.19 mol of said polyfunctional compound per mol equivalent of secondary amino group in said polyaminoamide, before or after the reaction of step (b) has taken place.

4,052,260

METHOD OF OPERATING A NUCLEAR-POWER-GENERATING INSTALLATION WITH CLOSED GAS CYCLE AND PLANT OPERATED BY THIS METHOD

Siegfried Forster, Alsdorf; Gunter Dibelius, Aachen; Gunter Hewing, and Jasbir Singh, both of Julich, all of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung, Julich, Germany

Filed June 10, 1976, Ser. No. 694,825

Claims priority, application Germany, June 12, 1975, 2526147
Int. Cl.² G21C 19/28

U.S. Cl. 176—60

20 Claims

1. A method of operating a nuclear power plant with a closed-gas cycle which comprises the steps of:

- heating a working gas in a total stream in a nuclear reactor and subdividing the total stream after heating into three parallel partial streams;
- extending each of said gas streams in a respective turbine of a respective turbine set to drive a respective compressor thereof;

4,052,256

METHOD OF DISPERSING GLASS FIBERS USING A LINEAR POLYSILOXANE AND DISPERSION OBTAINED THEREBY

Laurent C. Renand, Pittsfield, Mass., and Clarence W. Charon, Newark, Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Continuation of Ser. No. 493,361, July 31, 1974, abandoned. This application Feb. 4, 1976, Ser. No. 655,175

Int. Cl.² D21D 3/00

U.S. Cl. 162—145

5 Claims

1. In the process of dispersing glass fibers in an aqueous solution, the improvement comprising:

vigorously agitating a mixture comprising water, glass fibers and an effective amount of a water solution of a linear polysiloxane containing at least 6 silicon atoms, each of said silicon atoms having 2 non-hydrolyzable oleophilic groups attached thereto, to uniformly disperse said glass fibers in said water.

5. An aqueous dispersion consisting essentially of:

- water;
- glass fibers;
- cellulose fibers; and,
- an effective amount of a linear polysiloxane, containing at least 6 silicon atoms and having 2 non-hydrolyzable oleophilic groups affixed to each of said silicon atoms, to hold said fibers dispersed throughout the water.

4,052,257

METHOD OF PRODUCING GLASS MATS

Homer G. Hill, Newark, Ohio, and Kenneth L. Austin, College Station, Tex., assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Continuation of Ser. No. 528,295, Nov. 29, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,488

Int. Cl.² C03B 25/02; C04B 43/02

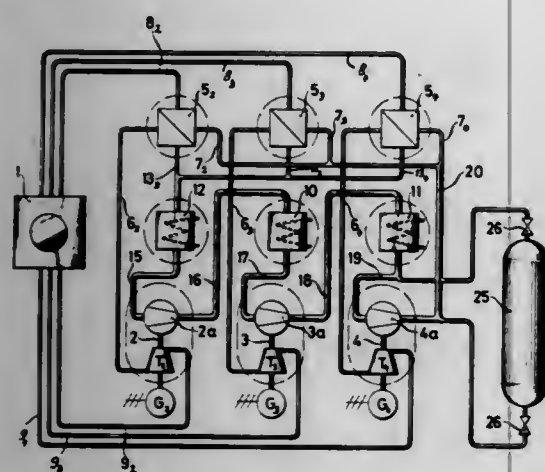
U.S. Cl. 162—156

10 Claims

1. A method of producing a glass mat which comprises:

- dispersing a plurality of glass fibers in an aqueous composition to form a dispersion, said glass fibers having at least a portion of their surface in contact with an effective amount of a size comprising a methyl trimethoxysilane and a malto-dextrin, said dispersion comprising an effective amount of a nonionic guar gum and an isostearic amide;
- withdrawing water from said dispersion to produce a glass mat; and,
- recovering said glass mat.

- c. abstracting useful heat from each of the partial gas streams expanded in the respective turbines in a respective recuperative heat exchanger;
- d. precooling the gas of said partial gas streams;
- e. combining the gas of said partial gas streams into a lesser number of gas streams and compressing same in at least two successive stages in said compressors with at least the compressor of the last of said stages compressing all of the combined gas of said streams;



- f. cooling the gas between said stages in at least one intervening cooler traversed by the combined gas of said partial gas streams;
- g. subdividing the combined gas from the last of said stages into three partial streams;
- h. preheating said partial streams upon subdivision in step (g) in said recuperative heat exchangers; and
- i. feeding the preheated partial gas streams to said nuclear reactor for heating therein in step (a); and
- j. driving electrical generators with the turbines of at least two of said sets.

4,052,261

PROCESS AND APPARATUS FOR THE FERMENTATION OF CARBOHYDRATE-CONTAINING NUTRIENT SUBSTRATE

Theodor Messing, Mulheim, and Karl H. Wamser, Moers, both of Germany, assignors to Standard-Messo Duisburg Gesellschaft fuer Chemie-technik mit Beschränkter Haftung & Co., Duisburg, Germany

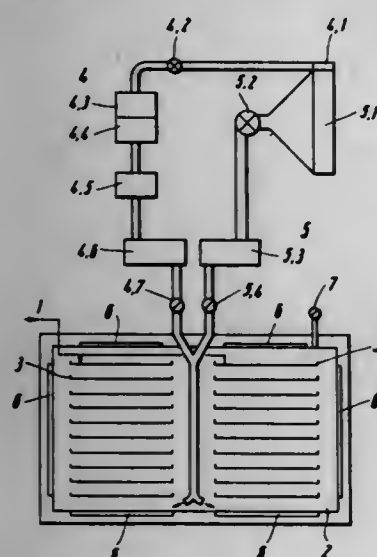
Filed Sept. 27, 1976, Ser. No. 726,778

Claims priority, application Germany, Sept. 27, 1975, 2543307

Int. Cl.² C12D 1/04; C12B 1/04

U.S. Cl. 195—36 R

9 Claims



1. Process for the fermentation of carbohydrate-containing nutrient substrate in the preparation of citric acid, wherein a fermentation solution is inoculated with a fermentation agent in a fermentation chamber, a layer of the fermentation agent

covering the entire surface of the nutrient substrate is formed in a germination phase, and subsequently a fermentation phase is carried out, characterized in that air is pretreated to a highly sterile state and fed into the fermentation chamber during the germination phase in a quantity sufficient to maintain the chamber at a slight positive pressure; the fermentation chamber is heated separately and independently of the air supply during the germination phase; the feeding of the highly sterile air and the heating of the fermentation chamber are discontinued during the fermentation phase, and fresh, normally filtered, unconditioned air is introduced in a quantity sufficient to maintain the fermentation solution at an optimum fermentation temperature.

4,052,262

PREPARATION OF AN ALKALINE PROTEASE

Koki Horikoshi, Saitama, and Yonosuke Ikeda, Tokyo, both of Japan, assignors to Rikagaku Kenkyusho, Japan

Filed May 27, 1970, Ser. No. 40,771

Claims priority, application Japan, May 31, 1969, 44-42646; Dec. 15, 1969, 44-100818; Apr. 22, 1970, 45-34535

Int. Cl.² C12D 13/10; C07G 7/02

U.S. Cl. 195—66 R

4 Claims

1. A process for preparing a novel alkaline protease which is a columnar crystalline powder, having a molecular weight of about 33,000 by the Archibald method, with analytical values of 48.04% carbon, 6.62% hydrogen, 16.07% nitrogen, 0.31% sulfur, the balance being oxygen, having an optimal activity at pH about 11.5, the relative activity being about 8%, 32%, 58%, 80%, 97% and 80% respectively at pH 7, 8, 9, 10, 11 and 13 with casein as the substrate, said enzyme exhibiting an isoelectric point of about 10 and a sedimentation constant of about 3.3S, comprising inoculating *Bacillus* sp. No. 221 (ATCC 21522) in a culture medium, in which no sugars are contained and having the composition of a carbonate, a carbon source other than a carbonate, a nitrogen source, and an inorganic material, culturing said *Bacillus* in said culture medium at pH 6 to 10 for a period sufficient to impart substantial proteolytic enzyme activity to said culture medium and to produce said alkaline protease in said medium, and collecting said alkaline protease from said culture medium.

4,052,263

PRODUCTION OF CHOLESTEROL ESTERASE USING *NOCARDIA CHOLESTEROLICUM*

Prakash S. Masurekar, Webster, and Charles T. Goodhue, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,690

Int. Cl.² C12D 13/00; C07G 7/02; C12B 1/20

U.S. Cl. 195—66 R

4 Claims

1. A method for the production of cholesterol esterase which comprises: growing a bacterium selected from *Nocardia cholesterolicum* species NRRL 5767 and NRRL 5768 in a medium comprising a cholesterol esterase inducer and at least 10 g./liter of yeast extract and separating the cholesterol esterase from the bacterium.

4,052,264

AGAR-BASE GELLING PRODUCTS

Horst Kragen, Velizy Villacoublay, Yvelines, France, assignor to Ceca S.A., Yvelines, France

Filed Mar. 3, 1976, Ser. No. 663,494

Claims priority, application France, Mar. 4, 1975, 75.06734; Dec. 29, 1975, 75.39975

Int. Cl.² C12K 1/10

U.S. Cl. 195—100

9 Claims

1. A bacteriological culture medium containing agar and galactomannane as gelling agents, said galactomannane being present in an amount effective to gel the medium up to 40% of said gelling agents.

4,052,265

PROCESS FOR THE PYROLYTIC TREATMENT OF ORGANIC, PSEUDO-ORGANIC AND INORGANIC MATERIAL

Klaus M. Kemp, 2410 Anacapa St., Santa Barbara, Calif. 93105

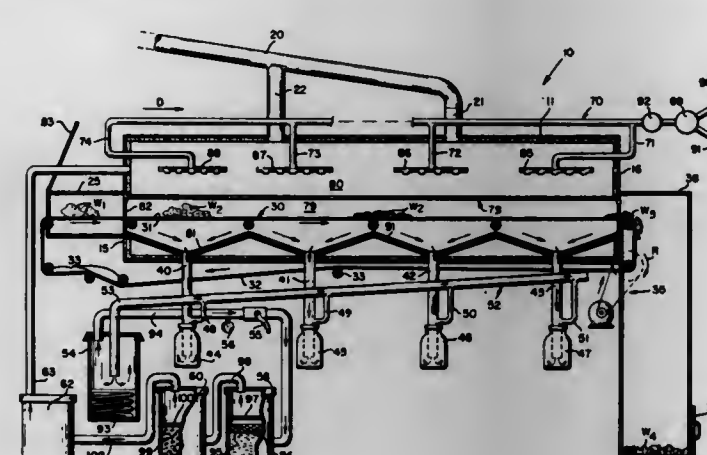
Division of Ser. No. 492,010, July 26, 1974, Pat. No. 3,945,890.

This application Jan. 12, 1976, Ser. No. 648,050

Int. Cl.² C10B 47/20, 53/02, 57/08

U.S. Cl. 201—2.5

3 Claims



1. A process for transformation of the chemical structure of organic matter, pseudo-organic and inorganic materials into recoverable useful compounds, or forms, by pyrolytic conversion, comprising the steps of:
 - a. conveying material continuously through a pyrolytic chamber;
 - b. restricting air flow into the pyrolytic chamber so as to result in negligible oxidation of the material;
 - c. heating the material with radiant heat to progressively cause decomposition by thermal breakdown resulting in the conversion of the material to product gaseous, vapor, liquid and solid constituents;
 - d. maintaining the pyrolytic chamber at a pressure at least as great as the ambient pressure to thereby substantially prevent the material from being exposed to air and any other oxidizing agents in the ambient atmosphere during heating;
 - e. applying a pressure gradient which continuously guides the gaseous-vapor stream with entrained droplets and particulates immediately upon formation through a bottom portion of the pyrolytic chamber formed with a plurality of troughs having sloping walls, from said troughs into corresponding take-off tubes, and from said take-off tubes into corresponding collection containers;
 - f. selectively condensing, collecting and recovering for reuse liquid condensate fractions obtained from said gaseous vapor stream through the use of a series of temperature controlled primary and secondary condensers connected via a fluid transfer manifold to the top of said collection containers;
 - g. collecting and recovering for reuse the gaseous constituents of said gaseous-vapor stream;
 - h. scrubbing the non-condensable portion of said gaseous constituents with adsorptive and absorptive scrubbers to remove droplets, particulates and pollutants;
 - i. accumulating the solid products of the pyrolytic conversion process at the exit end of the pyrolytic chamber;
 - j. cooling, sorting and continuously conveying away the solid products for reuse; and
 - k. diverting combustible gas and vapor constituents of the product gaseous-vapor stream to a combustion chamber wherein the combustible gas and vapor constituents are burned and heat is thereby generated for the pyrolytic process, and wherein the combustion chamber is separated from the pyrolytic chamber by a heat transfer barrier.

4,052,266

METHOD AND APPARATUS FOR PURIFYING PROCESS WASTE EMISSIONS

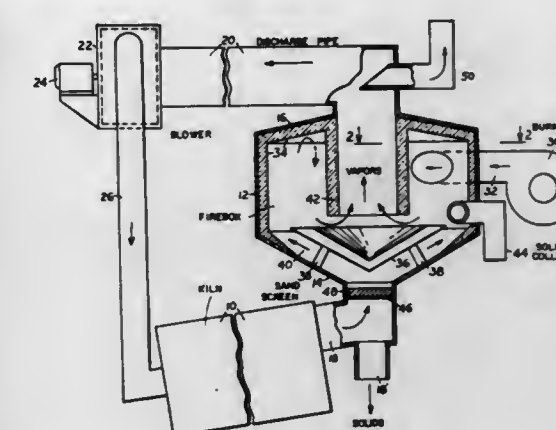
Joseph W. Griffith, 8705 SW. White Court, Portland, Oreg. 97225

Filed May 11, 1973, Ser. No. 359,475

Int. Cl.² C10B 47/00; F23D 13/20; F23B 3/00

U.S. Cl. 201—15

6 Claims



1. Apparatus for purifying process vapor-laden waste emissions, comprising
 - a. a chamber closed at both ends by end walls,
 - b. an oxidizing air-fuel burner having an outlet communicating with the interior of the chamber for causing the gases of combustion to move therein at high speed,
 - c. a waste emission inlet at one end of the chamber communicating the interior of the chamber with a source of waste emissions,
 - d. a vapor outlet communicating with the interior of the chamber downstream from the inlet and upstream from the end of the chamber opposite said inlet, said outlet being offset from said inlet for causing the flow of waste emissions to reverse directions between said inlet and outlet, whereby to delay the exit of vapors from the chamber until the combustible content of the air-fuel mixture and waste emissions have been substantially completely oxidized, said offset providing an indirect path of travel of waste emission particles from the inlet to the outlet, whereby further to delay the exit of vapors from the chamber,
 - e. the portions of the chamber and outlet which are contacted by the gases of combustion being constructed of material characterized by having a surface capable of being heated to and maintained at a temperature exceeding the ignition temperature of the air-fuel mixture and by a mass capable of insulating said surface against exterior cooling below said ignition temperature.

4,052,267

WATER DISTILLER

Richard McFee, 852 Ostrom Ave., Syracuse, N.Y. 13210

Filed July 7, 1975, Ser. No. 593,379

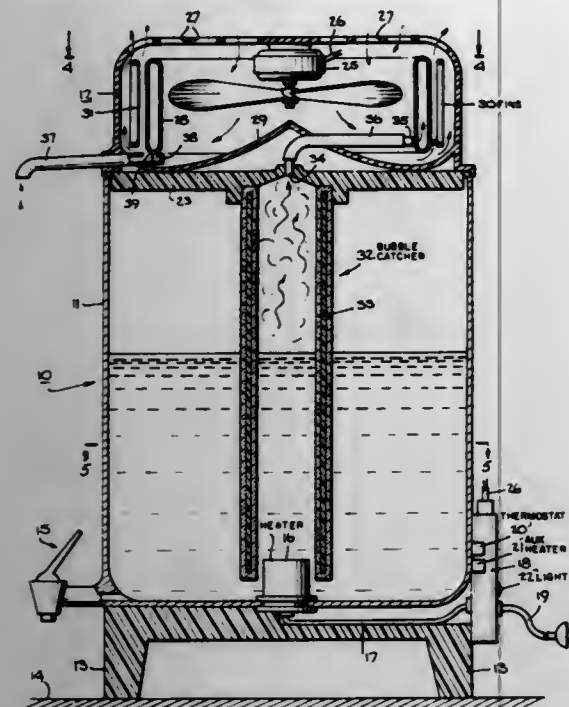
Int. Cl.² B01D 3/00, 5/00

U.S. Cl. 202—185 B

8 Claims

1. A water distiller comprising
 - a housing defining a raw water storage space;
 - a heater disposed in said housing for vaporizing water in said space; and
 - a cap removably mounted on said housing in sealed relation to said housing, said cap having a radiator therein in communication with said raw storage space to receive a flow

of vapor therefrom, a fan for blowing air over said radiator to condense the vapor therein to water and an outlet



connected to said radiator for dispensing the water therefrom.

4,052,268

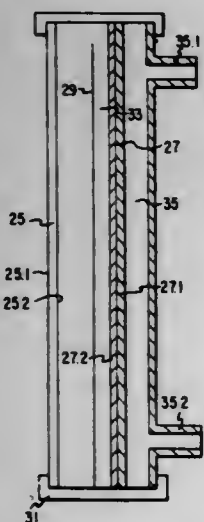
METHOD FOR THE DETECTION AND MEASUREMENT OF NITRIC OXIDE, NITROGEN DIOXIDE AND MIXTURES THEREOF

Keth F. Blorton, Yorktown, N.Y., and John M. Sedlak, Norwalk, Conn., assignors to Energetics Science, Inc., Elmsford, N.Y.

Division of Ser. No. 517,648, Oct. 24, 1974, abandoned. This application Apr. 8, 1976, Ser. No. 675,062
Int. Cl.² G01N 27/46

U.S. Cl. 204—1 T

6 Claims



1. A method for electrochemically detecting a gas selected from the group consisting of NO, NO₂ and mixtures thereof including the steps of (1) feeding a gaseous sample containing said gas to the anode of an electrochemical cell comprising an anode, a reference electrode, a cathode, and an aqueous electrolyte in contact with said anode, cathode, and reference electrode, said anode comprising a gold catalyst bonded to a hydrophobic material to provide diffusion electrode; (2) maintaining said anode at a fixed potential of in excess of 1.5 up to about 1.9 volts with respect to the potential of the reversible hydrogen couple in the electrolyte of said cell; and (3) measuring the current flowing between said anode and cathode of said cell to quantitatively determine the amount of said NO, NO₂ and mixtures thereof in said gaseous sample.

4,052,269 METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE AND SEMICONDUCTOR DEVICE MANUFACTURED BY USING SAID METHOD

Jacques Michel, Limeil Brevannes, and Michel Iost, Bouasy Saint Antoine, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 8, 1976, Ser. No. 730,939

Claims priority, application France, Oct. 15, 1975, 75.31520
Int. Cl.² C25D 5/02; C23C 15/00

U.S. Cl. 204—15

8 Claims

1. A method of manufacturing a semiconductor device, comprising the steps of:

- providing a semiconductor body comprising a surface and a semiconductor region of a certain conductivity type located at said surface;
- providing on said surface at said semiconductor region an electrically insulating layer comprising at least one island;
- forming a window in said insulating layer by the steps of:
 - electrolytically growing a metal masking layer on the parts of said semiconductor surface not covered by said island until said masking layer over the edge of said insulating island and partly over said insulating island so that a small surface part of said insulating island is uncovered;
 - then removing said insulating layer at the area of said surface part by ion bombardment so as to form said window, removing said masking layer at most only partly by said ion bombardment, and
 - removing entirely said masking layer;
- providing a metal contact layer on said insulating layer and in said window, said contact layer portion located within said window forming a rectifying metal-semiconductor contact with said semiconductor surface.

4,052,270

METHODS FOR MANUFACTURING PELLET SIZING SCREEN RODS

Dean R. Eallen, and James Sainick, both of Abrams, Wis., assignors to Ultra Plating Corporation, Green Bay, Wis.

Division of Ser. No. 581,092, May 27, 1975, Pat. No. 4,012,309.
This application Nov. 26, 1976, Ser. No. 745,398

Int. Cl.² C25D 7/00, 5/36

U.S. Cl. 204—25

4 Claims

1. A method for applying chromium plating to a stainless steel member having a high chromium content comprising the steps of: abrading the surface of said stainless steel member to expose sub-surface impurities; cleaning the surface of said stainless steel member by exposing it to a descaler to remove foreign matter therefrom; submerging at least a portion of the cleaned and abraded surface of said stainless steel member in a plating bath in spaced relationship from lead alloy plating anode means in said plating bath; initiating electric current flow in said bath between the submerged portion of said stainless steel member and said lead alloy plating anode in such direction to effect etching of said submerged portion of said stainless steel member; reversing said electric current flow to effect chromium plating of said submerged portion of said stainless steel member; and increasing the voltage and amperage of said electric current flow in a plurality of discrete stages, each stage being a predetermined interval of time.

4,052,271

METHOD OF MAKING AN ELECTRODE HAVING A COATING CONTAINING A PLATINUM METAL OXIDE THEREON

Henri Bernard Beer, Heide-Kalmthout, Belgium, assignor to Diamond Shamrock Technologies, S.A., Geneva, Switzerland
Continuation of Ser. No. 528,867, Dec. 2, 1974, abandoned, which is a division of Ser. No. 237,969, March 24, 1972, Pat. No. 3,864,163, which is a division of Ser. No. 75,726, Sept. 25, 1970, Pat. No. 3,711,385, which is a continuation-in-part of Ser. No. 549,194, May 11, 1966, abandoned. This application June 25, 1976, Ser. No. 699,807

Claims priority, application United Kingdom, May 12, 1965, 20133/65

Int. Cl.² C25D 11/34, 13/02

U.S. Cl. 204—38 A

16 Claims

1. A method of making an electrode comprising forming on at least part of the surface of a core of a film-forming metal a layer containing at least one platinum metal taken from the group consisting of platinum and alloys of platinum with at least one of the metals iridium, rhodium, palladium, ruthenium and osmium, the amount of platinum metal being sufficient, when converted to the oxide thereof, to be effective for carrying out electrolysis, and electrolyzing the thus metal coated core by connecting the core with the layer thereon as an anode in a sulfuric acid solution and electrolyzing the core with a combination of direct and alternating current until the platinum metal in at least the outside portion of the layer is oxidized to a depth of at least about 0.054 microns.

8. A method of making an electrode comprising forming a material containing as a substance effective to carry out electrolysis at least one oxide of a platinum metal taken from the group consisting of platinum, iridium, rhodium, palladium, ruthenium and osmium, and alloys of these metals with each other, and electrophoretically applying the material to at least a part of the surface of a core of a film-forming metal to form a layer on said part of the surface of the core, which layer is at least 0.054 microns thick.

16. A method of making an electrode comprising forming an electrolyte which is a hydrochloric acid solution containing a salt of platinum, the amount of platinum salt being sufficient, when converted to the oxide of platinum, to be effective for carrying out electrolysis, inserting at least part of the surface of a core of a film-forming metal into the solution, and carrying out electrolysis using the immersed core as an anode in the electrolyte and using a direct and an alternating current together, the electrolysis being carried out for a time sufficient to form a layer which is at least 0.054 microns thick for causing a layer to be formed on the part of the surface of the core which contains, as a material effective for carrying out electrolysis, platinum oxide.

4,052,272

METHOD OF DEPOSITING METAL CONDUCTING PATTERNS ON LARGE AREA SURFACES

James Cleary McGroddy, Putnam Valley, and Bruce Albert Scott, Pleasantville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,888

Int. Cl.² C25D 5/02, 5/54; G03G 13/22

U.S. Cl. 204—15

6 Claims

1. A method for depositing metal conducting patterns on large area surfaces including the steps of:

- photochemically depositing organic π -electron donor-halide salt onto a substrate in a predetermined pattern and
- simultaneously electrolytically depositing a metal film according to said predetermined pattern while removing said organic π -electron donor halide salt.

4,052,273

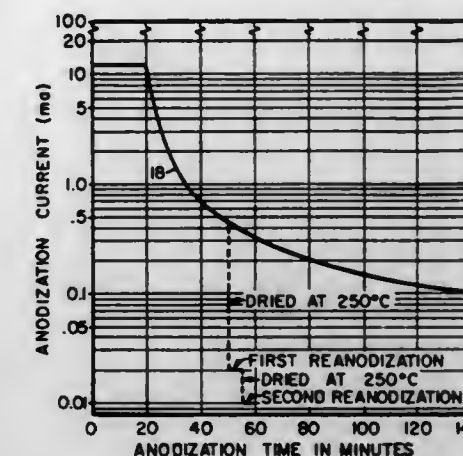
METHOD OF ANODIZING POROUS TANTALUM Bernard S. Aronson, Elmira, and James A. Murphy, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 10, 1974, Ser. No. 477,676

Int. Cl.² C25D 5/50, 11/00

U.S. Cl. 204—37 R

4 Claims



1. The method of anodizing a porous tantalum pellet comprising the steps of providing a porous tantalum pellet, preparing an anodizing bath of an aqueous nitric acid solution, disposing said pellet in said anodizing bath, passing an electrical current of up to 90 ma. per gram of pellet weight through said period of at least 30 minutes, said current being substantially constant until a predetermined desired voltage is reached and thereafter said voltage remaining substantially constant, removing said pellet from said bath, heating said pellet to a temperature of between 150° C. and 300° C., maintaining said pellet at said temperature for at least 3 minutes to dry out the pores therein, returning said pellet to said anodizing bath, passing an electrical current through said pellet at a voltage up to about said predetermined desired voltage for at least one minute, and thereafter removing said pellet from said bath.

4,052,274

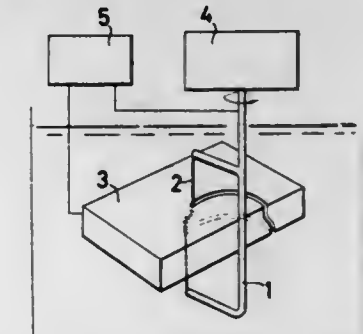
ELECTROCHEMICAL WIRE CUTTING METHOD Kunio Chikamori, Tokyo, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 669,206

Claims priority, application Japan, Apr. 5, 1975, 50-41629
Int. Cl.² B23P 1/12

U.S. Cl. 204—129.43

7 Claims



1. In a method of electrochemical machining in which a work blank member and a cathode member are disposed opposite each other in an electrolyte, a pulsed electric current having a pulse width of 0.01 to 10 ms and a duty factor of not more than 0.5 is passed between said members while one of said members is moved relative to the other member, the cathode member being a thin wire having two end portions

mounted on a support and a central portion intermediate said end portions, the improvement which comprises said central portion being laterally offset from a straight line connecting said end portions.

4,052,275

PROCESS FOR ELECTROLYTIC GRAINING OF ALUMINUM SHEET

Robert Gumbinner, Tarrytown, and Jen-Chi Huang, Yonkers, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Dec. 2, 1976, Ser. No. 746,918
Int. Cl.² C25F 3/04, 3/00

U.S. Cl. 204—129.95

5 Claims

1. A method for electrolytically graining aluminum which comprises immersing the aluminum in an aqueous electrolytic solution containing hydrochloric acid and tartaric acid as electrolytes, applying thereto an electric current having a current density in excess of 40 amperes per square foot and maintaining the electrolytic solution at a temperature of about 45° C wherein the tartaric acid is present in a concentration of from 0.2% to 1.0% by weight and wherein the hydrochloric acid is present in a concentration of from 0.75% to 3.5% by weight.

4,052,276

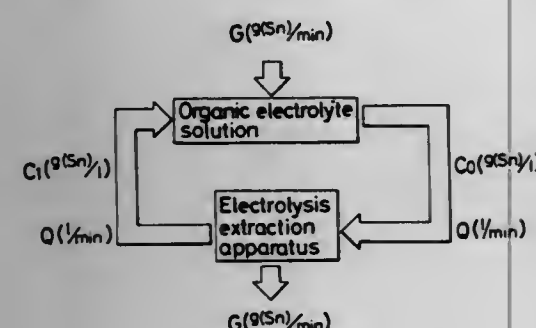
TREATMENT PROCESS FOR ELECTROLYTIC PURIFYING OF USED SOLUTION FOR ELECTROLYTIC TIN PLATING

Mitsuru Yoshida, Susumu Yamaguchi, and Yoshihiko Hirano, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 676,668
Int. Cl.² C25D 5/50; C25C 1/14

U.S. Cl. 204—130

11 Claims



1. In an electrolytic tin plating process wherein a material is subjected to a tin melting treatment and prior to the melting treatment, the material is contacted with a solution of an organic electrolyte, the improvement which comprises the organic electrolyte, after being used to contact the material being subjected to an electrolytic treatment to deposit the tin therefrom so as to maintain the tin concentration therein in the range from 0.2 to 5.0 g/l and the electrolytically treated solution being returned to the material contact step.

4,052,277

PROCESS FOR PREPARING PERFLUORINATED ETHERS

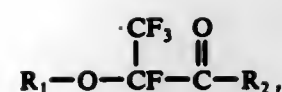
Thomas Martini, Neuenhain, Tausus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed July 12, 1976, Ser. No. 704,689

Claims priority, application Germany, July 12, 1975, 2531511
Int. Cl.² B01J 1/10

U.S. Cl. 204—158 R

5 Claims

1. Process for the preparation of perfluorinated ethers, which comprises exposing perfluoro-carbonyl compounds of the formula II



wherein R₁ and R₂ mean identical or different perfluoroalkyl radicals optionally containing one or several ether-like bound oxygen atoms in a liquid phase to light rays having a wave length of from 180 to 600 m μ.

4,052,278

FINELY DIVIDED, IRRADIATED TETRAFLUORETHYLENE POLYMERS

Michael Trevenen Brown, Welwyn Garden City, and William George Rodway, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England
Continuation of Ser. No. 346,243, March 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 267,035, June 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 111,700, Feb. 1, 1971, abandoned. This application Aug. 16, 1974, Ser. No. 498,219

Claims priority, application United Kingdom, Feb. 3, 1970, 5037/70; Sept. 17, 1971, 43436/71

Int. Cl.² C08F 2/46, 8/00

U.S. Cl. 204—159.2

4 Claims

1. An unsintered powder of a coagulated dispersion grade of a homopolymer of tetrafluoroethylene or a copolymer of tetrafluoroethylene with up to 10% by weight of the copolymer, of an ethylenically unsaturated comonomer, characterized in that the powder has been irradiated by gamma radiation until it has received a dose of from 2 to 50 M Rad, has a particle size of 3 to 5 microns measured optically, a surface area of 3–7 m²/gm, and a sheen gauge result measured by the sheen gauge test of at least 1, 2, 5, 20, smear.

4,052,279

HYDROXY AROMATIC COMPOUND CONTAINING SULFUR AND AN ORGANIC PHOSPHONATE AS POLYMER ANTIOXIDANT

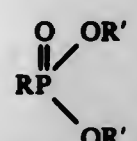
Bernard J. Lyons, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 513,864, Oct. 10, 1974, and a continuation-in-part of Ser. No. 405,554, Oct. 11, 1973, abandoned. This application Apr. 8, 1976, Ser. No. 675,065
Int. Cl.² C08F 8/00, 8/34, 2/46

U.S. Cl. 204—159.15

35 Claims

1. A polymer composition having improved resistance to oxidation comprising a polymer susceptible to oxidation and an anti-oxidant effective amount of a composition comprising a non-metallic hydroxy aromatic compound having at least one sulfur atom attached to an aromatic carbocyclic ring and an organic phosphonate compound having the general formula



wherein any two or all three of R, R', and R'' may be the same or different and may contain further phosphonic moieties and wherein R is independently selected from the group consisting of substituted and unsubstituted alkyl, alkenyl, aryl, aralkyl, alkylaryl and triazine and wherein R' and R'' are independently selected from the group consisting of substituted and unsubstituted alkyl, alkenyl, aryl, alkylaryl, aralkyl and triazine wherein R' and R'' can be linked together to form a ring.

4,052,280

UV CURING OF POLYMERIZABLE BINDERS

Vincent D. McGinnis, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Nov. 6, 1975, Ser. No. 629,295

Int. Cl.² C08F 8/00, 2/46

U.S. Cl. 204—159.14

6 Claims

1. A protective coating composition for application of a protective coating surface film to a substrate, the coating composition containing an ultraviolet curable polymeric binder of ethylenically unsaturated polymer being reactive to ultraviolet energy and photocurable by free-radical induced addition polymerization of the ethylenic double bonds, the improvement comprising:

said ethylenically unsaturated polymer containing at least about 2% of an ultraviolet photosensitizer attached to the polymer structure; and
said ultraviolet photosensitizer being connected to the polymer structure in a spaced relationship with said ethylenic unsaturation by an intervening polymer chain having a molecular weight of at least about 100, and said intervening polymer chain having between 2 and 50 repeating polymer units.

4,052,281

METHOD FOR PRODUCTION OF SULFHYDRYL COMPOUNDS

Bobby F. Dannels, and Emil J. Geering, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 535,631, Dec. 23, 1974, Pat. No. 3,992,289.
This application Oct. 4, 1976, Ser. No. 730,031

Int. Cl.² C08F 2/46; B01J 1/10

U.S. Cl. 204—159.22

13 Claims

1. In a process for the formation of a sulfhydryl-terminated polythioether which comprises the steps of

1. Condensing an allene compound and hydrogen sulfide in liquid phase to produce a sulfhydryl-terminated hydrocarbon,
2. Recovering the sulfhydryl-terminated hydrocarbon,
3. Condensing the recovered sulfhydryl-terminated hydrocarbon with an unsaturated hydrocarbon having at least one acetylenic bond or at least two ethylenic bonds to obtain the sulfhydryl-terminated polythioether,

the improvement which comprises carrying out the step 1 reaction at a reaction temperature of about -100° to about 95° Centigrade, a reaction pressure of about 0 to about 3000 p.s.i.g. and a molar ratio of hydrogen sulfide to the allene compound of about 1:1 to about 20:1 in the presence of ultraviolet light of wavelength substantially above about 2600 Angstroms to obtain a sulfhydryl-terminated polythioether substantially devoid of color.

4,052,282

PHOTOCURABLE FLEXIBLE ORTHOPEDIC BANDAGE

Kanemitsu Kubushiro, Ami, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Oct. 8, 1975, Ser. No. 620,844

Int. Cl.² C08F 2/46, 4/00

U.S. Cl. 204—159.23

17 Claims

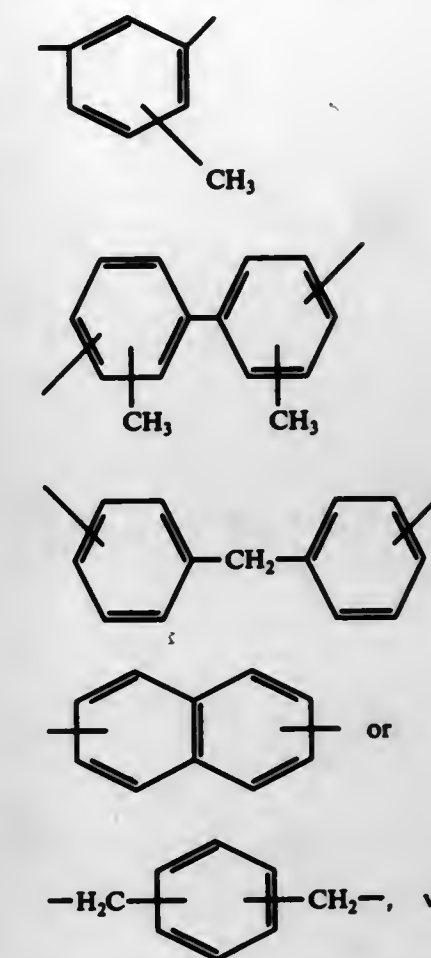
1. A storage-stable flexible photocurable orthopedic material such as bandage or splint for application to a body member, said orthopedic material comprising a flexible fabric, a photosensitizer and a photocurable tacky composition impregnated in the fabric, said tacky composition being a reaction product obtained by reacting a reaction product (D) of

A. at least one hydroxyalkyl acrylate or hydroxyalkyl methacrylate, wherein said hydroxyalkyl portion contains 2 or 3 atoms and
B. 0.55 to 3 moles, per mole of said acrylate, of at least one diisocyanate of the following formula



963 O.G.—9

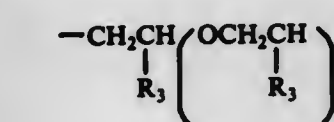
wherein R₁ represents (CH₂)₆



C. at least one polyhydric alcohol of the following formula



wherein R₂ represents a straight-chain or branched chain saturated aliphatic hydrocarbon group containing 2 to 8 carbon atoms, a cycloaliphatic hydrocarbon group, or the group



in which n is a number of 1 to 4 and R₃ is a hydrocarbon atom or a methyl group, and m is 2, wherein the amount of the polyhydric alcohol (C) is one which affords 1.05 to 1.50 equivalents, of hydroxyl groups based on the isocyanate groups remaining in the reaction product (D),

said reaction product of (D) and (C) containing at least one compound having at least two carbon-carbon double bonds capable of being polymerized and crosslinked by light and being substantially free from free isocyanate groups.

4,052,283

SENSITIZED PRODUCTION OF SULFHYDRYL COMPOUNDS USING ULTRAVIOLET RADIATION

Bobby F. Dannels, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 535,632, Dec. 23, 1974, Pat. No. 3,992,274.
This application Oct. 4, 1976, Ser. No. 729,457

Int. Cl.² C08F 2/46; B01J 1/10

U.S. Cl. 204—159.23

17 Claims

1. In a process for the production of a sulfhydryl-terminated polythioether which comprises the steps of

1. condensing an allene compound and hydrogen sulfide in liquid phase to produce a crude sulfhydryl-terminated hydrocarbon product,

2. polymerizing said crude sulfhydryl-terminated hydrocarbon product with an unsaturated hydrocarbon having at least one acetylenic bond or at least two ethylenic bonds to obtain the sulfhydryl-terminated polythioether, the improvement which comprises carrying out the step 1 reaction at a reaction temperature of about -100° to about 90° Centigrade, a reaction pressure of 0 to 3000 p.s.i.g. and a molar ratio of hydrogen sulfide to the allene compound of about 1:1 to about 20:1 in the presence of ultraviolet light of wavelength substantially above about 2600 Angstroms and a photosensitizing amount in the range of about 0.0005% to about 5% based on the weight of the reaction mixture of an organic photosensitizing reagent for said reaction to obtain a sulfhydryl-terminated thioether polymer substantially devoid of color.

4,052,284

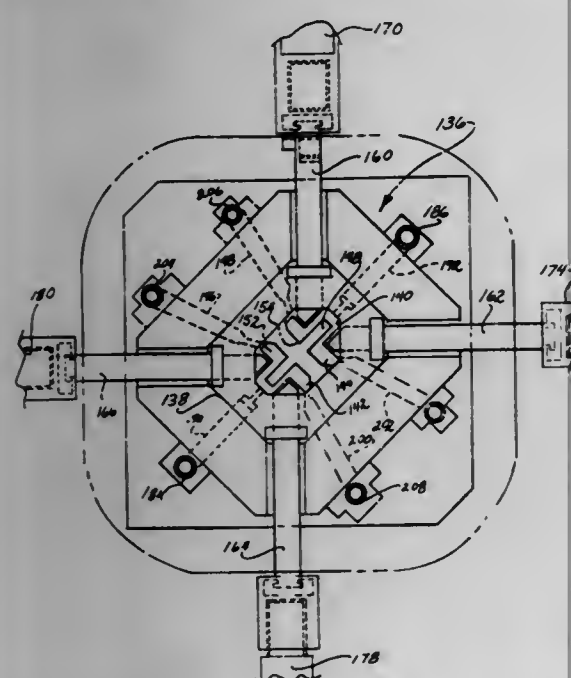
APPARATUS FOR ELECTROCHEMICALLY FORMING A PLURALITY OF ARTICLES

Gustav E. Scharader, Pepper Pike, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 30, 1976, Ser. No. 681,779
Int. Cl.² C25D 17/00, 17/12

U.S. Cl. 204—224 M

27 Claims



3. An apparatus for at least partially forming articles by electrolytically removing material from a workpiece having opposing sides and at least partially composed of an electrically conductive material, said apparatus comprising working chamber means for receiving at least a portion of the workpiece, means for holding at least a portion of the workpiece in said working chamber means, first and second separately movable electrode means at least partially disposed in said working chamber means for use in effecting the electrolytic removal of material from opposite sides of the workpiece to at least partially form opposing side surfaces of an article, said first and second electrode means being movable toward each other through working strokes during which material is electrolytically removed from opposite sides of the workpiece, said first and second electrode means being movable away from each other through return strokes after material has been electrolytically removed from opposite sides of the workpiece, third and fourth separately movable electrode means spaced apart from said first and second electrode means and at least partially disposed in said working chamber means for use in effecting the electrolytic removal of material from opposite sides of the workpiece to at least partially form opposing side surfaces of an article, said third and fourth electrode means being movable toward said first and second electrode means and toward each other through working strokes during which material is electrolytically removed from opposite sides of the workpiece, said third and fourth electrode means being movable away from said first and second electrode means and away from each other through return strokes after material has been electrolytically removed from opposite sides of the workpiece.

cally removed from the workpiece, means for supporting each of said electrode means for movement relative to each of the other electrode means during movement of said electrode means through their working and return strokes, means for establishing an electrical potential between the workpiece and each of said electrode means during movement of each of said electrode means through its working stroke, means for establishing a flow of electrolyte between the workpiece and each of said electrode means during movement of each of said electrode means through its working stroke, and means for simultaneously moving each of said electrode means through working strokes toward each other while the electrical potential is established between each of said electrode means and the workpiece and during the flow of electrolyte between each of said electrode means and the workpiece to effect the electrolytic removal of material from the workpiece.

4,052,285

ION SELECTIVE ELECTRODES

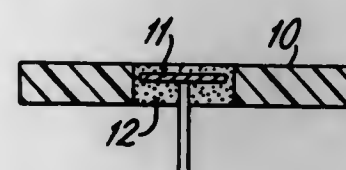
John Vincent Dobson, Hartlepool, England, assignor to National Research Development Corporation, London, England

Filed Mar. 20, 1975, Ser. No. 560,238

Int. Cl.² G01N 27/46, 27/36

U.S. Cl. 204—195 G

32 Claims



1. Ion sensitive electrode means, including a matrix of low conductivity material containing particles of an ion sensitive material selected from the group consisting of a finely divided ion sensitive glass and a finely divided mica, the ion sensitive material having an outer hydrated layer thereon, and contact means for allowing direct electrical coupling with the interface formed when the matrix is in contact with a liquid.

4,052,286

SOLID SENSOR ELECTRODE

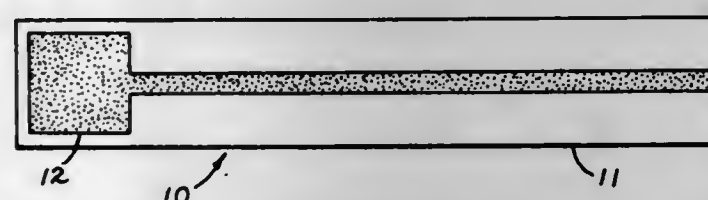
Don N. Gray, Sylvania, Ohio, and George G. Guilbault, New Orleans, La., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 31, 1973, Ser. No. 328,360

Int. Cl.² G01N 27/46

U.S. Cl. 204—195 R

9 Claims



1. In a sensor electrode having a noble metal sensing surface adapted for direct contact with a test specimen, the improvement wherein said sensing surface comprises the composite, solid-state, fusion product of a mixture of noble metal powder and powdered glass, fused to an inert substrate.

4,052,287

ELECTROLYTIC SYSTEM AND NOVEL ELECTROLYTIC CELLS AND REACTOR THEREFOR

G. Oscar Westerlund, Vancouver, Canada, assignor to Gow Enterprises Limited, Vancouver, Canada

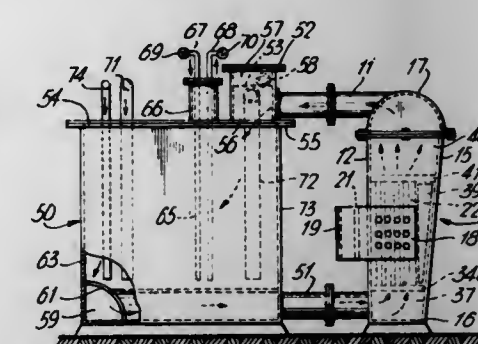
Filed June 8, 1976, Ser. No. 693,888

Claims priority, application Canada, Apr. 1, 1976, 249382

Int. Cl.² C25B 15/08, 9/00

U.S. Cl. 204—237

32 Claims



1. An improved closed loop system for effecting an electrolysis reaction and for subsequently removing reacted products of electrolysis said system comprising an electrolyzer, a reactor, a major liquor outflow means from said electrolyzer to said reactor and a major liquor inflow means from said reactor to said electrolyzer:

1. said electrolyzer including a plurality of electrically interconnected electrolytic cells, said electrically interconnected electrolytic cells including a selected cell and other cells, said other cells also being provided with liquor conduit means leading between said cells to said selected electrolytic cell, and liquor conduit means leading from said selected electrolytic cell to said other cells, said selected cell being provided with liquor outlet means connected directly to said major liquor outflow means, and liquor inlet means connected directly from said major liquor inflow means for removal of liquor and entrained and/or entrapped gaseous products of electrolysis from said electrolyzer and return of degasified liquor to said electrolyzer; and
2. said reactor means including degasifier means disposed atop said reactor means, and connected directly to said major liquor outflow means, said degasifier means including an upper gas outlet means for withdrawal of the separated gases, and a lower outlet slot directly connected to an upper zone of said reactor means, for the introduction of the substantially gasfree liquor into said reactor means, said reactor means including a lower liquor channelling means, connected to said major liquor inflow means to recirculate liquor back to said electrolyzer, conduit means for the introduction of fresh liquor, to said reactor conduit means for the introduction of a pH adjusting liquid, to said reactor and indirect cooling means coupled to said reactor.

4,052,288

PROCESS FOR BRASQUING FUSED ELECTROLYSIS CELLS

Jean-Marie Sala, La Coruna, Spain, assignor to Aluminium Pechiney, Lyon, France

Filed Jan. 11, 1977, Ser. No. 758,490

Claims priority, application France, Jan. 13, 1976, 76.01193
Int. Cl.² C25C 3/08; C25B 11/12; F27D 1/16

U.S. Cl. 204—243 R

7 Claims

1. A process for brasquing the base and lateral walls of a cell for the fused electrolysis of alumina from the recovery of used brasques by treating the ground carbon-containing and refractory products of the used base and walls by a known process with filtration of the insoluble constituents, wherein the improvement consists of the steps of (a) covering the base and lateral walls of the cell with a heat-insulating bed consisting of a mixture of carbon, NaF, CaF₂, Al₂O₃, Na₂SO₄ and CaSO₄;

and (b) providing cathode means on the heat-insulating bed with electrically conductive current feeder elements contained



therein, the cathode means being a brasque paste derived from used brasque consisting of a mixture of carbon, NaF, CaF₂, Al₂O₃, AlF₃, Na₂O and a binder.

4,052,289

APPARATUS FOR ELECTROSTATICALLY PURIFYING NON-CONDUCTIVE LIQUID

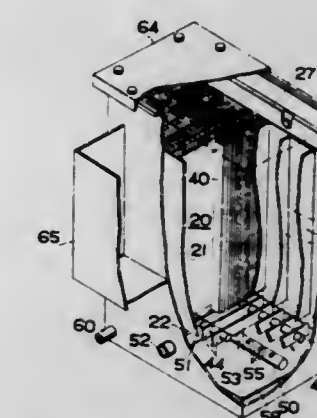
Torao Tobisu, 9-5, Chuo 1-chome, Ota, Tokyo, Japan

Filed June 28, 1976, Ser. No. 700,123

Int. Cl.² B03C 5/02; B01D 17/06

U.S. Cl. 204—302

6 Claims



1. An apparatus for electrostatically purifying non-conductive liquids comprising:

- a tank;
- a plurality of anode and cathode plates disposed in an interleaved opposed relationship within said tank;
- a conduit for introducing liquid to be treated into said tank, said conduit being disposed below lower edges of said electrode plates and having apertures at the upper surface thereof for dispersing liquid between said electrodes;
- a plurality of particle collecting members made of porous dielectric fiber disposed between said electrode plates so as to be in parallel with the direction of the electric field created by said electrode plates and the flow of liquid spurted from said conduit, thereby defining a particle precipitation space between said conduit and the bottom of said tank;
- a liquid supply pipe communicating with said liquid conduit;
- a liquid outlet pipe for removing the treated liquid from the upper part of said tank to the exterior; and
- a drainage pipe for discharging the liquid remaining in said particle precipitation space.

4,052,290

ASPHALT COMPOSITIONS

Donald R. Cushman, Wenonah; Charles A. Pagen, Woodbury; John W. Schick, Cherry Hill, all of N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 26, 1976, Ser. No. 708,803

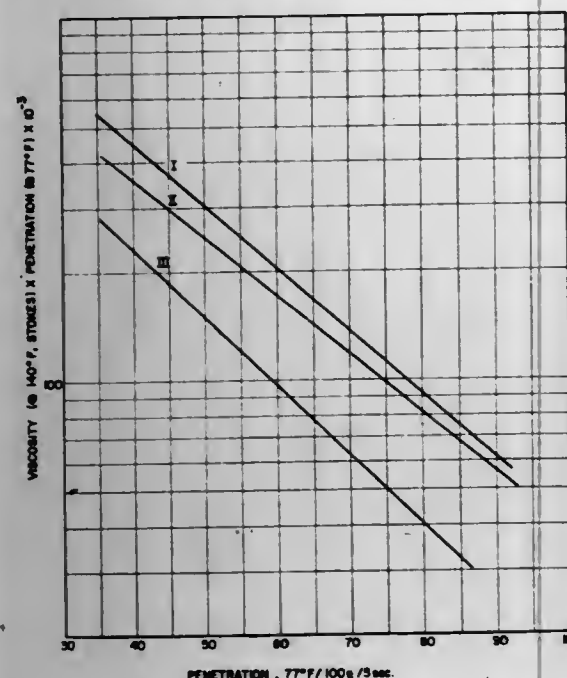
Int. Cl.² C10G 3/00

U.S. Cl. 208—6

7 Claims

1. A process for upgrading asphalt which consists essentially of admixing and forming a homogeneous blend of coal-derived asphaltene with a marginal asphalt which has a potential

air-blown viscosity-penetration index lower than about 2.5×10^3 and air blowing the homogeneous blend to yield an asphalt



composition having a viscosity-penetration index higher than about 2.5×10^3 .

4,052,291

PRODUCTION OF ASPHALT CEMENT

Wilton F. Espenscheid, Princeton, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,877
Int. Cl.² C10G 1/04

U.S. Cl. 208-8

2 Claims

1. A process for producing asphalt cement which comprises (1) forming a slurry by admixing solvent-refined coal with a fluidized catalytic cracking main column bottoms petroleum solvent in admixture quantities between about 1.0 and 5 parts by weight of petroleum solvent per part by weight of solvent-refined coal, wherein said petroleum solvent has a hydrogen content distribution in which the H_{α} proton content is between about 30 and 50 percent, the H_{α} proton content is at least about 30 percent, and the H_{α}/H_{β} proton ratio is above about 1.4; and (2) heating said slurry at a temperature between about 350° F and 850° F for a period of time between about 0.2 and 2 hours to convert the slurry into a homogeneous composition which has a flowable asphaltic consistency at standard temperature.

4,052,292

LIQUEFACTION OF SOLID CARBONACEOUS MATERIALS

Wilton F. Espenscheid, Princeton, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 5, 1976, Ser. No. 664,220
Int. Cl.² C10G 1/04

U.S. Cl. 208-8

9 Claims

1. A process for liquefaction of solid carbonaceous materials which comprises forming a slurry by admixing comminuted wood with a petroleum solvent selected from thermally stable petroleum refinery FCC main column bottoms and TCC syntower bottoms having a boiling point between about 450° F and 1100° F, and heating said slurry at a temperature in the range between about 350° F and 850° F for a period of time sufficient to convert the slurry into a homogeneous composition which has a flowable pitch-like consistency at standard temperature.

5. A process for liquefaction of solid carbonaceous materials which comprises forming a slurry by admixing comminuted wood and coal with a petroleum solvent selected from thermally stable petroleum refinery FCC main column bottoms and TCC syntower bottoms having a boiling point between

about 450° F and 1100° F, and heating said slurry at a temperature in the range between about 350° F and 850° F for a period of time sufficient to convert the slurry into a homogeneous composition which has a flowable pitch-like consistency at standard temperature.

4,052,293

METHOD AND APPARATUS FOR EXTRACTING OIL FROM HYDROCARBONACEOUS SOLID MATERIAL

James L. Mercer, Los Altos, and Hachiro J. Togashi, Palo Alto, both of Calif., assignors to CRYO-MAID Inc., Del.

Filed Oct. 10, 1975, Ser. No. 621,474
Int. Cl.² C10G 1/02

U.S. Cl. 208-11 R

9 Claims

1. In a method for extracting oil and other hydrocarbons from oil shale, tar sand, coal, lignite and like hydrocarbonaceous solid material, the steps of advancing discrete individual pieces of said hydrocarbonaceous solid material along a pathway in a substantially evacuated system at a pressure no more than about 50 torr, said substantially evacuated system being in communication with at least one condenser surface, supplying heat energy to said pieces of hydrocarbonaceous material to raise the temperature thereof to within the range from about 600° to no more than 900° F. to cause the oil and other hydrocarbons therein to be liberated as a vapor in said evacuated system, and thereafter selectively condensing and recovering the oil from said vapor.

4,052,294

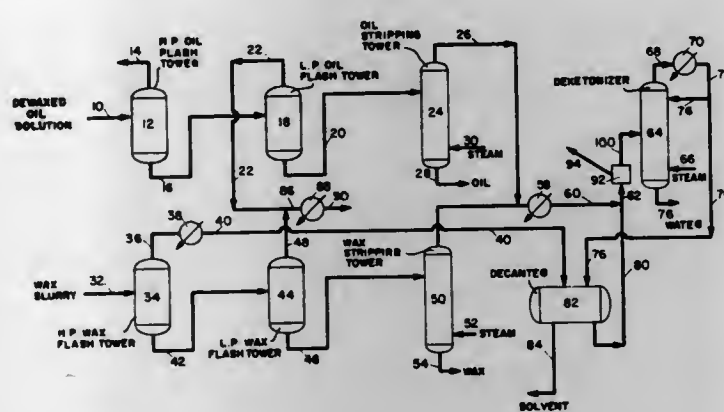
METHOD OF SOLVENT RECOVERY IN AUTOREFRIGERANT/KETONE DEWAXING PROCESSES

John H. Blume, Chester, and James D. Bushnell, Berkeley Heights, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 31, 1975, Ser. No. 627,711
Int. Cl.² C10G 43/08

U.S. Cl. 208-33

12 Claims



1. In a dewaxing process comprising contacting a waxy oil with a dewaxing solvent comprising a mixture of a ketone wax antisolvent and an autorefrigerant to produce a dewaxed oil and wax slurry containing said solvents, separating said wax from said oil and wherein at least a portion of said solvents are recovered from the wax and dewaxed oil by a method which introduces excess water into said recovered solvents, the improvement which comprises removing the excess water from the recovered solvents by passing at least a major portion thereof to directly to a deketonizing zone to produce substantially ketone-free water and wet ketone with at least a portion of said wet ketone being passed directly to a decanting zone in which is maintained a liquid layer of said autorefrigerant containing said ketone and minor amounts of water and in which is also maintained a liquid layer of wet ketone and continuously recycling said wet ketone layer back to said deketonizing zone and continuously removing autorefrigerant from the decanting zone.

4,052,295

PROCESS FOR THE DESULFURIZATION OF HYDROCARBON OILS WITH WATER VAPOR ADDITION TO THE REACTION ZONE

Karel M. A. Pronk, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 9, 1976, Ser. No. 656,544

Claims priority, application Netherlands, Mar. 24, 1975; U.S. Cl. 209-1 7503466

Int. Cl.² C10G 23/02

U.S. Cl. 208-211

10 Claims

1. A continuous process for the catalytic hydrodesulfurization of vanadium-containing heavy hydrocarbon oils which comprises (a) contacting in a reaction zone vanadium-containing heavy hydrocarbon oil at elevated temperature and pressure with hydrogen and with a catalyst which contains from about 0.5 to 20 parts by weight of nickel and/or cobalt and from about 2.5 to 60 parts by weight of molybdenum and/or tungsten per 100 parts by weight of a porous carrier selected from the group consisting of alumina, silica, magnesia, zirconia and mixtures thereof and in the absence of added water vapor until the average vanadium content of the catalyst has increased during said contacting by at least 5 parts by weight per 100 parts by weight of said catalyst and (b) adding and maintaining a quantity of water vapor to the reaction zone after said vanadium content of said catalyst has increased during said contacting by at least 5 parts by weight per 100 parts by weight of said catalyst, said quantity of water corresponding to a water vapor partial pressure in the range from 0.5 to 30 bar during the process.

4,052,297

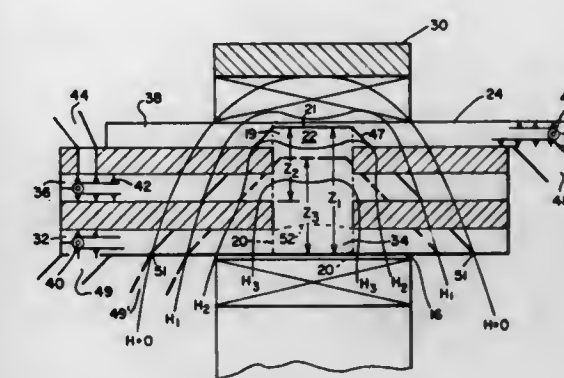
MATERIALS HANDLING APPARATUS FOR A FERROFLUID SINK/FLOAT SEPARATOR

Leon Mir, Brookline, Mass., assignor to Avco Corporation, Wilmington, Mass.

Filed May 30, 1973, Ser. No. 365,066

Int. Cl.² B03B 13/04

7 Claims



1. A ferrofluid sink/float separator with access means into and out of the ferrofluid comprising:
a. means for supplying a magnetic field capable of supporting an unconstrained column of ferrofluid within the magnetic field, said magnetic field further having defined therein a predetermined volume of space, the top of said volume is positioned in the magnetic field above where the top of the unconstrained column would occur, and
b. a partially closed container defined by a bottom closure and side walls containing ferrofluid filling said predetermined volume of space and further containing ferrofluid-air interfaces, the location of which are defined by the relationship:

$$Z = \frac{1}{\rho g} \frac{H_{\alpha(\text{upper})}}{H_{\alpha(\text{lower})}} M dH$$

where:

$H_{\alpha(\text{lower})}$ = the magnetic field intensity at the lower edge of the ferrofluid-air interface,
 $H_{\alpha(\text{upper})}$ = the magnetic field intensity at the top surface of the ferrofluid,
 M = the ferrofluid magnetization,
 dH = the incremental change of the magnetic field intensity within the ferrofluid,
 ρ = the density of the ferrofluid,
 g = acceleration of gravity, and
 Z = the vertical distance of any point on the interface below the top surface of the ferrofluid.

c. an access opening in a side wall to expose an interface, the marginal edge of the access opening being no closer to the column of ferrofluid than intercepting the interface.

4,052,298

TREATMENT OF ELECTROPHOTOGRAPHIC TONER COMPOSITIONS

Edward T. Bradley, Caledonia, Wis., assignor to Colorkrome, Inc., Traverse City, Mich.

Filed Nov. 26, 1974, Ser. No. 527,485

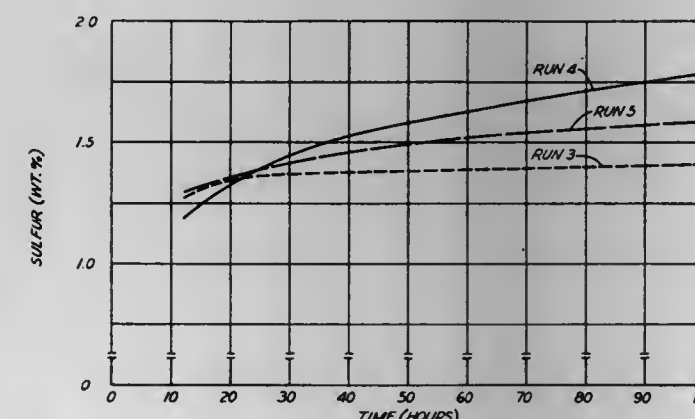
Int. Cl.² B03D 1/00; B03D 3/06

U.S. Cl. 209-5

15 Claims

1. A process which comprises contacting a hydrocarbon feed selected from the group consisting of naphtha and heavier liquid hydrocarbons with a catalyst in a hydrogenation zone under hydrogenation conditions to separate sulfur and nitrogen from said hydrocarbon feed, said catalyst consisting essentially of a Group VI-B metal, nickel and zinc supported on alumina or a silica-stabilized alumina, the Group VI-B metal and nickel being in the sulfided form, and recovering a hydrogenated hydrocarbon product from said hydrogenation zone.

1. Method for separating mineral spirit solvent vehicle constituents from charge-responsive colorant constituents in electrophotographic quality, normally liquid hydrocarbon mineral spirit-based toner compositions containing said charge responsive colorant constituents, which are resin binder coated colorant materials, dispersed in the solvent vehicle, said charge response colorant constituents being responsive to attraction by electrical charge so as to deposit on a sensitized and exposed



latest image retaining electroconductive base material whereby the image is fixed and developed in the base, which method comprises the steps of:

- i. uniformly dispersing said toner in water to form a dispersion;
- ii. introducing generally onto the surface of said dispersion, without substantial physical intermixing, a quantity of an extractant mixture comprising a normally liquid hydrocarbon mineral spirit which contains between about 1.0 to about 10.0 wt. % of a conventional charge control agent of the type utilized in liquid toners;
- iii. contacting said quantity of an extractant mixture, without substantial intermixing, with said dispersion for a time sufficient for at least a portion of the charge-responsive colorant constituent in the toner to be attracted to said quantity of an extractant mixture by substantially agglomerating and clustering in close physical proximity thereabout at the interface of the water and dispersed solvent and extractant liquid, thereby forming a colorant constituent agglomeration;
- iv. physically separating said colorant constituent agglomeration and extractant mixture associated therewith from that which remains of said dispersion.

4,052,299

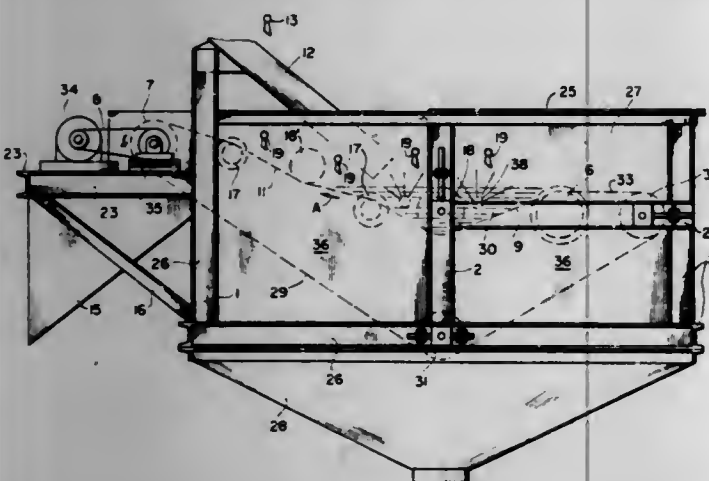
APPARATUS FOR WASHING IMPURITIES OUT OF GRANULAR MATERIAL

Wolfgang Rohr, Altripfer Str. 115, Waldsee, Germany (D-6701)
Filed Dec. 29, 1975, Ser. No. 644,637

Claims priority, application Germany, Sept. 26, 1975, 2542940
Int. Cl.² B03B 5/08

U.S. Cl. 209—430

3 Claims



1. An apparatus for washing out organic and loamy impurities from a solid granular material continuously conveyed through a wash zone, the granular material being heavier than the impurities, comprising the combination of

- a. liquid spray means arranged in the wash zone for spraying wash liquid on the material and forming a mixture of the wash liquid and the material,
- b. a chute in the wash zone for continuously delivering the solid granular material in a first direction,
- c. a plane endless conveyor band entrained in a direction opposite to the first direction, the conveyor band having two lateral edges,
- d. a set of rollers over which the endless conveyor band is trained, the set of rollers including
 1. a first pair of rollers cooperating to define an upper and a lower course of the conveyor band, at least one of the rollers of the first pair being a drive roller for entraining the conveyor band in the opposite direction,
 2. a second pair of rollers arranged in vertical alignment and between the rollers of the first pair, a lower one of the rollers of the second pair guiding the lower course of the conveyor band and an upper one of the rollers of the second pair being vertically adjustably mounted, the upper roller being arranged to depress the upper course

of the conveyor band and to form a basin in the wash zone, the chute being arranged to deliver the solid granular material continuously to the basin, the upper roller consisting of a series of spaced apart disc-like elements and dividing the upper course of the conveyor band into an ascending downstream portion extending underneath the chute and an upstream portion, one roller of the first pair guiding the ascending portion of the conveyor band underneath the chute being vertically adjustably mounted, the heavier solid granular material forming a sediment in the basin and the ascending downstream portion of the conveyor band conveying the sediment towards the one roller of the first pair, and the lighter organic and loamy impurities forming a sludge with the wash liquid, the sludge floating above the sediment, and

3. a guide and support roller for the upstream portion of the conveyor band, the guide and support roller dividing the upstream conveyor band portion into an ascending part forming part of the basin and a contiguous substantially horizontal part extending from the guide and support roller towards the other roller of the first pair, the floating sludge flowing along the ascending and horizontal parts of the upstream conveyor band portion towards the other roller of the first pair,
- e. a housing for the conveyor band, the housing including
 1. side walls closely adjacent the lateral edge of the plane conveyor band,
 2. a hopper below the conveyor band,
 3. a passageway adjacent the other roller of the first pair to permit overflowing sludge to pass into the hopper by gravity, and
 4. a vertical support for the lower and upper rollers, and
 - f. a discharge chute for the solid granular material arranged underneath the one roller of the first pair to receive the solid granular material by gravity.

4,052,300

PROCESS AND DEVICE FOR THE FILTRATION OF LIQUIDS POLLUTED BY SUSPENDED SOLID BODIES

Franco Achille Mosso, Monza (Milan), Italy, assignor to Italtel, S.p.A., Milan, Italy

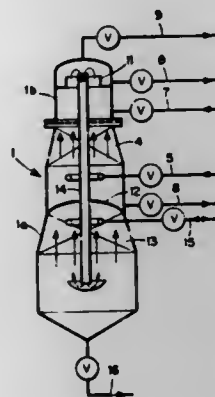
Continuation of Ser. No. 527,596, Nov. 27, 1974, abandoned.

This application May 26, 1976, Ser. No. 690,133

Int. Cl.² B01D 23/24

U.S. Cl. 210—20

5 Claims



5. A process for filtering liquids containing suspended solids in a device having a substantially vertical cylindrical container divided into a top and bottom chamber by a non-porous plate member arranged in a fixed and immovable position transversely of said container, at least the top chamber further divided into an upper and lower section by a porous plate member arranged in a fixed and immovable position transversely of said top chamber, at least the upper portion of the side walls of the said lower section formed into a truncated cone shaped portion along its vertical axis with the smaller diameter end of said truncated cone shaped portion arranged adjacent the said porous fixed plate member, a first filter bed located in said lower section of said top chamber and a second

filter bed separately located in said bottom chamber, the process comprising passing the said liquid in an upwardly direction through said first filter bed at a velocity sufficient to compact the filter material into a bed or pack disposed within and occupying said truncated cone shaped chamber, said filter material formed of particles having a specific gravity no greater than the said liquid being filtered, the top smaller diameter end of said truncated cone shaped chamber being permeable to the passage of liquid there through but not to the filter material, passing the effluent in series flow from said first filter bed through fluid conduit means positioned internally of said cylindrical container and passing directly through said non-porous plate member to the other chamber and through the second filter bed contained therein and removing the effluent from said second filter bed as twice filtered liquid, thereafter backwashing each of said filter beds by flowing backwashing liquid in a direction opposite to the direction employed in the filtration step and at a flow rate sufficient to cause the temporary expansion of said first filter bed to result in the separation and removal of filtered solids.

4,052,301

PROCESS FOR PURIFYING WASTE WATER

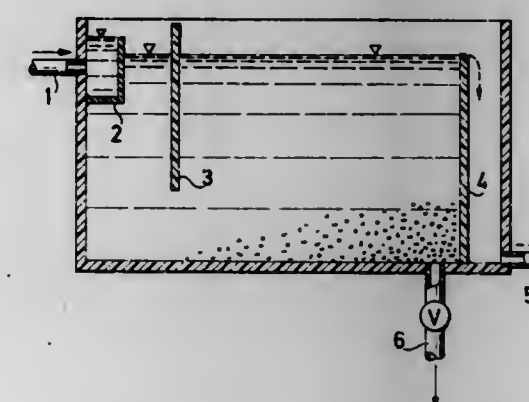
Rainer Klein, and Jurgen Helberg, both of Kelkheim, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 15, 1975, Ser. No. 596,162

Claims priority, application Germany, July 17, 1974, 2434293
Int. Cl.² C02B 1/20

U.S. Cl. 210—51

3 Claims



1. A process for the simultaneous precipitation and removal of aluminum and titanium from extraction waste water obtained by water-alcohol extraction and separation of aluminum titanium halide olefin polymerization catalyst from an olefin polymerization reaction carried out in an inert hydrocarbon solvent, said extraction water containing water soluble aluminum and titanium compounds, hydrogen halide acids or inorganic alkali bases, and alkali halides, said process consisting essentially of adjusting the pH of the waste water to a pH of from 5 to 9 by adding acid or base, at a temperature of 40° to 80° C, to precipitate said water soluble aluminum and titanium compounds as the corresponding hydroxides, settling the hydroxide precipitates, and separating said precipitated hydroxides from said waste water.

4,052,302

PROCESS OF FORMING CATALYTIC SURFACES FOR WET OXIDATION REACTIONS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, Robert B. Jagow, San Jose, Calif.

Filed May 10, 1976, Ser. No. 685,027

Int. Cl.² C02C 5/04

U.S. Cl. 210—63 R

12 Claims

1. A method of forming catalytic surfaces comprising dissolving a soluble ruthenium salt in a liquid medium, introducing said liquid medium containing the dissolved salt into a reaction vessel having internal surfaces of metallic material,

maintaining the operating temperature within said reaction vessel at a temperature such that ruthenium black is deposited on the internal surfaces of said vessel, said ruthenium salt being present in said liquid medium in an amount sufficient to provide a catalytically active amount of ruthenium black on said surfaces of said reaction vessel.

4,052,303

METHOD OF OPERATING A CENTRIFUGAL FILTER AND A FILTER CENTRIFUGE OPERATING ACCORDING TO THIS METHOD

Günther Hultsch, Kurt Zeppenfeld, Peter Niedner, and Peter Ostermeyer, all of Munich, Germany, assignors to Krause-Maffel AG, Munich, Germany

Continuation-in-part of Ser. No. 423,579, Dec. 10, 1973, Pat. No. 3,943,056. This application Feb. 27, 1976, Ser. No. 662,163

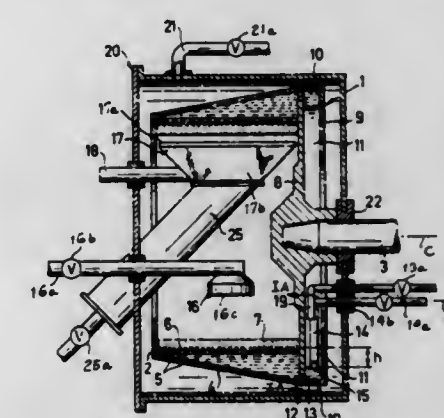
Claims priority, application Germany, Dec. 11, 1972, 2260461; June 19, 1973, 2331202

The portion of the term of this patent subsequent to Aug. 27, 1992, has been disclaimed.

Int. Cl.² B01D 33/02; B04B 3/00

U.S. Cl. 210—78

8 Claims



1. A filter centrifuge comprising: a perforated drum rotatable about an axis; means forming an annular chamber around said drum and rotatable therewith; pump means for evacuating said chamber to withdraw air therefrom; means for rotating said drum about said axis to displace said liquid phase through said filter cake; and means for forming a continuum consisting of liquid which radiates outwardly through said drum; said drum being adapted to form a filter cake through which a liquid phase can pass outwardly into said chamber with a hydrostatic pressure determined by the rate at which liquid of said continuum is withdrawn from said chamber.

7. A method of operating a filter centrifuge comprising a perforated drum rotatable about an axis and formed with a filter medium upon which a filter cake can form during filtration, said drum being surrounded by a liquid-collecting compartment rotating together with said drum and having at least one outlet radially outwardly of said filter medium, said method comprising the steps of:

- rotating said drum about said axis at a rate sufficient to induce passage of a liquid phase of a suspension outwardly through said filter medium into said liquid-collecting compartment;
- initially forming a liquid suction-pressure head within said liquid-collecting compartment;
- withdrawing air from said liquid-collecting compartment; and
- maintaining the liquid suction-pressure head so as to produce a continuum consisting of liquid, which radiates outwardly through said drum, resulting from said rotating.

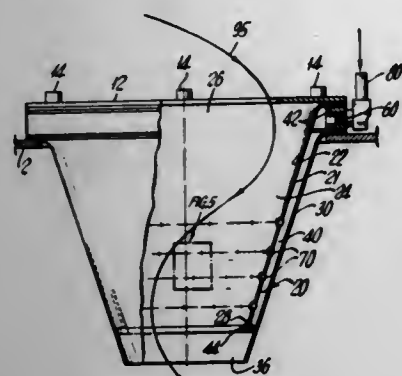
4,052,304

PREHEATING DEVICE FOR CENTRIFUGAL

Mathias J. Vertenstein, Denver, Colo., assignor to CF&I Engineers, Inc., Denver, Colo.

Filed July 21, 1976, Ser. No. 707,154
Int. Cl.² B04B 3/00; B01D 33/02

U.S. Cl. 210—78



8. An air and suspension warming device for location above the basket of a rotating basket centrifuge for the downward flow through said device of massecuite, said device comprising:

- a first tubular member having an upper opening communicating with the air and a lower opening communicating with the centrifuge inlet;
- a steam source connected to said first tubular member;
- a plurality of nozzles in the wall of said first member communicating with said steam source, said nozzles being inwardly directed at an angle of approximately 15°-20° from a horizontal tangent to said tubular member, whereby the steam discharged from said nozzles mixes with the air without substantial quantities of said steam directly impinging on the massecuite flowing from the upper opening to the lower opening.

13. A method for reducing the viscosity of heat sensitive suspensions to be separated in a continuous rotating basket centrifuge comprising the steps of:

- Passing the suspension downwardly through a first tubular member;
- Introducing steam into the member through nozzles on the wall of the first tubular member, the angle between the nozzles and a horizontal tangent to the first tubular member ranging between approximately 15°-20° to thereby form a vortex with the air in the member such that the steam does not directly impinge on the suspension.

4,052,305

METHOD AND APPARATUS FOR CLARIFYING LIQUIDS BY STRAINING

Kostas Savas Arvanitakis, 14945 S. Dogwood, Orland Park, Ill. 60462

Filed Sept. 30, 1975, Ser. No. 618,139
Int. Cl.² B01D 23/24, 27/12, 29/38, 35/22

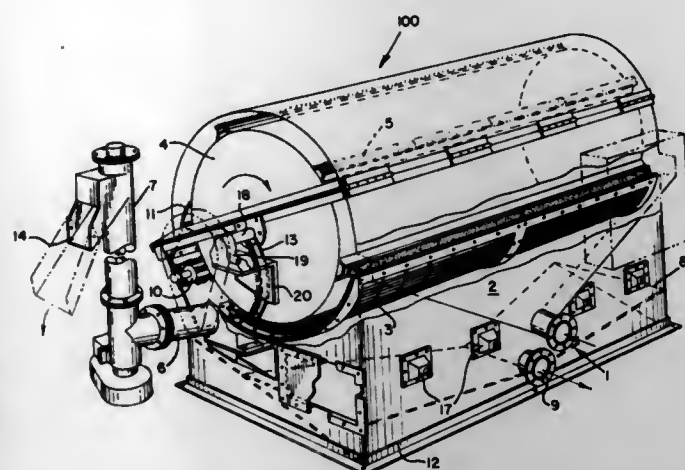
U.S. Cl. 210—79

6 Claims

1. A liquid solid separation microstrainer apparatus for removing suspended solids material from a contaminated liquid passed into the apparatus comprising a rotatable drum straining means for separating solid material from a liquid, passing the liquid therethrough and retaining the solids material on the surface thereof, said straining means positioned adjacent to the inlet for contaminated liquid and extending downwardly therefrom to a lowermost point and then upwardly to a discharge position above said lowermost point, brushing means carried by said rotatable drum for conveying the solids materials from the surface of said straining means positioned adjacent the surface thereof and in engagement therewith, conveyor means for removing and draining solids material passed thereto positioned adjacent the discharge position

of said strainer means to receive solids material conveyed thereto by said brushing means, said conveyor means positioned to forward solids material passed thereto and to drain liquid therefrom, and means for discharging solids material from said conveyor means.

5. The method of liquid/solid separation in a microstrainer comprising passing contaminated liquid bearing suspended solids material therein over a separating medium,



gravitationally straining contaminated liquid through the separating medium removing the suspended solids material therefrom and passing the clarified liquid there-through,

brushing the suspended contaminants from the surface of said separating medium and conveying said contaminants upwardly to permit gravitational separation of liquid contained therewith by brushing means carried by a rotatable drum of the microstrainer, and conveying said solids material for disposal.

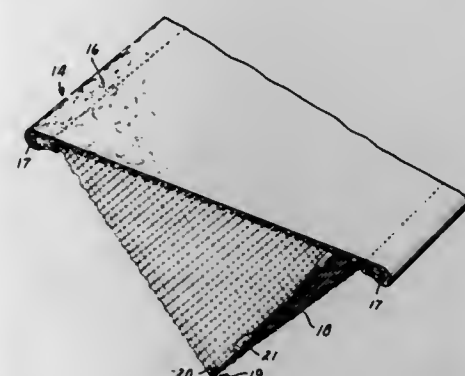
4,052,306
OIL SWEEP

Michael G. Schwartz, St. Paul; Alan P. Lorentzen, White Bear Township, Ramsey County, and David J. Bucheck, N. St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 12, 1976, Ser. No. 731,464
Int. Cl.² E02B 15/04

U.S. Cl. 210—242 S

7 Claims



1. A floatable oil sweep useful in controlling oil spills on moving bodies of water comprising an elongated web of oil sorbent adapted to float on a body of water with its large-area faces parallel to the waterline, said web being reinforced along its edges with ropes that extend along the length of the web; an open-mesh netting disposed over one large-area face of the oil sorbent, with first and second longitudinal edges of the netting attached to corresponding first and second edges of the web; and weight means attached to the netting at points intermediate the edges of the web and extending along the length of the sweep such that when the web is horizontal a chamber en-

4,052,308

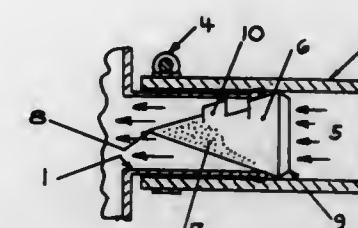
CONTAMINATION ENTRAPMENT AND CLEANING DEVICE FOR MOTOR VEHICLE ENGINE LIQUID COOLING SYSTEM COOLANT

Edward Wilford Higga, 124 S. 250 E., N. Salt Lake, Utah 84054
Filed Aug. 25, 1975, Ser. No. 607,729

Int. Cl.² B01D 29/42

U.S. Cl. 210—167

1 Claim



1. A filtering device installed in the radiator inlet of an internal combustion engine cooling system comprising a self supporting, hollow, conical, one piece metal wire cloth filter means which has its longitudinal axis disposed parallel to the coolant duct and having an integral bypass consisting of an opening in the uppermost portion of said conical filter means said opening being of a size such that any particle passing through an open thermostat will be captured or bypassed without reducing coolant flow rate in either event even when the filtering surface becomes clogged in normal operation.

4,052,309

PROCESS OF ELECTRODEPOSITION OF COATING COMPOSITIONS CONTAINING AN AMMONIA COMPLEX

Franz Holzer, and Gerhard Schmolzer, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Vienna, Austria
Continuation of Ser. No. 303,400, Nov. 3, 1972. This application Jan. 15, 1975, Ser. No. 541,122

Claims priority, application Austria, Nov. 8, 1971, 9589/71
Int. Cl.² C25D 13/10

U.S. Cl. 204—181

7 Claims

1. The method of coating a substrate by electrodeposition comprising (1) providing a paint formulation comprising (A) at least one water-soluble binding agent which can be deposited anodically under the action of applied current, and (B) in an amount sufficient to increase the throwing power of said paint formulation a partially soluble ammonia complex of a salt of a metal of the group consisting of zinc, cadmium, copper, silver, nickel, and cobalt which is capable of forming an ammoniacate; and (2) forming an electrical circuit comprising an anode and cathode with said anode being said substrate being coated and said substrate being in contact with said paint formulation of (1) while an electrodeposition current is applied to said substrate, the throwing power of said paint being increased due to the presence of said ammonia complex.

4,052,310

SEAL ASSEMBLY

John J. Nolan, Cambridge, Mass., assignor to Sala Magnetics, Inc., Cambridge, Mass.

Filed Sept. 27, 1976, Ser. No. 726,577
Int. Cl.² B01D 35/06

U.S. Cl. 210—222

10 Claims

1. In a moving matrix magnetic separator in which a multi-compartment matrix moves through at least one processing station—
a matrix device with a pair of spaced apart, longitudinal edges and at least one transverse edge extending between them;
a resilient, transverse seal at said transverse edge of said

closed by the netting is formed below the lower face of the web, with the weight means hanging freely below the web a distance equal to at least 15 percent of the transverse width of the web; said oil sweep being windable into a compact storage roll in which the web is wound in tightly overlaid convolutions with netting sandwiched between the convolutions.

4,052,307

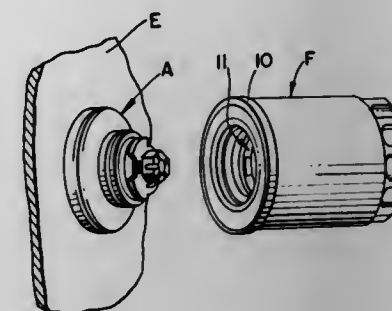
UNIVERSAL FILTER MOUNTING ATTACHMENT

Kingsley E. Humbert, Jr., Gastonia, N.C., assignor to Wix Corporation, Gastonia, N.C.

Filed July 8, 1976, Ser. No. 703,370
Int. Cl.² B01D 27/10

U.S. Cl. 210—130

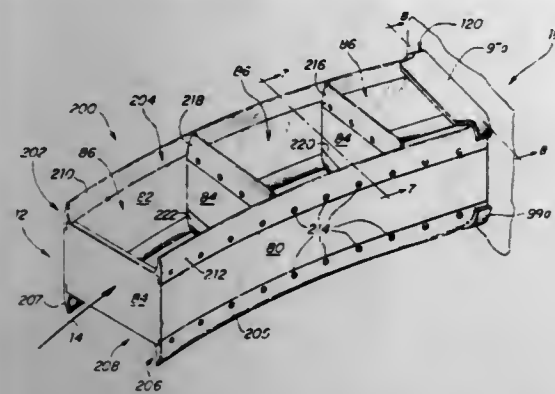
13 Claims



1. A universal filter mounting adaptor for internal combustion engines, comprises: a base plate having first seal means thereon for sealing engagement with an engine on which the adaptor is to be mounted and having first aperture means therethrough for flow of fluid from an engine and through the adaptor; a coupling member carried by the base plate for coupling engagement with complementary means on an internal combustion engine to secure the adaptor to the engine, said coupling member being selected for attachment to the particular engine on which it is used; a latch member carried by the base plate in a position for complementary latching engagement with latch means on a filter to be attached to the adaptor, said latch member being cooperable with all filters manufactured for use with the adaptor; second seal means on the base plate for sealing cooperation with a filter attached to the adaptor; normally closed valve means carried by the base plate to prevent loss of fluid from the engine through the first aperture means, said valve means being openable by fluid pressure developed in an engine to which the adaptor is attached; and said coupling member extending through the base plate and having means thereon for holding the base plate, latch and valve means assembled together for attachment as a unit to an engine.

6. In combination, an oil filter adaptor means having coupling means thereon for cooperation with conventional filter attaching structure on an engine to attach the adaptor means to the engine, latch means on the adaptor means for latching engagement with complementary latch means on a filter manufactured for use therewith, and a filter having complementary latch means thereon engaged with the latch means on the adaptor means, releasably latching the filter to the adaptor means and thereby releasably latching the filter to the engine, said adaptor means having first apertures therethrough for flow of oil from the engine through the adaptor means to the filter for filtration of the oil, first valve closure means biased toward closing relationship with the first apertures, said first valve closure means being moved toward open position by oil pressure developed in the engine, valve means in the filter, biasing means in the filter biasing the valve means toward closed position when the filter is removed from the adaptor means to prevent spillage of oil from the filter, and valve actuating means on the adaptor means engageable with the valve means in the filter to open the valve means when the filter is latched to the adaptor means to enable flow of oil through the filter.

device arranged transversely of the direction of relative motion between the processing station and said device, said transverse seal extending a distance beyond said device greater than the distance between a surface of said station and said device, and constructed and arranged to be bent rearwardly from a direction of motion to firmly, sealingly engage the surface; and
a resilient, longitudinal seal at each said longitudinal edge of



said device arranged generally longitudinally to the direction of relative motion between the surface and said device; each said longitudinal seal extending a distance beyond said device greater than the distance between a surface of said station and said device for enabling each said longitudinal seal to be bent inwardly of said device, and firmly, sealingly engage said surface, and being constructed and arranged to sealingly engage opposite ends of said transverse seal when bent inwardly.

4,052,311

APPARATUS FOR SEPARATING SOLIDS FROM LIQUIDS

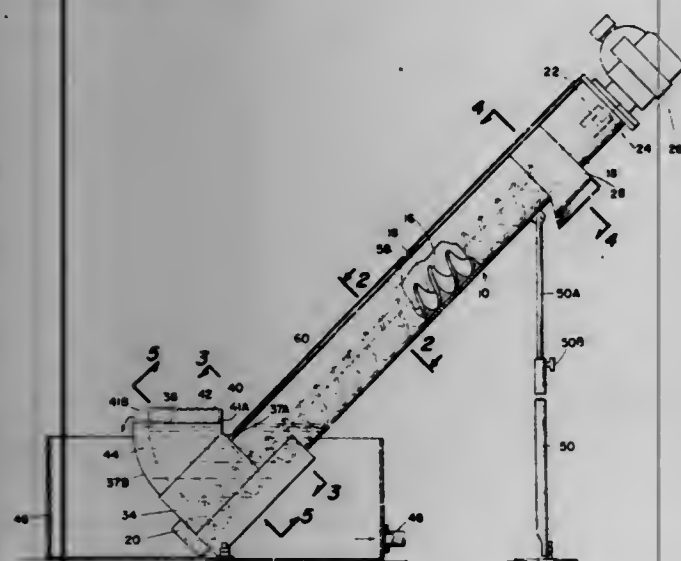
William F. Martin, Tulsa, Okla., assignor to James A. Herring, Tulsa, Okla., a part interest

Filed Jan. 19, 1976, Ser. No. 650,039

Int. Cl.² B01D 35/06, 21/24

U.S. Cl. 210-223

10 Claims



1. An apparatus for separating solids from liquids, such as metal cuttings from machine coolant, comprising:
 - an upwardly inclined elongated housing having a solids discharge chute adjacent the upper end and an inlet opening adjacent the bottom;
 - a helix rotatably positioned in said housing extending from the housing inlet and upwardly at least to said solids discharge chute;
 - an upwardly extending liquid outlet chamber having an inwardly inclined open bottom connecting with said housing inlet opening adjacent and above said helix, the open top of the outlet chamber forming an overflow weir;
 - an upwardly extending inlet chamber having an inwardly inclined open bottom adjacent and above said helix, the inlet chamber being supported within said outlet chamber

and providing fluid passageways between the inlet chamber bottom and the interior of the outlet chamber, whereby fluid received in said inlet chamber flows out the inlet chamber bottom and at least partially into the lower portion of said housing and upwardly through said fluid passageways to the upper portion of said outlet chamber, the upper end of the outlet chamber being lower than the upper end of the inlet chamber whereby liquid passes out by flowing over the outlet chamber upper overflow weir, solids passing downwardly from said inlet chamber into said housing inlet opening, the inlet chamber and outlet chambers forming a quiescent fluid reservoir from which solids are permitted to settle into said housing and the lower portion of said helix; and

means of rotating said helix to move separated solids upwardly in said housing for discharge out said discharge chute.

4,052,312

STRAINER MAGNETS

Charles King, Belleville, Mich., assignor to Flow Ezy Filters, Inc., Ann Arbor, Mich.

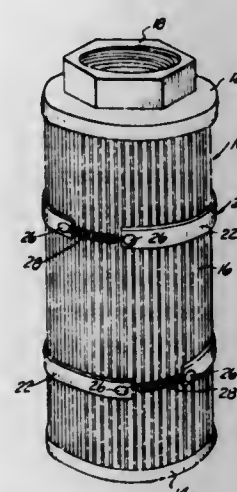
Continuation-in-part of Ser. No. 299,953, Oct. 13, 1972,

abandoned. This application Nov. 16, 1973, Ser. No. 416,596

Int. Cl.² B01D 35/06

U.S. Cl. 210-223

1 Claim



1. A fluid filter assembly comprising:
 - an annular filter element adapted for insertion into a filter housing, said filter element being pleated and having an exterior surface constructed of nonmagnetizable material through which a fluid to be filtered flows into the interior of said filter element;
 - an annular band of magnet material, said magnet material being formed from a pliable, relatively nonresilient material to adapt itself to the exterior surface of filter elements of different diameters and having a plurality of magnet members embedded therein throughout its length; and
 - a spring member removably mounted to the ends of said band of pliable magnet material for fastening said ends together around the exterior surface of said filter element intermediate said filter element and the filter housing whereby in operation the band is in direct fluid contact with the fluid.

4,052,313

MATERIAL RECOVERY SYSTEMS

George Henry Rolls, Lymington, England, assignor to John Rolls, Dorset, England, a part interest

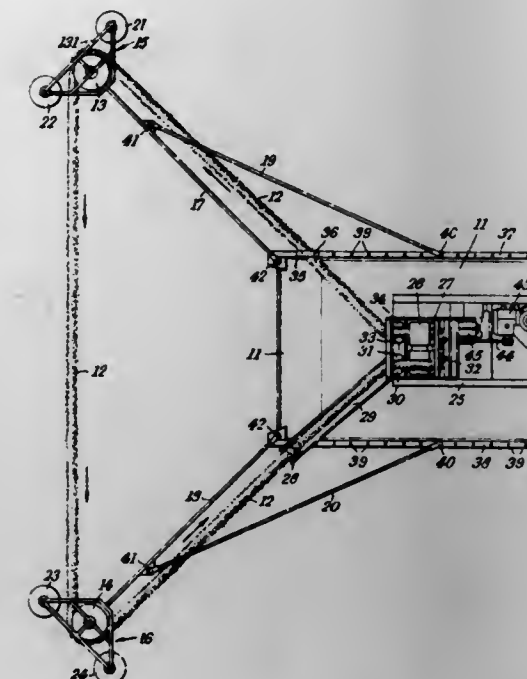
Filed Apr. 8, 1976, Ser. No. 674,756

Claims priority, application United Kingdom, Apr. 14, 1975, 15249/75

Int. Cl.² E02B 15/04

U.S. Cl. 210-242 AS

6 Claims



1. In an oil recovery system, the combination of a marine craft arranged for movement on the surface of water contaminated by oil, oil extraction means mounted on said craft, a continuous loop of a rope of adsorbent material which is arranged for floating on the surface of the water in proximity to the craft, said rope preferentially adsorbing oil from the water and passing to said extraction means for extraction of oil therefrom, a rope guide float unit arranged for floating on the water and including rope guide means around which the rope is guided, and a float unit support structure comprising rigid strut means connected at one end direct to the float unit, pivotal mounting means pivotally mounting the other end of the strut means on the craft at a pivot position thereon to permit pitching movement of the float unit relative to the craft while maintaining the float unit at a predetermined distance from said pivot position, and restraining means preventing yaw movements of the float unit relative to the craft.

4,052,314

FILTER PLATE FOR A PLATE TYPE FILTER PRESS

Oswald Busse, and Hugo Klesper, both of Aarbergen, Germany, assignors to Passavant-Werke Michelbacher Hütte, Germany

Filed June 28, 1976, Ser. No. 700,322

Claims priority, application Germany, June 28, 1975, 7520639

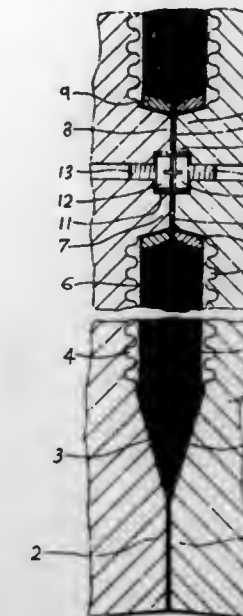
Int. Cl.² B01D 25/12

U.S. Cl. 210-230

5 Claims

1. In a filter plate for a plate type filter press particularly adapted for use in the dewatering of sewage sludges wherein each filter plate of said filter press is adjacent another filter plate with each filter plate having a plate frame with filtrate discharge means covered by filter cloth disposed adjacent the bottom of a filter cake chamber formed by recesses in the filter plate, the improvement comprising:
 - a. at least one cam projecting from the bottom of said filter cake chamber of said filter plate in position to engage a corresponding cam on an adjacent filter plate and support its filter plate on said corresponding cam on an adjacent filter plate with said cam extending substantially to the level of the outer surface of the frame of its filter plate;
 - b. said filter cloth covering its plate frame and having an opening therein adapted to receive said cam,

c. a clamping ring surrounding said cam and the filter cloth adjacent thereto to provide a seal therebetween, and



d. a washer-like member overlying and forming part of said cam and overlying a portion of said clamping ring and retaining said clamping ring in place.

4,052,315

ONE-PIECE MOLDED FILTER

Ernest Harold Lindsay, Jr., Joliet, and Richard Francis Daubert, Jr., Bridgeview, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

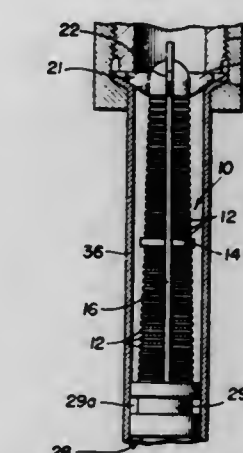
Continuation of Ser. No. 516,781, Oct. 21, 1974, abandoned.

This application Mar. 1, 1976, Ser. No. 663,002

Int. Cl.² B01D 29/10

U.S. Cl. 210-232

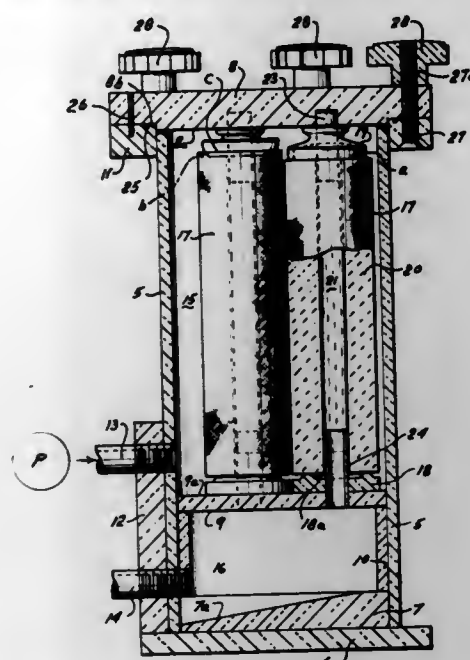
8 Claims



1. A one-piece injection molded plastic fluid filter including a base portion having a fluid passageway therethrough, a head portion spaced axially from said base a predetermined distance, a plurality of axially spaced apart annular rings positioned between said base portion and said head portion, each of said rings having a predetermined internal and external diameter, a plurality of arcuately spaced axially disposed ribs extending between said base and head portions and extending solely in a direction radially inwardly from an internal juncture of the radially outer edges of said ribs with the predetermined internal diameter of each of said rings, said ribs and said annular rings each projecting in radially opposite directions from said junctions and cooperating to provide a multiplicity of predetermined size filtration openings at said juncture between said spaced ribs and rings, said ribs have a substantially uniform cross-section and are substantially uniformly spaced from each other and said ribs have inwardly converging side surfaces for providing said openings with a substantially uniform size and shape, and at least one axially disposed larger rib extending between said head and base portions and extending radially

outwardly from said juncture, said larger rib having a greater circumferential thickness than the other said ribs integrally connecting each adjacent ring throughout the entire radial extent between said predetermined internal and external diameters for a limited portion of their circumferential extent, whereby said larger rib serves to rigidify said filter rings and serves as a conduit for the injection molded plastic to ensure completed rings.

second annular seat member associated respectively with the end portions of said cartridge and each substantially centered with respect to said central hollow of the cartridge, one seat member being secured between the cartridge and the divider and the other seat member being secured between the cartridge and the cover, the said filter cartridge and the said two seat members having a total axial dimension greater than the said predetermined distance between the rigid divider and the rigid cover when the cartridge and said two annular seat members



are uncompressed, and said first annular seat member comprising a resilient material substantially nonpermeable and impervious to attach by the fluid to be filtered and having an interior hollow cavity defined by a flexible wall, said flexible wall being deformable in the direction of the axis of the cartridge to such extent as to accommodate said filter cartridge and to permit the two seat members to seat and to seal the ends of the filter cartridge when the cartridge and said annular members are pressed between the cover and the rigid divider.

4,052,318

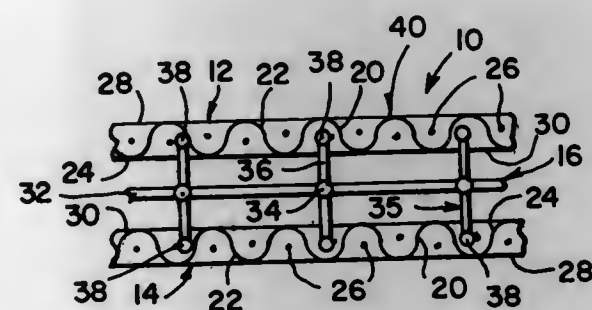
MESH COFFEE FILTER

Bonnie E. Krebs, No. 84 Countryside Village, Great Falls, Mont. 59404

Filed July 8, 1976, Ser. No. 703,429
Int. Cl.² B01D 25/02

U.S. Cl. 210—337

9 Claims



1. A filter for use in a hot beverage making machine of the type where the hot beverage has grounds and fines which must be separated from the hot beverage comprising:

- a fine mesh top filter,
- a fine mesh bottom filter,
- carrier means adapted to be positioned between said top and bottom filters and permit the hot beverages to pass therethrough,
- securing means to provide said top and bottom filters in fixed relation to said carrier means across the complete area defined by said filters, so as to permit said filters to be

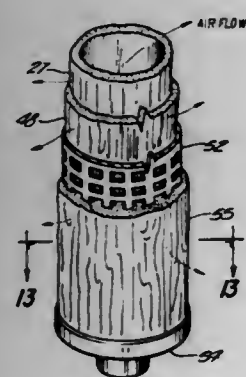
4,052,316
COMPOSITE COALESCING FILTER TUBE

Leo Joseph Berger, Jr., Birmingham, and Denis D. Guequierre, Livonia, both of Mich., assignors to Finite Filter Company, Madison Heights, Mich.

Division of Ser. No. 593,831, July 17, 1975. This application
Feb. 17, 1976, Ser. No. 658,222
Int. Cl.² B01D 29/14

U.S. Cl. 210—315

24 Claims



1. A vacuum formed highly porous pre-filter support tube formed of randomly oriented glass fibers being bound together by a cured epoxy binder and having a perforated rigid retaining tube surrounding the porous pre-filter support layer, and being in intimate interlocking contact therewith at all points of contact along the boundary between said rigid support tube and said pre-filter support tube.

4,052,317

FILTERING EQUIPMENT

Karl Palnik, Huntingdon Valley, Pa., assignor to The Carolinac Company, Huntingdon Valley, Pa.

Filed Dec. 29, 1975, Ser. No. 644,663
Int. Cl.² B01D 23/00

U.S. Cl. 210—323 T

10 Claims

1. Filtering equipment for filtering fluid under pressure, adaptable for insertion and removal of at least one filter cartridge of the type which may vary in dimension, particularly length and end configuration, comprising a filter chamber, a flow passage, a rigid divider between said chamber and said passage, a removable rigid cover for said chamber spaced from said divider a predetermined distance with the cover fixedly mounted to close said chamber, at least one substantially cylindrical filter cartridge in the chamber having a central hollow and adapted to be removably positioned within said chamber, said hollow connected with said discharge connection to allow flow of said fluid from said chamber, through said cartridge, through said discharge connection to said flow passage, a first annular seat member and a

removed for cleaning or replacement when a force of predetermined magnitude is manually applied to overcome the frictional engagement between said securing means and said filters, and

E. said securing means includes:

1. a plurality of hinges connected at one end thereof to said carrier means and extending on both sides thereof, and
2. locking members formed at the free end of each of said hinges and having an enlarged head portion adapted to extend into said mesh filters in interlocking relation therewith.

4,052,319

COOKING OIL FILTRATION

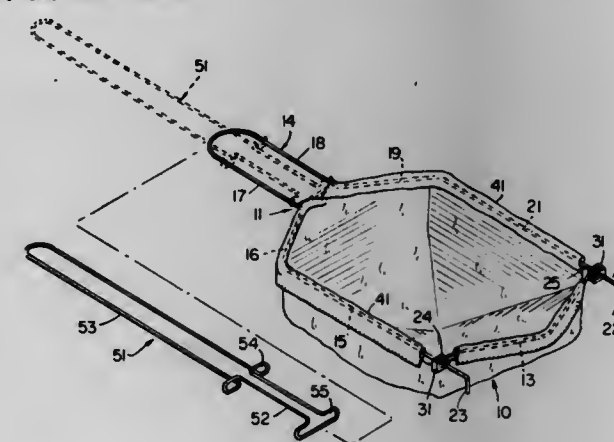
Bernard Friedman, 2730 Chew St., Allentown, Pa. 18104

Filed Nov. 3, 1975, Ser. No. 627,904

Int. Cl.² B01D 35/02, 23/20

U.S. Cl. 210—465

9 Claims



1. A filter for cooking oil, comprising:

- a filter support, said filter support being comprised of a first member having a first side portion, a second side portion opposite said first side portion, a first end portion and a handle portion extending from said first end portion, said first member being formed of a single first rod, and a second member in the form of a second rod extending between said first and second side portions to define a second end portion opposite to said first end portion, said second rod member including first and second hooked end portions said first hooked end portion being hooked around the first side portion of said first rod member and the second hooked portion being hooked around the second side portion of said first rod member; means for retaining the second member in position between said first and second side portions, said means for retaining the second rod member in position being comprised of first and second clips for receiving said hooked portions, said clips being removably secured to said first and second rod portions to prevent unhooking of said hooked portions from the first rod member; and
- a filter bag, said filter bag being removably supported on said filter support, said filter bag including sleeve portions, said first and second members being inserted into said sleeve portions to thereby removably support said filter bag.

4,052,320

TELESCOPING SERUM SEPARATOR AND DISPENSER

Raymond F. Jakubowicz, Manchester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 609,121, Aug. 29, 1975, abandoned. This application July 8, 1976, Ser. No. 703,476

Int. Cl.² B01D 21/26

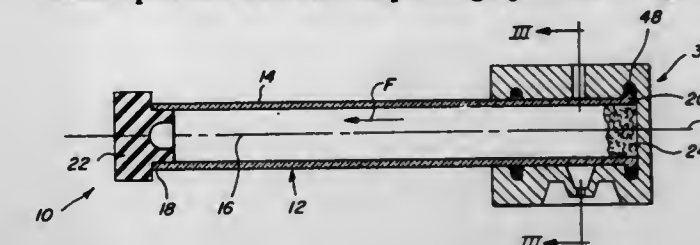
U.S. Cl. 210—516

22 Claims

1. A device comprising, in combination, a blood serum separation compartment having wall means

extending between two opposite ends one of which is open for serum flow, and telescoped over said open end, a serum dispensing container comprising wall means including an end wall and side walls encompassing said compartment, said side walls including a dispensing aperture and a pressurizing aperture,

said compartment and said container being movable between a first position for receiving a sample in which said end wall provides an airtight seal against said compartment open end and said dispensing aperture being removed



ably blocked from serum flow communication with said compartment by a portion of said wall means of said compartment and a second position for dispensing serum in which said open end is unblocked for flow of serum into said container and said dispensing aperture when said container end wall is moved away from said open end, sealing means for providing an airtight seal between said compartment and said container when in said second position, and a thixotropic gel phase separator disposed in sealing position within said compartment against said container end wall.

4,052,321

FLAME-RETARDANT YARN OR THREAD CONTAINING

BROMINATED ESTER OF OLEIC OR LINOLEIC ACID

Jefferson Lyle Claiborne, Hexson, Tenn., assignor to Dixie Yarns, Inc., Chattanooga, Tenn.

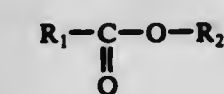
Filed Mar. 17, 1976, Ser. No. 667,659

Int. Cl.² D06M 13/20

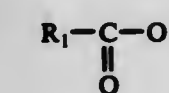
U.S. Cl. 252—8.6

16 Claims

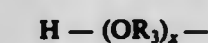
1. A flame-retardant yarn or thread, comprising a yarn or thread having applied thereto a flame-retardant lubricant which is a polybrominated ester selected from (1) compounds of the formula



wherein



is a dibrominated oleic or linoleic acid moiety and R_2 is selected from the group consisting of unsubstituted, dibrominated, or tetrabrominated straight or branched chain saturated aliphatic groups having from 1 to about 20 carbon atoms;



wherein R_3 is an alkylene group having 2 to 3 carbon atoms and x is a number from 1 to about 25 and glycerol sans a hydroxyl group;

2. hexabromo glycerol trioleate, (3) hexabromo sorbitan trioleate, (4) tetrabromo polyethylene glycol dioleate, (5) tetrabromo polyethylene glycol dioleate and (6) brominated lecithin.

4,052,322

CORROSION-INHIBITED GREASE COMPOSITIONS
Fred T. Crookshank, Port Arthur, Tex., assignor to Texaco Inc., New York, N.Y.Filed June 24, 1976, Ser. No. 699,409
Int. Cl.² C10M 3/18

U.S. Cl. 252-18

11 Claims

1. A lubricating grease having superior anti-corrosive properties comprising a homogeneous admixture of the following components in their indicated range of proportions:

- from about 75 to 96 parts by weight of oil of lubricating viscosity thickened to grease consistency with about 2 to 25 parts by weight of a soap selected from the group consisting of alkali metal soaps, alkaline earth metal soaps and mixtures thereof; and
- from about 1.0 to 10.0 parts by weight of a corrosion-inhibiting composition comprising:
 - at least one inorganic nitrite;
 - at least one N-acyl sarcosine selected from the group consisting of lauroyl sarcosine, cocoyl sarcosine, oleoyl sarcosine, stearoyl sarcosine, fatty acid sarcosines containing from 8 to 22 carbon atoms per molecule and mixtures thereof, the weight ratio of sarcosine to nitrite varying from about 0.05 to 7.5 parts by weight of sarcosine to 0.075 to 7.5 parts by weight of nitrite.

4,052,323

HIGH-TEMPERATURE LUBRICANT FOR THE HOT-WORKING OF METALSKurt Feneberger, and Rolf Gely, both of Sins, Switzerland, assignors to Lonza, Ltd., Gampel, Valais, Switzerland
Filed Nov. 13, 1974, Ser. No. 523,499

Claims priority, application Switzerland, May 8, 1974, 006242/74; Sept. 6, 1974, 012127/74

Int. Cl.² C10M 3/18

U.S. Cl. 252-23

31 Claims

1. The high-temperature lubricant for the hot-working of metals which comprises (a) 10 to 90 percent by weight of graphite, (b) 2 to 45 percent by weight of an homopolymer or copolymer selected from the group consisting of polyethylene, poly(methyl methacrylate), polystyrene, poly(vinyl acetate), poly(vinyl laurate), poly(vinyl propionate), a copolymer of methyl methacrylate and styrene, a copolymer of methyl methacrylate and alpha-methyl-styrene, polyisobutylene, poly(dibutyl maleinate), poly(diallylphthalate), polypropylene, poly(methyl acrylate), a copolymer of vinyl acetate and ethylene, polyisobutylene and mixtures thereof, and (c) 0.5 to 8 percent by weight of a dispersing agent which is selected from the group consisting of a polysaccharide, an alkyl cellulose and an alginate, said lubricant being solid at room temperature.

4,052,324

REACTION PRODUCT OF DIALKYL ALKANEPHOSPHONATE, SUBSTITUTED IMIDAZOLINE, AND WATER IN LUBRICANT COMPOSITIONS

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

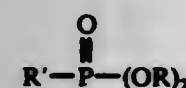
Filed Nov. 4, 1976, Ser. No. 738,762
Int. Cl.² C10M 1/44, 3/38, 5/24, 7/24

U.S. Cl. 252-32.5

19 Claims

1. A lubricant composition which comprises: an oleaginous media; and an antiwear improving amount of the product formed by reacting:

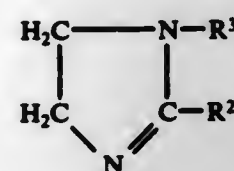
- a dialkyl alkane phosphonate compound having the formula



where R' is a substantially unbranched paraffinic alkyl group

containing from about 10 to about 36 carbon atoms and R is a hydrocarbyl group containing from 1 to about 4 carbon atoms with at least one hydrogen atom present on the carbon atom which is bonded to the oxygen;

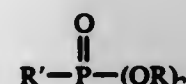
- a substituted imidazoline of the formula:



where one of the R² and R³ substituents must be a substantially unbranched paraffinic or olefinic hydrocarbyl group containing from about 12 to about 35 carbon atoms; and the other R² or R³ substituent is selected from the group consisting of: paraffinic alkyl containing from 1 to about 35 carbon atoms, alkenyl containing from 1 to about 35 carbon atoms and hydroxy-, alkoxy-, alkoxymethoxy-, and oxo-substituted alkyl and alkenyl containing from 1 to about 20 carbon atoms; and c. water at a temperature of from about 130° to about 170° C and wherein compounds (a), (b), and (c) are reacted in molar ratios from about 1:1 :30 to 1:1.2: 2.4 respectively.

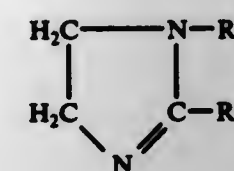
- A product formed by reacting

- a dialkyl alkane phosphonate compound having the formula



where R' is a substantially unbranched paraffinic alkyl group containing from about 10 to about 36 carbon atoms and R is a hydrocarbyl group containing from 1 to about 4 carbon atoms with at least one hydrogen atom present on the carbon atom which is bonded to the oxygen;

- substituted imidazoline of the formula:



where one of the R² and R³ substituents must be a substantially unbranched paraffinic or olefinic hydrocarbyl group containing from about 12 to about 35 carbon atoms; and the other R² or R³ substituent is selected from the group consisting of: paraffinic alkyl containing from 1 to about 35 carbon atoms, alkenyl containing from 1 to about 35 carbon atoms; and hydroxy-, alkoxy-, alkoxymethoxy-, and oxo-substituted alkyl and alkenyl containing from 1 to about 20 carbon atoms; and c. water at a temperature of from about 130° to about 170° C and wherein compounds (a), (b), and (c) are reacted in molar ratios from about 1:1 :30 to 1:1.2: 2.4 respectively.

4,052,325

LIQUID ELECTROGRAPHIC DEVELOPER COMPOSITION CONTAINING REDISPERSIBLE POLYESTER TONER AND PROCESS

Domenic Santilli, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 535,618, Dec. 23, 1974, abandoned. This application June 28, 1976, Ser. No. 700,249

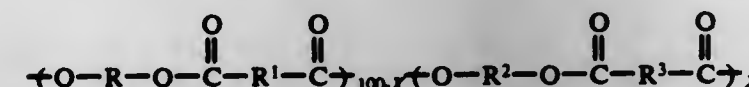
Int. Cl.² G03G 9/12

U.S. Cl. 252-62.1 L

10 Claims

1. An electrographic liquid developer composition comprising a mixture of electrostatically-attractable, heat-fixable redis-

persible toner particles in an electrically insulating liquid carrier having a volume resistivity greater than 10¹⁰ ohm-cms. and a dielectric constant less than about 3.0, said toner particles (a) present in an amount of from about 0.05 to about 15 weight percent of said developer composition, (b) having a melting point in the range of from about 40° to about 150° C, and (c) comprising, in an amount greater than about 0.05 weight percent of said developer composition, a linear polyester physically inert with respect to said carrier liquid, said polyester having the formula



wherein X represents a mole percentage value within the range of 0 to 100 mole percent; R and R², which may be the same or different, represent a member of the group selected from the divalent residue of an aliphatic, alicyclic, or aromatic diol upon removal of the two hydroxy groups from said diol; R¹ is a member selected from the group consisting of the divalent residue of a sulfonamido-free aliphatic, alicyclic or aromatic dicarboxylic acid upon removal of the two carboxy groups from said acid; and R³ represents (i) a member selected from the same group as R¹ and may be the same as or different from R¹ or (ii) the divalent residue of a disulfonamido group-containing aromatic dicarboxylic acid upon removal of the two carboxyl groups from said acid, said disulfonamido group having a monovalent cation on the amido nitrogen atom thereof.

4,052,326

MANUFACTURE OF γ-IRON(III) OXIDE

Eduard Schöenaflinger, Mannheim, and Bernd Leutner, Maxdorf, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation-in-part of Ser. No. 514,095, Oct. 11, 1974, abandoned. This application Aug. 30, 1976, Ser. No. 718,690

Claims priority, application Germany, Oct. 19, 1973, 2352440
Int. Cl.² C01G 49/02

U.S. Cl. 252-62.56

4 Claims

1. In a process for the manufacture of acicular γ-iron(III) oxide of improved crystallinity and high coercive force by heating goethite or acicular γ-iron(III) oxide at a temperature of from 500° to 800° C, reducing the resulting product to magnetite at a temperature of from 280° to 600° C and subsequently oxidizing the magnetite to γ-iron(III) oxide, the improvement which comprises adding heat to the magnetite in an inert gas atmosphere to maintain a temperature of from 400° to 600° C after the reduction step has been completed.

4,052,327

COMPOSITIONS FOR ERADICATING ELECTROPHOTOGRAPHIC IMAGES FROM TRANSLUCENT PAPER

Ronald D. Arena, Durham, and Eric G. Lowry, Middletown, both of Conn., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 431,391, Jan. 7, 1974, abandoned. This application July 28, 1975, Ser. No. 599,719

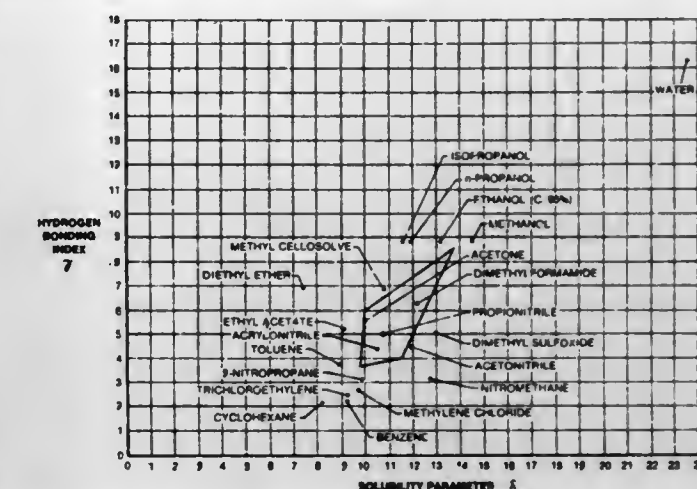
Int. Cl.² C11D 7/02, 3/16, 3/43

U.S. Cl. 252-141

4 Claims

1. A composition for eradicating electrophotographic images from paper which comprises a solvent mixture, the Cartesian coordinates of which fall within the quadrangle bounded by the coordinates (9.8, 3.7), (10.0, 6.0) (13.7, 8.5) and (11.5, 4.0) on the Hydrogen Bonding Index (δ) versus Solubility

Parameter (δ) plot of the drawing, said solvent mixture containing a nitrile having from 2 to 3 carbon atoms, and a solvent



selected from the group consisting of ketones and esters having up to 4 carbon atoms.

4,052,328

AZEOTROPE-LIKE COMPOSITIONS OF TRICHLOROTRIFLUOROETHANE, ETHANOL, ISOPROPANOL AND NITROMETHANE

Francis J. Figiel, Boonton, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 638,237, Dec. 8, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 741,636

Int. Cl.² C11D 7/50, 7/32, 7/30; C23G 5/02

U.S. Cl. 252-171

4 Claims

1. Azeotrope-like compositions comprising about 94.8 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane, about 2.4 weight percent ethanol, about 0.9 weight percent isopropanol and about 1.9 weight percent nitromethane.

4,052,329

METHOD OF PREPARING CERIUM-ACTIVATED YTTRIUM SILICATE PHOSPHOR

Yoji Fukuda; Fumio Fukushima, both of Neyagawa; Yoshinobu Tsujimoto, Kashiwara; Masakazu Fukai, Nishinomiya, and Shinji Sugai, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation-in-part of Ser. No. 447,817, March 4, 1974, abandoned. This application June 7, 1976, Ser. No. 693,930

Claims priority, application Japan, Mar. 2, 1973, 48-24951; Aug. 28, 1973, 48-96822

Int. Cl.² C09K 11/46

U.S. Cl. 252-301.4 F

3 Claims

1. A method of increasing the emission intensity of a Y₂SiO₅:Ce phosphor at around the 450nm wavelength comprising adding BaF₂ to a mixture of Y₂O₃, SiO₂ and CeO₂, wherein the BaF₂ is added in an amount such that the BaF₂/Y₂O₃ mol ratio is 0.01 to 0.2 inclusive and wherein the SiO₂/Y₂O₃ mol ratio is 1.0 to 1.2 inclusive, and thereafter firing the BaF₂-containing mixture at a temperature of the order of 1200-1500° C in air or a reducing atmosphere of an inert gas containing up to 5% hydrogen to produce a cerium-activated phosphate phosphor exhibiting increased luminosity and emission intensity.

4,052,330

SINTERING URANIUM OXIDE USING A PREHEATING STEP

Neil John Jensen, Mountain View; Yogesh Nivas, San Jose, and Douglas Randall Packard, Sunol, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 20, 1975, Ser. No. 560,534

Int. Cl.² G21C 3/58

U.S. Cl. 252-301.1 R

21 Claims

1. A method for producing dense sintered bodies of a partic-

ulate composition comprising uranium oxide substantially free of fluoride ions comprising the steps of (1) preheating compacted bodies of the composition comprising uranium oxide, which composition can contain fluoride impurities, for a period of at least about 20 minutes to a temperature in the range of about 600° to about 900° C in an atmosphere consisting essentially of an initial mixture of carbon dioxide and hydrogen, either alone or with an inert gas, which mixture reacts to give the presence of water vapor and carbon monoxide, said atmosphere having about 30 ± 2 percent hydrogen by volume with the balance being carbon dioxide, (2) heating the compacted bodies to a temperature in the range of about 900° to about 1500° C in an atmosphere consisting essentially of a mixture of carbon dioxide and hydrogen, either alone or with an inert gas, which mixture reacts to give the presence of water vapor and carbon monoxide thus effecting sintering of the bodies in said atmosphere, said atmosphere having from about 0.5 to about 90 percent hydrogen by volume with the balance being carbon dioxide, (3) thereafter holding the sintered bodies in a reducing atmosphere consisting essentially of a mixture of hydrogen and carbon dioxide to alter the ratio of oxygen to uranium atoms in the sintered uranium oxide to within the range of 1.98:1 to about 2.10:1, said atmosphere having from about 10 to about 90 percent hydrogen by volume with the balance being carbon dioxide, and (4) cooling the bodies in a protective atmosphere having an oxygen partial pressure in the range of about 10⁻⁴ to about 10^{-4.5} atmospheres of oxygen, said atmosphere being selected from the group consisting of dry hydrogen, wet hydrogen, dry carbon monoxide, wet carbon monoxide, inert gases, a mixture of hydrogen and carbon dioxide, and a mixture of any of the foregoing.

4,052,331

SURFACE ACTIVE COMPOSITION

Jean Dumoulin, Rhone, France, assignor to Rhone-Poulenc S.A., Paris, France

Division of Ser. No. 412,141, Nov. 2, 1973, Pat. No. 3,975,294. This application Apr. 13, 1976, Ser. No. 676,500

Claims priority, application France, Nov. 3, 1972, 72.38957 Int. Cl.² B01F 17/42; B01J 13/00; C08L 43/04

U.S. Cl. 252—312

13 Claims

1. A process for preparing a transparent aqueous micro-emulsion or transparent gel in which a surface active composition and an organo-silicon compound are mixed together and the resulting mixture introduced into an aqueous medium wherein the surface active composition comprises by weight: p1 a. 45 to 90% of at least one n-alkyl monoether of a polyethylene glycol, containing 4 to 9 —CH₂CH₂O— units, the n-alkyl radicals containing 5 to 15 carbon atoms,

b. 5 to 35% of a sodium dialkylsulphosuccinate, the linear or branched alkyl radicals containing 6 to 12 carbon atoms, c. 2 to 17% of at least one acid selected from the group consisting of oleic, linoleic, linolenic and ricinoleic acid, and

d. 1.5 to 12% of at least one amine selected from the group consisting of triethanolamine and N-hydroxyethylmorpholine,

and wherein the organosilicon compound is a monomer of the formula R₄Si or R₃SiO₂SiR₃ or an organopolysiloxane polymer having 0.8 to 2.6 organic groups per silicon atom and formed of units selected from the group consisting of R₃SiO_{0.5}, R₂SiO, RSiO_{1.5}, SiO₂ and O_{3/2}—R₂SiQ₂SiR₂O_{3/2} in which R represents a monovalent organic group containing 1 to 20 carbon atoms, Q represents a divalent hydrocarbon radical having 1 to 12 carbon atoms, a is 0 or 1 and b is 0, 1 or 2, the organosilicon compound forming 0.05 to 15% by weight of the emulsion or gel and the mixture of the surface active composition and the organo-silicon compound forming at most 60% of the weight of the emulsion or gel.

4,052,332

CATALYST REGENERATION WITH IMPREGNATION OF BISMUTH AND MOLYBDENUM

Michael Brian D'Amore, Wilmington, Del., and Arthur William Sleight, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 20, 1976, Ser. No. 678,708

Int. Cl.² B01J 23/92; C07C 121/02

U.S. Cl. 252—413

14 Claims

1. A process for regenerating a catalyst of the general formula A_xB_yC_zFe₂Bi₂Mo₂O_x wherein A is at least one element selected from the group consisting of an alkali metal, rare earth metal, tantalum and niobium, B is at least one element selected from the class consisting of nickel and cobalt, C is at least one element selected from the class consisting of phosphorus and arsenic, "a" and "c" are numbers from 0 to 3, "b" is a number from 0.1 to 20, "d" is a number from 0.1 to 8, "e" is a number from 0.1 to 6, "f" is a number from 8 to 16, and "x" is a number determined by the valence requirements of the other elements present, wherein said catalyst has become at least partially deactivated by exposure to ammoxidation conditions which exposure is accompanied by the loss of a portion of the molybdenum originally present in the catalyst, which process comprises impregnating said catalyst with molybdenum and bismuth, separating the catalyst thus impregnated from any bismuth and molybdenum not absorbed by the catalyst and thereafter calcining the catalyst by heating the catalyst to a temperature in the range of about 300°–700° C in an oxidizing atmosphere to form a regenerated catalyst wherein the mole ratio of added molybdenum to bismuth is in the range 0.5–20 and at least 50% of the molybdenum lost is replaced.

13. A process for regenerating an ammoxidation catalyst which catalyst comprises the combined oxides of potassium, cobalt, nickel, iron, bismuth, phosphorus and molybdenum on a silicon oxide support and in powder form, wherein said catalyst has become at least partially deactivated by exposure to ammoxidation conditions said process comprising thoroughly contacting said catalyst with a solution prepared by dissolving sufficient molybdenum trioxide and phosphoric acid in water to provide a solution having at least 29 grams/liter of molybdenum and at least 0.8 gram/liter of phosphorus, adding nitric acid and finally dissolving sufficient bismuth nitrate pentahydrate in the resultant solution to provide a solution having at least 11 grams/liter of bismuth, separating the catalyst from any solution not absorbed therein and calcining the catalyst thus treated at a temperature in the range 450°–650° C in an oxidizing atmosphere to form an active catalyst.

4,052,333

CATALYST TREATMENT

Emerson H. Lee, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed June 25, 1976, Ser. No. 699,779

Int. Cl.² B01J 23/92

U.S. Cl. 252—416

5 Claims

1. A process for the regeneration of a spent olefin ammoxidation catalyst in which at least 20% of the atoms of the active metallic elements in the catalyst are molybdenum atoms which comprises heating the catalyst at a temperature of from 400° to 650° C and at a pressure of from 1.0 to 2.0 kg/cm² in an atmosphere comprising from 20 to 45% by volume of steam, the balance being air or a gas inert to the catalyst under the above conditions, for a period of at least one hour.

5. A process for the regeneration of an olefin ammoxidation catalyst composition defined by the following formula:



where M is an alkali metal, E is an alkaline earth metal, X is phosphorus, arsenic or antimony, Z is cobalt or nickel, a and b

are from 0.1 to 12, m is 0.1 to 8, e is from 0 to 8, x is from 0 to 6, z is from 0 to 12 and n is a number determined by the valence requirements of the other elements present, a, b, m, e, x, and z being chosen such that molybdenum provides at least 20% of the atoms of the active metallic element in the catalyst, which process comprises heating the catalyst composition at substantially atmospheric pressure and a temperature of from 500° to 550° C for a period of 1 to 24 hours under an atmosphere consisting of a mixture of air and steam with a partial pressure of steam of from 200 to 300 mm.

4,052,334

CATALYST SUPPORT

Keith Henry George Mockett, Alloa, Scotland, assignor to BP Chemicals Limited, London, England

Filed June 1, 1976, Ser. No. 691,553

Claims priority, application United Kingdom, June 10, 1975, 24789/75

Int. Cl.² B01J 31/02, 27/24, 27/06, 21/08

U.S. Cl. 252—429 R

8 Claims

1. A process for producing a pelleted silica support for catalysts comprising heating to cure a shaped article, formed from a mixture of an ionic detergent, finely divided silica powder and colloidal silica and containing water in the range of 5 to 40% by weight of the total mixture sufficient to prevent the shaped article from disintegrating on heating at elevated temperature.

4,052,335

CATALYST FOR THE PRODUCTION OF GAMMA-BUTYROLACTONE AND A METHOD FOR PREPARING THE CATALYST

Georg Michalczyk, Neukirchen-Vluyn, and Karl-Heinz Gluzek, Alpen, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 583,363, June 4, 1975, Pat. No. 3,994,928. This application May 17, 1976, Ser. No. 686,853

Claims priority, application Germany, June 18, 1974, 2429085

Int. Cl.² B01J 21/08, 21/18, 23/44, 23/74

U.S. Cl. 252—446

7 Claims

1. A catalyst consisting of cobalt oxide and palladium on silica, wherein said catalyst comprises from about 20 to 30 percent cobalt oxide and from 0.5 to 1.0 weight percent palladium.

4,052,336

PROCESS FOR PREPARING NOBLE METAL CATALYSTS

Abraham van Montfort, Geleen, and Joseph J. F. Scholten, Sittard, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Mar. 9, 1976, Ser. No. 665,442

Claims priority, application Netherlands, Mar. 13, 1975, 7502968

Int. Cl.² B01J 23/40, 23/42, 23/44, 21/18

U.S. Cl. 252—447

13 Claims

1. In a process for preparing active noble-metal catalyst on a carbon carrier by adsorbing at least one water-soluble salt of a catalytically active metal onto the carbon in an aqueous medium, by hydrolyzing said salt by treating the salt with a basic reagent to form the oxide or hydroxide, and by reducing said oxide or hydroxide to the metal, the improvement comprising employing an active carbon having an acid to neutral reaction in water and an internal surface area of at least 300 m²/g and up to about 1000 m²/g with a particle size between 1 and 60 microns and with an ash content that does not exceed 3.5% by weight, whose ratio between (1) the pore volume, of the pores between 20 to 1000 Å plus the pores exceeding 1000 Å and (2) the total pore volume of said particles lies between 0.6 and 1.0 whereby the hydrolysis of the noble metal salt and the reduction of the oxide or hydroxide formed thereby are carried out

in a single processing step with liquid hydrolyzing and reducing agents.

4,052,337

CATALYST FOR REDUCTION OF NITROGEN OXIDES AND PROCESS FOR PREPARING SAME

Eiichiro Nishikawa, Takuji Itoh, Tsugio Maehama, and Setsuo Kamiyama, all of Ohi, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 19, 1976, Ser. No. 668,608

Claims priority, application Japan, Mar. 28, 1975, 50-37676 Int. Cl.² B01J 29/06, 8/00; C01B 21/00

U.S. Cl. 252—455 Z

2 Claims

1. A process for preparing a catalyst for reduction of nitrogen oxides, characterized in that: a. a synthetic crystalline aluminosilicate is contacted with a solution containing one or more alkaline earth metal ions to ion-exchange the alkali metals in the synthetic crystalline aluminosilicate with the alkaline earth metal(s) so that the alkali metal content remaining will be within the range from 0.2 to 0.6 equivalents per gram atom of alumina; (b) the ion-exchanged synthetic crystalline aluminosilicate is calcined, if necessary; and (c) the synthetic crystalline aluminosilicate is contacted with a solution containing one or more active metal ions having an effect of reducing nitrogen oxides, whereby the active metal component(s) is (are) carried on the aluminosilicate by impregnation.

4,052,338

DEHYDROGENATION CATALYST

Gregor H. Riesser, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 593,335, July 3, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 740,262

Int. Cl.² B01J 23/04, 23/84, 23/86

U.S. Cl. 252—470

16 Claims

1. A catalyst for the dehydrogenation of hydrocarbons to more unsaturated hydrocarbons comprising a mixture having: a. from about 35 to about 67 percent by weight of an iron oxide, measured as iron metal; b. from about 4 to about 25 percent by weight of a potassium compound selected from the group consisting of potassium oxide, potassium carbonate, and mixtures thereof, measured as potassium metal; c. from about 0.0065 to about 4.5 percent by weight of a chromium oxide, measured as chromium metal; d. from about 0.5 to about 3.5 percent by weight of a vanadium oxide, measured as vanadium metal, and e. from about 0.0075 to about 8 percent by weight of a cobalt oxide, measured as cobalt metal.

4,052,339

REFRACTORIES AND METHODS OF MAKING SAME

Darryl J. Costin, Columbus, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed June 10, 1974, Ser. No. 477,705

Int. Cl.² H01B 1/02; H01C 1/02

U.S. Cl. 252—512

22 Claims

1. A new and improved refractory of controlled conductivity, consisting essentially of: essentially pure particles each having a crystalline oxide lattice of an element from the class consisting of, a Group IV, Group V, or Group VI element, the lattice of said particles containing a dopant having a valence different from said element of said lattice and having an atomic radius sufficiently similar to that of the lattice forming element that it diffuses into said lattice without forming deposits at the grain boundaries between the particles and in an amount not appreciably exceeding the solubility of said dopant in said lattice, said refractory being generally devoid of Group I and II fluxing elements at the grain boundaries, and said particles being sintered together to form a refractory body.

4,052,340

METHOD FOR PRODUCING A VOLTAGE DEPENDENT RESISTOR AND A VOLTAGE DEPENDENT RESISTOR OBTAINED THEREWITH

Ronald Karel Eijthoven, and Johannes Trudo Cornelis van Kemnade, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,537

Claims priority, application Netherlands, Nov. 13, 1974, 7414775

Int. Cl.² H01B 1/08

U.S. Cl. 252—518

3 Claims

1. In a method for producing a voltage dependent resistor consisting mainly of a sintered body of zinc oxide and about 0.1-10% by weight of bismuth oxide in which, there is optionally present, small quantities of oxides of other metals and which body is provided, at opposite faces thereof, with ohmic electrodes, wherein the improvement comprises sintering a mixture of zinc oxide and oxides of metals which may be optionally present, at a temperature of between about 900° C - 1450° C, in an atmosphere containing bismuth oxide to produce a sintered body and then applying the ohmic electrodes to the resultant sintered body.

4,052,341

3-METHYL-5-(2,2,3-TRIMETHYLCYCLOPENT-3-EN-1-YL)PENTAN-2-OL COMPOUND AND PERFUME COMPOSITIONS

Richard E. Naipawer, Wallington, and William M. Easter, Hasbrouck Heights, both of N.J., assignors to Givandan Corporation, Clifton, N.J.

Filed Apr. 29, 1976, Ser. No. 681,351

Int. Cl.² C11B 9/00

U.S. Cl. 252—522

17 Claims

1. A composition consisting essentially of from less than 100% to more than 60% of 3-methyl-5-(2,2,3-trimethylcyclopent-3-en-1-yl)pentan-2-ol and a definite amount, but not more than 40%, of 6-(2,2,3-trimethylcyclopent-3-en-1-yl)hexan-3-ol.

4,052,342

SECONDARY ALKYL SULFATE: ALCOHOL ETHOXYLATE MIXTURES

George W. Feraley, and Cecil M. Stone, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 13, 1976, Ser. No. 657,805

Claims priority, application United Kingdom, July 17, 1975, 34037/75

Int. Cl.² C11D 1/14

U.S. Cl. 252—541

3 Claims

1. A detergent composition consisting essentially of a first component selected from the group consisting of a potassium, sodium, ammonium and amine salt of a low crystalline fraction secondary alkyl sulfate derived from C₁₃ to C₁₅ olefins having less than about 70% of the sulfate groups on the 2- and 3-carbon atoms and a second component consisting of C₈ to C₁₁ alcohol ethoxylates containing on the average eight moles of ethylene oxide per mole of alcohol prepared by hydroformylating and ethoxylating a mixture of C₈ to C₁₀ olefins and wherein the weight ratio of said first component to said second component ranges from about 3:1 to about 1:1.

4,052,343

CROSSLINKED, MACRORETICULAR POLY(DIMETHYLAMINOETHYL METHACRYLATE) ION-EXCHANGE RESINS AND METHOD OF PREPARATION BY AQUEOUS SUSPENSION POLYMERIZATION USING TRIALKYLAMINE PHASE EXTENDER

Virginia L. Cunningham, Hatboro, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 10, 1975, Ser. No. 630,477

Int. Cl.² C08F 20/34, 2/18

U.S. Cl. 260—2.1 E

2 Claims

1. A process for preparing a cross-linked macroreticular ion-exchange polymer of dimethylaminoethyl methacrylate which process comprises copolymerizing dimethylaminoethyl methacrylate by suspension polymerization in an aqueous medium with from about 0.5% to about 30% by weight of the total polymer mixture of a polyfunctional crosslinking monomer in the presence of between about 20% and 80% by weight of a trialkylamine phase extender, based on the total weight of the organic mixture, said trialkylamine having alkyl substituents of 2 to 8 carbon atoms.

4,052,344

METHOD OF RECLAIMING SCRAP VULCANIZED RUBBER AND THE SOLUBLE RECLAIMED RUBBER THUS PRODUCED

Grant Crane, and Edward Leo Kay, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 30, 1973, Ser. No. 365,381

Int. Cl.² C08J 11/04

U.S. Cl. 260—2.3

9 Claims

1. The process of producing a soluble reclaimed rubber from vulcanized rubber by the steps of combining a first charge of vulcanized rubber with a hydrocarbon solvent in the ratio of about 10 to 100 parts of rubber to 100 parts of solvent, by weight, maintaining the resultant mixture at a temperature of from 400° to 700° F. until the rubber is solubilized, adding to the solubilized mixture thus formed at least one additional charge of vulcanized rubber in an amount sufficient to increase the rubber content of the mixture to at least 60 percent by weight, while maintaining the temperature of the mixture between 400° and 700° F. until all of the vulcanized rubber has been solubilized.

4,052,345

PROCESS FOR THE PREPARATION OF POLYURETHANE FOAMS

Arthur L. Austin, Southgate; William W. Lewis, Jr., Wyandotte; Louis C. Pizzini, Trenton, and Robert J. Hartman, Southgate, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 425,524, Dec. 17, 1973, Pat. No. 3,957,922.

This application June 25, 1975, Ser. No. 590,333

Int. Cl.² C08G 18/14

U.S. Cl. 260—2.5 AP

20 Claims

1. In a process for preparing a polyurethane foam which comprises mixing and reacting a polyol, a polyarylpolyalkylene polyisocyanate, a polymerization catalyst, a wetting agent and a blowing agent, the improvement which comprises using as a polyol therein, based on the total weight of the ingredients, 20 to about 100 parts of an oxyalkylation polyol product prepared by the process of

1. providing a reaction mixture containing

- a phenol, at least in an amount sufficient to form a complex with aluminum or iron substances in the mixture,
- a non-phenolic active hydrogen compound having from 2 to 8 active hydrogens per molecule and hav-

ing an average molecular weight below about 10,000, and

- a substance containing aluminum or iron which will form a complex with the phenol a), in an amount sufficient to form a complex with the phenol a),
- heating the mixture to a temperature in the range of from about 80° C. to about 250° C., and
- oxyalkylating the heated mixture by adding thereto sufficient alkylene oxide having from 2 to 12 carbon atoms to form an oxyalkylated polyol product, per 40 to about 60 parts of a polyarylpolyalkylene polyisocyanate having a functionality of about 2.2 to about 3.3 or of an isocyanate-terminated prepolymer derived from the reaction of a stoichiometric excess of said polyarylpolyalkylene polyisocyanate with said oxyalkylation polyol,

- 0.2 to about 2 parts of a polymerization catalyst,
- 0.15 to about 3 parts of a wetting agent, and
- 5 to about 30 parts of a blowing agent.

4,052,346

FLAME-RETARDANT POLYURETHANE FOAM COMPOSITIONS

Bernard Rudner, Ridgewood, N.J., and Peter Daniel Pauly, Mountaintop, Pa., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed June 3, 1975, Ser. No. 583,329

Int. Cl.² C08G 18/14

U.S. Cl. 260—2.5 AM

12 Claims

1. In a process for the in situ preparation of a flexible, non-lustrous, substantially membrane-free polyurethane foam from a reaction mixture comprising one or more polyols selected from the group consisting of polyester polyols and polyether polyols, an organic polyisocyanate, water, a hydrophilic organosilicon foam-stabilizing emulsifier-surfactant designed and adapted for use in the preparation of urethane polymer foam from a polyether polyol and an organic polyisocyanate, and a cell-opener selected from the group consisting of hydrophobic anti-foaming organosilicon compounds, and esters of the formula (RCOO), R', R and R' in the preceding formula being alkyl or alkenyl groups having from 1 to 30 carbon atoms, at least one of R and R' having at least 3 carbon atoms and *n* being an integer from one to three, with the proviso that when *n* is one at least one of R and R' has at least 8 carbon atoms, the amount of cell opener being from about 0.1 to about 3 parts by weight of hydrophobic anti-foaming organosilicon compound or from about 2 to about 10 parts per weight of ester of the formula (RCOO), R', R' per 100 parts total weight of said polyols, the improvement which comprises including in the reaction mixture a flame-retarding amount of tribromoneopentyl alcohol whereby a permanently flame-retardant open-cell foam is obtained.

4,052,347

INORGANIC-ORGANIC COMPOSITIONS

Dieter Dieterich, and Peter Markusch, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 13, 1974, Ser. No. 469,254

Claims priority, application Germany, May 17, 1973, 2325090

Int. Cl.² C08G 18/12, 18/14; C08K 3/34

U.S. Cl. 260—2.5 AK

27 Claims

1. An inorganic-organic composition obtained by reacting a mixture of

- from 5-98% by weight of an organic, non-ionic-hydrophilic polyisocyanate prepared by reacting an excess of an organic polyisocyanate with an organic hydrophilic compound containing at least one group which is reactive with isocyanate groups, and
- from 2-95% by weight of an aqueous alkali metal silicate solution containing about 20-70% by weight of alkali metal silicate based on the weight of said aqueous solution,

the percents by weight of (A) and (B) based on the total weight of (A) and (B), said composition being a solid/solid xerosol.

4,052,348

MOLDING COMPOSITIONS

Alva F. Harris, and Peter Shapras, both of Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 15, 1973, Ser. No. 323,772

Int. Cl.² C08L 7/00, 25/12

U.S. Cl. 260—5

5 Claims

1. A process for preparing an extruded, pelleted molding composition for use in food, beverages and other related packaging applications which process comprises:

- Dry blending a nitrile polymer, having an extractable HCN content greater than 20 PPB, in an essentially solvent free condition with a formaldehyde compound containing from 0.0005 to 2% by weight of available formaldehyde based on the weight of the nitrile polymer, wherein the nitrile polymer is a polymer of acrylonitrile and at least one comonomer selected from the group consisting of styrene, alpha-methyl styrene, methacrylonitrile, lower alpha olefins containing 2 to 6 carbon atoms, alkyl esters of acrylic and methacrylic acid wherein the alkyl group contains from 1 to 4 carbon atoms, vinyl acetate and alkyl vinyl ethers wherein the alkyl group contains from 1 to 4 carbon atoms, and mixtures thereof; wherein the polymer contains from 60 to 85% by weight of acrylonitrile and from 0 to 16% by weight of methacrylonitrile, based on the total polymer weight;
- Heating and extruding the resulting blend in a molten state and then
- Pelletizing the extruded polymer.

4,052,349

EPOXY COMPOSITION CONTAINING A CHLORINE-CONTAINING POLYOL AND ITS USE AS AN ADHESIVE

Richard J. Turley, Orange, and Alexandre Ozolins, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 28, 1975, Ser. No. 625,903

Int. Cl.² C08L 5/00

U.S. Cl. 260—17.2

12 Claims

1. A liquid, curable epoxy composition comprised of a. an epoxy resin having more than one α-epoxy group in the molecule, b. a curing agent for said resin, and c. a chlorine-containing polyol having an average of 2-8 hydroxy groups and at least one (2,2-dichlorovinyl) ethylene group in the polyol chain.

4,052,350

CHLORINE-CONTAINING RESIN COMPOSITION

Tomoo Shiohara; Minoru Kohara, both of Kyoto, and Hiroshi Miyoshi, Takatsuki, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 28, 1975, Ser. No. 636,199

Claims priority, application Japan, Apr. 11, 1975, 50-44436; Sept. 19, 1975, 50-113914; Nov. 27, 1974, 49-137509

Int. Cl.² C08K 3/34

U.S. Cl. 260—23 XA

17 Claims

1. A chlorine-containing resin composition comprising a chlorine-containing resin selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, a vinyl chloride-vinylidene chloride copolymer, a vinyl chloride-vinyl acetate copolymer, a vinyl chloride-ethylene copolymer, a chlorinated polyvinyl chloride and chlorinated polyethylene and at least one calcium compound selected from the group consisting of

CaO.TiO₂, 2CaO.TiO₂, 3CaO.TiO₂,
CaO.Al₂O₃, 2CaO.Al₂O₃, 3CaO.Al₂O₃, CaAl₂O₄,
CaB₂O₆, Ca₇MgAl₁₀O₂₃, CaNb₂O₆, CaTa₂O₆, CaTiO₃,

CaZrO_3 , $\text{CaZrTi}_2\text{O}_7$, $2\text{CaO} \cdot \text{SiO}_2$, $3\text{CaO} \cdot \text{SiO}_2$ or $3\text{CaO} \cdot 2\text{SiO}_2$ wherein said calcium compound is present in said composition in an amount of about 0.5 to about 20 parts by weight per 100 parts by weight of said chlorine-containing resin.

4,052,351

STABILIZATION OF OLEFIN POLYMERS

James S. Dix, Greenville, and Ronald D. Mathis, Taylors, both of S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 4, 1975, Ser. No. 601,734
Int. Cl.² C08L 93/00

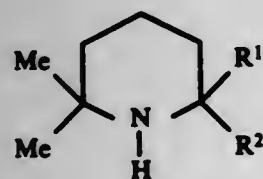
U.S. Cl. 260—23 H

17 Claims

1. A polyolefin composition stabilized against ultraviolet degradation comprising a normally solid polymer of an aliphatic 1-olefin having from 2 to 8 carbon atoms per molecule having incorporated therein a stabilizing amount of an ultraviolet light stabilizing system consisting of:

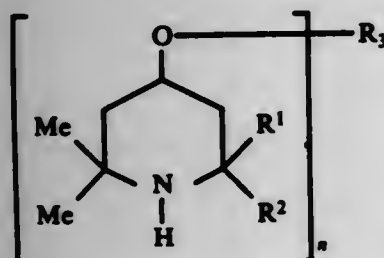
- A. a nickel salt of a saturated fatty acid having from 8 to 20 carbon atoms per molecule, and
B. a piperidine derivative selected from the group consisting of

1. compounds of the formula



wherein Me is methyl, and R¹ and R² are individually selected from the group consisting of hydrogen and an alkyl member of 1 to 4 carbon atoms;

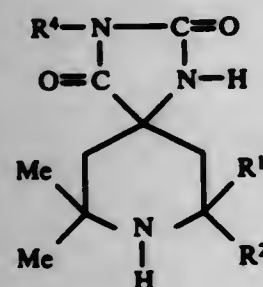
2. compounds of the formula



wherein Me, R¹ and R² are as described above, and n is an integer having a value of 1 or 2, wherein when n is 1, R³ is selected from the group consisting of hydrogen and an acyl member derived from a saturated, unsubstituted aliphatic monocarboxylic acid having from 6 to 20 carbon atoms or an unsubstituted or alkyl-substituted aromatic monocarboxylic acid having from 7 to 20 carbon atoms,

when n is 2, R³ is a diacyl member derived from a saturated, unsubstituted aliphatic dicarboxylic acid having from 6 to 20 carbon atoms or an unsubstituted or alkyl-substituted aromatic dicarboxylic acid having from 8 to 20 carbon atoms; and

3. compounds of the formula



wherein Me, R¹ and R² are as defined above and R⁴ is a

member selected from the group consisting of hydrogen and alkyl having from 1 to 12 carbon atoms.

4,052,352

TETRAHYDROPYRANYL ETHERS OF ESTROGENS

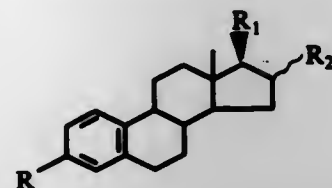
Pietro de Ruggieri, and Orazio Sighinolfi, both of Milan, Italy, assignors to Farmilla Farmaceutici Milano S.p.A., Italy

Filed Nov. 19, 1975, Ser. No. 633,474
Claims priority, application Italy, Dec. 13, 1974, 30574/74
Int. Cl.² C07J 17/00

U.S. Cl. 260—239.55 R

5 Claims

1. Compounds of the formula:



where R is 2'-tetrahydropyranyloxy; R₁ is beta-hydroxy; R₂ is beta-hydroxy with the proviso that, when R₁ and R₂ are beta-hydroxy, R is 2'-tetrahydropyranyloxy.

2. A process for preparing 3-(2'-tetrahydropyranyloxy)-estra-1,3,5(10)—trien-16 beta, 17 beta—diol which comprises reacting a corresponding 3-benzyloxy—16 beta, 17 beta-dihydroxy compound with an acetic anhydride or an acetyl chloride, subjecting the 16, 17-diester so-obtained to hydrogenolysis of the benzyl group in an organic solvent, etherifying the phenolic function thus liberated with 2,3-dihydroxypropan in the presence of an acid catalyst selected from the group consisting of p-toluenesulphonic acid, POCl₃ and HCl, and finally removing the acetate groups by alkaline hydrolysis.

4,052,353

DISPERSIONS OF WATER SOLUBLE POLYMERS IN OIL

Clyde S. Scanley, 330 Speedwell Ave., Morristown, N.J. 07960
Continuation-in-part of Ser. No. 429,548, Jan. 2, 1974,
abandoned. This application Sept. 15, 1975, Ser. No. 613,231

Int. Cl.² C08F 2/32

U.S. Cl. 260—29.6 PM

8 Claims

1. A self water dissolving composition of a water soluble polymer dispersed in oil which is stable to polymer coagulation and agglomeration, comprising:

a water soluble polymer dispersed in oil, said polymer having a water content at which the polymer remains finely divided and dispersed in the oil, said water content being less than 40%, by weight, based on polymer and water, said water soluble polymer dispersed in oil having been prepared from a water in oil emulsion of said water soluble polymer by reduction of the water content thereof; and

a water soluble surfactant, having an HLB number of above 8 in an amount effective to render the water soluble polymer self dissolving in water.

4,052,354

AQUEOUS ANTIFOULING COATING COMPOSITION COMPRISED OF EMULSIFIED WATER-INSOLUBLE POLYMER AND TRIPHENYLITIN DERIVATIVE

Charles B. Belter, Carteret, and Lee A. Hafner, Edison, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.
Filed Apr. 30, 1973, Ser. No. 355,405

Int. Cl.² C08L 31/00; C09D 5/14; C08L 31/02

U.S. Cl. 260—29.6 M

2 Claims

1. A stable antifouling coating composition comprising

a. a liquid carrier wherein between 50 and 100% by weight of said carrier is water, the remainder being selected from water-miscible liquid organic compounds;

b. between 8 and 40%, based on the weight of said composi-

4,052,357

HIGH MODULUS SILICONE RUBBER

James A. Marinik, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 19, 1976, Ser. No. 687,733
Int. Cl.² C08L 83/04

U.S. Cl. 260—37 SB

18 Claims

1. A silicone rubber composition consisting essentially of
A. 100 parts by weight of polydiorganosiloxane gum where the organic radicals are selected from methyl, phenyl, vinyl, ethyl and 3,3,3-trifluoropropyl and mixtures thereof the polydiorganosiloxane gum having at least 50 percent of the organic radicals being methyl and no more than 2 percent being vinyl, the polydiorganosiloxane gums being endblocked with hydroxyl radicals or triorganosiloxyl units where the organic radicals are defined above,
B. from 25 to 75 parts by weight of reinforcing silica filler,
C. from 5 to 20 parts by weight of hydroxylated diorganosilicon compound which has an average of about 2 hydroxyl radicals per molecule, at least 3 weight percent silicon-bonded hydroxyl radicals based on the weight of the hydroxylated diorganosilicon compound, and the organic radicals are selected from a combination of methyl, phenyl and vinyl, there being from 10 to 50 percent phenyl radicals, from 2 to 20 percent vinyl radicals and the remainder being methyl radicals,

D. from 20 to 80 parts by weight fiberized blast furnace slag fibers having an average length of from 0.0001 to 0.0005 meter and a diameter of 0.00001 to 0.00001 meter, and
E. from 0 to 10 parts by weight of alkoxy silicon compound having at least 25 weight percent silicon-bonded alkoxy radical selected from methoxy, ethoxy and propoxy and any remaining monovalent organic groups attached to silicon atoms being bonded through silicon-carbon bonds and being selected from methyl, ethyl and vinyl.

4,052,355

ACRYLONITRILE POLYMER SOLUTIONS

Theo Neukam, Dormagen; Francis Bentz, Cologne, and Günther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 18, 1976, Ser. No. 658,904

Claims priority, application Germany, Feb. 22, 1975, 2507777
Int. Cl.² C08F 4/34, 20/44; C08K 5/34

U.S. Cl. 260—30.2

17 Claims

1. A process for the production of a spinnable solution of acrylonitrile homopolymer or a copolymer of at least 90% by weight of acrylonitrile and up to 10% by weight of an unsaturated copolymerizable monomer which comprises polymerizing acrylonitrile or a mixture of acrylonitrile and an unsaturated copolymerizable monomer in an organic solvent in the presence of a catalyst system comprising an acid, a peroxodisulphate and a 1,3-diketone in which said acid is nitric acid, phosphoric acid, hydrochloric acid, sulphuric acid, benzene sulphonic acid, α-naphthalene sulphonic acid, β-naphthalene sulphonic acid, 3-chlorobenzene sulphonic acid, 1,3-benzene disulphonic acid or oxalic acid; the molar ratio of peroxodisulphate to 1,3-diketone is 1.1:1 to 1:3; to molar ratio of 1,3-diketone to acid is 1.2:1 to 3.2:1; and said acid and the amount thereof is such that the acrylonitrile polymer or copolymer produced is less colored and has a K-value higher than is obtained by the same process conducted without said acid.

4,052,356

MOLDING COMPOUNDS BASED ON POLYBUTYLENE TEREPHTHALATE

Franz Breitenfellner, Bensheim, and Josef Hrach, Einhausen, both of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 6, 1976, Ser. No. 674,258

Claims priority, application Switzerland, Apr. 18, 1975, 4993/75

Int. Cl.² C08K 3/34

U.S. Cl. 260—40 R

6 Claims

1. A moulding compound with improved arc resistance and tracking resistance, consisting of
a. a polybutylene terephthalate,
b. 5 to 50 percent by weight, referred to the total composition, of a kaolin, and
c. 5 to 40 percent by weight, referred to the total composition, of a reinforcing filler, the amount of kaolin and reinforcing filler being at most 60 percent by weight of the total composition.

4,052,358

PIGMENTABLE LOW-SHRINKAGE UNSATURATED POLYESTER RESIN COMPOSITION

Moriyasu Wada, Kanagawa; Katuya Kumagai, and Takashi Kamo, both of Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki and Toshiba Chemical Products Co., Ltd., Tokyo, both of Japan

Filed Feb. 19, 1976, Ser. No. 659,583

Claims priority, application Japan, Mar. 5, 1975, 50-26031
Int. Cl.² C08K 7/14; C08L 67/06

U.S. Cl. 260—40 R

9 Claims

1. A pigmentable low-shrinkage unsaturated polyester resin composition comprising a mixture of:

25 to 70% by weight of unsaturated polyester based on a reaction product of a dicarboxylic acid component comprising α,β-unsaturated dicarboxylic acid with a glycol component comprising, on the basis of the total amount of the glycol component, 15 to 70 mol% of neopentyl glycol and 10 to 30 mol% of 2,2-bis(4-hydroxycyclohexyl) propane;
60 to 18% by weight of unsaturated monomer copolymerizable with the unsaturated polyester; and
45 to 4% by weight of polystyrene or a butadiene modified polystyrene having such a particle size as to pass through a 50-mesh screen.

4,052,359

DILUTABLE RESOLE RESIN SOLUTIONS HAVING STABILIZED DISPERSED INERT SALTS

Harold P. Higginbottom, Wilbraham, Mass., assignor to Monsanto Company, Saint Louis, Mo.

Filed Feb. 18, 1976, Ser. No. 658,988

The portion of the term of this patent subsequent to Mar. 8, 1994, has been disclaimed.
Int. Cl.² C08L 61/10, 97/00

U.S. Cl. 260—17.5

22 Claims

1. A stable dilutable aqueous solution of a resole resin having pH of 3 to 8.5 comprising:

- said resole resin having a number average molecular weight is less than about 250, a water tolerance greater than 500 percent, a combined formaldehyde to phenol ratio in the range of from about 1.0:1 to 2.9:1,
- a dispersion of insoluble oxalate salt particles, wherein, said resole being prepared with a catalyst comprising alkaline earth metal hydroxides selected from the group consisting of magnesium, calcium, barium strontium and mixtures thereof, said pH being adjusted with a compound selected from the group consisting of oxalic acid, ammonium oxalate and mixtures thereof providing a dispersion of insoluble oxalate salt particles of said alkaline earth metal ions in said solution, and
- said solution having present an anionic dispersing agent in an amount of from about 0.10 to 20 percent based on the weight of said resole resin, said dispersing agent being selected so as to prevent flocculation of said particles when water, up to the water tolerance of said resole resin is added to said solution.

4,052,360

REINFORCED FLAME RETARDANT POLYESTER COMPOSITION HAVING NON-DRIP CHARACTERISTICS

Frank M. Berardinelli, Millington, N.J., and Robert Edelman, Staten Island, N.Y., assignors to Celanese Corporation, New York, N.Y.

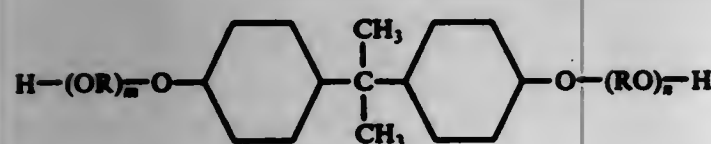
Continuation-in-part of Ser. No. 617,201, Sept. 24, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,528
Int. Cl.² C08G 3/36; C08K 3/22

U.S. Cl. 260—40 R

21 Claims

1. A process for preparing a reinforced flame retardant copolyester molding resin composition having non-drip characteristics comprising intimately mixing

- at least one reinforcing agent
- at least one Group Vb metal-containing compound, and
- the molten reaction product of
 - a copolyester of
 - at least one alkane diol having from two to six carbon atoms selected from the group consisting of ethylene glycol, 1,3-propane diol, 1,4-butane diol, 1,5-pentane diol, and 1,6-hexane diol,
 - terephthalic acid, isophthalic acid, or a dialkyl ester thereof wherein the alkyl radical contains from 1 to 7 carbon atoms, and
 - a halogenated derivative of the bishydroxyethylether of p,p'-isopropylidenediphenol, having the formula



wherein the aromatic nuclei of the p,p'-isopropylidenediphenol are substituted with from one to four halogen atoms, R is a bivalent hydrocarbon radical containing from two to six carbon atoms, m and n are integers of from 1 to 10, and the halogenated derivative of the bishydroxyethylether of p,p'-isopropylidenediphenol comprises from about 8 to

about 40% by weight of the copolyester composition, and

- at least one polycarbodiimide, which polycarbodiimide both
 - is derived from at least one aromatic diisocyanate which is either unsubstituted or contains up to one methyl substituent on each aromatic ring, and
 - contains at least three carbodiimide units per polycarbodiimide molecule, whereby said resulting reinforced copolyester molding resin composition is flame retardant and exhibits non-drip characteristics.

4,052,361

N-(2,2-DIMETHYL-6,6-DILOWER ALKYL)-4-PIPERIDINYL-AMIDES OF HINDERED 3,5-DIALKYL-4-HYDROXYBENZOIC ACIDS AND USE AS LIGHT STABILIZERS IN POLYOLEFINS

Peter Vincent Sasi, Middlesex, and John Christian Oppelt, Somerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

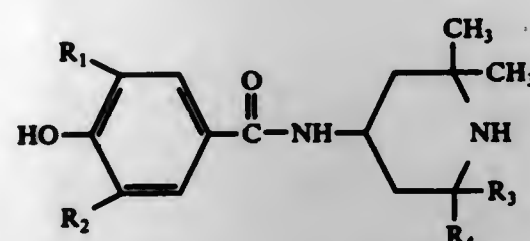
Filed Dec. 30, 1974, Ser. No. 537,152

Int. Cl.² C08K 5/34

U.S. Cl. 260—45.8 N

10 Claims

1. A polyolefin stabilized against the deteriorating effects of light by having incorporated therein an effective amount of a light stabilizer of the formula:



wherein R₁ and R₂ are each branch-chain alkyl of 3 to 8 carbon atoms and R₃ and R₄ are each alkyl of 1 to 4 carbon atoms.

4,052,362

OLEFIN POLYMER COMPOSITION

Toshio Yoshikawa, Nagayoshi Sakamoto, Masayuki Kurita, Shunji Oh-e, and Tomitada Nagamori, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Sept. 14, 1976, Ser. No. 723,092

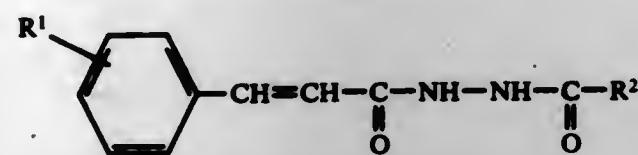
Claims priority, application Japan, Jan. 30, 1976, 51-8389; May 18, 1976, 51-56075

Int. Cl.² C08K 5/25

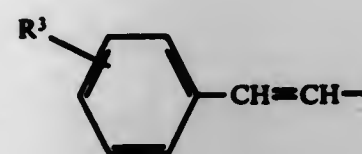
U.S. Cl. 260—45.9 NC

12 Claims

1. An olefin polymer composition which comprises 100 parts by weight of an olefin polymer and from 0.001 to 5 parts by weight of a compound having the formula



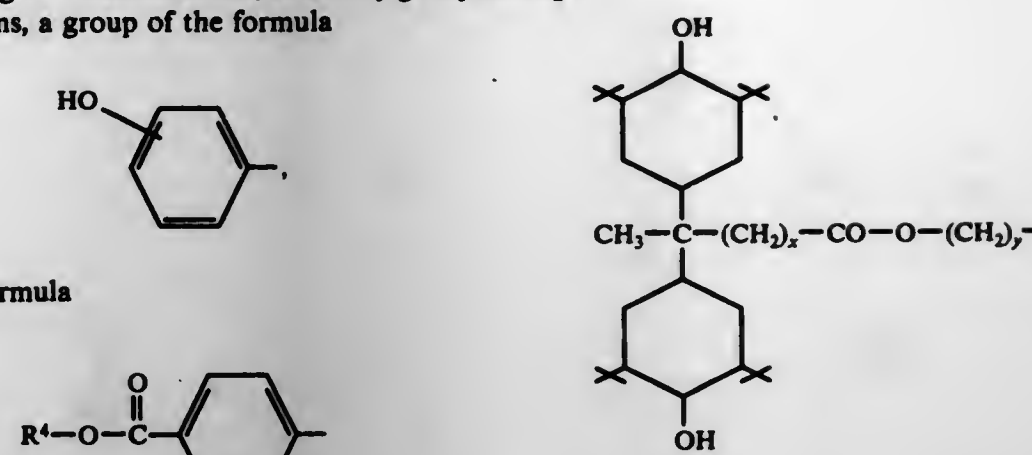
in which R¹ represents a hydrogen atom, a halogen atom, a hydroxyl group, an alkyl group having 1 - 3 carbon atoms or an alkoxy group having 1 - 3 carbon atoms, and R² represents a group of the formula



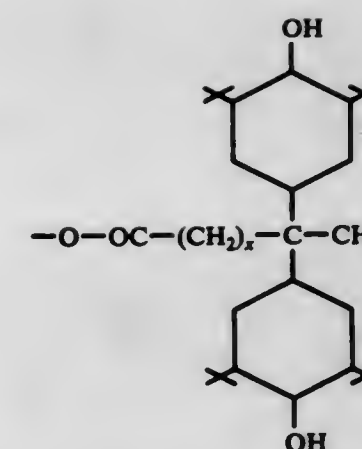
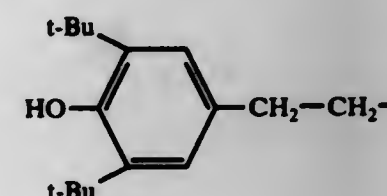
in which R³ represents a hydrogen atom, a hydroxyl group, an

alkyl group having 1 - 3 carbon atoms, an alkoxy group having 1 - 3 carbon atoms, a group of the formula

a group of the formula



in which R⁴ represents an alkyl group having 1 - 3 carbon atoms, or a group of the formula



in which x is zero or a whole number in the range of from 1 to 8 and y is a whole number in the range of from 2 to 18.

4,052,363

METHOD OF PROTECTION FROM OZONE DETERIORATION FOR RUBBER

Shuichi Kanagawa, Osaka; Shozo Tanimura, Minoo, and Seiji Sagawa, Kawachinagano, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

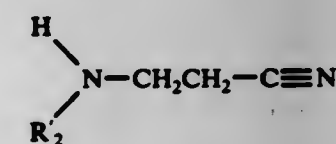
Filed Nov. 5, 1975, Ser. No. 629,130

Claims priority, application Japan, Nov. 14, 1974, 49-131763
Int. Cl.² C08K 5/17

U.S. Cl. 260—45.9 KA

8 Claims

1. A method for inhibiting ozone deterioration of rubber which comprises adding to the rubber an effective antiozonant amount of a nitrile of the formula



wherein R² is alkyl of 6-18 carbon atoms.

4,052,365

MANUFACTURE OF CRYSTALLIZABLE POLYMERIC PHENYLENE ETHER SULPHONE KETONES

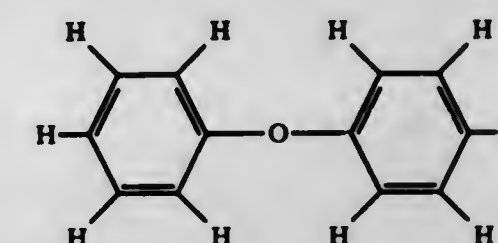
Michael Edward Benet Jones, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England
Continuation of Ser. No. 635,664, May 3, 1967, abandoned, which is a continuation-in-part of Ser. No. 320,508, Oct. 31, 1963, abandoned. This application June 24, 1974, Ser. No. 482,603

Claims priority, application United Kingdom, Nov. 6, 1962, 41976/62; Mar. 18, 1963, 10592/63; Oct. 3, 1963, 38973/63
The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.
Int. Cl.² C08G 67/00, 75/23

U.S. Cl. 260—49

3 Claims

1. A crystallizable copolymer containing phenylene, ether, sulphone and ketone groups in the polymer chain, which is formed of repeating units having the structure —Ar—SO₂— and repeating units of the structure —Ar—CO—, where Ar is a divalent aromatic residue derived from a compound having the structure:



by removing the hydrogen atoms which are para to the oxygen atoms.

4,052,364

BIS(HYDROXY-DI-TERT-BUTYLPHENYL)-ALKANOIC ACID ESTERS

Yani Christidis, Paris, France; Otto Mauz, Liederbach, Taunus, and Eberhard Prinz, Kelkheim, Taunus, both of Germany, assignors to Nobel Hoechst Chemie, Puteaux, France and Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 30, 1975, Ser. No. 545,532

Claims priority, application France, Feb. 1, 1974, 74.03523
Int. Cl.² C07C 69/76

U.S. Cl. 260—45.85 B

3 Claims

1. A crystalline bis(hydroxy-di-tert-butylphenyl)-alkanoic acid diester of the formula I

4,052,387
METHOD OF PREPARATION OF
3-METHYLENECEPHAMS

Stjepan Kukolja, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

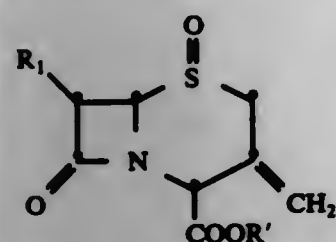
Continuation-in-part of Ser. No. 632,733, Nov. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 536,280, Dec. 24, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 673,036

Int. Cl.² C07D 501/02

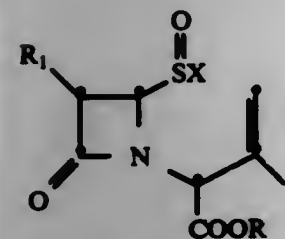
U.S. Cl. 544-22

35 Claims

1. The process for preparing a 3-methylenecepham sulfoxide of the formula

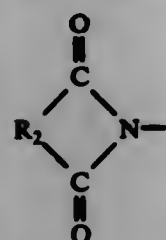


by reacting a compound of the formula



with a Lewis acid type Friedel-Crafts catalyst, a Bronsted proton acid type Friedel-Crafts catalyst or a metathetic cation-forming agent in a dry inert organic solvent, or dissolving such compound in a Bronsted acid selected from the group consisting of methanesulfonic acid, trifluoromethanesulfonic acid, trifluoroacetic acid, trichloroacetic acid, or dichloroacetic acid; wherein in the above formulae

R is a carboxylic acid protecting group;
R' is R or hydrogen;
R1 is (1) an imido group of the formula



wherein R2 is C2-C4 alkenylene, C2-C4 alkylene, 1,2-phenylene, 1,2-cyclohexenylene; or

2. an amido group of the formula



wherein R2 is

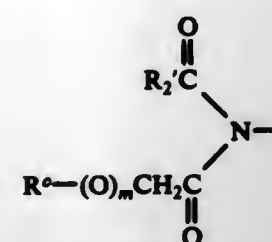
- hydrogen, C1-C3 alkyl, halomethyl, cyanomethyl or 3-(2-chlorophenyl)-5-methylisoxazol-4-yl;
- benzyloxy, 4-nitrobenzyloxy, 2,2,2-trichloroethoxy, tert-butoxy, or 4-methoxybenzyloxy;
- the group R'' wherein R'' is phenyl or phenyl substituted with 1 or 2 substituents independently selected from the group consisting of halo, protected hydroxy, nitro, cyano, trifluoromethyl, C1-C3 alkyl, and C1-C4 alkoxy;
- an arylalkyl group of the formula



wherein R'' is R'' as defined above, 2-thienyl, 3-thienyl or 1,4-cyclohexadienyl, m is 0 or 1, and Q is O or S subject to the limitation that when m is 1, R'' is R'';
e. a substituted arylalkyl group of the formula

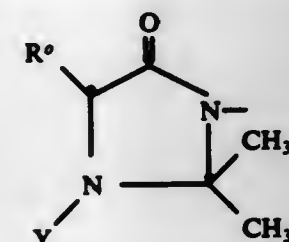


wherein R'' is as defined above and W is protected hydroxy or protected amino;
3. an imido group of the formula



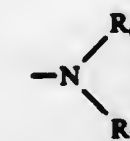
wherein R'' and m are as defined hereinabove and R2' is C1-C3 alkyl, C1-C6 haloalkyl, C1-C3 alkoxy or trichloroethoxy; or R1 is

4. an imidazolidinyl group of the formula



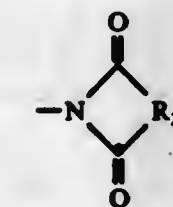
wherein R'' is as defined above and Y is acetyl or nitroso; and X is

- chloro or bromo;
- a group of the formula -OR4 wherein R4 is hydrogen, C1-C10 alkyl, aryl (C1-C3 alkyl) or C1-C6 haloalkyl;
- a group of the formula -SR3 wherein R3 is C1-C6 alkyl, aryl or aryl (C1-C3 alkyl); or
- a group of the formula



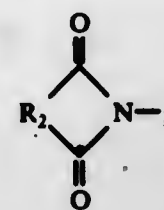
wherein

- R4 is hydrogen and R7 is hydrogen, R'' is as defined hereinabove, or a group of the formula -NHR8 wherein R8 is aminocarbonyl, C1-C3 alkylaminocarbonyl, C1-C3 alkylcarbonyl, C1-C3 alkoxy carbonyl or tosyl;
- R4 is -COOR9 or -COR9 and R7 is -NHCOOR9 or -NHCOR9 wherein R9 is C1-C6 alkyl or phenyl; or wherein
- R4, R7 and the nitrogen atom to which they are bonded taken together form an imido group of the formula

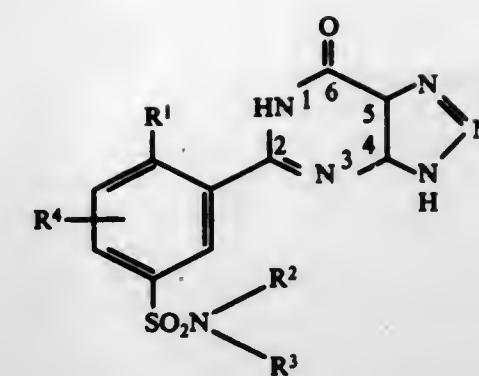


wherein R2 is as defined hereinabove; and when R6 is -COOR9 or -COR9 and R7 is -NHCOOR9 or -NHCOR9, R3 is additionally a heteroarylmethyl group of

the formula R'''CH2- wherein R''' is 2-furyl, 3-furyl, 2-thiazolyl or 5-isoxazolyl;
with the limitations that when X is bromo, R1 is only an imido group of the formula



when the cyclizing agent is a metathetic cation-forming agent or a Lewis acid, X is only chloro or bromo; and when R is an acid labile carboxylic acid protecting group, the product is a 3-methylenecepham-4-carboxylic acid sulfoxide.



wherein R1 represents a member selected from the class consisting of hydroxy, alkoxy of 1 to 10 carbon atoms, and alkylthio of 1 to 10 carbon atoms, the group NR2R3 represents piperidino, 1-pyrrolidinyl, or morpholino, and R4 represents hydrogen, methyl or ethyl, or a pharmaceutically acceptable salt thereof.

4,052,388
3-ACETYLTETRAHYDRO-2-(NITROMETHYLENE)-2H-1,3-THIAZINE

James E. Powell, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 12, 1976, Ser. No. 731,147

Int. Cl.² C07D 279/06

U.S. Cl. 544-54

1 Claim

1. 3-acetyltetrahydro-2-(nitromethylene)-2H-1,3-thiazine.

4,052,389
DERIVATIVES OF
9,10-DIHYDROXY-1-(p-ALKOXYBENZYL)-PERHYDROISOQUINOLINE OXAZINE-3-ONE
Ivo Monkovic, Candiac; Carol Bachand, Cote Ste-Catherine, and Henry Wong, Candiac, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

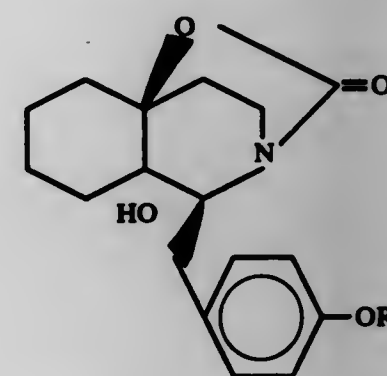
Filed Mar. 23, 1976, Ser. No. 669,540

Int. Cl.² C07D 265/00, 273/00, 295/00

U.S. Cl. 544-89

2 Claims

1. A compound having the formula



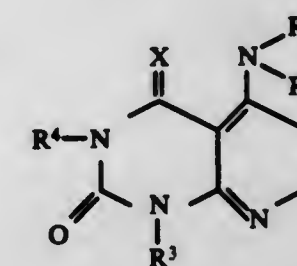
in which R2 is loweralkyl.

4,052,390
AZAPURINONES
Barbara Joyce Broughton, Croydon; Bryan John Large, Ilkley; Stuart Malcolm Marshall, Stanford-le-Hope; David Lord Pain, Upminster, and Kenneth Robert Harry Wooldridge, Brentwood, all of England, assignors to May & Baker Limited, England
Division of Ser. No. 478,387, June 11, 1974, Pat. No. 3,933,822.
This application May 6, 1975, Ser. No. 574,870
Claims priority, application United Kingdom, June 12, 1973, 27920/73
Int. Cl.² C07D 487/04; A61K 31/505

U.S. Cl. 544-118

5 Claims

1. An 8-azapurin-6-one of the formula:



wherein

R1 and R2, together with the adjacent nitrogen atom, form a piperazine, morpholine, pyrrole, pyrrolidine or 4-formylpiperazine-1-yl ring,

R3 is selected from the group consisting of (1) alkyl of up to 5 carbon atoms, (2) alkyl of up to 5 carbon atoms, substituted by hydroxy, halogen, lower alkoxy, nitro or lower acyloxy, (3) alkenyl of up to 5 carbon atoms, (4) alkenyl of up to 5 carbon atoms, substituted by hydroxy, halogen, lower alkoxy, nitro or lower acyloxy, (5) phenyl, (6) phenyl substituted by lower alkyl, halogen, lower alkoxy or nitro, (7) naphthyl, (8) naphthyl substituted by lower alkyl, halogen, lower alkoxy or nitro, (9) aralkyl of 7-11 carbon atoms, (10) aralkyl of 7-11 carbon atoms, substituted by lower alkyl, halogen, lower alkoxy or nitro, (11) aralkenyl of 7-11 carbon atoms and (12) aralkenyl of 7-11 carbon atoms substituted by lower alkyl, halogen, lower alkoxy or nitro,

R4 is hydrogen or alkyl of up to 5 carbon atoms, and X is oxygen or imino, a pharmaceutically acceptable salt of said compound, a tautomer of said compound, and a pharmaceutically acceptable salt of said tautomer, with the proviso that when X is imino R4 is hydrogen.

4,052,392

2-AMINO-4-CHLORO-6-(2'-HYDROXY-PHENOXY)-S-TRIAZINE

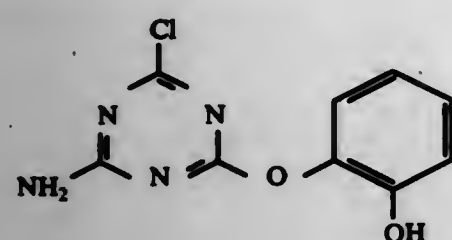
John Langshaw Brooks; David Crawford Eaton, and Barry Williams, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England
Filed Mar. 29, 1976, Ser. No. 671,547

Claims priority, application United Kingdom, June 3, 1975, 23922/75

Int. Cl.² C07D 251/42

U.S. Cl. 544—211

1. The compound of the formula:



4,052,393

4-SUBSTITUTED DERIVATIVES OF PYRAZOLO [1,5-a] QUINOXALINE-3-CARBOXYLIC ACIDS AND ESTERS

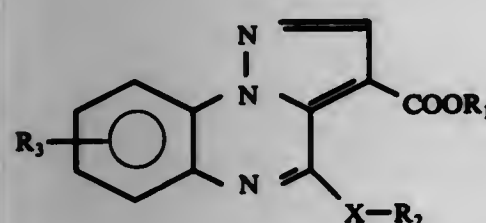
Uwe D. Treuner, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 628,277, Nov. 3, 1975, Pat. No. 3,994,893. This application Mar. 22, 1976, Ser. No. 669,114

Int. Cl.² C07D 487/04; A61K 31/495

U.S. Cl. 260—250 Q

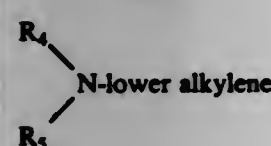
1. A compound of the formula



wherein

R1 is hydrogen or lower alkyl;

R2 is hydrogen, lower alkyl, phenyl-lower alkylene or



wherein

R4 and R5 each is hydrogen or lower alkyl or together with the nitrogen complete one of the heterocyclics pyrrolidino, piperidino, said heterocyclics being unsubstituted or

substituted with one or two lower alkyl groups;

R6 is hydrogen, lower alkyl, halogen or lower alkoxy;

X is oxygen or sulfur;

and salts thereof.

4,052,394

2-(DICYANOMETHYLENE)-1,3-DITHIOLO-(4,5-b)PYRAZINE-5,6-DICARBONITRILE

Craig E. Mixon, and R. Garth Pew, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 24, 1976, Ser. No. 744,485

Int. Cl.² C07D 495/04

U.S. Cl. 260—250 BC

1. 2-(Dicyanomethylene)-1,3-dithio(4,5-b)-pyrazine-5,6-dicarbonitrile.

4,052,395

AGRICULTURAL FUNGICIDAL COMPOSITIONS CONTAINING 6-(SUBSTITUTED PHENYL)-PYRIDAZINONES AND SAID PYRIDAZINONES

Teruomi Jojima, Tokyo, and Yukiyoichi Takahi, Yasumachi, both of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Aug. 30, 1976, Ser. No. 718,589

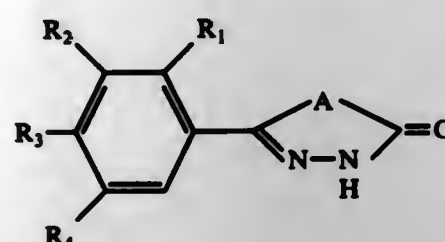
Claims priority, application Japan, Sept. 11, 1975, 50-110331; Apr. 1, 1976, 51-36453

Int. Cl.² A61K 31/50; C07D 237/14, 237/04

U.S. Cl. 424—250

24 Claims

1. An agricultural fungicidal composition which comprises as an active ingredient a compound having the formula



wherein

R1 is hydrogen atom, hydroxy group, a group of the formula —O—CO—R5 in which R5 is an alkyl group of 1–5 carbon atoms or a group of the formula —O—SO2—R6 in which R6 is a phenyl group optionally substituted with a halogen atom or an alkyl group of 1–3 carbon atoms;

R2 and R4 may be the same or different and each represents halogen atom or one of R2 and R4 is a halogen atom and the other is hydrogen atom;

R3 is hydrogen atom, an alkyl group of 1–6 carbon atoms, an alkoxy group of 1–6 carbon atoms, an alkenyloxy group of 3–5 carbon atoms, an alkynyloxy group of 3–4 carbon atoms, amino group, hydroxy group, a halogen atom, a group of the formula —O—CO—R5 in which R5 is as defined above or a group of the formula —O—SO2—R6 in which R6 is as defined above; and

A is a group of —CH2—CH2— or —CH=CH— or a salt thereof where A is the group —CH=CH— and an agriculturally acceptable carrier.

16. 6-(3,5-Dichloro-4-methylphenyl)-3(2H)pyridazinone.

4,052,396

PROCESS FOR THE PRODUCTION OF 2-ALKYL OR 2-CYCLOALKYL-4-METHYL-6-HYDROXYPYRIMIDINES

Joseph R. Pociask, Greensboro, N.C., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

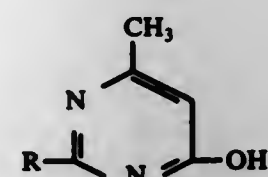
Filed Nov. 22, 1976, Ser. No. 743,555

Int. Cl.² C07D 239/02

U.S. Cl. 260—251 R

8 Claims

1. A process for the preparation of 2-alkyl or 2-cycloalkyl-4-methyl-6-hydroxypyrimidine of the formula



wherein R represents alkyl of 1 to 4 carbon atoms and cycloalkyl of 3 to 6 carbon atoms, which comprises

1. reacting diketene and a nitrile of the formula

RCN

wherein R has the same meaning as given above, in an organic solvent at a temperature ranging from about 20° C to 150° C and in the presence of a catalytic amount of a Lewis or Bronsted, acid, and

2. reacting the reaction product obtained in the first step with ammonia in an organic solvent at a temperature ranging from about 80° to 150° C and in the presence or absence of a Bronsted acid.

4,052,397

PROCESS FOR THE PRODUCTION OF 2-ALKYL OR 2-CYCLOALKYL-4-METHYL-6-HYDROXYPYRIMIDINES

J. Thomas Blackwell, Greensboro; John T. Gupton, Jamestown, and Jim B. Nabors, Greensboro, all of N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

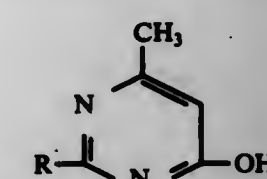
Filed Nov. 22, 1976, Ser. No. 743,556

Int. Cl.² C07D 239/02

U.S. Cl. 260—251 R

8 Claims

1. A process for the preparation of a 2-alkyl or 2-cycloalkyl-4-methyl-6-hydroxypyrimidine of the formula



wherein R represents alkyl of 1 to 4 carbon atoms and cycloalkyl of 3 to 6 carbon atoms, which comprises sequentially reacting without isolation of intermediates in an organic solvent

1. diketene and ammonia to form β-aminocrotonamide and
2. said β-aminocrotonamide after removal of the coproduced water, with a lower alkanolic or cycloalkanoic acid ester of the formula

RCOOR1

wherein R represents alkyl of 1 to 4 carbon atoms and cycloalkyl of 3 to 6 carbon atoms and R1 represents lower alkyl of up to 4 carbon atoms and a metal alkoxide of the formula

MOR2

wherein M is an alkali metal and R2 represents lower alkyl of up to 4 carbon atoms.

4,052,398

DIAZARHODAMINE-LACTONES, THEIR MANUFACTURE AND THEIR USE AS DYE INTERMEDIATES FOR COPYING PROCESSES

Hellmut Kast, Bobenheim-Roxheim, and Guenter Dunkelmann, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

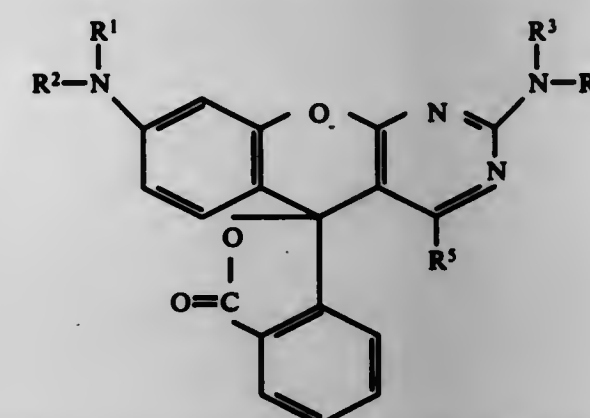
Filed Feb. 13, 1976, Ser. No. 657,861

Claims priority, application Germany, Mar. 6, 1975, 2509793
Int. Cl.² C07D 491/20

U.S. Cl. 260—256.4 F

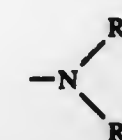
6 Claims

1. A diazarhodamine-lactone of the formula



where R1 is hydrogen or alkyl of 1 to 4 carbon atoms, R2 is alkyl of 1 to 4 carbon atoms, unsubstituted phenyl, or phenyl in which 1 or 2 hydrogens are replaced by alkyl of 1 to 3 carbon atoms, chlorine or bromine, the substituents being identical or different, R3 and R4 independently of one another are hydrogen, alkyl of 1 to 7 carbon atoms, cycloalkyl of 5 to 7 carbon

atoms, phenylalkyl of 7 to 10 carbon atoms or alkoxyalkyl of a total of 3 to 8 carbon atoms, or the group



is a pyrrolidine, piperidine, piperazine, N-methylpiperazine, N-ethylpiperazine or hexamethylenimine radical, and R5 is unsubstituted phenyl or phenyl which is substituted by alkyl of 1 to 3 carbon atoms, methoxy, ethoxy, chlorine.

4,052,399

1-[2-(HEXAHYDRO-1H-AZEPINO)ETHYL]-2(1H)PYRIMIDONE DIHYDROCHLORIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

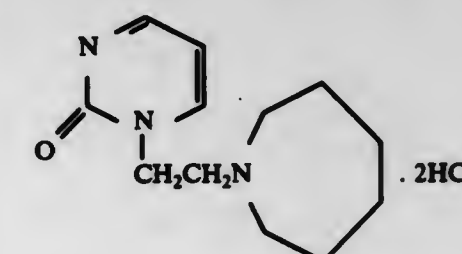
Filed Sept. 13, 1976, Ser. No. 722,564

Int. Cl.² C07D 403/06

U.S. Cl. 260—256.4 C

1 Claim

1. The compound of the formula:



4,052,400

HYPERTENSIVE 1-SUBSTITUTED 2(1H)-PYRIMIDONES

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

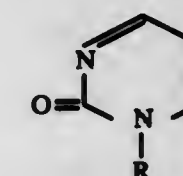
Filed Oct. 29, 1976, Ser. No. 736,836

Int. Cl.² C07D 401/06, 239/22

U.S. Cl. 260—256.4 C

3 Claims

1. A compound of the formula:



Where R is 2-(N-piperidino)ethyl and 1-dimethylaminoisopropyl.

4,052,401

PRODUCTION OF 3-(1',3'-DIOXANE)PROPIONALDEHYDE COMPOUNDS

Oscar Richard Hughes, Chatham, N.J., assignor to Celanese Corporation, New York, N.Y.

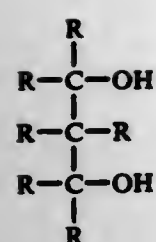
Division of Ser. No. 640,618, Dec. 15, 1975, Pat. No. 4,003,918.
This application Sept. 7, 1976, Ser. No. 720,788

Int. Cl.² C07D 319/04

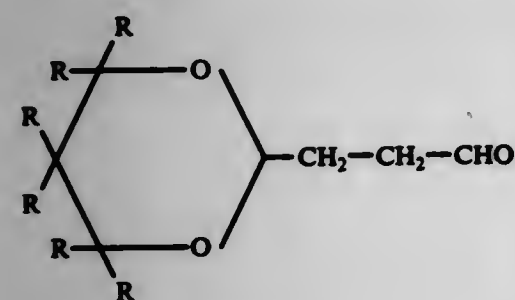
U.S. Cl. 260—340.7

2 Claims

1. A process for producing 3-(1',3'-dioxane)-propionaldehyde compounds which comprises (1) forming a liquid feed mixture of acrolein and a diol compound of the formula:



wherein R is hydrogen or methyl; (2) passing the acrolein-diol feed mixture through a fixed bed of perfluoro sulfonic acid cation exchange resin in acid form, at a liquid hourly space velocity between about 0.1 and 50 and a reaction temperature in the range between about 10° C and 60° C, to yield an effluent mixture containing 2-vinyl-1,3-dioxane product; and (3) subjecting the effluent mixture to hydroformylation conditions to produce 3-(1'3'-dioxane)propionaldehyde corresponding to the formula:



wherein R is hydrogen or methyl.

4,052,402

PROCESS FOR SYNTHESIZING CODEINONE FROM THEBAINE

Fernando Calvo, Madrid, Spain, assignor to Fabrica de Productos Quimicos y Farmaceuticos Abello, S.A., Madrid, Spain
Filed Mar. 15, 1976, Ser. No. 666,663
Int. Cl.² C07D 489/00

U.S. Cl. 260—285

2 Claims

1. A process for preparing codeinone, which comprises the steps of: reacting thebaine dissolved in an inert halogenated hydrocarbon solvent, with hydrogen chloride or hydrogen bromide dissolved in an inert alkyl (C₁ to C₄) ether solvent, in the presence of iodine as a catalyst, under anhydrous conditions, to form a halogenated reaction product, then hydrolyzing the halogenated reaction product with an aqueous solution of sodium bicarbonate to transform the halogenated reaction product to codeinone, the reacting and hydrolyzing steps being carried out at temperatures below about 10° C, and recovering codeinone from the product of the hydrolysis step.

4,052,403

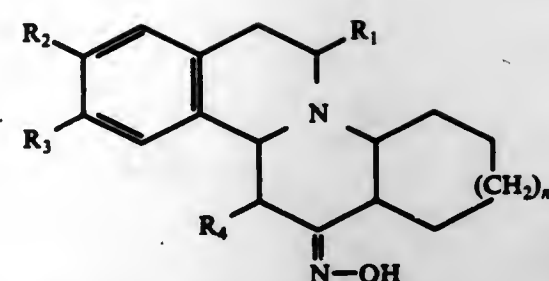
2-HYDROXYIMINO-1,2,3,4,6,7-HEXAHYDRO-11bH-BENZO [a] QUINOLISINE DERIVATIVES

Csaba Szantay; Andras Vedres; Karoly Thuranszky; Gyula Balogh, and Maria Vedres nee Kozma, all of Budapest, Hungary, assignors to EGYT Gyogyszervegyeszet Gyar, Budapest, Hungary
Filed Apr. 21, 1976, Ser. No. 678,902
Claims priority, application Hungary, Apr. 21, 1975, EE 2321
Int. Cl.² C07D 215/42

U.S. Cl. 260—288 CF

6 Claims

1. 2-Hydroxyimino-1,2,3,4,6,7-hexahydro-11bH-benzo[a]-quinolisin derivative of the general formula



wherein R₁ and R₄ are each selected from the group consisting of hydrogen and an alkyl group of 1-4 carbon atoms, R₂ and R₃ are each selected from the group consisting of hydrogen, a hydroxyl group, an alkoxy group of 1-4 carbon atoms and an R₂-R₃ joint methylenedioxy group, and n is an integer from 0-2.

4,052,404

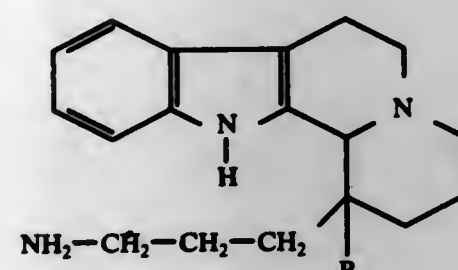
INDOLO (2,3-α)QUINOLIZINES

Csaba Szantay; Lajos Szabo; Gyorgy Kalas; Egon Karpati, and Laszlo Szporay, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary
Filed Nov. 25, 1975, Ser. No. 635,092
Claims priority, application Hungary, Nov. 26, 1974, RI-555
Int. Cl.² C07D 455/02

U.S. Cl. 260—293.53

2 Claims

1. A compound of the formula (I),



wherein R stands for alkyl, having from 1 to 6 carbon atoms, or a pharmaceutically acceptable salt thereof or optically active isomer thereof.

4,052,405

MANUFACTURE OF 1,1'-DIALKYL-4,4'-BIPYRIDILIUM SALTS

John Reginald Case, and Geoffrey James Moore, both of Runcom, England, assignors to Imperial Chemical Industries Limited, London, England
Filed May 7, 1973, Ser. No. 357,656
Claims priority, application United Kingdom, Sept. 4, 1972, 40953/72
Int. Cl.² C07D 213/22

U.S. Cl. 260—294.8 R

2 Claims

1. A method of preparing a 1,1'-dialkyl-4,4'-bipyridylium salt which comprises interacting a 4,4'-bipyridyl with a quaternizing agent consisting essentially of a 1,1'-disubstituted-4,4'-bipyridylium di(alkylsulphate).

4,052,406

PROCESS FOR THE PRODUCTION OF 3-HYDROXY-2-IMINO-(2H)-PYRIDINESULPHONIC ACID MONOHYDRATE

Gunter Mattern, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed May 27, 1976, Ser. No. 690,497
Int. Cl.² C07D 213/73

U.S. Cl. 260—294.8 R

8 Claims

1. Process for the production of 3-hydroxy-2-imino-1(2H)-pyridinesulphonic acid monohydrate by oxidation of furfural

and reaction of the oxidation product with sulphamic acid, which process comprises oxidising furfural in an aqueous medium at a temperature of -10° C to 0° C, with a pH value of 0 to 0.5, in the presence of an oxyacid of tri- or pentavalent phosphorus or of a water-soluble salt of such an acid and with the oxidising agent being chlorine, alkali hypochlorite, bromine, sodium bromate, potassium bromate or chlorine in the presence of hydrogen bromide; subsequently reacting the oxidation product with 2 to 3 moles of sulphamic acid per mole of employed furfural; and then separating the formed 3-hydroxy-2-imino-1(2H)-pyridinesulphonic acid monohydrate.

4,052,407

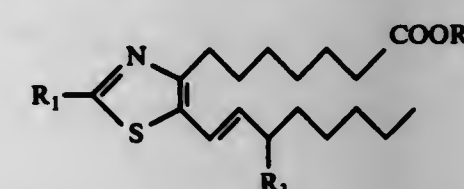
THIAZOLE DERIVATIVES AND PROCESSES FOR PREPARING THE SAME

Gabor Ambrus; Istvan Barta; Zsuzsanna Mehesfalvi, nee Vajna, and Gyula Horvath, all of Budapest, Hungary, assignors to Gyogyszerkutató Intézet, Budapest, Hungary
Filed May 14, 1975, Ser. No. 577,348
Claims priority, application Hungary, May 14, 1974, GA 1269
Int. Cl.² C07D 277/20

U.S. Cl. 260—302 R

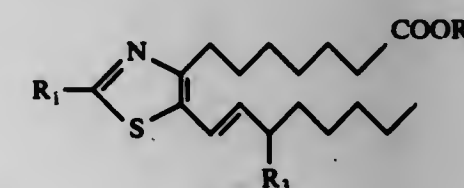
14 Claims

1. A thiazole derivative of the formula

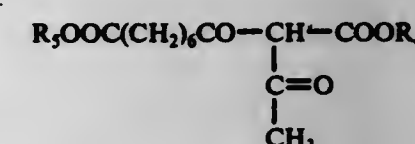


wherein R₁ and R₂ are hydrogen or methyl and R₃ is oxo, hydroxyl or acetoxy.

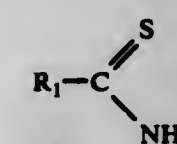
2. A process for the production of thiazole derivatives of the formula



wherein R₁ and R₂ are hydrogen or methyl and R₃ is oxo, hydroxyl or acetoxy, comprising the steps of reacting the sodium derivative of an acetoacetic acid methylester of the formula CH₃COCH₂COOR₂, wherein R₂ is methyl, with a 7-carbomethoxyheptanoyl chloride of the formula R₃OOC(CH₂)₆COCl, wherein R₃ is methyl, and converting the obtained 10-carbomethoxy-2,4-diketodecane-3-carboxylic acid methylester of the formula

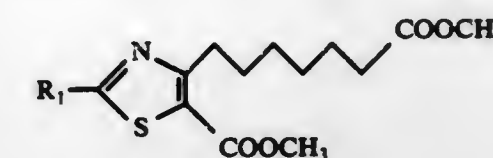


wherein R₄ and R₅ have the same meanings as above, with sodium methylate into 9-carbomethoxy-3-ketodecanoic acid methylester of the formula CH₃OOC(CH₂)₈CO-CH₂-COOCH₃ halogenating the latter compound to 9-carbomethoxy-2-halo-3-ketodecanoic acid methylester of the formula CH₃OOC(CH₂)₈CO-CHY-COOCH₃ wherein Y is halogen, reacting the last-named compound with a thioacid amide of the formula

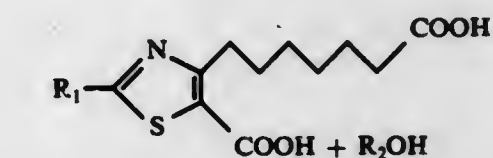


wherein R₁ is hydrogen or methyl, hydrolyzing the obtained

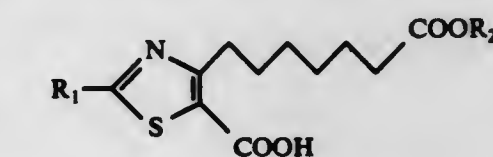
4-(6-carbomethoxyhexyl)-thiazole-5-carboxylic acid methylester of the formula



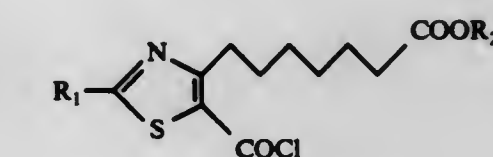
wherein R₁ is hydrogen or methyl, to obtain 4-(6-carboxyhexyl)-thiazole-5-carboxylic acid of the formula



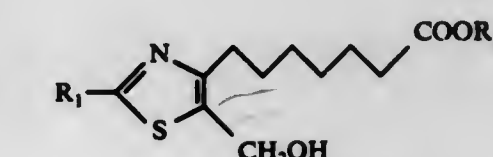
wherein R₁ is hydrogen or methyl, subjecting the last-named compound to selective esterification with an alcohol of the formula R₂OH, wherein R₂ is methyl, in the presence of p-toluenesulphonic acid, converting the thus-obtained 4-(6-carbomethoxyhexyl)-thiazole-5-carboxylic acid of the formula



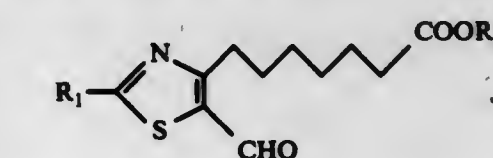
wherein R₁ is hydrogen or methyl and R₂ is methyl, into 4-(6-carbomethoxyhexyl)-thiazole-5-carboxylic chloride of the formula



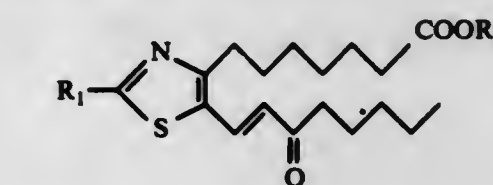
wherein R₁ is hydrogen or methyl and R₂ is methyl, reducing the last-named compound with an alkali metal borohydride to 4-(6-carbomethoxyhexyl)-5-hydroxy-methyl-thiazole of the formula



wherein R₁ is hydrogen or methyl and R₂ is methyl, then oxidizing the last-named compound to 4-(6-carbomethoxyhexyl)-thiazole-5-carbaldehyde of the formula

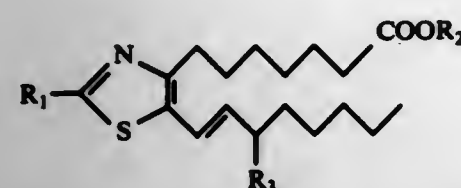


wherein R₁ is hydrogen or methyl and R₂ is methyl, reacting the last-named compound with 2-oxo-heptylidene-triphenyl phosphorane to obtain 4-(6-carbomethoxyhexyl)-5-(3-keto-1-trans-octenyl)-thiazole of the formula

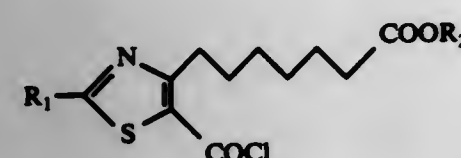


wherein R₁ is hydrogen or methyl and R₂ is methyl.

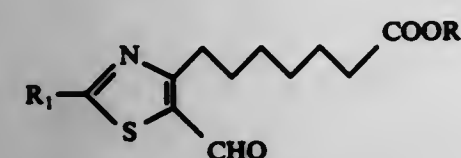
3. A process for the production of thiazole derivatives of the formula



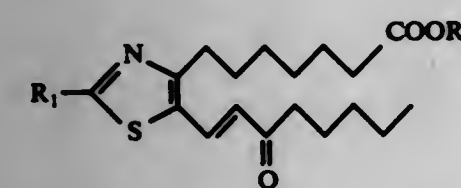
wherein R_1 and R_2 are hydrogen or methyl and R_3 is oxo, hydroxyl or acetoxy, comprising the steps of reducing 4-(6-carbomethoxyhexyl)-thiazole-5-carboxylic chloride of the formula



wherein R_1 is hydrogen or methyl and R_2 is methyl, with lithium tri-tert-butoxy-aluminum hydride to 4-(6-carbomethoxyhexyl)-thiazole-5-carbaldehyde of the formula

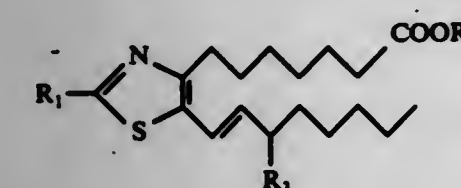


wherein R_1 is hydrogen or methyl and R_2 is methyl, then reacting the last-named compound with 2-oxo-heptylidene-triphenyl phosphorane to obtain 4-(6-carbomethoxyhexyl)-5-(3-keto-1-trans-octenyl)-thiazole of the formula

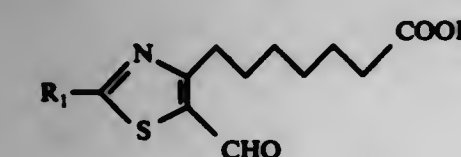


wherein R_1 is hydrogen or methyl and R_2 is methyl.

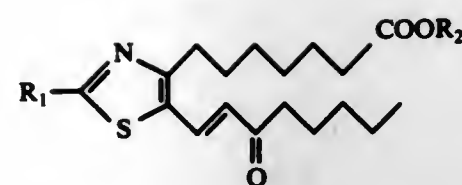
4. A process for the production of thiazole derivatives of the formula



wherein R_1 and R_2 are hydrogen or methyl and R_3 is oxo, hydroxyl or acetoxy, comprising converting 4-(6-carbomethoxyhexyl)-thiazole-5-carbaldehyde of the formula



wherein R_1 is hydrogen or methyl and R_2 is methyl, with the sodium derivative of 2-oxoheptylphosphonic acid dimethyl ester or with 2-oxo-heptylidene-triphenyl phosphorane into 4-(6-carbomethoxyhexyl)-5-(3-keto-1-trans-octenyl)-thiazole of the formula



wherein R_1 is hydrogen or methyl and R_2 is methyl.

4,052,408

OXYACETIC ACID COMPOUNDS AND PROCESS FOR THEIR MANUFACTURE

Karl Heusler, Basel, Switzerland, and Robert Burns Woodward, Cambridge, Mass., assignors to Ciba-Geigy Corporation, Ardley, N.Y.

Continuation of Ser. No. 843,754, July 22, 1969, abandoned.

This application Nov. 18, 1974, Ser. No. 524,699

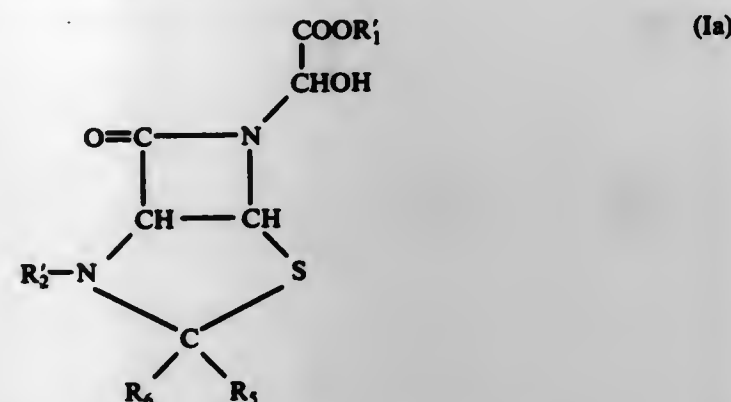
Claims priority, application Switzerland, July 23, 1968, 10994/68; July 23, 1968, 10995/68; July 23, 1968, 10996/68; Dec. 11, 1968, 18502/68; Dec. 11, 1968, 18503/68; Dec. 11, 1968, 18505/68

Int. Cl.² C07D 513/04

U.S. Cl. 260—306.7 C

5 Claims

1. A compound of the formula



in which R_1' represents a member selected from the group consisting of hydrogen, lower alkyl, halogeno-lower alkyl, and phenyl-lower alkyl, R_2' represents a member selected from the group consisting of a hydrogen atom and an acyl residue of a lower alkyl, lower alkenyl, phenyl or phenyl-lower alkyl half-ester of carbonic acid, and each of the radicals R_3 and R_4 stands for lower alkyl, each of said lower alkyl and lower alkenyl groups having up to 7 carbon atoms.

4,052,409

DISUBSTITUTED TRIPHENYLMETHYLIMIDAZOLES

Karl Heinz Buchel; Erik Regel, and Manfred Plempel, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Mar. 8, 1973, Ser. No. 339,430

Claims priority, application Germany, Mar. 22, 1972, 2213863

Int. Cl.² C07D 233/62

U.S. Cl. 548—341

3 Claims

1. 1-(2,6-Dichlorophenyl-diphenyl)-methyl-imidazole or a pharmaceutically acceptable non-toxic salt thereof.

4,052,410

IMINOISINDOLINE PIGMENTS

Jost von der Crone; Andre Pugin, both of Riehen, and Rudolf Mory, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardley, N.Y.

Division of Ser. No. 472,401, May 22, 1974, Pat. No. 3,979,386.

This application July 12, 1976, Ser. No. 704,276

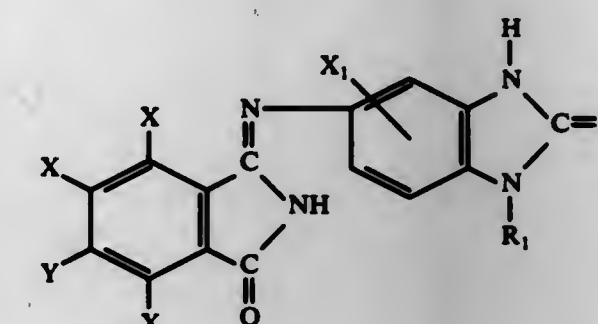
Claims priority, application Switzerland, May 29, 1973, 7718/73; May 29, 1973, 7719/73

Int. Cl.² C07D 403/12, 401/12

U.S. Cl. 548—305

3 Claims

1. An iminoisindolinone of the formula



wherein

X represents a halogen atom,

Y represents a halogen atom, alkoxy of 1-4 carbon atoms, phenoxy, chlorophenoxy, methylphenoxy, or alkylthio of 1 or 2 carbon atoms,

R_1 represents a hydrogen atom, alkyl having 1-4 carbon atoms, unsubstituted phenyl, phenyl substituted by a halogen atom, alkyl having 1-4 carbon atoms, alkoxy having 1-4 carbon atoms, or alkanoylamino having 1-4 carbon atoms,

X_1 represents a hydrogen atom, a halogen atom, alkyl having 1-4 carbon atoms, alkoxy having 1-4 carbon atoms, or phenoxy.

4,052,411

ESTERS OF DERIVATIVES OF

2-IMIDAZOLIDINYLIDENENITROACETIC ACID

Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

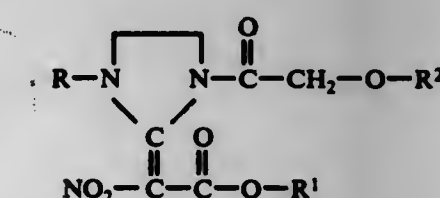
Filed Oct. 6, 1976, Ser. No. 729,741

Int. Cl.² C07D 233/26

U.S. Cl. 548—342

2 Claims

1. A compound of the formula:



wherein R and R^1 each is alkyl of from one to twenty carbon atoms and R^2 is 2,4-dichloro-, 2-methyl-4-chloro- or 2,4,5-trichloro-phenyl.

4,052,412

BENZO CYCLOHEPTATHIOPHENE CARBOXYLIC ACID DERIVATIVES

Jean-Michel Bastian, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 644,816, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 511,994, Oct. 4, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 673,257

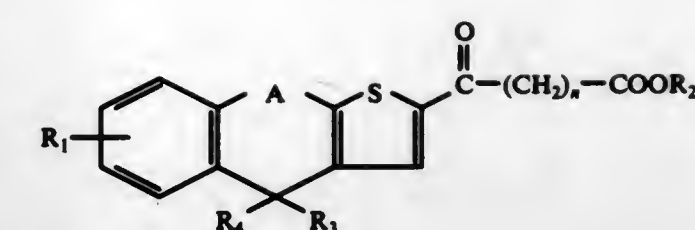
Claims priority, application Switzerland, Oct. 10, 1973, 14396/73; May 22, 1975, 6582/75

Int. Cl.² C07D 333/24; A01N 9/00

U.S. Cl. 260—332.2 A

27 Claims

1. A compound of formula I,



wherein

R_1 is hydrogen, halogen of atomic number from 9 to 35 or lower alkyl,

R_2 is hydrogen or lower alkyl,

R_3 and R_4 together are oxygen,

n is 2, 3 or 4, and

A is ethylene or vinylene,

or when R_2 is hydrogen alternatively in pharmaceutically acceptable salt form.

4,052,413

STEREOSPECIFIC TOTAL STEREOIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche, Inc., Nutley, N.J.

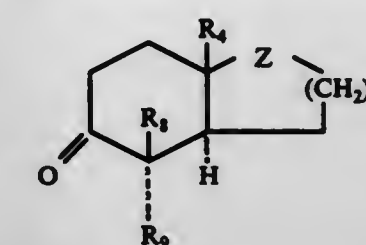
Division of Ser. No. 482,711, June 24, 1974, Pat. No. 3,984,473, which is a division of Ser. No. 765,023, Oct. 4, 1968, Pat. No. 3,897,460. This application July 14, 1976, Ser. No. 705,376

Int. Cl.² C07D 317/72

U.S. Cl. 260—340.9 AS

1 Claim

1. A compound of the formula



wherein Z is ethylenedioxyethylene; R_4 is hydrogen or lower alkyl; m is an integer having the value of 1 or 2 and R_5 and R_6 is methylene; its optical enantiomer and the racemate thereof.

4,052,414

CIS-ZEARALANONE, CIS-ZEARALENOL, AND CIS-ZEARALENE

Charles Allan Peters, Wichita, Kans., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

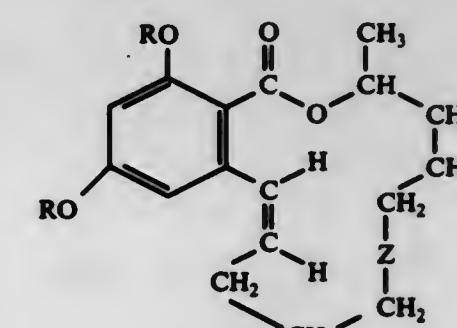
Continuation-in-part of Ser. No. 523,414, Nov. 13, 1974, abandoned, which is a continuation of Ser. No. 317,117, Dec. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 119,833, March 1, 1971, abandoned. This application Nov. 20, 1975, Ser. No. 633,691

Int. Cl.² C07D 313/00

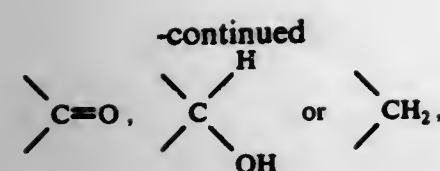
U.S. Cl. 260—343.41

6 Claims

1. An essentially pure cis compound of the formula:



wherein Z is



and wherein R is selected from the group consisting of hydrogen, lower alkyl, lower alkanoyl, monocyclic aryl of up to about 10 carbon atoms, and aralkyl of monocyclic aryl containing up to about 10 carbon atoms and lower alkyl.

4,052,415

MANUFACTURE OF LACTONES OF THE TRIPHENYLMETHANE SERIES

Kurt Mayer, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Dec. 3, 1976, Ser. No. 747,398

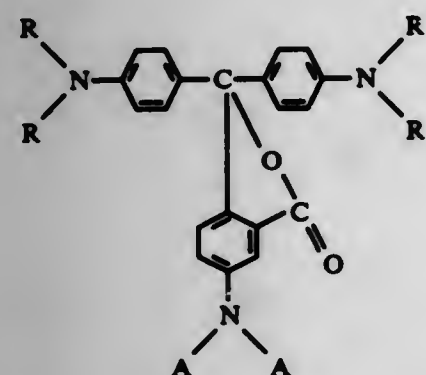
Claims priority, application Germany, Dec. 20, 1975, 2557687

Int. Cl.² C07D 307/94; C09B 11/24; C07D 307/88

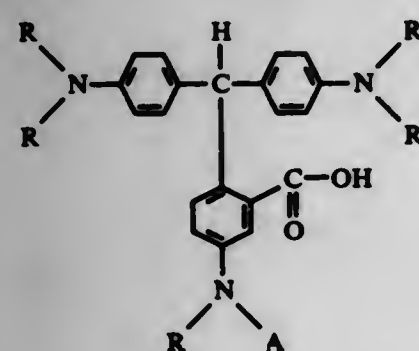
U.S. Cl. 260—343.4

10 Claims

1. A process for the manufacture of compounds of the formula



where R is alkyl of 1 to 4 carbon atoms and A is alkyl of 1 to 4 carbon atoms, and R and A may be identical or different, wherein compounds of the formula



are oxidized with air, oxygen or oxygen-air mixtures in an acid medium, at a pH of from 1.5 to 5.5, in the presence or absence of oxidation catalysts, at from 30° to 150° C.

4,052,416

HALOGENATED ESTERS OF PHOSPHORUS-CONTAINING ACIDS (III)

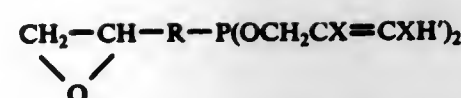
Geotano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617
Continuation-in-part of Ser. No. 539,812, Jan. 9, 1975, Pat. No. 3,970,727, which is a continuation-in-part of Ser. No. 179,543, Sept. 10, 1971, Pat. No. 3,780,144, which is a continuation of Ser. No. 785,335, Dec. 19, 1968, abandoned. This application Jan. 5, 1976, Ser. No. 646,504

Int. Cl.² C07F 9/40

U.S. Cl. 260—348.42

4 Claims

1. A phosphorus halogen-containing compound having the formula



wherein X represents Cl or Br and R represents CH₂ or CH₂CH₂.

4,052,417

VAPOR PHASE OXIDATION OF BUTANE PRODUCING MALEIC ANHYDRIDE AND ACETIC ACID

William Earl Slinkard, and Anthony Basil Baylis, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 6, 1975, Ser. No. 629,440

Int. Cl.² C07D 307/60

U.S. Cl. 260—346.75

10 Claims

1. A process for producing maleic acid anhydride which comprises contacting butane, oxygen in the range between about 0.05 and 5.0 mol per mol of butane and water in the vapor phase at a temperature between about 180° C and 350° C with a reduced molybdenum catalyst wherein said molybdenum catalyst consists essentially of a catalyst prepared by reducing a calcined mixture of molybdenum compound coprecipitated with phosphorus compound.

6. A process for producing maleic acid anhydride which comprises contacting butane, oxygen in the range between about 0.05 and 5.0 mol per mol of butane and water in the vapor phase at a temperature between about 180° C and 350° C with a reduced molybdenum catalyst wherein said molybdenum catalyst consists essentially of a catalyst prepared by reducing a calcined mixture of a molybdenum compound and phosphorus compound coprecipitated with one or more metal compounds selected from the group consisting of a bismuth compound and a niobium compound.

4,052,418

PREPARATION OF MALEIC ANHYDRIDE FROM FOUR-CARBON HYDROCARBONS

Dev D. Suresh, Macedonia; Noel J. Bremer, Stow, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 6, 1975, Ser. No. 602,343

Int. Cl.² C07D 307/60; B01J 21/02, 23/16, 23/84

U.S. Cl. 260—346.74

9 Claims

1. In the process for the preparation of maleic anhydride by the oxidation of n-butane, n-butenes, butadiene or mixture thereof with molecular oxygen in the vapor phase at a reaction temperature of about 300° C to about 600° C in the presence of a catalyst, the improvement comprising using as a catalyst a catalyst of the formula:



wherein

A is at least one element selected from the group consisting of an alkali metal, zinc, cadmium, arsenic, copper, cerium, thorium, tin, manganese, iron and uranium; and

D is at least one element selected from the group consisting of boron, niobium, tantalum, antimony, tungsten and chromium;

and wherein

a is 0 to 5;

b and c are 0.1 to 10; and

x is the number as determined by the combined valence requirements of elements other than oxygen present in the catalyst.

4,052,419

METHOD OF PREPARING 5-NITROFURFURAL DIACETATE

Solomon Aronovich Giller, ulitsa Pernavas, 10, kv. 76; Karl Karlovich Venter, ulitsa Sporta, 7, kv. 10; Margarita Al-donovna Trushule, ulitsa Katrindambis, 22-D, kv. 10; Guntis Erikovich Berggrin, ulitsa Pernavas, 57, kv. 10; Robert Avgus-tovich Brinkmanis, ulitsa Brivzemnieka, 22, kv. 4, all of Riga; Uldis Yanovich Mikstals, ulitsa Elgavas, 4, kv. 64, and Paul Alexandrovich Stankevich, ulitsa Mendeleeva, 20, kv. 84, both of Olaine, all of U.S.S.R.

Filed May 27, 1975, Ser. No. 580,900

Int. Cl.² C07D 307/71

U.S. Cl. 260—347.4

9 Claims

1. A method of preparing 5-nitrofurfural diacetate comprising nitrating a compound selected from the group consisting of furfural and furfural diacetate at a temperature ranging from -10° to +10° C; said nitrating being effected by gradually, simultaneously, and separately adding said compound and a mixture of nitric and sulphuric acids into acetic anhydride having a temperature ranging from -10° to +10° C with constant stirring of the resulting reaction mixture; molar ratios of the compound being nitrated, nitric and sulphuric acids being maintained equal to 1:1.1-2:0.036-0.041, respectively; said compound and the mixture of acids being added into the acetic anhydride at such rates as to maintain the nitrating reaction temperature at a predetermined level; said furfural diacetate, when used as the compound being nitrated, being employed in the form of its solution in acetic anhydride; treating the reaction mixture resulting from the nitration with water at a temperature ranging from 0° to 15° C at a weight ratio between water and the starting acetic anhydride of from 1.1:1 to 1.8:1, respectively, and neutralizing it with an alkali to a pH of 3.5-5 at a temperature of from 0° to 25° C, then maintaining the reaction mixture at a pH within said range at a temperature of from 45° to 55° C, and thereafter isolating the desired product from the reaction mixture.

4,052,421

13-ETHINYL-STERIODS AND PROCESSES FOR THEIR MANUFACTURE

Michel Biollaz, Basel, and Jaroslav Kalvoda, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 20, 1976, Ser. No. 650,653

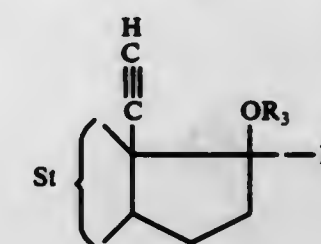
Claims priority, application Switzerland, Jan. 30, 1975, 1123/75

Int. Cl.² C07J 1/00

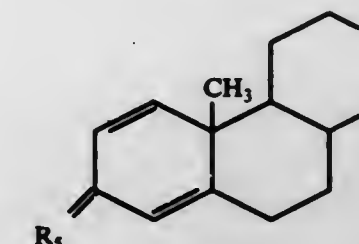
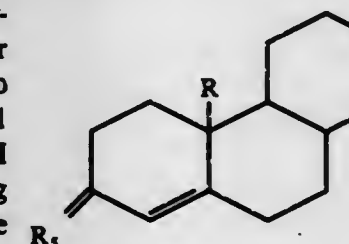
U.S. Cl. 260—397.5

14 Claims

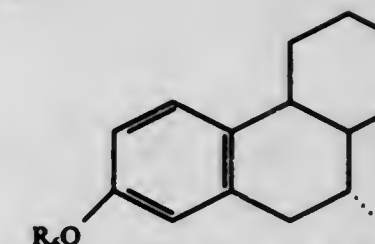
7. 13-Ethynyl-steroids of the general formula



wherein R₃ denotes a hydrogen atom or a lower alkyl or lower alkanoyl group, R₄ denotes a hydrogen atom or a lower aliphatic hydrocarbon radical, or OR₃ and R₄ together denote an oxo group, and St represents a residue selected from a group consisting of residues of the partial formulae



and



wherein R and R₇ each denotes a hydrogen atom or the methyl group, R₃ denotes an oxo group, a hydrogen atom together with a free hydroxyl group, a hydrogen atom together with an esterified hydroxyl group, or two hydrogen atoms, and R₄ denotes a hydrogen atom or a lower alkyl group.

4,052,422

4,5-SECOPREGNANE DERIVATIVES

Christopher M. Cimarusti, Hamilton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

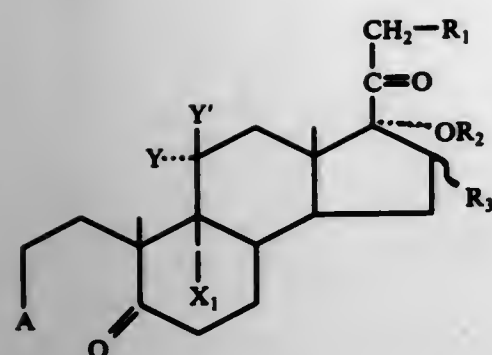
Filed Nov. 8, 1974, Ser. No. 522,178

Int. Cl.² C07C 49/26, 69/18, 69/30, 69/78

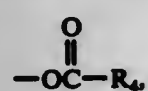
U.S. Cl. 260—408

13 Claims

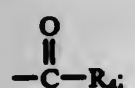
1. A compound having the structure



wherein A is $-\text{CH}=\text{CH}_2$ or $-\text{CH}_2\text{CH}_3$; X_1 is hydrogen, chlorine, bromine or fluorine; R_1 is hydrogen, hydroxyl,



chlorine, bromine, fluorine or iodine; R_2 is hydrogen or



R_3 is hydrogen, α -methyl, β -methyl, or methylene; R_4 is lower alkyl or phenyl; and Y is hydrogen and Y' is hydroxyl or together Y and Y' are $=\text{O}$; wherein lower alkyl is alkyl of 1 to 7 carbon atoms.

4,052,423

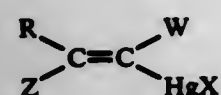
SYNTHESIS OF α,β -UNSATURATED CARBOXYLIC ACIDS AND ESTERS

Richard Craig Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Jan. 19, 1976, Ser. No. 650,143
Int. Cl.² C11C 3/02; C09F 5/08

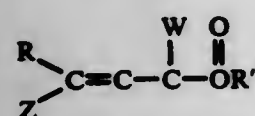
U.S. Cl. 260—410.9 R

14 Claims

1. A method of preparing alpha beta-unsaturated carboxylic acid esters, said method comprising:
reacting in a Polar Solvent a vinylmercuric halide compound of the formula:



in the presence of a noble metal carbonylation promoter selected from the group consisting of reaction equivalent amounts of noble metal simple salts in combination with lithium chloride, catalytic amounts of noble metals, and noble metal halide simple salts with carbon monoxide and an alcohol of the formula $\text{R}'\text{OH}$ to provide an alpha beta-unsaturated carboxylic acid ester of the formula:



at a percentage of theoretical yield of at least 85 weight %, wherein R, Z, W and R' are hydrogen or organic moieties which are non-reactive in the carbonylation reaction which occurs between said carbon monoxide and said vinylmercuric halide, of preselected determination to represent the desired ester being synthesized, and X is a halide.

4,052,424

PRODUCTION OF ESTERS FROM ALCOHOLS

Thomas H. Vanderspurt, Gillette, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,548

Int. Cl.² C09F 5/08; C11C 3/02

U.S. Cl. 260—410

9 Claims

1. A process for producing alkyl alkanolate esters which comprises contacting primary alkanol in vapor phase with a silver-cadmium alloy catalyst at a temperature between about 250° C and 600° C, wherein the atomic ratio of silver to cadmium in the alloy is in the range of between about 0.1 and 3 to 1.

4,052,425

FATTY ACID FEED STOCK BLEND OF RED OIL AND SOAP STOCK FOR THE PREPARATION OF DIMER FATTY ACIDS

Edward C. Leonard, Memphis, Tenn., assignor to Kraft, Inc., Glenview, Ill.

Filed Aug. 20, 1975, Ser. No. 606,187

Int. Cl.² C11C 1/00

U.S. Cl. 260—413

6 Claims

1. A fatty acid feed stock suitable for use in the preparation of dimer fatty acids having properties generally similar to dimer fatty acids produced from tall oil fatty acids, said feed stock comprising a distillation product derived from about 35 percent to about 45 percent by weight of crude red oil and from about 55 percent to about 65 percent by weight crude soya fatty acid soap stock, said feed stock having a composition of from about 0.5 to about 2 percent by weight of palmitoleic acid, from about 40 to about 52 percent by weight of oleic acid, from about 20 to about 40 percent by weight of linoleic acid, from about 2 to about 7 percent by weight of linolenic acid and from about 3.5 to about 11.5 percent by weight of saturated fatty acids.

4. A method for providing a fatty acid feed stock suitable for use in the preparation of dimer fatty acids having properties generally similar to dimer fatty acids produced from tall oil fatty acids, said method comprising providing a blend of from about 35 percent to about 45 percent by weight of crude red oil and from about 55 percent to about 65 percent by weight crude soya fatty acid soap stock, and distilling said blend of said crude red oil or said soap stock to provide a fatty acid feed stock having a composition of from about 0.5 to about 2 percent by weight of palmitoleic acid, from about 40 to about 52 percent by weight of oleic acid, from about 20 to about 40 percent by weight of linoleic acid, from about 2 to about 7 percent by weight of linolenic acid and from about 3.5 to about 11.5 percent by weight of saturated fatty acids.

4,052,426

PROCESS FOR THE MANUFACTURE OF DIMETHYL-TIN DICHLORIDE

Wolfgang Wehner, Zwingenberg; Rudolf Maul, Lorsch, Hessen, and Hans-Wolf Jung, Burgdorf-Ehlershausen, all of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 509,886, Sept. 27, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,865

Claims priority, application Switzerland, Oct. 1, 1973, 14031/73

Int. Cl.² C07F 7/22

U.S. Cl. 260—429.7

8 Claims

1. An improved process for the manufacture of dimethyl-tin dichloride by the reaction of metallic tin or tin alloys with methyl chloride at 100° to 300° under a pressure of 0 to 150 atmospheres gauge in the presence of at least one compound of formula I



in which R is a straight or branched chain alkyl of 1 to 18

carbon atoms, R' has the same meaning as R or is a Cl atom and a has the value 0 or 1, wherein the improvement comprises carrying out the reaction in the presence of a solvent selected from the group consisting of cyclic sulfones, cyclic carbonates and cyclic thiocarbonates.

4,052,427

PROCESS FOR THE PREPARATION OF DIALKYL TIN DIHALIDES

William E. Leistner, Atlanta Beach, N.Y.; Gerald H. Spiegelman, Wayne, and Louis J. Hover, Oak Ridge, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Filed June 21, 1976, Ser. No. 698,481

Int. Cl.² C07F 7/22

U.S. Cl. 260—429.7

11 Claims

1. A process for the preparation of dialkyltin dihalides of the formula:



wherein R equals methyl or R'; R' equals $\text{C}_2\text{--C}_{20}$ alkyl; and X equals halogen; comprising:

- refluxing Me_2SnX_2 and $\text{R}'\text{X}$ in a molar ratio of about 1:1 to 1:3 in the presence of a phosphonium iodide catalyst at about 150°–200° C for from 1 to 50 hours and;
- recovering the dialkyltin dihalide product having one or more methyl group of the Me_2SnX_2 replaced by R'.

4,052,428

STABLE ALUMINUM ALKOXIDE SOLUTIONS

Robert Wendell Lerner, Trumbull, Conn.; Russell S. Towers, and John Robert Flasch, both of Adrian, Mich., assignors to Stauffer Chemical Company, Adrian, Mich.

Filed Dec. 15, 1975, Ser. No. 640,502

Int. Cl.² C07F 5/06

U.S. Cl. 260—448 AD

4 Claims

1. An improved process for preparing stable solutions of aluminum butoxides by reacting metallic aluminum with butyl alcohol, the improvement which comprises reacting metallic aluminum with a mixture containing isobutyl alcohol and n-butyl alcohol at the reflux temperature of the alcohols but below the decomposition temperature of the aluminum butoxides, said alcohols are present in a mol ratio of isobutyl alcohol to n-butyl alcohol of from 1:1 to 20:1.

4,052,429

METHOD OF FORMING A COMPOUND CONTAINING ALUMINUM AND GLYCEROL

George C. Merkl, 46 Sunset Court, Haworth, N.J. 07641

Filed Jan. 13, 1975, Ser. No. 540,786

The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.

Int. Cl.² C07F 5/06

U.S. Cl. 260—448 AD

9 Claims

1. A method of forming a compound containing aluminum and glycerol which comprises:
contacting and reacting:

- a reactive aluminum comprising aluminum of a purity of at least about 99.9% by weight permeated with a liquid metal selected from mercury, gallium and indium/gallium alloys;
 - in a reaction medium consisting essentially of:
 - glycerol; and
 - a liquid selected from:
 - water;
 - lower alcohols;
 - glycols; and
 - phenols,
- said reactive aluminum being consumed during the reaction to form said compound containing aluminum and glycerol; and
terminating the reaction to recover said compound contain-

ing aluminum and glycerol by withdrawing any unreacted reactive aluminum from the reaction medium.

4,052,430

METHOD FOR PRODUCING ORGANOSILICON HIGH MOLECULAR WEIGHT COMPOUNDS HAVING SILICON AND CARBON AS MAIN SKELETON COMPONENTS AND SAID ORGANOSILICON HIGH MOLECULAR WEIGHT COMPOUNDS

Seishi Yajima; Josaburo Hayashi, and Mamoru Omori, all of Ohara, Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Sendai, Japan

Filed Apr. 19, 1976, Ser. No. 677,959

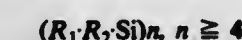
Claims priority, application Japan, Apr. 26, 1975, 50-50223

Int. Cl.² C07F 7/08

U.S. Cl. 260—448.2 D

5 Claims

1. A method for producing organosilicon high molecular weight compounds having silicon and carbon as the main skeleton components and consisting of a mixture of linear polycarbosilanes having silicon and carbon as the main skeleton components, cyclic polycarbosilanes having silicon and carbon as the main skeleton components and polycarbosilanes in which linear carbosilane and cyclic carbosilane are chemically bonded, which comprises thermally decomposing and polycondensing at least one of organosilicon compounds having polysilane skeleton selected from the group consisting of cyclic polysilanes shown by the following formula



wherein R_1 and R_2 are hydrogen, alkyl group, aryl group, silyl group, or a halogen and linear polysilane shown by the following formula



wherein R_1 , R_2 , R_3 and R_4 are hydrogen, alkyl group, aryl group, silyl group or a halogen, by heating at a temperature of 300°–2,000° C under at least 1 atmosphere of an inert gas and hydrogen gas or under a vacuum.

5. The organosilicon high molecular weight amorphous compounds consisting of a mixture of linear polycarbosilanes having silicon and carbon as the main skeleton components, cyclic polycarbosilanes having silicon and carbon as the main skeleton components and polycarbosilanes in which linear carbosilane and cyclic carbosilane are chemically bonded, which have an average molecular weight of 300–50,000 and an intrinsic viscosity of 0.005–1.50.

4,052,431

PROCESS FOR THE PRODUCTION OF COMMERCIAL ALPHA OLEFIN SULFONATES

Thomas G. Baker, Wilmette, and Raymond J. Shute, Chicago, both of Ill., assignors to Stepan Chemical Company, Northfield, Ill.

Filed Mar. 3, 1976, Ser. No. 663,611

Int. Cl.² C07C 139/14; C07B 13/02

U.S. Cl. 260—513 T

12 Claims

1. In a process for making an alpha olefin sulfonate product by contacting a stream of vaporized sulphur trioxide in an inert gas mixture with alpha olefins containing from about 8 through 24 carbon atoms per molecule followed by admixture of the reaction product with aqueous alkali metal hydroxide to produce an aqueous mixture which comprises, on a 100 weight percent total weight basis at least about 52 weight percent water with the balance up to 100 weight percent comprising

solids, said solids comprising, on a 100 weight percent dry basis, from about 50 to 90 weight percent of alkali metal salts of alpha olefin sulfonate, from about 5 to 40 weight percent dispersed residual oil, and the balance up to 100 weight percent being alkali metal hydroxide, the exact amount of alkali metal hydroxide present in any given system being sufficient to maintain a pH in said aqueous mixture greater than about 12, the improvement which is to substantially completely eliminate sultones from the final product and comprises the steps of

- A. heating such resulting aqueous mixture at a temperature of from about 95° to 190° C while maintaining said system under a pressure of from about atmospheric to about 230 p.s.i. for a time typically ranging from about 30 minutes to 8 hours but which is sufficient to substantially completely eliminate sultones from residual oil in said system, said heating being conducted while maintaining sufficient dissolved free alkali metal hydroxide present in said system to produce a system pH in the range of from about 12 to 14,
- B. cooling the resulting system to a temperature not above about 60° C, and
- C. contacting such cooled resulting system under liquid phase aqueous conditions with sodium hypochlorite bleaching agent, the total active ingredient amount of said bleaching agent used being from about 0.1 to 6 weight percent of the total weight of alkali metal sulfonates present in said resulting system, said contacting being conducted while maintaining said resulting system at a pH in the range of from about 12 to 14 and while maintaining a temperature of from about 25° to 60° C, said contacting being conducted for a time sufficient to produce a product having a Klett color based on 5 weight percent alpha olefin sulfonate in water of less than about 180, such bleaching substantially completely preventing reformation of sultones.

4,052,432

N-(1,1 SUBSTITUTED ACETONITRILE)- α -(3,5-SUBSTITUTED PHENOXY) ALKYL AMIDES

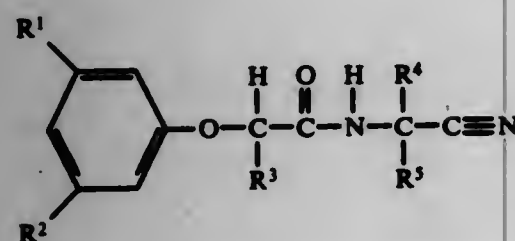
Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 524,424, Nov. 18, 1974, abandoned, which is a continuation of Ser. No. 396,922, Sept. 13, 1973, abandoned, which is a continuation of Ser. No. 157,059, June 25, 1971, abandoned. This application May 20, 1976, Ser. No. 688,498

Int. Cl.² A01N 9/20; C07C 121/78

U.S. Cl. 260—465 D

1. Compounds of the formula



in which R¹ and R² are methyl or chlorine; R³ is ethyl; R⁴ is methyl; and R⁵ is methyl.

4,052,433 AROMATIC AZOMETHINES

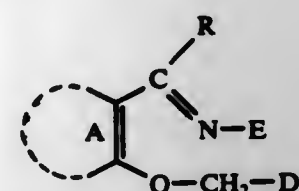
Wilfried Sahn, Kerkheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Germany
Division of Ser. No. 567,357, April 11, 1975, Pat. No. 3,994,879, which is a division of Ser. No. 427,016, Dec. 13, 1973, Pat. No. 3,892,807. This application Sept. 9, 1976, Ser. No. 721,811
Claims priority, application Switzerland, Dec. 18, 1972, 18397/72

Int. Cl.² C07C 119/00

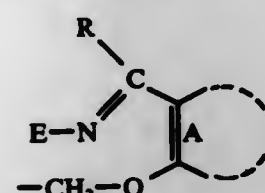
U.S. Cl. 260—465 E

5 Claims

1. A compound of the formula



in which A is phenyl or naphthyl which is unsubstituted or substituted by halogen, lower alkyl, lower alkoxy, lower alkylene forming an annellated ring, or phenyl, R is hydrogen, lower alkyl or phenyl, E is lower tertiary alkyl, phenyl, chlorophenyl, lower alkyl phenyl, lower hydroxyalkyl phenyl or naphthyl and D' is phenyl, naphthyl, styryl, or a bivalent group selected from ethenylene, phenylene and p,omega-styrylene which bivalent group is substituted by a group of the formula



in which A, R and E are as defined above, which radical D' may be substituted by carboxy, lower carboalkoxy, cyano, or nitro.

4,052,434

PROSTAGLANDIN INTERMEDIATES

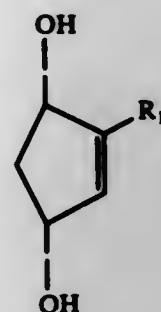
David A. Evans, Pasadena, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 499,287, Aug. 21, 1974, which is a continuation-in-part of Ser. No. 349,888, April 10, 1973, abandoned. This application May 17, 1976, Ser. No. 687,420
Int. Cl.² C07C 61/38, 69/74

U.S. Cl. 560—121

2 Claims

1. A compound of the formula:



wherein R₁ is a member of the group consisting of alkyl, (cis or trans) alkenyl and alkynyl groups of from 2 to 9 carbon atoms substituted by a terminal carboxyl group.

2. A compound of the formula:

4,052,437

PROCESS FOR PRODUCING URETHANE FROM NITRO COMPOUNDS, HYDROXYL COMPOUNDS AND CARBON MONOXIDE USING RHODIUM OXIDE CATALYSTS

George C. Licke, Oxford, Mich., assignor to Ethyl Corporation, Richmond, Va.

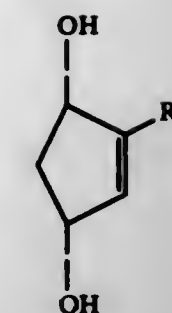
Filed Sept. 22, 1975, Ser. No. 615,778

Int. Cl.² C07C 125/06

U.S. Cl. 560—25

20 Claims

wherein R₁ is a member of the group consisting of alkyl, (cis or trans) alkenyl and alkynyl groups of from 2 to 9 carbon atoms substituted by a terminal carboalkoxy (—COOR') group where R' is an alkyl group of 1 to 6 carbon atoms.

4,052,435
ETHYL

4-METHYL-2,6-CYCLOOCTADIENE-1-CARBOXYLATE Gunther Wilke, and Paul Heimbach, both of Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Division of Ser. No. 585,287, June 9, 1975, which is a division of Ser. No. 463,087, April 22, 1974, Pat. No. 3,929,921, which is a division of Ser. No. 109,949, Jan. 26, 1971, Pat. No. 3,849,506, which is a division of Ser. No. 843,220, July 18, 1969, Pat. No. 3,586,727, and Ser. No. 845,901, July 29, 1969, Pat. No. 3,629,347, and Ser. No. 845,904, July 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 582,775, Sept. 27, 1966, abandoned. This application Nov. 1, 1976, Ser. No. 739,166
Claims priority, application Germany, Sept. 29, 1965, 1493221
Int. Cl.² C07C 69/74

U.S. Cl. 560—128

2 Claims

1. Compounds of the formula:



wherein:

Θ is cyclooctadiene-(1,5);
A is 3-carboethoxy, and
B is methyl in the 8 position.

4,052,436

FLUORENE-2-ACETIC ACIDS AND DERIVATIVES, PROCESS AND METHOD OF USING

Eric T. Stiller, Sarasota, Fla.; Seymour D. Levine, North Brunswick, N.J.; Pacifico A. Principe, South River, N.J., and Patrick A. Diassi, Westfield, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

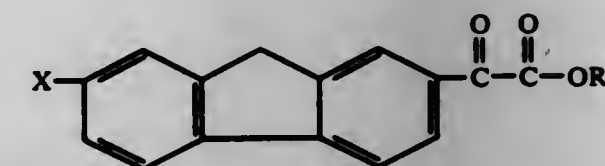
Division of Ser. No. 510,850, Sept. 30, 1974, Pat. No. 3,989,841, which is a continuation of Ser. No. 298,102, Oct. 16, 1972, Pat. No. 3,856,977, which is a continuation-in-part of Ser. No. 70,913, Sept. 9, 1970, Pat. No. 3,859,340. This application Aug. 17, 1976, Ser. No. 715,033

Int. Cl.² C07C 69/76; A61K 31/235

U.S. Cl. 560—52

5 Claims

1. A compound having the structure



wherein X is selected from the group consisting of hydrogen, hydroxyl, lower alkyl, lower alkoxy, halogen, amino, trifluoromethyl and nitro; and R³ is selected from the group consisting of hydrogen and lower alkyl.

4,052,439

CARBOXYLIC ESTERS OF PHOSPHONOACETIC ACID Thomas Raymond Herrin, Waukegan, and John Scott Fairgrieve, Lake Villa, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

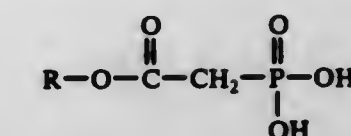
Filed Apr. 30, 1976, Ser. No. 681,874

Int. Cl.² C07D 69/14; A61K 31/22

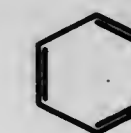
U.S. Cl. 560—129

7 Claims

1. A carboxylic ester of phosphonoacetic acid of the formula



wherein r is C₃-C₈ alkyl, aralkyl,



or adamantly.

4,052,440

METHOD FOR PREPARING MERCAPTO PROPIONIC ACID ESTERS AND POLYTHIO DIPROPIONIC ACID ESTERS

Shaul Gladstone, Arden; Srinivasa R. Rao, Newark, both of Del., and C. Joseph Rosshart, Satsuma, Ala., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 380,006, July 17, 1973, abandoned. This application Sept. 19, 1975, Ser. No. 614,828 Int. Cl.² C07C 149/00, 149/20

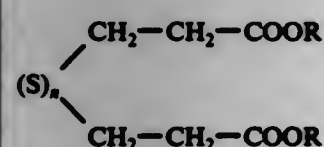
U.S. Cl. 560—154

20 Claims

1. A process for the preparation of at least one reaction product selected from the group consisting of mercaptopropionic acid esters of the formula:



and polythiodipropionic acid esters of the formula:

wherein n is a number from 2 to 6 and R is selected from the group consisting of alkyl, cycloalkyl, and alkyl cycloalkyl having from one to about eight carbon atoms which comprises reacting hydrogen sulfide and an acrylic acid ester of the formula:wherein R is selected from the group consisting of alkyl, cycloalkyl, and alkyl cycloalkyl having from one to about eight carbon atoms, in an essentially nonaqueous system containing less than 5% water and in the presence of a reactive solvent comprising polythiodipropionic acid ester of the formula above; the polythiodipropionic acid ester being present in an amount of at least 30% by weight of the total of any monothiodipropionic acid ester and of the polythiodipropionic acid ester present; and a weakly basic amine catalyst selected from the group consisting of ammonia, primary, secondary, and tertiary aminesand quaternary amines; the weakly basic amine catalyst being present in an amount within the range from about 0.1 to about 10% by weight of the reaction mixture; the reaction being carried out at a temperature within the range from about 0° to about 150° C and an H_2S concentration within the range from about 0.1% to saturation in the reactive solvent under the reaction conditions; and recovering at least one reaction product selected from the group consisting of mercaptopropionic acid ester and polythiodipropionic acid ester from the resulting reaction mixture.

4,052,441

SEPARATION OF ACIDS AND ESTERS IN THE PROCESSING OF WASTE SALT SOLUTION OF CYCLOHEXANONE MANUFACTURE

Josef Klemens Brunner, Schenkerstrasse 47, Zurich, Switzerland

Filed Oct. 7, 1975, Ser. No. 620,306

Claims priority, application Austria, Oct. 10, 1974, 8175/74 Int. Cl.² C07C 69/66

U.S. Cl. 560—179

8 Claims

1. In a process for producing esters of monocarboxylic acids and also dicarboxylic acids or their esters from the waste aqueous solution of cyclohexanone manufacture which consists essentially of salts of monocarboxy and dicarboxy straight chain aliphatic acids and of hydroxycaproic acid, comprising the steps of acidifying such a waste salt solution with a strong acid to produce an aqueous phase and an organic phase and then separating a water-containing fraction from the resulting organic phase by distillation at temperatures up to 120° C, followed by esterification of said water-containing fraction

with a lower alcohol, the improvement whereby said distillation is accomplished in two distillation steps in a sequence of steps comprising the following:

a first distillation step in which mainly water is distilled off; cooling the residue of said first distillation step to a temperature between +5° C and -10° C; separating crystals of solid dicarboxylic acids precipitated in the cooling step, and a second distillation step performed with fractionation at temperatures up to 120° C using the liquid remaining after removal of the crystals, for separation of the more volatile components both from a hydroxyacid fraction recoverable as a separate fraction and from the dicarboxylic acids that remain in the liquid residue.

4,052,442

PROCESS FOR PREPARING GLYCOL ESTERS

Masuhiko Tamura, and Tetsuo Yasui, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Japan

Filed Jan. 12, 1967, Ser. No. 608,756

Claims priority, application Japan, Jan. 21, 1966, 41-3557; Aug. 25, 1966, 41-56170

Int. Cl.² C07C 67/05

U.S. Cl. 560—243

15 Claims

1. A process for preparing glycol esters from a monoolefin selected from alpha-monoolefinic aliphatic hydrocarbons having up to 8 carbon atoms and styrene, which consists essentially of contacting said monoolefin with a solution of a palladium salt and at least one compound selected from alkali metal nitrates and nitrites in an organic acid selected from alkanolic acids having not more than 7 carbon atoms and benzoic acid at a temperature ranging from 20° to 150° C.

4,052,443

PROCESS FOR PREPARING AQUEOUS SLURRIES OF TABULAR HABIT DIPERISOPHTHALIC ACID

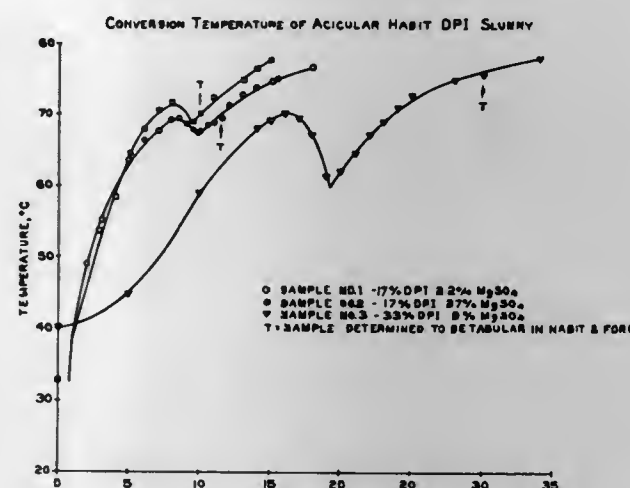
Robert G. Briody, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 19, 1975, Ser. No. 633,184

Int. Cl.² C07C 179/10

U.S. Cl. 260—502 R

1 Claim



1. A method of preparing an aqueous slurry of metastable tabular habit diperisophthalic acid said slurry consisting essentially of diperisophthalic acid and water which comprises maintaining an aqueous slurry containing acicular habit diperisophthalic acid and having a water content of over 30 weight percent at a temperature from above 67° C. to about 90° C. whereby to convert acicular diperisophthalic acid to tabular habit diperisophthalic acid.

4,052,444

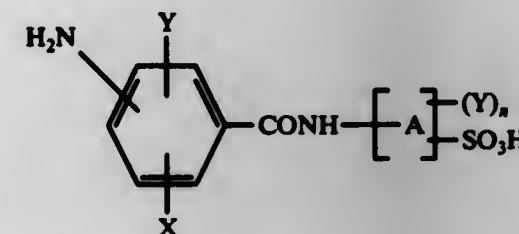
N-(AMINO BENZOYL)-AMINOARYLSULFONIC ACIDS
Günter Laubert, Frankfurt am Main, and Joachim Ribka, Offenbach, Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 325,597, Jan. 22, 1973, abandoned, and Ser. No. 325,656, Jan. 22, 1973, Pat. No. 3,997,523. This application June 12, 1975, Ser. No. 586,151 Claims priority, application Germany, Jan. 22, 1972, 2203093; Jan. 22, 1972, 2203094

Int. Cl.² C07C 143/52; C09B 29/20; C07C 149/40, 121/50 U.S. Cl. 260—507 R

7 Claims

1. A N-(aminobenzoyl)-aminoarylsulfonic acid or its alkali metal salt of the formula

wherein X is hydrogen, chloride, bromine, lower alkyl, lower alkoxy, carbomethoxy, carboethoxy, mono- or dilower alkyl-amino, trifluoromethyl, phenyl, phenoxy, nitro or cyano, Y is hydrogen, chlorine, bromine, lower alkyl or lower alkoxy, A is phenyl or 1-naphthyl, n is 1 or 2, the sulfo group standing in 4-position.

4,052,445

PROCESS FOR THE PRODUCTION OF ALKYL SULFONIC ACIDS

Gerd Schreyer, Friedhelm Geiger, and Jorg Hensel, all of Hanau, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation-in-part of Ser. No. 654,062, Feb. 2, 1976, abandoned. This application Feb. 4, 1976, Ser. No. 655,018 Claims priority, application Germany, Feb. 1, 1975, 2504201 Int. Cl.² C07C 143/02

U.S. Cl. 260—513 R

13 Claims

1. A process for the production of an alkylsulfonic acid comprising oxidizing an alkyl mercaptan or a dialkyl disulfide with hydrogen peroxide in an inert medium in the presence of ammonium molybdate, alkali metal molybdate, ammonium tungstate or alkali metal tungstate.

4,052,446

11,16-SUBSTITUTED PROSTAGLANDINS

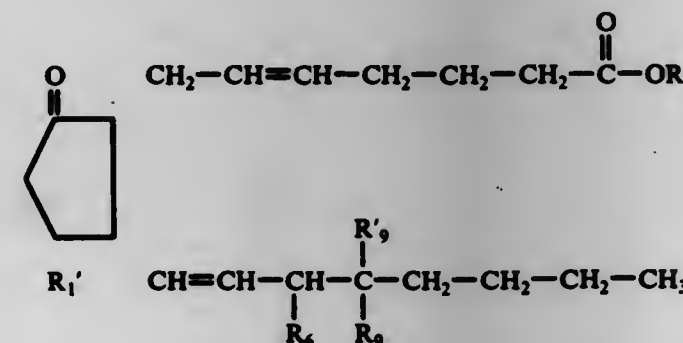
George William Holland, Cedar Grove; Jane Liu Jernow, Verona, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 386,117, Aug. 6, 1973, abandoned. This application June 18, 1974, Ser. No. 480,458 Int. Cl.² C07C 177/00

U.S. Cl. 260—514 D

6 Claims

1. A compound of the formula

wherein R is hydrogen or lower alkyl; R_1' is lower alkyl; R_4 is OR_7 ; R_7 is hydrogen, lower alkanoyloxy, benzyloxy, benzyl, tetrahydropyranyl, alpha-lower alkoxy lower alkyl or trilower alkyl silyl; R_5 is hydrogen or lower alkyl; and R_6 is lower alkyl, hydrogen or fluoro; with the proviso that R_4 and R_5 are not both hydrogen; or enantiomers or racemates thereof.

4,052,447

PROCESS FOR THE PREPARATION OF BICYCLOALKANE DERIVATIVES

Helmut Dahl, and Hans Peter Lorenz, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

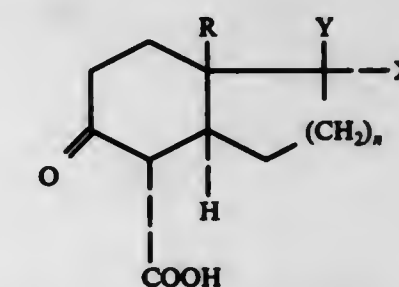
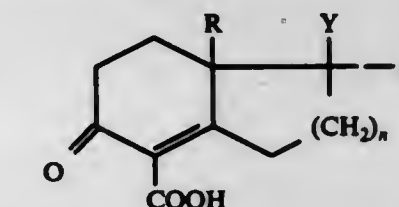
Continuation of Ser. No. 461,279, April 16, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 641,998 Claims priority, application Germany, Apr. 18, 1973, 2320285; Feb. 25, 1974, 2409597

Int. Cl.² C07C 51/36

U.S. Cl. 260—514 G

6 Claims

1. In a process for the production of a bicycloalkane derivative of the formula

wherein n is the integer 1 or 2; R is methyl or ethyl, and X and Y collectively are oxo, alkylendioxy of 2-6 carbon atoms inclusive and 2-3 bridging carbon atoms or phenylendioxy or X is a hydrogen atom and Y is hydroxy, alkoxy of 1-6 carbon atoms, inclusive, or acyloxy wherein acyl is the acyl radical of a hydrocarbon carboxylic acid of 1-8 carbon atoms, inclusive, by the hydrogenation of a compound of the formulawherein n , R , X and Y have the values given above, with hydrogen and a palladium-, platinum-, or rhodium-containing hydrogenation catalyst, the improvement which comprises hydrogenating the starting compound as its alkali metal salt in water at about 0° C.

4,052,448

ORGANIC ACIDS AND PROCESS FOR PREPARING SAME

J. Gustav Schulz, Pittsburgh, and Edward T. Sabourin, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 16, 1976, Ser. No. 696,752

Int. Cl.² C07C 63/33; C08J 9/14

U.S. Cl. 260—515 H

7 Claims

1. A process for preparing a mixture of polycyclic aromatic polycarboxylic acids carrying nuclear nitro groups that is soluble in acetone but insoluble in water which comprises subjecting a slurry containing coal to reaction with aqueous nitric acid having a concentration of about 5 to about 90 percent at a temperature of about 15° to about 200° C. for about

4,052,457

3,7,11,11-TETRAMETHYL-SPIRO-[5,5]UNDECA-8-ENE-1-ONE

Akira Nagakura, Kawaguchi; Michio Moroe, Musashino; Yasuo Koyama, and Haruki Kurihara, both of Tokyo, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1975, Ser. No. 636,858

Claims priority, application Japan, Dec. 2, 1974, 49-138613; Dec. 2, 1974, 49-138614

Int. Cl.² C07C 45/00, 49/48, 49/54

U.S. Cl. 260—586 G

5 Claims

1. 3,7,11,11-tetramethyl-spiro[5,5]undeca-8-ene-1-one.
2. A process of producing 3,7,11,11-tetramethyl-spiro[5,5]undeca-8-ene-1-one which comprises reacting pulegone and piperylene in an inert solvent under Diels-Alder reaction conditions in the presence of a Lewis-acid catalyst.

4,052,458

PROCESS FOR PREPARING 2-(1-CYCLOHEXYNYL)-CYCLOHEXANONE

Joseph F. M. Klein, Bunde; Petrus A. M. J. Stijfs, Munstergeleen, and Jozef A. Thoma, Sittard, all of Netherlands, assignors to Stamcarbon B.V., Geleen, Netherlands

Filed Jan. 16, 1976, Ser. No. 649,575

Claims priority, application Netherlands, Jan. 17, 1975, 7500549

Int. Cl.² C07C 45/00

U.S. Cl. 260—586 C

4 Claims

1. In a process for preparing 2-(1-cyclohexenyl)-cyclohexanone including condensing cyclohexanone in the presence of a strong acid ion exchange catalyst and removing the water formed by distillation of the resulting reaction mixture, the improvement comprising conducting the condensation with a macro-porous ion exchange resin at atmospheric pressure and a temperature of about 50° to 125° C., the macro-porous ion exchange resin comprising a sulfonated copolymer of styrene having 15 to 20% by weight of divinyl benzene therein, and pores having an average pore size in excess of 100Å in diameter, or an internal surface area greater than 30 square meters per gram, or both, contacting the cyclohexanone with the macro-porous ion exchange resin at a space velocity from 660 to 1320 grams of cyclohexanone per gram of resin per hour, continuing the condensation such that the conversion of the cyclohexanone is maintained at 50% or less, separating the ion exchange resin from the reaction mixture and distilling the reaction mixture to remove the water formed in the absence of the ion exchange resin and recovering the 2-(1-cyclohexenyl)-cyclohexanone product.

4,052,459

PROCESS FOR THE MANUFACTURE OF ALKYLACETOPHENONES

Pierre Malfroid, Jemeppe-sur-Sambre, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed July 9, 1975, Ser. No. 594,223

Claims priority, application France, July 16, 1974, 74.25123

Int. Cl.² C07C 49/78

U.S. Cl. 260—592

12 Claims

1. In a process for the manufacture of alkylacetophenones wherein (1) benzene is acylated by means of an acylating agent selected from the group consisting of anhydrides and chlorides of aliphatic organic acids in order to obtain an alkylphenylketone, (2) the alkylphenylketone thus obtained is hydrogenated catalytically in order to obtain the corresponding alkylbenzene and (3) the alkylbenzene thus obtained is acetylated by means of an acetylating agent selected from the group consisting of acetic anhydride and acetyl chloride in order to obtain the corresponding alkylacetophenone, the improvement wherein the three reactions involving (1) alkylation, (2) hydrogenation and (3) acetylation are carried out in only one solvent selected from the group consisting of chlorinated aliphatic hydrocar-

bons containing 1 to 3 carbon atoms and 2 or 3 chlorine atoms per molecule, and their mixtures.

4,052,460

PRODUCTION OF 3,3-DIMETHYL-2-OXO-BUTYRIC ACID SALT

Karlfrid Dickoré, Leverkusen; Hans Dieter Engels, Solingen; Hans Kratzer, Wuppertal, and Walter Merz, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 20, 1976, Ser. No. 650,651

Int. Cl.² C07C 45/00, 49/16

U.S. Cl. 260—593 H

2 Claims

1. A process comprising introducing into pinacolone twice the molar amount of chlorine, the exothermic reaction mass being cooled initially to maintain the temperature below about 50° C until about 60 to 80% of the chlorine has been introduced, then heating the reaction mass during introducing of the remainder of the chlorine, with the temperature being raised during heating to a final temperature above 50° C, the temperature being kept high enough to maintain the mass in liquid state, thereby to produce dichloropinacolone, and terminating chlorine introduction when the dichloropinacolone content of the reaction mass is at least about 97%.

4,052,461

HYDROFORMYLATION PROCESS

Harold Burnham Tinker, Zurich, Switzerland, and Donald E. Morris, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 546,227, Feb. 3, 1975, abandoned, and Ser. No. 466,660, March 3, 1974, abandoned, and Ser. No. 310,621, Nov. 29, 1972, abandoned. This application Apr. 4, 1975, Ser. No. 565,167

Int. Cl.² C07C 47/48; B01J 21/02

U.S. Cl. 260—599

29 Claims

1. In an improved process for the production of aldehydes, by the reaction of a olefinically unsaturated hydrocarbon having from 2 to 30 carbon atoms, carbon monoxide, and hydrogen at a total pressure of from 4.6 to 142 kg/cm², and at a temperature of from about 60° C to about 180° C, the improvement which comprises contacting the said reactants in the presence of a solution of a rhodium catalyst, in which said catalyst is provided by (I) introducing rhodium into the reaction solution in the form of an ionic rhodium compound, the said ionic compound consisting of (a) a rhodium-containing cation having rhodium complexed with ligands selected from the group consisting of:

mono-enes of 2 to 12 carbon atoms,
dienes of 4 to 12 carbon atoms,
trienes of 6 to 16 carbon atoms,
alkynes of 2 to 12 carbon atoms,
ketones of 3 to 12 carbon atoms,
nitriles of 2 to 12 carbon atoms,
N-alkylamides of 2 to 12 carbon atoms,
N,N-dialkylamides of 3 to 12 carbon atoms,
sulfoxides of 2 to 12 carbon atoms,
tertiary phosphines and phosphites of 3 to 90 carbon atoms,
tertiary arsines and arsenites of 3 to 90 carbon atoms,
tertiary stibines and stibites of 3 to 90 carbon atoms,
carbon monoxide, and combinations thereof,

and (b) BPh₄⁻; and (2) furnishing to the reaction solution at least two moles of a modifying ligand per mole of ionic rhodium compound where the modifying ligand is furnished either pre-coordinated in the said ionic rhodium compound or as a free compound; and where the modifying ligand, is selected from the group consisting of tertiary phosphines and phosphites, arsines and arsenites, stibines, and stibites, having from 3 to 90 carbon atoms.

4,052,462

CATALYST COMPOSITION FOR OXIDATION OF OLEFINS

Kouzou Sakakibara; Iwao Abe; Takushi Yokoyama, and Kazuyuki Matuokadecare, all of Saitama, Japan, assignors to Daicel Ltd., Osaka, Japan

Continuation of Ser. No. 363,521, May 24, 1973, abandoned.

This application Nov. 17, 1975, Ser. No. 632,358

Claims priority, application Japan, June 9, 1972, 47-57421

Int. Cl.² C07C 45/16

U.S. Cl. 260—604 R

7 Claims

1. In a process for preparing an α,β -unsaturated aldehyde by the gas phase catalytic oxidation of the corresponding α,β -unsaturated olefinic hydrocarbon, which comprises contacting a gas phase mixture of said olefinic hydrocarbon and molecular oxygen, with a catalyst composition consisting essentially of a carrier having deposited thereon a mixture of at least two metal oxides, at least one of which is molybdenum oxide in an amount of at least about 25% by weight, based on the total metal oxides, and the other metal oxide or metal oxides also being present in an amount of at least 25% by weight, based on the total metal oxides, the improvement which comprises; the carrier of said catalyst composition consists of silica having a specific surface area of 250 m²/g up to 700 m²/g, the catalyst composition has a specific surface area in the range of from 150 m²/g to 200 m²/g, and the reaction temperature is in the range of from about 310° to about 340° C.

4,052,463

PROCESS FOR PREPARING TERTIARY PHOSPHINE SULFIDES AND OXIDES

Eugene H. Uhlig, Plessantville, N.Y., and Arthur D. F. Toy, Stamford, Conn., assignors to Stauffer Chemical Company, Westport, Conn.

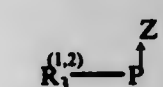
Filed Oct. 6, 1975, Ser. No. 619,744

Int. Cl.² C07F 9/53

U.S. Cl. 260—606.5 P

7 Claims

1. A method of preparing compounds of the formula:



(I)

wherein R^(1,2) is selected from the group consisting of C₁ to C₇ alkyl; the aryl substituted derivatives thereof, said aryl substituted derivatives having 1 or 2 fused rings; cycloalkyl of 5 - 6 carbons in the ring; aryl of up to 3 fused rings; biphenyl and the C₁ to C₄ alkyl substituted derivatives of said cycloalkyl, aryl and biphenyl and Z is selected from the group consisting of sulfur and oxygen, provided that when Z is oxygen R^(1,2) is methyl, comprising contacting under at least an autogenous pressure at a temperature of from about 200° C. to about 400° C. a reactant of the formula:



(II)

wherein R¹ and R² are the same or different and have the same definition as R^(1,2) as defined above and Z is as defined above, with elemental phosphorus in the presence of a catalyst selected from the group consisting of iodine, alkyl halide, aryl halide and iodide salt.

4,052,464

PROCESS FOR THE MANUFACTURE OF DI-T-BUTYLPEROXY KETALS

Duane B. Priddy, Coleman, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 21, 1975, Ser. No. 597,792

Int. Cl.² C07C 179/06

U.S. Cl. 260—610 C

3 Claims

1. In a method for the preparation of ethylbenzene soluble di-t-butylperoxy ketals from a ketone and tertiarybutyl hydroperoxide in the presence of an acidic catalyst wherein the ketone and tertiarybutyl hydroperoxide in a molar ratio of 1:2½

to 1:4 and acidic catalyst such as sulfuric acid, para-toluene sulfonic acid, phosphoric acid, dodecylbenzenesulfonic acid, dodecylphosphoric acid, oxalic acid are dispersed in a solvent at a temperature 30°-80° C below the decomposition temperature of the desired di-t-butylperoxy ketals and under a pressure from 20 to 100 millimeters mercury, a pressure sufficiently low that water is removed from the reaction mixture and condensed at a location remote from the reaction mixture to thereby convert at least a major portion of the ketone to the corresponding di-t-butylperoxy ketals, the improvement which comprises employing ethylbenzene in proportions of about 1 to 10 times by weight of the ketone as the solvent conducting the reaction in the presence of an excess of tertiarybutyl hydroperoxide, removing water from the reaction mixture by azeotropic distillation with ethylbenzene and removing at least a major portion of the excess tertiarybutyl hydroperoxide by azeotropic distillation with ethylbenzene to provide a solution containing at least one di-t-butylperoxy ketal and ethylbenzene.

4,052,465

PREPARATION OF ORGANIC PEROXIDES

Lodewijk Roskott, Gossel, and Arnold Schroeder, Deventer, both of Netherlands, assignors to Akzona, Incorporated, Asheville, N.C.

Filed Dec. 18, 1973, Ser. No. 425,856

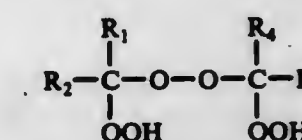
Claims priority, application United Kingdom, Dec. 22, 1972, 59395/72

Int. Cl.² C07C 179/02, 179/06

U.S. Cl. 260—610 R

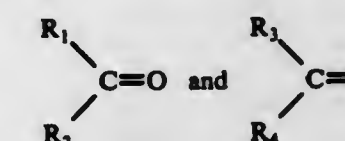
10 Claims

1. A process for preparing an organic peroxidic composition, consisting essentially of a compound having the general formula



wherein R₁ and R₄ each are selected from the group consisting of hydrogen and a lower alkyl group, R₂ and R₃ may be the same or different and each is selected from the group consisting of branched alkyl group having from 1 to 12 carbon atoms, an unbranched alkyl group having from 1 to 12 carbon atoms, a branched alkyl group having from 1 to 12 carbon atoms substituted with a group selected from the group consisting of hydroxy, lower alkoxy, lower alkoxy carbonyl, halogen and phenyl, an unbranched alkyl group having from 1 to 12 carbon atoms substituted with a group selected from the group consisting of hydroxy, lower alkoxy, lower alkoxy carbonyl, halogen and phenyl; phenyl, phenyl substituted with a group selected from the group consisting of lower alkoxy and halogen, and wherein R₁ together with R₂, R₃ together with R₄ form a branched or unbranched alkylene group having a total 12 carbon atoms and 5 or 6 carbon atoms in the nucleus, and wherein R₁ together with R₄ form a lower alkylene group, comprising

reacting carbonyl compounds having the formulae



wherein the symbols R₁, R₂, R₃ and R₄ have the meanings as defined, with hydrogen peroxide in an organic solvent, which forms an azeotrope with water and wherein both the starting carbonyl compound and the peroxidic composition formed are substantially soluble, said solvent being other than the starting carbonyl compound,

in the presence of an acid catalyst selected from the group consisting of mineral acids, strong organic acids, and strong acid ion exchangers, in an amount of 0.2-200 mg equivalent per mole of said carbonyl compounds, at a temperature of 10°-50° C. while simultaneously removing water by distillation under reduced pressure.

4,052,466

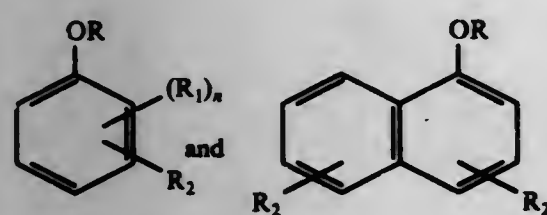
PROCESS FOR THE PREPARATION OF BISPHENOL-A
Kwok K. Sun, Hamden, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 27, 1976, Ser. No. 726,835
Int. Cl.² C07C 37/20, 37/00, 39/16

U.S. Cl. 260-619 A

25 Claims

1. In a process for the preparation of Bisphenol A by condensing phenol and acetone in the presence of acidic catalyst the improvement which comprises employing as cocatalyst, in an amount from 0.1 to 10 moles percent based on phenol, a member selected from the group consisting of compounds of the formulae:



wherein R and R₂ are independently selected from the class consisting of hydrogen and lower-alkyl, R₁ is selected from the class consisting of hydroxyl, lower-alkoxy and lower-alkyl, R₃ is selected from the class consisting of hydrogen, hydroxyl, lower-alkoxy and lower-alkyl and n is an integer from 1 to 2.

4,052,467

CATALYTIC REDUCTION OF ALDEHYDES TO ALCOHOLS

King L. Mills, and Roy V. Denton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Continuation-in-part of Ser. No. 681,590, Nov. 8, 1967, abandoned. This application Sept. 18, 1970, Ser. No. 73,584

Int. Cl.² C07C 29/14, 29/24, 29/16

U.S. Cl. 260-638 B

7 Claims

1. A process for reducing an aldehyde to the corresponding alcohol in a hydroformylation process derived liquid feed containing at least 1 weight percent of said aldehyde and further containing at least 10 ppm and up to 1 weight percent of sulfur in the form of ring-type sulfur compounds, said aldehyde containing up to 30 carbon atoms per molecule, which comprises contacting said liquid feed under substantially liquid conditions in admixture with H₂ in an amount sufficient to hydrogenate said aldehyde at a temperature in the range of 450° to 550° F., a pressure in the range of 800 to 1200 psig sufficient to maintain substantially a liquid phase, and a liquid hourly space rate in the range of 1.0 to 1.5, with a catalyst comprising a mixture of the oxides or hydroxides of Zn and Cu reduced by treatment with CO, H₂, or mixture, wherein said catalyst initially contains 40 to 90 weight percent ZnO and 60 to 10 weight percent CuO exclusive of support, if any, prior to said reduction, and wherein said treatment with CO, H₂, or mixture is conducted at about 400° F. to 800° F.

4,052,468

PROCESS FOR THE PRODUCTION OF CHLOROFLUORINATED CYCLOALIPHATIC HYDROCARBONS

James Oliver Peterson, Snyder; Bernard Sukornick, Williams-ville; Richard Francis Sweeney, Elma; Henry R. Nychka, East Aurora; Richard E. Elbeck, Orchard Park, all of N.Y., and Morris B. Berenbaum, Summit, N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 22, 1975, Ser. No. 642,835

Int. Cl.² C07C 23/06

U.S. Cl. 260-648 F

57 Claims

1. The process for the production of chlorofluorinated cycloaliphatic hydrocarbons which comprises reacting a gaseous mixture of a starting material selected from a cycloaliphatic hydrocarbon and a cycloaliphatic hydrohalocarbon in which the halo atoms are selected from chloro and fluoro, or mixtures thereof, at least .25 mole oxygen in an oxygen-containing gas for each C-H bond in the starting material, at least 0.50 mole HCl or equivalent amount of Cl₂ for each C-H bond and C=C bond present in the starting material, and HF, in the presence of a Deacon catalyst supported by a stable, inert metal salt carrier, with the weight percentage of cation in the Deacon catalyst ranging from about 0.6-20 based on the total cation content of the Deacon catalyst and metal salt carrier, at elevated temperatures and with a contact time of from about 0.1-20 seconds.

4,052,469

ETHYLFLUORIDE PRODUCTION

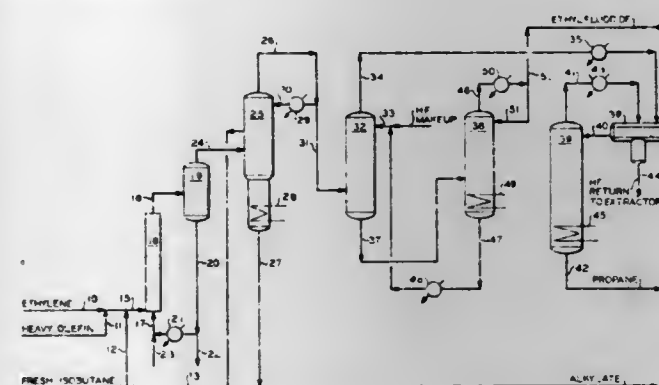
Thomas Hutson, Jr., and Cecil O. Carter, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1975, Ser. No. 578,041

Int. Cl.² C07C 19/08

U.S. Cl. 260-653.6

9 Claims



1. A process for the production of ethylfluoride which comprises reacting ethylene with hydrogen fluoride under conditions which produce ethylfluoride as the major or primary product and in the presence of at least one heavier C₃ and C₄ olefin in a minor amount ranging from 0.01 to 30 weight percent of the total olefin present which is sufficient to increase the conversion and improve the selectivity of the reaction.

4,052,470

PROCESS FOR THE PRODUCTION OF CHLOROFLUORINATED ACYCLIC HYDROCARBONS
Henry R. Nychka, East Aurora; Richard E. Elbeck, Orchard Park, both of N.Y., and Morris B. Berenbaum, Summit, N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 22, 1975, Ser. No. 642,874

Int. Cl.² C07C 19/08

U.S. Cl. 260-653.7

74 Claims

1. The process for the production of chlorofluorinated acyclic hydrocarbons which comprises reacting a gaseous mixture of a starting material selected from an acyclic hydrocarbon containing up to four carbon atoms and an acyclic hydrohalo-

carbon containing up to four carbon atoms in which the halo atoms are selected from chloro and fluoro, or mixtures thereof, at least 0.25 mole oxygen in an oxygen-containing gas for each C-H bond in the starting material, at least 0.50 mole HCl or equivalent amount of Cl₂ for each C-H bond and C=C bond present in the starting material, and HF, in the presence of a Deacon catalyst supported by a stable, inert metal salt carrier, with the weight percentage of cation in the Deacon catalyst ranging from about 0.6-20 based on the total cation content of the Deacon catalyst and metal salt carrier, at elevated temperatures and with a contact time of from about 0.1-20 seconds.

4,052,471

PROCESS FOR CHLORINATING C₁ TO C₃₀ LINEAR HYDROCARBONS

Mason P. Pearsall, Houston, Tex., assignor to Pearsall Chemical Corporation, Houston, Tex.

Filed Aug. 6, 1975, Ser. No. 602,244

Int. Cl.² C07C 17/02, 17/08, 17/10

U.S. Cl. 260-660

9 Claims

1. A process for chlorinating hydrocarbons comprising: intimately mixing a substantially linear liquid long chain hydrocarbon having 8 to 30 carbon atoms with water in a weight ratio of 0.09:1 to 10:1, feeding said mixture of hydrocarbon and water to a reactor, adding 2 to 20 moles chlorine per mole of hydrocarbon to said mixture in countercurrent flow to said mixture at a rate of 20 to 600 grams per hour per kilogram of hydrocarbon, contacting said hydrocarbon, water and chlorine for from 0.5 to 10 hours at a temperature in the range of 50° to 150° C and separating an organic phase containing chlorinated hydrocarbons.

4,052,472

MORDENITE CONVERSION OF ALKANOLS TO PENTA- AND HEXAMETHYL BENZENES

Edwin Neil Given, Pitman; Charles Joseph Plank, Woodbury, and Edward Joseph Rosinski, Pedricktown, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 16, 1976, Ser. No. 649,771

Int. Cl.² C07C 1/20

U.S. Cl. 260-668 B

8 Claims

1. A method for converting aliphatic oxygenated organic compounds to hydrocarbon mixtures, which comprises: contacting a feed comprising one or more oxygenated organic compounds selected from the group consisting of methanol and methyl ethers of the lower alkanols with a mordenite catalyst having a silica to alumina ratio greater than 15 and a constraint index of less than about 1, said contacting being at a temperature from about 500° F. to about 850° F., a pressure of 0.1 atmosphere to 50 atmospheres, and a W.H.S.V. of 0.1 to 30; and converting at least about 80% of said oxygenated organic compounds to water and a hydrocarbon mixture containing less than 10 weight percent methane and more than about 50% of C₉, C₁₀ and heavier aromatics.

4,052,473

PROCESS FOR PRODUCING LIQUID POLYMER

Yoshiharu Yagi, Toyonaka; Seimei Yasui, Ibaraki; Hiroshi Sato, Takatsuki; Takano Nobu, Takatsuki, and Michio Yamamoto, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 425,701, Dec. 18, 1973, abandoned. This application Nov. 24, 1975, Ser. No. 634,508

Claims priority, application Japan, Mar. 9, 1973, 48-28142

Int. Cl.² C07C 3/10

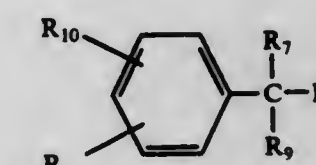
U.S. Cl. 260-669 P

11 Claims

1. A process for producing a liquid polymer of isoprene or a copolymer of isoprene and an aromatic vinyl compound having a molecular weight of at least 200 which comprises polymerizing isoprene or copolymerizing isoprene with an aro-

matic vinyl compound in the presence of 0.01 to 100 moles of ethylene, propylene or a mixture thereof, per mole of isoprene, and in the presence of a catalyst system comprising:

- at least one nickel compound selected from the group consisting of a nickel salt of a carboxylic acid, nickel chloridepyridine complex, trisdipyridylnickel chloride, bisethylenediaminenickel sulfate, bisacetylacetonatonickel, bis(ethyl acetoacetato)nickel, bisdimethylglyoximatonicnickel, bis(π-allyl)nickel, bis(π-methallyl)nickel, bis(π-crotyl)nickel, bis(π-cyclooctenyl)nickel, bis(π-cyclopentenyl)nickel and tetracarbonyl nickel, and
- at least one organometallic compound selected from the group consisting of:
 - an alkylaluminum halide of the formula: R_nAlX_{3-n}, wherein R is alkyl or alkylaryl having 1 to 20 carbon atoms or phenyl, X is chlorine, bromine, or iodine and n is 1 or 2, and
 - a combination of (b₁) at least one compound selected from the group consisting of (i) an organoaluminum compound of the formula AlR₁R₂R₃, wherein R₁ is hydrogen, fluorine, alkyl, cycloalkyl, aryl or aralkyl and R₂R₃ are each alkyl, cycloalkyl, aryl or aralkyl; (ii) an organomagnesium or organozinc compound of the formula (R₄)₂M, wherein M is magnesium or zinc and R₄ is alkyl, cycloalkyl, aryl or aralkyl; and (iii) an organolithium compound of the formula R₅Li, wherein R₅ is alkyl, cycloalkyl, aryl or aralkyl, and (b₂) at least one halogen compound selected from the group consisting of (i) a chloride, bromide or iodide of a metal belonging to Group III, IV, V or VI in the Periodic Table, or an ether complex, ester complex or aldehyde complex thereof; (ii) is hydrogen halide or the formula HX, wherein X is chlorine, bromine or iodine; (iii) on alkylmetal halide of the formula (R₆)_nMX_{3-n}, wherein M is a metal of Group III or IV in the Periodic Table, R₆ is alkyl, X is chlorine, bromine or iodine and n is 1 or 2; (iv) a halide of an aliphatic or alicyclic hydrocarbon; (v) a compound of the formula:



wherein R₇ is chlorine, bromine or iodine, R₈ and R₉ are each hydrogen, chlorine, bromine, iodine, lower alkyl or phenyl and R₁₀ and R₁₁ are each hydrogen, halogen, lower alkyl or halogen-substituted lower alkyl; (vi) an alkynyl halide; (vii) a ketone containing chlorine or bromine; and (viii) a halogen-containing allyl compound of the formula R₁₂CH=CHCH₂X, wherein R₁₂ is hydrogen or an aliphatic hydrocarbon having 1 to 6 carbon atoms and X is chlorine, bromine or iodine.

4,052,474

TOLUENE DISPROPORTIONATION PROCESS USING AN UNSUPPORTED PERFLUORINATED POLYMER CATALYST

James D. McClure, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 663,897, March 4, 1976, Pat. No. 4,022,847.

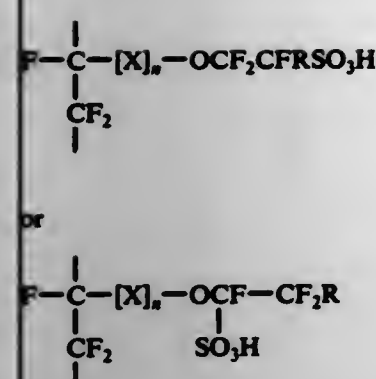
This application Dec. 20, 1976, Ser. No. 752,351

Int. Cl.² C07C 3/62

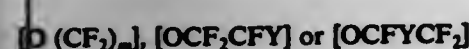
U.S. Cl. 260-672 T

3 Claims

1. A process for the catalytic disproportionation of toluene which comprises contacting a toluene feed stream in a reaction zone at a temperature of between about 150° C and 225° C with an unsupported solid perfluorinated polymer catalyst wherein said catalyst contains a repeating structure selected from the group of:



where n is 0, 1 or 2; R is a radical selected from the group consisting of fluorine and perfluoroalkyl radicals having from 1 to 10 carbon atoms; and X is selected from the group consisting of:



where m is an integer from 2 to 10 and Y is a radical selected from the class consisting of fluorine and the trifluoromethyl radical.

4,052,475

TOLUENE DISPROPORTIONATION PROCESS USING A SUPPORTED PERFLUORINATED POLYMER CATALYST

James D. McClure, and Stanley G. Brandenberger, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

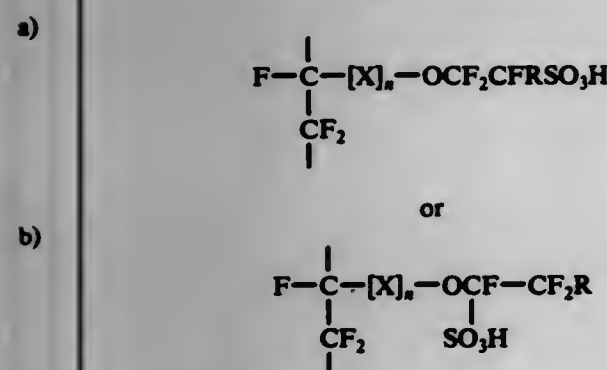
Division of Ser. No. 663,956, March 4, 1976. This application Apr. 1, 1977, Ser. No. 783,908

Int. Cl.² C07C 3/62

U.S. Cl. 260—672 T

7 Claims

1. A process for the catalytic disproportionation of toluene which comprises contacting a toluene feed stream in a reaction zone at a temperature of between about 150° C and 225° C with a catalyst composition comprising a solid perfluorinated polymer catalyst supported on an inert porous carrier having an average pore diameter of between about 50 Å and about 600 Å in a weight ratio of catalyst to support of between about 0.1:100 and about 20:100 wherein said catalyst contains a repeating structure selected from the group of:



where n is 0, 1 or 2; R is a radical selected from the group consisting of fluorine and perfluoroalkyl radicals having from 1 to 10 carbon atoms; and X is selected from the group consisting of:



where m is an integer from 2 to 10 and Y is a radical selected from the class consisting of fluorine and the trifluoromethyl radical.

4,052,476 TOLUENE DISPROPORTIONATION OVER ZEOLITE CATALYST

Roger A. Morrison, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 571,122, April 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 431,519, Jan. 7, 1974, abandoned. This application Feb. 12, 1976, Ser. No. 657,411

Int. Cl.² C07C 3/62

U.S. Cl. 260—672 T

23 Claims

1. A process for effecting vapor-phase disproportionation of toluene which comprises contacting toluene with a catalyst composition comprising a crystalline aluminosilicate zeolite characterized by a silica/alumina mole ratio of greater than 12 and a constraint index within the approximate range of 1 to 12 and containing cations which are predominately hydrogen, hydrogen precursor and/or a non-noble metal of Group VIII of the Periodic Table of Elements, said toluene having been dried prior to said contacting, under conditions effective for accomplishing said vapor-phase disproportionation including a reactor inlet temperature between about 650° F and about 1100° F, a hydrogen to hydrocarbon mole ratio of between 0 and about 4, a reactor pressure between atmospheric and about 1000 psig and a weight hourly space velocity of between about 1 and about 20, whereby from about 40 to about 50 weight percent of said toluene is disproportionated and the approach to equilibrium for para-xylene in the process is greater than 100%.

4,052,477

METHOD FOR UPGRADING A FISCHER-TROPSCH LIGHT OIL

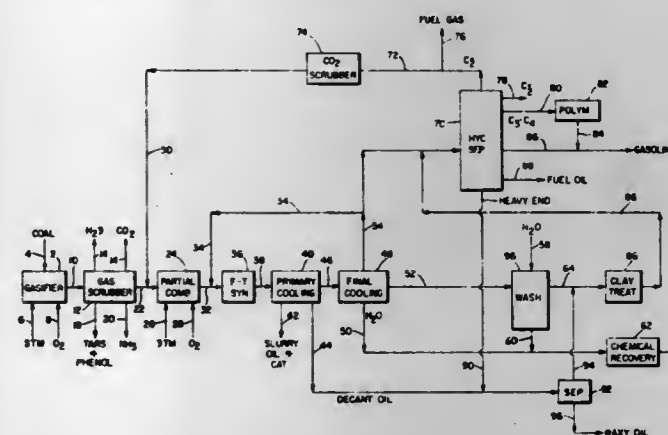
Henry R. Ireland, Woodbury; Alan W. Peters, and Thomas R. Stein, both of Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 7, 1976, Ser. No. 684,511

Int. Cl.² C07C 1/02

U.S. Cl. 260—676 R

12 Claims



1. A method for upgrading the C₅+ liquid product of a Fischer-Tropsch synthesis having an end point from about 340°–400° F which comprises hydrogenating said liquid in the presence of a hydrogenation catalyst component at conditions of temperature and pressure so as the selectively hydrogenate substantially only the diolefins contained therein and thereafter contacting said liquid at a temperature within the range of about 575° to about 850° F and at a pressure within the range of from about atmospheric to 700 psig with a crystalline aluminosilicate catalyst component characterized by a pore dimension greater than about 5 Angstroms, a silica to alumina ratio of at least 12, and a constraint index within the range of 1:12 said catalyst being presulfided prior to use, and recovering a gasoline boiling range product having an enhanced octane number.

4,052,478

METHOD FOR PREPARATION OF ALKYL-SUBSTITUTED BUTADIENES

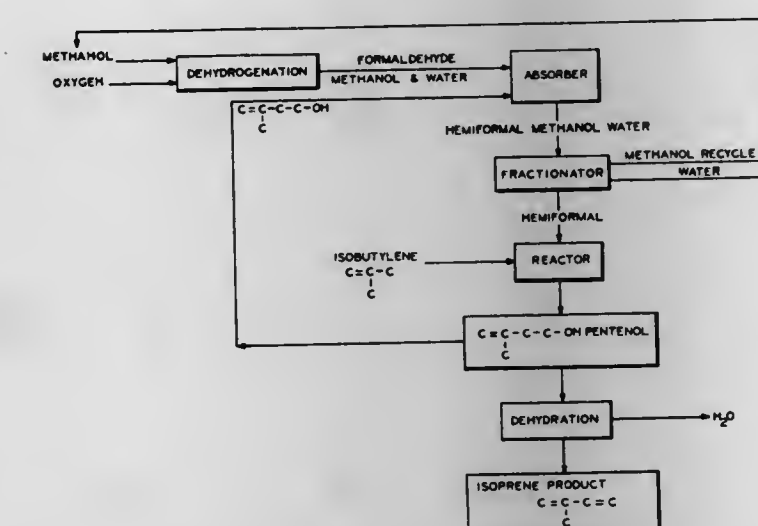
Harold M. Hawkins, deceased, late of Bartlesville, Okla., by Marjorie W. Hawkins, executrix, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 617,755, Sept. 29, 1975, Pat. No. 3,993,702. This application June 24, 1976, Ser. No. 699,548

Int. Cl.² C07C 1/24

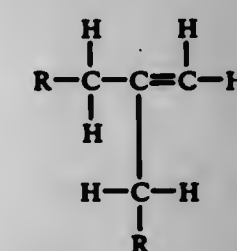
U.S. Cl. 260—681

21 Claims



1. A method for the preparation of alkyl-substituted butadienes which comprises the steps:

- oxidizing a lower alkanol at least in part to the corresponding lower aldehyde,
- contacting said lower aldehyde with an aliphatic hydrocarbyl monoolefinic alcohol, thereby forming a hemialdehyde,
- contacting said hemialdehyde with an aliphatic hydrocarbyl isomonoolefin represented by:



wherein each R is hydrogen or a saturated hydrocarbon aliphatic radical of up to 3 carbon atoms per R group, under reaction conditions, thereby forming said aliphatic hydrocarbyl monoolefinic alcohol,

- recycling a portion of said aliphatic monoolefinic alcohol to said contacting step (b), and
- dehydrating under dehydration conditions at least a further portion of said aliphatic monoolefinic alcohol under dehydration conditions, thereby forming said alkyl-substituted butadiene.

4,052,479

CONVERSION OF METHANOL TO OLEFINIC COMPONENTS

Clarence D. Chang, Princeton; William H. Lang, Pennington, both of N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 387,222, Aug. 9, 1973, Pat. No. 3,894,106, and a continuation-in-part of Ser. No. 537,043, Dec. 27, 1974, abandoned. This application May 13, 1976, Ser. No. 686,445

The portion of the term of this patent subsequent to July 8, 1992, has been disclaimed.

Int. Cl.² C07C 1/24

U.S. Cl. 260—682

6 Claims

1. A method for producing olefins from a feed selected from

the group consisting of lower alcohols, one or more ether dehydration products of lower alcohols and mixtures of one or more lower alcohols and an ether derivative thereof which comprises passing said feed in contact with a crystalline aluminosilicate zeolite having a pore dimension greater than about 5 Angstroms, a silica to alumina ratio of at least about 12, and a constraint index of about 1 to 12, said contact being carried out at a temperature within the range of 500–900° F, a pressure from atmospheric up to about 100 psi, a space velocity of 50–1000 LHSV, said temperature and space velocity being selected within said ranges so as to restrict conversion of the feed within the range of 5 to 25%, and recovering an olefin product.

4,052,480

HIGH SOLIDS COATING COMPOSITIONS CONTAINING LIQUID BISPHENOL PROPYL ETHER OF A BISPHENOL

Kazys Sekmakas, Chicago, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed June 23, 1976, Ser. No. 698,851

Int. Cl.² C08L 61/26, 61/20

U.S. Cl. 260—856

8 Claims

1. A fluid resinous coating composition containing less than about 30% of volatile organic solvent and which cures on baking, said coating composition consisting essentially of a mixture of:

- a copolymer of monoethylenic monomers including from about 5–20% of monoethylenic monomer having a functional group reactive with the N-methylol group and selected from carboxylic acid, hydroxy, and amide groups, said copolymer being produced by copolymerization in an organic solvent solution containing a major proportion of component (2) below;
- liquid bishydroxy propyl ether of a bisphenol formed by reacting propylene oxide with a bisphenol; and
- an aminoplast resin;

said copolymer constituting from about 4.5% to 35% of the mixture, the bishydroxy propyl ether constituting from about 20% to 40% of the mixture, and the balance of the mixture of the three components consisting essentially of aminoplast resin, there being at least about 0.8 parts of aminoplast resin per part of copolymer, and said copolymer being present in an amount of from about 15–80% of the weight of the bishydroxy propyl ether.

4,052,481

RESIN COMPOSITION AND A PROCESS FOR PREPARING SAME

Nakaba Asahara; Yasuhiko Asai, and Kenji Yasue, all of Uji, Japan, assignors to Unitika Ltd., Amagasaki, Japan

Filed Oct. 14, 1976, Ser. No. 732,695

Claims priority, application Japan, Oct. 15, 1975, 50-124796;

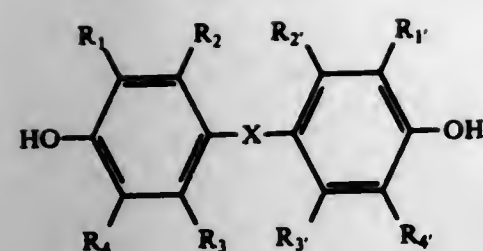
Apr. 12, 1976, 51-41635

Int. Cl.² C08L 77/00

U.S. Cl. 260—857 PE

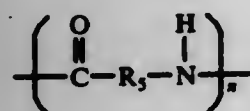
18 Claims

1. A resin composition comprising:
A. 1 to 98.9% by weight, based on the resin composition, of an aromatic copolyester comprising the reaction product in about equi-molar amounts of (1) terephthalic acid and isophthalic acid and/or the functional derivatives thereof, wherein the terephthalic acid unit/isophthalic acid unit molar ratio ranges from about 9:1 to about 1:9, and (2) a bisphenol of the following general formula

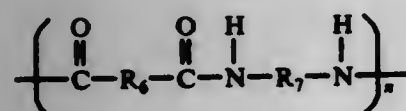


wherein X represents a member selected from group consisting of $-O-$, $-S-$, $-SO_2-$, $-SO-$, $-CO-$, and alkylene and alkylidene groups containing 1 to 4 carbon atoms, and each of R_1 , R_2 , R_3 , R_4 , R_1' , R_2' , R_3' and R_4' is selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom and an alkyl group containing 1 to 4 carbon atoms, or a derivative thereof;

B. 1 to 98.9% by weight, based on the resin composition, of a polyamide of the following general formula:

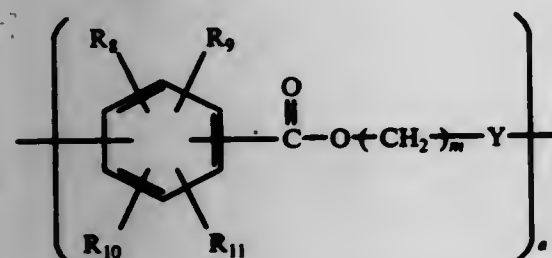


or



wherein R_5 , R_6 and R_7 each represents an alkylene group containing 4 to 11 carbon atoms and n is an integer of from 30 to 500; and

C. 0.1 to 98% by weight, based on the resin composition, of a polyalkylene phenylene ester or polyalkylene phenylene ester ether of the following formula:



wherein R_9 , R_{10} and R_{11} each represents a member selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom and an alkyl group containing 1 to 4 carbon atoms, m is an integer of from 1 to 10, n is an integer of from 30 to 500. Y is an ester unit or an ether unit.

4,052,482

VINYL CHLORIDE POLYMER COMPOSITION

Fumio Ide, Kazuo Kishida, and Akira Hasegawa, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 427,550, Dec. 26, 1973, abandoned. This application Nov. 21, 1975, Ser. No. 634,284
Claims priority, application Japan, Dec. 29, 1972, 48-1161; Mar. 13, 1973, 48-28594

Int. Cl.² C08L 31/02, 51/00

U.S. Cl. 260—578 R

5 Claims

1. A thermoplastic vinyl chloride polymer composition of improved processability which comprises

1. 70 to 99.9 parts by weight of polyvinyl chloride or a copolymer of no less than 80% by weight of vinyl chloride and no greater than 20% by weight of at least one other copolymerizable ethylenically unsaturated monomer, and

2. 0.1 to 30 parts by weight of a two stage sequentially

produced methyl methacrylate composite polymer consisting essentially of

1 to 49% by weight of component A polymerized from a monomer or a monomer mixture of 90 to 100% by weight of methyl methacrylate and 0 to 10% by weight of at least one copolymerizable unsaturated monomer, said component A having a glass transition temperature (T_g) of at least 75° C and a reduced viscosity (η_{sp}/C) of 1.8 to approximately 10 as determined at 25° C on a solution in chloroform of a concentration of 0.10g/100ml, and;

51 to 99% by weight of component B polymerized onto or in the presence of said component from a monomer mixture of 55 to 90% by weight of methyl methacrylate, 10 to 45% by weight of acrylic acid ester and 0 to 20% by weight of at least one unsaturated monomer copolymerizable with methyl methacrylate and the acrylic acid ester, said component B exhibiting, if polymerized in the absence of said component A, a glass transition temperature (T_g) of 25° to 80° C and a reduced viscosity (η_{sp}/C) of 1.8 to 10 as determined at 25° C on a solution in chloroform of a concentration of 0.10g/100ml.

4,052,483

ADHESIVE COMPOSITION AND BUTADIENE, STYRENE, ACRYLONITRILE COPOLYMER THEREFOR

George W. Feeney, Akron, and Gary L. Burroway, Doylestown, both of, OH, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 528,299, Nov. 29, 1974, Pat. No. 3,970,623.

This application May 21, 1976, Ser. No. 688,642

Int. Cl.² C08L 47/00, 9/00

U.S. Cl. 260—880 R

3 Claims

1. A copolymer of butadiene, styrene and acrylonitrile, suitable for use in a pressure sensitive adhesive, characterized by having an ultimate tensile strength in the range of about 50 to about 100 pounds per square inch and an ultimate elongation in the range of about 600 to about 1200 percent at 25° C., and further characterized by a Mooney plasticity of about 25 to about 85, a benzene solution viscosity at a 4 weight percent concentration at 25° C of about 10 to about 100 centipoises (cps) and a hexane solution viscosity at a 10 weight percent concentration at 25° C of about 200 to about 2000cps, prepared by the method which comprises (1) aqueous emulsion free radical polymerizing in the presence of a modifier composed of primary and/or tertiary mercaptans, a monomer mixture comprising about 3 to about 8 weight percent styrene, about 97 to about 92 weight percent 1,3-butadiene and about 1 to about 4 weight percent acrylonitrile based on 100 weight percent monomer mixture to a conversion of about 50 to about 75 weight percent of said monomers to a copolymer thereof, and (2) reacting an additional amount of about 2 to about 5 weight percent styrene, based on the total monomers used, with said copolymer to an extent of about 80 to about 98 weight percent conversion of the total monomers to a copolymer thereof, with additional mercaptan modifier.

4,052,484

SUBSTITUTED CYCLIC PHOSPHINE OXIDES

Reinhard Schliebs, and Hans-Dieter Block, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 13, 1976, Ser. No. 648,710

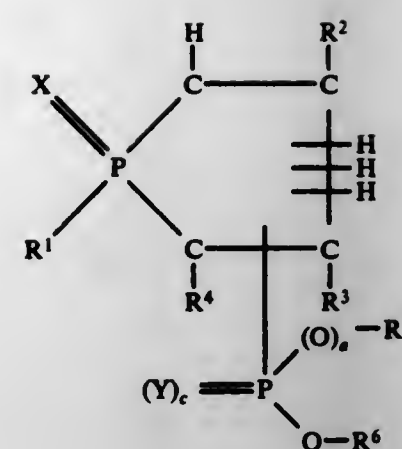
Claims priority, application Germany, Feb. 1, 1975, 2504333

Int. Cl.² C07F 9/32, 9/48

U.S. Cl. 260—927 R

2 Claims

1. A cyclic phosphine oxide of the formula



in which

R^1 is an alkyl or an aryl radical having up to 14 carbon atoms,

R^2 , R^3 and R^4 each independently is a C_1 - C_4 -alkyl radical, hydrogen, chlorine or bromine,

X and Y each independently is oxygen or sulfur,

a and c each independently is 0 or 1, and

R^5 is a C_1 - C_{12} -alkyl radical and, where $a = 0$, also an aryl radical and, where $a = 1$, also an equivalent of a cation,

R^6 is a C_1 - C_{12} -alkyl radical.

4,052,485

PERFLUORO COMPOUNDS CONTAINING PHOSPHORUS

Helmut Huber-Emden, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 18, 1972, Ser. No. 227,661

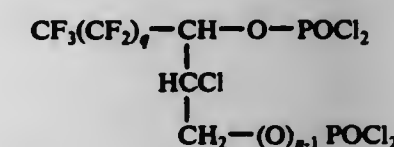
Claims priority, application Switzerland, Feb. 25, 1971, 2731/71; Dec. 29, 1971, 19121/71

Int. Cl.² C07F 9/14, 9/42

U.S. Cl. 260—928

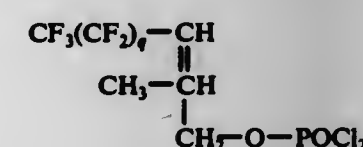
2 Claims

1. Perfluoro compounds containing phosphorus, of the formula



wherein q denotes an integer having a value of 5 to 13 and n is 1 or 2.

2. Perfluoro compounds containing phosphorus, of the formula



wherein q is an integer having a value of 5 to 13.

4,052,486

PROCESS FOR PREPARING CYCLIC PHOSPHINIC ACID ESTERS

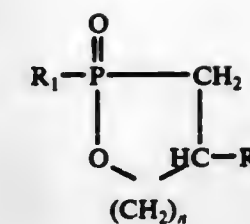
Manfred Flnke, Fischbach, Taunus, and Hans-Jerg Kleiner, Kronberg, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Continuation-in-part of Ser. No. 534,277, Dec. 19, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,745
Claims priority, application Germany, Apr. 5, 1975, 2514871

Int. Cl.² C07F 9/15

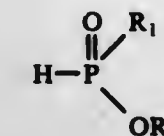
U.S. Cl. 260—970

13 Claims

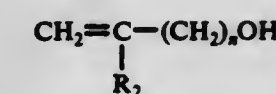
1. A process for preparing a cyclic phosphinic acid ester of the formula



wherein R_1 is an alkyl of up to 18 carbon atoms, phenyl or phenyl substituted by alkyl, halogen or alkylated amino, R_2 is hydrogen or has the same meaning as R_1 and n is 1 or 2, which comprises reacting a phosphinic acid monoester of the formula



wherein R_3 is an alkyl of up to 8 carbon atoms, or an alkyl of up to 8 carbon atoms substituted by chlorine, with an alkenol of the formula



in the presence of a catalytic quantity of a free radical forming agent at a temperature of from 100° C to 190° C.

4,052,487

DIOL-PHOSPHONATES

Georges L. Sturtz, Brest; Serge L. Lecolier, Janville-sur-Juine; Jean-Claude Clement, Brest, and Jean Marie Blehler, Brunstatt, all of France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed Apr. 22, 1975, Ser. No. 570,413

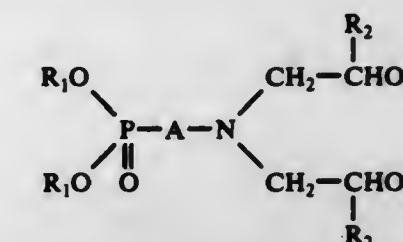
Claims priority, application France, May 13, 1974, 74.16477

Int. Cl.² C07F 9/40; C08J 9/00

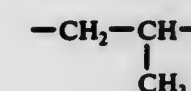
U.S. Cl. 260—945

6 Claims

1. A compound of the formula:



in which R_1 is an alkyl group with 1 to 4 carbon atoms, R_2 is hydrogen, methyl, or ethyl, and A is $-CH_2-CH_2-CH_2-$, or



4,052,488

SUPPLYING FUEL TO INTERNAL COMBUSTION ENGINES

Marthinus Johannes Schoeman, 13-14th Ave., Edenvale, Transvaal Province, South Africa

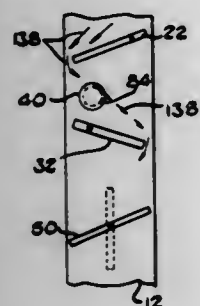
Filed Aug. 12, 1975, Ser. No. 604,002

Claims priority, application South Africa, Sept. 12, 1974, 74/5824

Int. Cl.² F02M 7/22

U.S. Cl. 261-18 A

13 Claims



1. A carburetor for an internal combustion engine including a duct connectable to a combustion charge inlet of the engine and having opposed internal wall portions which are parallel,
 - a. a vacuum inducing vane pivotally mounted about an offset pivot axis within the duct near the upstream end thereof, being biased by biasing means towards a closed position to impede airflow through the duct and being displaceable against the biasing means by airflow through the duct, thereby, during operation, to create a negative pressure downstream thereof;
 - b. a fuel control vane mounted to be displaceable by the airflow through the duct;
 - c. a control valve and a regulating valve, the valves being connected in series and being located transversely to the axis of the duct in opposed end to end relationship, the control valve being connectable to a fuel source and the regulating valve having a fuel outlet for feeding fuel into the duct, said outlet being located downstream of the vacuum inducing vane and within the concentrated airstream resulting from the airflow deflected by the vacuum inducing vane;
 - d. means linking the regulating valve to the fuel control vane so that the regulating valve is controllable in response to movement of the fuel control vane;
 - e. a butterfly valve in the duct operable by a throttle linkage and means operably connecting the butterfly valve with the control valve.

4,052,489

CARBURETOR CIRCUIT FOR INTERNAL COMBUSTION ENGINES

Roberto Jose Frey, Rua Gaspare, 450, Sao Paulo, S.P., Brazil

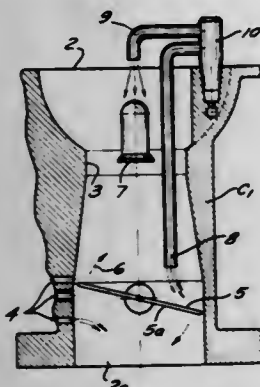
Filed Apr. 12, 1976, Ser. No. 675,907

Claims priority, application Brazil, May 15, 1975, 5500450

Int. Cl.² F02M 7/08

U.S. Cl. 261-34 A

5 Claims



1. In a carburetor circuit for an internal combustion engine,

a combination comprising a carburetor having wall means defining an intake manifold having an air inlet end, an opposite discharge end, and a throat portion between said ends, said wall means being formed in the region of said inlet end with an outlet through which fuel is fed during acceleration of said engine; a butterfly valve in said intake manifold adjacent said discharge end movable between an open and a closed position; fuel feed passages communicating with the interior of said manifold in the region of said butterfly valve for feeding fuel into the manifold during idling of the engine; first fuel injection means for injecting fuel into the region of the throat portion into the interior of the manifold during the normal operation of said engine; and second fuel injection means for feeding fuel into said manifold during acceleration of the engine and comprising a tube portion tightly inserted into said outlet, a first small diameter tube communicating with said tube portion and having an outlet end in the region of said inlet end of said manifold and a second small diameter tube communicating with said tube portion and having an outlet end closely adjacent said butterfly valve, said second small diameter tube extending through the interior of said manifold.

4,052,490

CARBURETOR WITH MANUALLY ADJUSTABLE FUEL SUPPLY

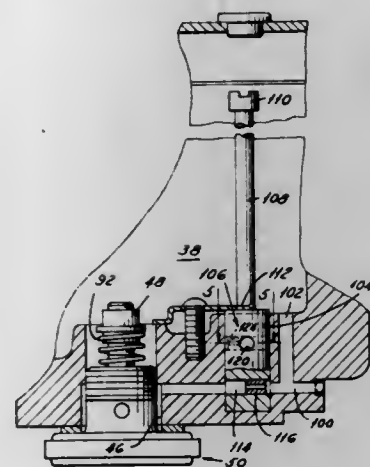
Walter W. Fedison, Ortonville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 10, 1976, Ser. No. 684,705

Int. Cl.² F02M 7/08

U.S. Cl. 261-34 A

7 Claims



1. A carburetor having an induction passage adapted to be connected to an engine intake manifold, a fuel bowl containing fuel, a first main conduit connecting the fuel bowl and induction passage for supplying the normal fuel requirements to the passage, a second conduit connected to the fuel bowl and operatively connected at times to the passage for supplying at times additional fuel to the passage, an accelerator pump connected to the fuel bowl, and third conduit means connecting the accelerator pump and passage for supplying further additional fuel to the passage in response to operation of the accelerator pump, and a single manually movable valve means operatively movably associated with both of the second and third conduits for simultaneously controlling flow of additional fuel through the second and third conduits to the passage.

4,052,491

MODULAR GAS AND LIQUID CONTACT MEANS

Marcel Robert Lefevre, Bernardsville, N.J., assignor to Research-Cottrell, Inc., Bound Brook, N.J.

Filed June 25, 1976, Ser. No. 700,029

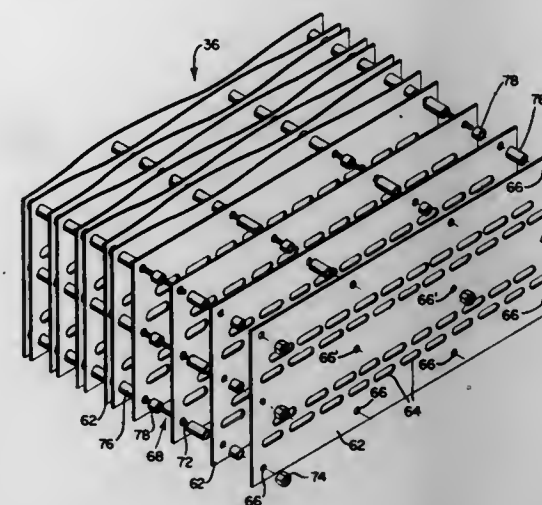
Int. Cl.² B01F 3/04

U.S. Cl. 261-112

5 Claims

1. In a cooling tower having an air inlet at its lower end, an air outlet at its upper end and an air passage extending between the air inlet and the air outlet, gas and liquid contact means in

the air passage and liquid distribution means positioned in the air passage above the gas and liquid contact means wherein the gas and liquid contact means comprise a plurality of sheet members, a plurality of sets of spacer members at least at the



peripheral margins of the sheet members maintaining the sheet members in side-by-side spaced relationship, at least two sets of the plurality of sets of spacer members having different lengths whereby the sheet members are spaced in an undulated array.

4,052,492

METHOD FOR PRODUCING PREFORMED EXPANSION JOINT FILLERS

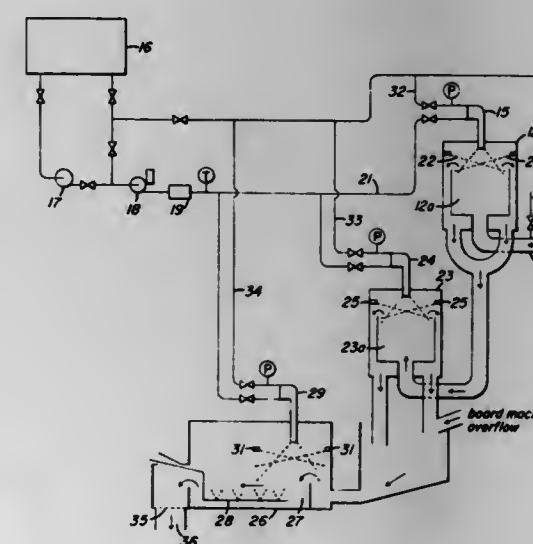
Merle E. Koutny, Portland, and Dorsey J. Morris, St. Helens, both of Oreg., assignors to Kaiser Gypsum Company, Inc., Oakland, Calif.

Filed June 16, 1975, Ser. No. 586,953

Int. Cl.² B01J 2/06

U.S. Cl. 264-6

5 Claims



1. In a method for producing preformed fiberboard expansion joint fillers wherein
 1. asphalt is heated to a liquid state,
 2. the liquid asphalt is sprayed through a first atomizing device to form a first atomized asphalt,
 3. the first atomized asphalt is passed through a first spray of cooling water whereby said first atomized asphalt is chilled and formed into a first shower of solidified asphalt particles,
 4. the shower of asphalt particles is incorporated into a cellulose-fiber-containing slurry in a first container to form an asphalt-and-cellulose-fiber-containing slurry,
 5. the asphalt-and-cellulose-fiber-containing slurry is conducted to a wire screen and wet mat formed thereon, and
 6. the wet mat dried then slit to form preformed fiberboard expansion joint fillers,
- the improvement comprising:

- a. using as the said asphalt in step (1), one having a penetration of at least 60 at 130° F, and
- b. carrying out said heating of the asphalt, in step (1), to about 350° F.

4,052,493

PROCESS FOR PRODUCING CONDUCTIVE FIBER

Sylvia Etchells, Pontypool, England, assignor to Imperial Chemical Industries Limited, Millbank, England

Filed Nov. 8, 1972, Ser. No. 304,867

Claims priority, application United Kingdom, Oct. 26, 1971, 49643/71

Int. Cl.² C08L 77/00; B29H 7/20

U.S. Cl. 264-49

7 Claims

1. A process for producing fibre which comprises melt spinning a fibre-forming polyamide having dispersed therein as a separate phase between 1% and 14% by weight inclusive of an additive which is the reaction product of a boric acid and a polyoxyalkylene material of average molecular weight within the range 600 to 30,000.

4,052,494

TRANSPARENCY FABRICATION METHOD

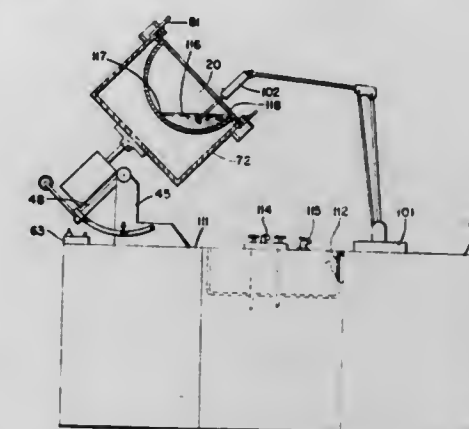
Peter P. Garrigan, Culver City; Alfred A. Gordon, Torrance, and Walter W. Watson, Rancho Palos Verdes, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Nov. 17, 1975, Ser. No. 632,695

Int. Cl.² B29C 9/00; D06P 3/00

U.S. Cl. 264-78

18 Claims



1. The process of uniformly dyeing the inside surface of a substantially hemispherically shaped transparent article for end use in a simulator visual display projection system or the like in which light is projected through said article to a screen, comprising:

- a. positioning said article concave side up with the extremities thereof level whereby the concavity can be completely filled with a dye solution;
- b. rotating said article about a central vertical axis;
- c. completely filling said article with said dye solution;
- d. mixing said dye solution while said article is rotating; and
- e. pouring said dye solution from said article when the desired color density is achieved.

4,052,495

METHOD OF OBTAINING RELEASE OF POLYURETHANE POLYMERS AND COMPOSITIONS THEREFOR

John G. Uhlmann, and Joseph A. Colquhoun, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 19, 1975, Ser. No. 578,561

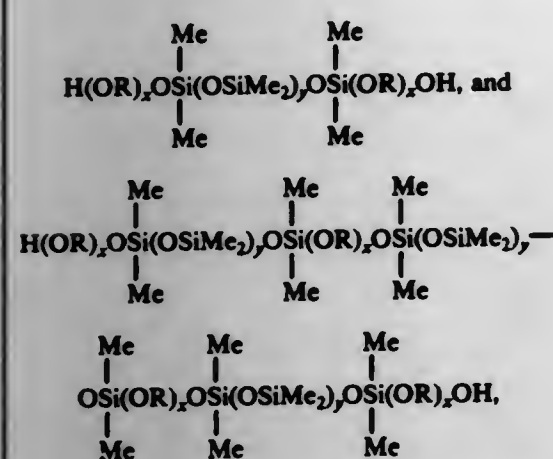
Int. Cl.² B29D 7/02; C08L 83/06

U.S. Cl. 264-216

12 Claims

1. A method of releasing non-cellular cured urethane polymers from substrates, which method consists of
 - I. introducing into an uncured non-cellular urethane poly-

mer from 0.5 to 5 weight percent based on the weight of the non-cellular urethane polymer and siloxane-polyox-yalkylene copolymer, a siloxane-polyox-yalkylene copolymer selected from the group consisting of



wherein each x has an average value of 3 to 45, each y has an average value of 8 to 198, Me is a methyl radical, wherein —OR— is a polyox-yalkylene polymer or copolymer wherein R is composed of ethylene radicals or butylene radicals and mixtures of ethylene or butylene radicals with propylene radicals, the amount of ethylene or butylene radicals relative to the propylene radicals being such that the ratio of carbon atoms to oxygen atoms in the total —OR— block ranges from 2.0/1 to 2.9/1.

- II. curing the non-cellular urethane polymer while in contact with a substrate, whereby the siloxane-polyox-yalkylene copolymer is reacted into the non-cellular urethane polymer, and
- III. releasing the cured non-cellular urethane-polymer from said substrate.

4,052,496

METHOD OF MAKING A TIRE BY FIRST MOLDING A TREAD AND THEN MOLDING SEPARATE SIDEWALLS ONTO THE TREAD

Anthony Gerald Goodfellow, Maghull, near Liverpool, England, assignor to Dunlop Limited, England

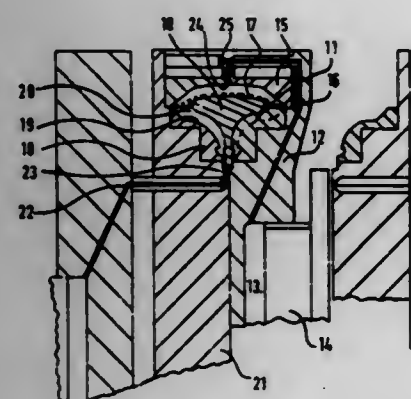
Filed May 20, 1975, Ser. No. 579,238

Claims priority, application United Kingdom, May 28, 1974, 23576/74

Int. Cl.² B29H 3/08, 5/02

U.S. Cl. 264—251

7 Claims



1. A method for the manufacture of a pneumatic tire comprising initially moulding the tread portion of the tire from uncured rubber in an annular mould cavity the radially inner surface of the cavity being a surface of a solid mould core of cured rubber and the radially outer surface of the cavity being a surface of a tread ring mould, the mould core having substantially the shape of the interior of the tire to be moulded, and being supported during moulding of the tread portion by rigid side plates which engage sidewall moulding surfaces of the core, removing said side plates after moulding said tread portion, leaving said tread portion in place between said core and

said tread ring mould, replacing said side plates by mould halves defining sidewall moulding cavities against the sidewall moulding surfaces of the core, forcing uncured rubber into the sidewall moulding cavities to mould said sidewalls onto the tread portion, and curing said rubber of said tread portion and said sidewalls.

(A)

4,052,497

METHOD OF INJECTION-MOULDING BY INJECTION OF AN ARTICLE COMPOSED OF AT LEAST THREE DIFFERENT MATERIALS

Bernard Léon Monnet, Bellignat, France, assignor to Billion S.A., Oyonnax, France

Division of Ser. No. 508,567, Sept. 23, 1974, Pat. No. 3,976,226.

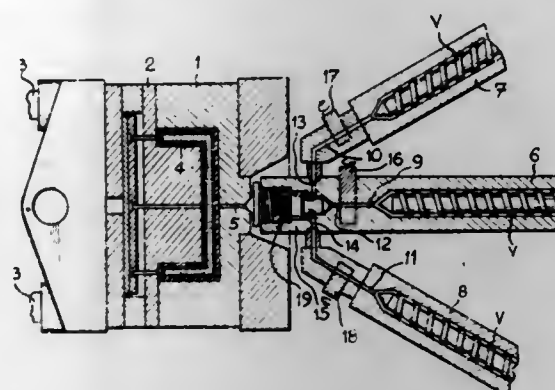
This application May 5, 1976, Ser. No. 683,384

Claims priority, application France, Sept. 21, 1973, 73.34011

Int. Cl.² B29F 1/03

U.S. Cl. 264—255

2 Claims



1. A method for manufacturing by injection molding in a mold of an article having a core, a skin and at least an intermediate layer embedding said core and being covered by said skin, said method comprising the steps of successively injecting into the mold, along the direction of the axis of a discharge channel connected to the mold, a quantity of a first material intended to form the skin of the article, stopping the injection of said first material in the channel, injecting along the same axis a quantity of a second material into the mold intended to form the intermediate layer of the article, said quantity of second material penetrating into the first material, stopping the injection of said second material in the channel, and injecting along the same axis a quantity of a third material into the mold intended to form the core of the article, said quantity of third material penetrating into the quantity of second material, the second material interposed between said first and third materials being of uniform thickness.

4,052,498

GUIDE APPARATUS FOR DEFLECTING A LINEAR STRUCTURE

Burghard Burow, Radevormwald, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Division of Ser. No. 670,142, March 25, 1976. This application Feb. 7, 1977, Ser. No. 765,998

Claims priority, application Germany, Mar. 29, 1975, 2514072

Int. Cl.² F16L 9/22

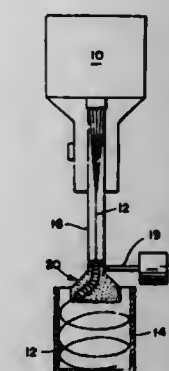
U.S. Cl. 264—261

2 Claims

1. A method utilizing an expandable mandrel for producing a filament deflecting curved guide tube within a casing, having an entry and exit opening, the guide tube being formed of a plurality of contiguous abutting segments which are held in a fixed array within said casing by means of a bonding agent, said method comprising:

inserting the segments in a predetermined order about the mandrel,

positioning said mandrel and segments within the casing so that the faces of the first and last segments about the inner surface of the casing about its entry and exit openings, twisting said segments about said mandrel to a position wherein they form the desired spatial curvature of the guide tube, applying fluid pressure to said mandrel so as to expand its diameter and thereby hold said segments in said desired position,



filling the interior of said casing with a bonding agent which hardens about said segments thereby fixing them in said desired position, relieving the fluid pressure from said mandrel so as to allow it to return to its original diameter prior to expansion, and withdrawing said mandrel from within said segment bores and casing.

4,052,499

METHOD OF REINFORCING THE HANDLE OF HOCKEY STICKS

Marcel Goupil, 948 Chasse Street; Gaston Ruel, 265 Lemire Boulevard, and Marc Ruel, 124 Biron Street, all of Drummondville, Quebec, Canada

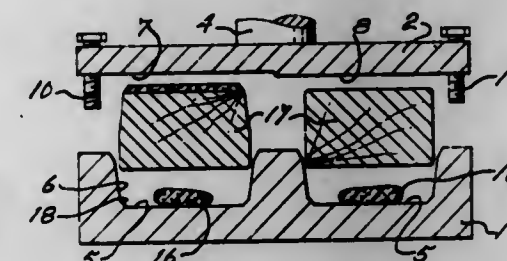
Filed July 7, 1975, Ser. No. 593,654

Claims priority, application Canada, Aug. 16, 1974, 207171

Int. Cl.² B29D 3/02

U.S. Cl. 264—265

4 Claims



1. The method of reinforcing the handle of a hockey stick comprising the steps of laying a roving of reinforcing fibers impregnated with uncured thermosetting synthetic resin longitudinally in the flat bottom of an elongated open top female solid having straight side walls flaring upwardly from said bottom and having corner faces at the junction of said bottom and side walls which are inclined relative to said bottom and side walls, using the handle of a hockey stick as a male molding part, said handle made of a compressible material selected from the group consisting of wood and foam plastic and having a substantially rectangular cross-section defining a pair of wider main faces and a pair of narrower faces, positioning said handle longitudinally in said mold and with one main face of said handle substantially parallel to said bottom and with the longitudinal edges of said main face abutting the respective side walls of said mold and retaining said main face spaced from said bottom, thereby defining a molding space between said female mold and said handle, pressing said handle towards said bottom and against said roving to cause said side walls to engage said narrower end faces of said handle and compress

said handle and seal said molding space along said side walls, and to cause said roving to flatten and to fill said molding space and to adhere to said handle main face, heat curing said resin, removing said handle from said female mold with the cured resin forming a flat layer covering and adhering to said face and having bevelled longitudinal edges, and said layer having said fibers embedded therein and longitudinally extending along said handle.

4,052,500

DRAWING ISOCYANATE-TREATED POLYESTER FILAMENTS

Robert P. Krehling, Fairfield; Donald J. Casey, Ridgefield, both of Conn., and David Z. Goldenberg, Mentor, Ohio, assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 16, 1972, Ser. No. 281,247

Int. Cl.² D01D 5/12

U.S. Cl. 264—290 T

4 Claims

1. In the process of dry heat drawing filaments of synthetic linear condensation polyester coated with an aromatic isocyanate containing at least two isocyanate groups per molecule to stretch such filaments to 4 to 7 times their undrawn length, the improvement comprising applying to the isocyanate-coated polyester filaments 0.02 to 0.4% on weight of fiber of a hydroxy-containing finish less than one hour prior to dry heat drawing said filaments by heating the filaments in air in contact with a heated surface

4,052,501

TREATMENT OF POLYESTER FILAMENTS WITH AROMATIC ISOCYANATE MIXTURE

Robert P. Krehling, Fairfield; Donald J. Casey, Ridgefield, both of Conn., and David Z. Goldenberg, Mentor, Ohio, assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 16, 1972, Ser. No. 281,248

Int. Cl.² D01D 5/12

U.S. Cl. 264—290 T

6 Claims

1. In the process, including a dry heat drawing step, of making filaments of synthetic linear condensation polyester useful as reinforcement for rubber articles wherein an organic isocyanate is applied to such filaments to improve the adhesion thereof to rubber, the improvement comprising applying, as the organic isocyanate, a mixture of 50 to 90% di-functional aromatic isocyanates, and the remainder higher than di-functional aromatic isocyanates, and then drawing said polyester filaments to 4 to 7 times their undrawn length after applying said mixture of aromatic isocyanates, said drawing step being dry heat drawing, performed by heating the filament in air in contact with a heated surface.

4,052,502

METHOD FOR MANUFACTURING BIDIRECTIONAL HYDRODYNAMIC POLYTETRAFLUOROETHYLENE SEALS

William Eugene Clark, Chelsea, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Division of Ser. No. 541,926, Jan. 17, 1975, Pat. No. 3,984,113.

This application Feb. 18, 1976, Ser. No. 659,006

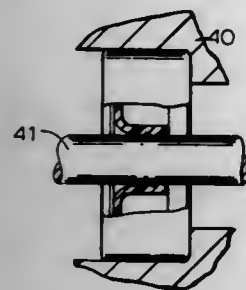
Int. Cl.² B29D 15/00

U.S. Cl. 264—293

2 Claims

1. A method for making a bidirectional hydrodynamic polytetrafluoroethylene sealing element, including in combination: providing a flat annular wafer of polytetrafluoroethylene of constant thickness and having an outer periphery and an inner periphery, coining in an annular inner portion of said wafer adjacent said inner periphery to compress said inner portion and make it thinner than the remainder of said wafer, while providing controlled areas that are coined to a lesser degree, thereby to provide a circular rib adjacent to said inner periphery projecting out from said inner portion and having an inner side on the side nearer said inner periph-

ery, and a series of straight segmental ribs spaced apart from each other and extending out from said inner portion along linear paths tangential to the inner side of said circular rib, thereby intersecting said inner rib, said segmental ribs projecting out further from the surface of said inner portion than said circular rib, and



forming said annular inner portion into a generally frustoconical shape, whereby said straight ribs appear as curved ribs, said frustoconical portion being flexed on installation on a shaft into a generally cylindrical portion where said ribs lie.

4,052,503

LOW-TEMPERATURE SYNTHESIS OF UREA

Richard L. Every, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 581,189, Sept. 22, 1966, abandoned. This application Apr. 23, 1970, Ser. No. 31,420

Int. Cl.² C01C 1/16; C07C 126/00

U.S. Cl. 423—470

8 Claims

1. A process for producing urea and ammonium chloride in high yield with a low level of impurities comprising combining as reactants phosgene and ammonia at a temperature in the range of about -70° C. to about -20° C. by adding one reactant to the other and maintaining the combination in said temperature range.

4,052,504

ASSAY FOR THYROXINE BINDING GLOBULIN

William Hertl, Corning, and Gerald Odstrchel, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 30, 1976, Ser. No. 701,191

Int. Cl.² G01N 33/00, 33/16

U.S. Cl. 424—1

6 Claims

1. A method of determining the concentration of thyroxine binding globulin in a sample, the method comprising the steps of

- adding to the sample an excess amount of thyroxine;
- analyzing the sample for thyroxine via separate immunoassays, one immunoassay being in the presence of a blocking agent and the other immunoassay being in the absence of a blocking agent to thereby establish a binding differential; and
- then correlating that differential with a standard curve which relates known thyroxine binding globulin concentrations with binding differentials.

4,052,505

OCULAR THERAPEUTIC SYSTEM MANUFACTURED FROM COPOLYMER

Takeru Higuchi, Lawrence, Kans., and Anwar Hussain, Lexington, Ky., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 582,353, May 5, 1975, which is a division of Ser. No. 281,446, Aug. 17, 1972, Pat. No. 3,903,880, which is a continuation-in-part of Ser. No. 80,531, Oct. 14, 1970, abandoned. This application July 15, 1976, Ser. No. 705,479

The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.² A61K 9/00, 9/22

U.S. Cl. 424—14

19 Claims

1. An ocular therapeutic system for the controlled release of drug comprising a flexible body formed of a polymeric material permeable to the passage of drug by diffusion and containing a drug capable of diffusing through the material at a therapeutically effective rate, the body shaped, sized and adapted for comfortable insertion and retention in the cul-de-sac of the conjunctiva between the sclera of the eyeball and the lid to be held in place against the eyeball by the pressure of the lid, and wherein said polymeric material comprises an ethylene-vinyl acetate copolymer having a vinyl acetate content of about 4 to 80% by weight, and a melt index of about 0.1 to 1000 grams per ten minutes.

4,052,506

PHARMACEUTICAL COMPOSITIONS AND METHOD OF PRODUCING ANTI-PARKINSONISM ACTIVITY

Carl Kaiser, Haddon Heights, N.J.; Robert G. Pendleton, Philadelphia, and Paulette E. Setler, Fort Washington, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

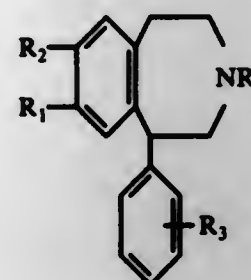
Filed Aug. 5, 1975, Ser. No. 602,042

Int. Cl.² A61K 31/33

U.S. Cl. 424—244

10 Claims

1. A method of producing anti-parkinsonism activity which comprises administering internally to an animal requiring said activity a nontoxic amount sufficient to produce said activity of a compound of the formula:



in which:

- R is hydrogen, lower alkyl of from 1 to 4 carbon atoms, hydroxyethyl or lower alkenyl of from 3 to 5 carbon atoms;
- R₁ is hydroxy, methoxy, ethoxy or alkanoyloxy;
- R₂ is hydrogen, hydroxy, methoxy, ethoxy or alkanoyloxy;
- R₃ is hydrogen, chloro, bromo, fluoro, methyl or trifluoromethyl; and
- said alkanoyl moieties have from 2 to 5 carbon atoms, provided that when R₁ and R₂ are both methoxy or ethoxy, R is hydrogen, or a pharmaceutically acceptable acid addition salt of said compound.

4,052,507

PIPERIDINESULFONYLUREA DERIVATIVES

Hans E. Wiedemann, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

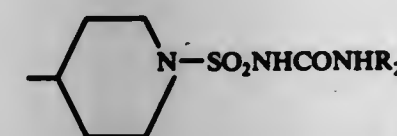
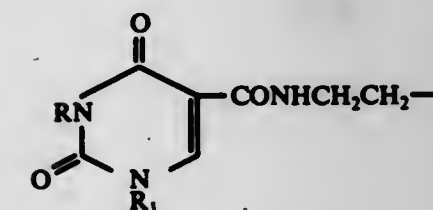
Division of Ser. No. 629,771, Nov. 7, 1975, Pat. No. 3,998,828, which is a division of Ser. No. 546,003, Jan. 31, 1975, Pat. No. 3,936,445. This application Sept. 24, 1976, Ser. No. 726,126

Int. Cl.² A61K 31/505

U.S. Cl. 424—251

12 Claims

1. A method for lowering blood sugar in the treatment of a diabetic animal, which comprises orally administering to said animal an effective blood sugar lowering amount of a compound selected from a group consisting of 1-piperidinesulfonylureas of the formula:



and the base salts thereof with pharmacologically acceptable cations, wherein R and R₁ are each alkyl having from one to three carbon atoms, and R₂ is a member selected from the group consisting of bicyclo[2.2.1]hept-5-en-2-yl-endo-methyl, bicyclo[2.2.1]hept-2-yl-endo-methyl, 7-oxabicyclo[2.2.1]hept-2-yl-endo-methyl, 1-adamantyl and cycloalkyl having from five to eight carbon atoms.

4,052,508

HETEROCYCLIC DIHYDROANTHRACEN IMINES

Paul S. Anderson, Lansdale; Marcia E. Christy, Perkase, and Gerald S. Ponticello, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

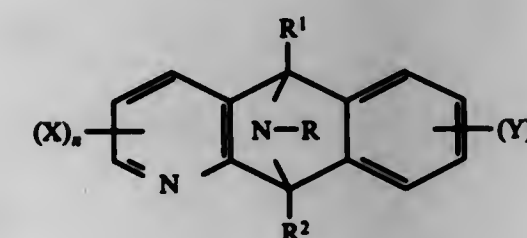
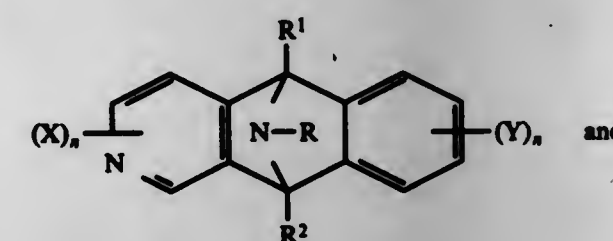
Continuation-in-part of Ser. No. 498,484, Aug. 19, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 564,012

Int. Cl.² C07D 471/08; A61K 31/395; C07D 487/08

U.S. Cl. 424—258

7 Claims

1. A compound selected from the group consisting of:



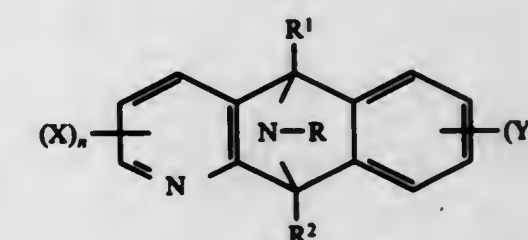
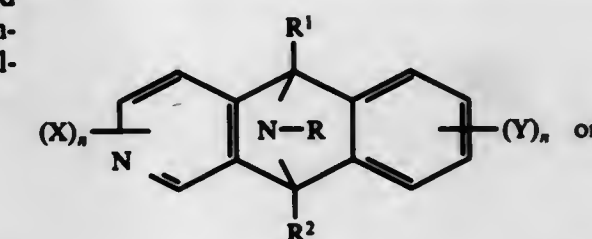
wherein

- R₁ and R₂ are selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, trifluoromethylsulfonyl, trifluoromethyl, dimethylaminopropyl; R is hydrogen or lower alkyl having from 1 to 6 carbon atoms, benzyl, dimethylaminopropyl, cyclopropyl, or cyclobutyl;
- X and Y are iodo, chloro, bromo, lower alkoxy having from

1 to 6 carbon atoms, lower alkyl having from 1 to 6 carbon atoms, thiomethyl, carboxamido, trifluoromethoxy, trifluoromethyl, trifluoromethylsulfonyl, and trifluoromethylthio;

n is an integer selected from 0 (X or Y is hydrogen), and 1.

3. A pharmaceutical composition for use as tranquilizer, muscle relaxant, anti-convulsant and/or anti-Parkinson agent in unit dosage form comprising a pharmaceutical carrier and an effective amount of a compound of formula:



wherein

R₁ and R₂ are selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, trifluoromethylsulfonyl, trifluoromethyl, dimethylaminopropyl; R is hydrogen or lower alkyl having from 1 to 6 carbon atoms, benzyl, dimethylaminopropyl, cyclopropyl, or cyclobutyl;

X and Y are iodo, chloro, bromo, lower alkoxy having from 1 to 6 carbon atoms, lower alkyl having from 1 to 6 carbon atoms, thiomethyl, carboxamido, trifluoromethoxy, trifluoromethyl, trifluoromethylsulfonyl, and trifluoromethylthio;

n is an integer selected from 0 (X or Y is hydrogen), and 1.

4,052,509

METHOD FOR REDUCING SERUM URIC ACID LEVELS

Shreekrishna M. Gaddekar, Trenton, N.J., assignor to Affiliated Medical Research, Inc., Princeton, N.J.

Division of Ser. No. 530,684, Dec. 9, 1974, Pat. No. 3,974,281, which is a continuation-in-part of Ser. No. 380,655, July 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 315,836, Dec. 18, 1972, Pat. No. 3,839,346. This application May 14, 1976, Ser. No. 686,650

Int. Cl.² A61K 31/44

U.S. Cl. 424—263

6 Claims

1. A method for reducing the uric acid level in the serum of a mammal in need of such reduction which comprises administering to said mammal a therapeutically effective amount of 5-methyl-1-phenyl-2-(1H)-pyridone.

4,052,510

4-ALKYL-2,6-DI(SECONDARY OR TERTIARY ALKYLAMINO) PYRIDINES, COMPOSITIONS THEREOF AND METHODS FOR TREATING DIABETES AND OBESITY

William R. Simpson, Mendham, and Robert J. Strohschein, Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

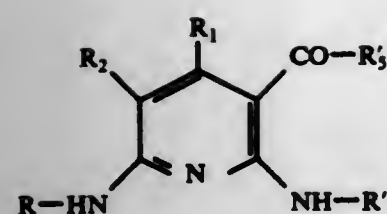
Continuation-in-part of Ser. No. 533,941, Dec. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 460,286, April 12, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,409

Int. Cl.² C07D 213/50; A61K 31/44, 31/455

U.S. Cl. 424—263

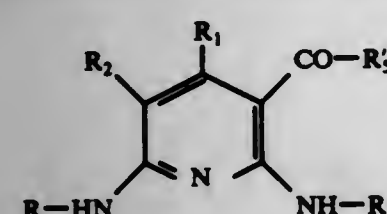
30 Claims

1. A compound having the formula



wherein

R is secondary alkyl of 3 to 7 carbon atoms or tertiary alkyl of 4 to 7 carbon atoms,
R' is secondary alkyl of 3 to 7 carbon atoms or tertiary alkyl of 4 to 7 carbon atoms,
R₁ is alkyl of 1 to 4 carbon atoms,
R₂ is hydrogen, chloro or bromo, and
R₃ is alkyl of 1 to 4 carbon atoms,
or a pharmaceutically acceptable acid addition salt thereof.
16. A pharmaceutical composition comprising a pharmaceutically effective amount of a compound of the formula



wherein

R is secondary alkyl of 3 to 7 carbon atoms or tertiary alkyl of 4 to 7 carbon atoms,
R' is secondary alkyl of 3 to 7 carbon atoms or tertiary alkyl of 4 to 7 carbon atoms,
R₁ is alkyl of 1 to 4 carbon atoms,
R₂ is hydrogen, chloro or bromo, and
R₃ is alkyl of 1 to 4 carbon atoms,
or a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier, said pharmaceutically effective amount being an amount effective for the treatment of obesity or diabetes.

4,052,511

CARBOXYACYLPROLINE DERIVATIVES

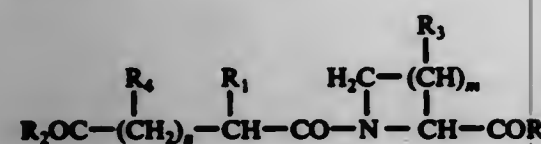
David W. Cushman, West Windsor, and Miguel Angel Ondetti, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 13, 1976, Ser. No. 657,793

Int. Cl.² A61K 31/40; C07D 207/10, 207/12

U.S. Cl. 424-274

1. A compound of the formula



wherein

R is hydroxy, amino or lower alkoxy;
R₁ and R₂ each is hydrogen, lower alkyl or phenyl-lower alkyl;
R₃ is hydroxy, amino, hydroxyamino, or lower alkoxy;
R₄ is hydrogen, hydroxy or lower alkyl;
n is 0, 1 or 2
and basic salts thereof, said lower alkyl and lower alkoxy groups having up to 7 carbons.

4,052,512

PROSTAGLANDIN ANALOGUES

Masaki Hayashi, Seiji Kori, and Hirohisa Wakatsuka, all of Takatsuki, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jan. 5, 1976, Ser. No. 646,316

The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.

Int. Cl.² C07C 177/00; A61K 31/19, 31/215

U.S. Cl. 424-305

1. 16,16-dimethyl-trans-Δ²-PGE₁ or the C₁-C₁₀ alkyl esters, cyclodextrin clathrate, or non-toxic salt thereof.

4,052,513

STABLE TOPICAL ANESTHETIC COMPOSITIONS

Carl Kaplan, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 532,533, Dec. 13, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 673,175

Claims priority, application United Kingdom, Dec. 11, 1975, 50867/75

Int. Cl.² A61K 31/245

U.S. Cl. 424-310

1. A stable cosmetically elegant oil in water emulsion useful as a topical anesthetic comprising 0.5 to 15 percent of benzocaine; 5 to 40 percent of a cosmetically acceptable dialkyl ester of an alkanedioic acid which is a liquid at 10° C and having the formula ROOC-C_nH_{2n}-COOR', where R and R' are alkyl groups of from 1 to 4 carbon atoms and n is an integer from 1 to 8; at least one cosmetically acceptable surfactant, and water.

4,052,514

TRIHALOSUBSTITUTED BIPHENYL PROPIONIC ACIDS

Stewart S. Adams, Redhill; Bernard J. Armitage, and John S. Nicholson, both of Beeston, all of England, assignors to The Boots Company Limited, England

Continuation-in-part of Ser. No. 235,825, March 17, 1972, abandoned. This application Sept. 14, 1973, Ser. No. 397,604

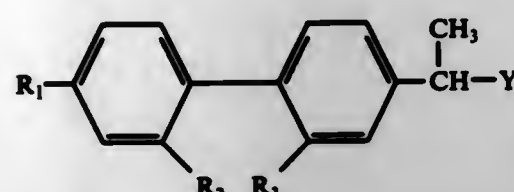
Claims priority, application United Kingdom, Sept. 22, 1972, 44013/72; Mar. 26, 1971, 7936/71

The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.

Int. Cl.² A61K 31/19, 31/205, 31/215; C07C 63/33

U.S. Cl. 424-316

1. A compound selected from the group consisting of acids having the general formula:



in which R₁, R₂ and R₃ are individually selected from chlorine, bromine and fluorine and Y is COOH, or a pharmaceutically acceptable lower-alkyl ester, in an alkali metal salt, or an amine salt thereof.

11. A therapeutic composition suitable for use in the treatment of inflammation comprising an effective anti-inflammatory amount of a compound according to claim 1 in association with a pharmaceutical excipient.

17. A method of treating inflammation in a patient comprising administering an effective amount of a compound according to claim 1.

4,052,515

METHOD OF TREATING ACNE WITH ALCOHOL

James A. McDermott, Robert L. Anderson, and Maurice E. Loomans, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 18, 1976, Ser. No. 658,956

Int. Cl.² A61K 31/045

U.S. Cl. 424-343

9 Claims

1. A method of treating acne comprising applying to the skin areas so affected from 3 milligrams per square centimeter to 10 milligrams per square centimeter of a composition containing from 1 to 10% of a saturated or unsaturated higher alcohol having from 6 to 12 carbon atoms and the balance a lower alcohol selected from the group consisting of ethanol, propanol, isopropanol and mixtures thereof.

4,052,516

PRECOOKED PEANUT-CONTAINING MATERIALS AND PROCESS FOR MAKING THE SAME

Jack H. Mitchell, 101 Bradley St., Clemson, S.C. 29631

Continuation-in-part of Ser. No. 187,837, Oct. 8, 1971, Pat. No. 3,800,056, which is a continuation-in-part of Ser. No. 839,673, July 7, 1969, Pat. No. 3,689,287. This application Mar. 22, 1974,

Ser. No. 453,615

Int. Cl.² A23L 1/36

U.S. Cl. 426-271

14 Claims

1. A process for making precooked dehydrated peanut food ingredients which comprises coarsely grinding shelled peanuts without releasing oil, and without reducing the moisture content of the peanuts, adding a sufficient amount of water to the coarsely ground peanuts to form a slurry and prevent congealment to a semisolid when the slurry is disintegrated, disintegrating the slurry in such a manner that the cellular tissue is torn into shreds thereby releasing oil, water soluble protein and carbohydrates to form an emulsion of oil with the water, and a suspension of solids, heating the emulsion-suspension at a temperature of about 200° F for 30 minutes up to about 325° F for about 5 seconds to increase the consistency as the protein coagulates and starch is gelatinized, and to stabilize the oil against oxidation, and drying the resultant material thereby providing a slightly coarse texture in the dehydrated food ingredient.

4,052,517

SHAPED TEXTURED PROTEIN FOOD PRODUCT

Rudolph William Youngquist, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 506,079, Sept. 16, 1974, abandoned.

This application Dec. 8, 1975, Ser. No. 638,771

Int. Cl.² A23J 1/14

U.S. Cl. 426-302

20 Claims

17. A protein food product comprising edible textured protein particles and a mixture of a cottonseed protein isolate and an edible salt, said salt exhibiting a solubility greater than 1 gram in 100 grams of water at 25° C, the weight ratio of cottonseed protein isolate to salt being from about 1:1 to 30:1.

4,052,518

METHOD FOR SEPARATING SEED COVER FROM ENDOSPERM OF GRAIN OF VARIOUS CEREAL CROPS

Vasily Nikolaevich Borisov, ulitsa Baumann, 14, kv. 12; Evgeny Alexandrovich Akulov, ulitsa Totmina, 13a, kv. 53, and Alexei Ivanovich Solovet, ulitsa 4 Prigoraya, all of Krasnoyarsk, U.S.S.R.

Division of Ser. No. 518,143, Oct. 25, 1974, Pat. No. 3,945,312.

This application Jan. 6, 1976, Ser. No. 646,882

Claims priority, application U.S.S.R., Dec. 19, 1973, 1974602

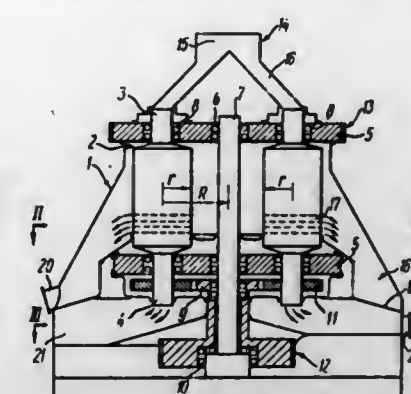
Int. Cl.² A23P 1/00; A23N 7/00

U.S. Cl. 426-482

2 Claims

1. A method for separating seed cover from endosperm of grain of various cereal crops comprising the steps of: continuously charging grain into a container; continuously imparting to the container a rotary motion about its own axis and impart-

ing concurrently an additional rotary motion about an axis of rotation extending in parallel with and in the same plane as the axis of the container, the acceleration of the grain in the con-



tainer being applied within the range from 100 g to 1000g for a period of time such that the seed covers are separated from the endosperm of the grain, and continuously discharging seed cover and endosperm from the container.

4,052,519

NON-SETTLING PROCESS FOR COATING A PHOSPHOR SLURRY ON THE INNER SURFACE OF A CATHODE RAY TUBE FACEPLATE

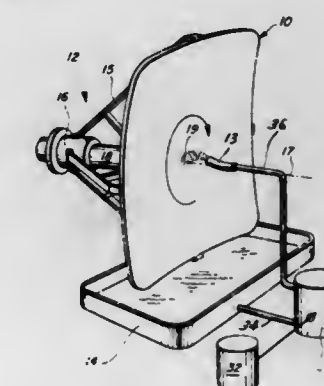
Charles J. Prazak, III, Elmhurst, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed July 2, 1975, Ser. No. 592,431

Int. Cl.² B05D 5/06, 3/12

U.S. Cl. 427-68

20 Claims



1. A non-settling process for forming on an inner viewing surface of a color cathode ray tube faceplate a coating of an aqueous slurry composed of a photosensitized organic binder and a suspension of phosphor particles, which coating exhibits a high degree of coating weight uniformity, a relatively high phosphor coating weight, and suppressed radial streaking, said process comprising:

supporting the faceplate such that the central axis of the faceplate has a substantial horizontal component;
slowly rotating the faceplate about the central axis thereof while dispensing a stream of phosphor slurry onto the central region of the faceplate inner surface such that, due to gravitational forces and the slow rotation of the faceplate through the descending slurry stream, the slurry is suffused to the perimeter of the faceplate inner surface without any significant settling out of phosphor particles onto the faceplate; and

levigating the coating by rotating the coated faceplate at a moderate angular velocity for a brief time interval, the joint effect of which moderate velocity and interval being to level and thin down the coating to a predetermined thickness while suppressing the formation of radial streaks in the coating radially outwardly of irregularities in or on the faceplate inner surface.

4,052,520

PROCESS FOR COATING A SYNTHETIC POLYMER SHEET MATERIAL WITH A DURABLE ABRASION-RESISTANT VITREOUS COMPOSITION
Leei Chang, and John A. Verburg, both of Swansey, N.H., assignors to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 510,270, Sept. 30, 1974, Pat. No. 3,991,234. This application Aug. 12, 1976, Ser. No. 713,934. The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.² B05D 3/10, 5/00

U.S. Cl. 427—164

9 Claims

1. The method of coating a sheet of material of diallyl glycol carbonate polymer comprising the steps of:

1. first step — hydroxylating the sheet surface to be coated;
2. second step — applying to the hydroxylated surface of the sheet by vacuum deposition a base coating of a material selected from the group consisting of silicon monoxide and a mixture of silicon dioxide and silicon monoxide, by evaporation of silicon monoxide in an oxygen atmosphere under a vacuum lower than 1×10^{-4} torr, said base coating being at least one molecule in thickness; and
3. third step — applying to the coated surface of the sheet of the second step by vacuum deposition an outer coating of evaporable glass, said evaporable glass being in a thickness of about one micrometer or higher, said glass coating being applied at a pressure lower than 5×10^{-4} torr.

4,052,521

COATING AND CALENDARING OF 2-DIMENSIONALLY TENSIONED FABRIC

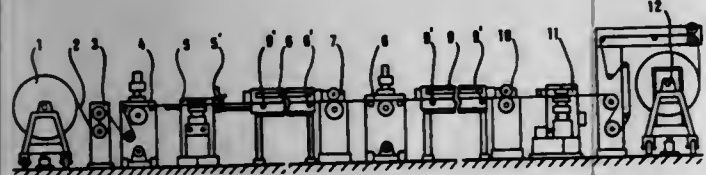
Serge Ferrari, 69390 Charly, Vernaison, Rhone, France

Continuation-in-part of Ser. No. 506,815, Sept. 19, 1974, abandoned. This application Sept. 20, 1976, Ser. No. 724,667

Int. Cl.² B29D 7/22; B05D 3/12

U.S. Cl. 427—173

2 Claims



1. The method of coating a flexible fabric having nubs on its surface with a coating of synthetic heat curable plastic material to produce on one side of the fabric a smooth and uniform coating thereover covering the nubs, comprising the steps of: drawing the fabric through a treating path while longitudinally tensioning the fabric;
- gripping the fabric along its edges while passing through said path and tensioning the fabric transversely of said path;
- applying a first coating of heat curable plastic material to said one side of said fabric;
- heat curing within said path said first coating on said fabric and calendaring said one side of the fabric and first coating to cause the nubs within the cured coating to be essentially uniform in height, while maintaining said longitudinal and transverse tensioning;
- applying a second coating of heat curable plastic material within said path to the same side of the fabric sufficient to fill the surface of the first coating to include said height of the calendared nubs while the fabric and first coating are still heated, and calendaring said fabric and second coating while maintaining said longitudinal and transverse tensioning;
- heat curing within said path said second coating on said fabric while maintaining said longitudinal and transverse tensioning; and

then releasing said tensioning and rolling up the coated fabric.

4,052,522

BICYCLE MUDGUARD

Koji Narita, Nagoya, Japan, assignor to Inoue Gomu Kogyo Kabushiki Kaisha, Nagoya, Japan

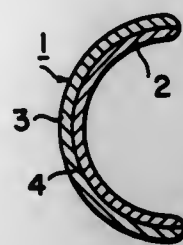
Filed Jan. 23, 1973, Ser. No. 326,098

Claims priority, application Japan, Aug. 2, 1972, 47-091324[U]

Int. Cl.² B60R 19/00; B32B 15/04; B62B 9/16

U.S. Cl. 428—31

4 Claims



1. A bicycle mudguard comprising: a substrate layer of an acrylonitrile-butadiene-styrene resin having the strength and rigidity required of such mudguards;
- a surface layer of at least one transparent, weather resistant resin selected from the group consisting of cellulose acetate-butyrate and vinyl chloride resins; and
- an intermediate layer having a thickness of 20 to 100 between said surface layer and said substrate layer, said intermediate layer being made of a synthetic resin material covered with a thin substantially continuous coating of fully reflective metallic material which reflects light rays passing through said transparent surface layer.

4,052,523

COMPOSITE SANDWICH LATTICE STRUCTURE

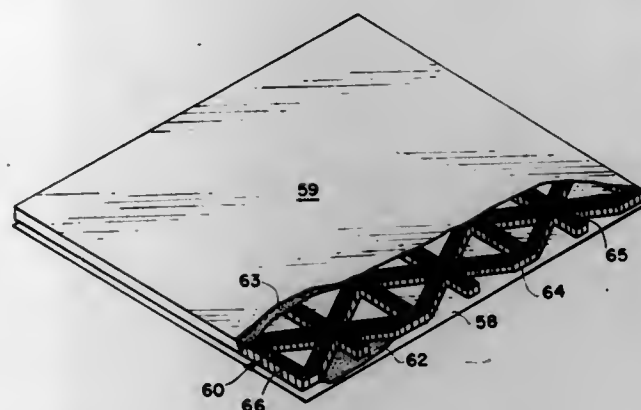
Marvin D. Rhodes, Yorktown, and Martin M. Mikulas, Jr., Williamsburg, both of Va., assignors to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 14, 1976, Ser. No. 723,264

Int. Cl.² B32B 3/12

U.S. Cl. 428—116

17 Claims



1. A lightweight sandwich panel comprising: an internal skin;
- an external skin spaced from said internal skin;
- an intermediate core disposed between said internal skin and said external skin and attached thereto;
- said intermediate core being formed of multiple honeycomb cells with the openings thereof being disposed toward and closed by said internal skin and said external skin,
- said intermediate core further having said honeycomb cells disposed in a plurality of rows with said rows forming a lattice structural configuration to provide a plurality of

triangular openings between adjacent rows of honeycomb cells, said internal and said external skins being formed of individual tape strips of material; and wherein said individual tapes of material secured to said rows of honeycomb cells are constructed of a graphite-epoxy composite.

4,052,524

METHOD FOR IMPROVING ADHESIVE BONDING IN STEEL/RUBBER COMPOSITES AND ARTICLE

Nicholas K. Harakas; Kent H. Fulton; Paul A. Tierney, all of Raleigh, and Malcolm F. Bender, Durham, all of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 15, 1975, Ser. No. 605,086

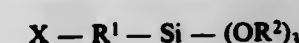
Int. Cl.² B32B 15/02, 15/08

U.S. Cl. 428—383

9 Claims

1. A method for improving the hydrolytic stability of the adhesive bond between an RFL organic adhesive and a steel reinforcing element for rubber articles, said method comprising the following steps in sequence:

- a. immersing a steel or alloy steel reinforcing element in an aqueous bath which contains an inorganic acid having a pH in the range of from about 1 to 2.5 at make-up or a strong base having a pH in the range of from about 9 to 10.5 at make-up for a period of from 3 to 25 seconds with the bath being maintained at a temperature in the range of from 20° C. to 95° C.;
- b. subjecting said element to a water rinse;
- c. coating the surface of the steel element with an organosilane compound of the formula



where X is an amino, glycidioxy or an aminoethyl radical; and wherein R¹ is an alkylene radical of from 2 to 4 carbon atoms when X is amino or glycidioxy and —HN—R³—, where R³ is an alkylene radical of from 2 to 3 carbon atoms when X is aminoethyl; and wherein R² is an alkyl of from 1 to 2 carbon atoms;

- d. dipping said element in an RFL organic adhesive; and
- e. curing said dipped element.

4,052,525

MULTI-LAYER STRUCTURE ACRYLIC POLYMER COMPOSITION

Fumio Ide; Kazuo Kishida, and Akira Hasegawa, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,712

Claims priority, application Japan, May 6, 1975, 50-54364

Int. Cl.² B32B 27/36, 27/08

U.S. Cl. 428—412

15 Claims

1. A multi-layer structure polymer composition, comprising: an innermost layer (A), an elastomeric polymer layer (B), and outermost layer (C), and at least one intermediate layer, said layer (A) has a glass transition temperature (T_g) of at least 10° C and consisting of 51 to 100 parts by weight of an alkyl methacrylate whose alkyl group has 4 or less carbon atoms, 0 to 49 parts by weight of a monomer having a copolymerizable double bond, 0 to 10 parts by weight of a polyfunctional monomer, and 0.1 to 5 parts by weight of a graftlinking agent; said layer (B) having a (T_g) of up to and including 0° C and consisting of 80 to 100 parts by weight of an alkyl acrylate whose alkyl group has 8 or less carbon atoms, 0 to 20 parts by weight of a monomer having a copolymerizable double bond, 0 to 10 parts by weight of a polyfunctional monomer, and 0.1 to 5 parts by weight of a graftlinking agent; said layer (C) having a (T_g) of at least 50° C and consisting of the polymerizate of 51 to 100 parts by weight of an alkyl methacrylate whose alkyl group has 4 or less carbon atoms, and 0 to 49 parts by weight of a monomer having a copolymerizable double bond; and said intermediate layer consisting of 10 to 90 parts by weight of an alkyl methacrylate whose alkyl group has 4 or less carbon atoms, 90 to 10 parts by weight of an alkyl acrylate whose alkyl

group has 8 or less carbon atoms, 0 to 10 parts by weight of a polyfunctional monomer, and 0.1 to 5 parts by weight of a graft-linking agent.

4,052,526

INTUMESCENT FIRE RETARDANT MATERIAL AND ARTICLE

Richard D. Pratt, Cincinnati; Paul F. Proffitt, Reading, and George Webb, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 550,933, Feb. 19, 1975, Pat. No. 3,983,082. This application May 17, 1976, Ser. No. 687,102

Int. Cl.² B32B 9/04

U.S. Cl. 428—447

3 Claims

1. A metallic article of manufacture including a metallic surface having bonded thereto an improved silicone-base intumescent fire retardant material comprising a mixture of:

- 35–75 parts by weight of a silicone resin; and
- 22–112 parts by weight of a mixture of ingredients comprising, by weight:
 - 1–10 parts of an oxide of iron;
 - 17–52 parts of a phosphate of potassium;
 - 2–30 parts of a charring material; and
 - 2–20 parts of a blowing agent.

4,052,527

RADIATION POLYMERIZED HOT MELT PRESSURE SENSITIVE ADHESIVES

Stephen D. Pastor, Edison, and Martin M. Skulitchi, Somerset, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Feb. 7, 1977, Ser. No. 766,026

Int. Cl.² C08F 2/46

U.S. Cl. 428—463

8 Claims

1. A method for the production of hot melt adhesive products having pressure sensitive properties comprising the steps of

- a. copolymerizing at least one 3-(chlorinated aryloxy)-2-hydroxypropyl ester of an alpha, beta unsaturated carboxylic acid with at least one acrylate based copolymerizable monomer;
- b. heating the resultant ethylenically unsaturated prepolymer to a temperature sufficient to render it fluid and flowable;
- c. coating the heated prepolymer onto a substrate, and
- d. exposing the coated substrate to ultraviolet radiation of wavelength 1800 to 4000 Å for a period of time sufficient to crosslink the prepolymer.

4,052,528

TETRAPOLYMER SUBBED PHOTOGRAPHIC FILM

Robert Stanley Cook, and Peter John Wright, both of Ilford, England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed June 23, 1975, Ser. No. 589,224

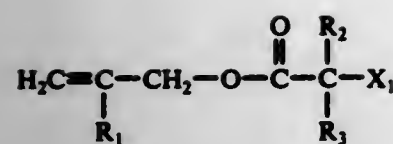
Claims priority, application United Kingdom, July 4, 1974, 29665/74

Int. Cl.² B32B 27/08, 27/28, 27/36; G03C 1/80

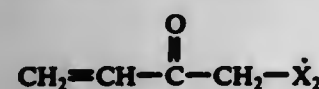
U.S. Cl. 428—483

4 Claims

1. Film material comprising a film of biaxially oriented synthetic linear polyester of highly hydrophobic character having superimposed thereon adherent to said film a layer which comprises a copolymer consisting of (a) 20 to 90 mole % of vinylidene chloride, (b) 5 to 50 mole % of a copolymerizable ethylenically unsaturated monomer selected from the group consisting of alkyl acrylate, alkyl methacrylate, vinyl acetate and acrylonitrile, (c) 1 to 20 mole % of at least one copolymerizable acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, maleic acid, fumaric acid, crotonic acid, mesaconic acid and citraconic acid and (d) 1 to 30 mole % of (d₁) an allyl component of the formula



R₁ is hydrogen or methyl X₁ is a bromine or chlorine atom and R₂ and R₃ are each hydrogen or methyl or are the same halogen atom as X₁, or (d₂) a vinyl component of the formula



wherein X₂ is a chlorine or bromine atom.

4,052,529

RADIATION-CURABLE MERCAPTOALKYL VINYL POLYDIORGANOSILOXANES, METHOD OF COATING THERE WITH AND COATED ARTICLE

Gary N. Bokerman; Joseph A. Colquhoun, both of Midland, and David J. Gordon, Essexville, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 3, 1976, Ser. No. 663,324
Int. Cl.² B05D 3/06

U.S. Cl. 428-537

23 Claims

1. A radiation-curable polydiorganosiloxane composition consisting essentially of a mixture of
 - A. a triorganosiloxane-terminated polydiorganosiloxane fluid having a viscosity of at least 0.5 pascal-seconds at 25° C., wherein from 50 to 99 percent of all organic radicals are methyl, from 1 to 5 percent of all organic radicals are mercaptoalkyl having the formula $-(\text{CH}_2)_n\text{SH}$, wherein n has a value of from 1 to 4 inclusive, any remaining organic radicals in (A) being alkyl radicals having from 2 to 6, inclusive, carbon atoms or phenyl, and
 - B. a methylvinylpolysiloxane, compatible with (A) and having an average of at least three vinyl groups per molecule, the amount of (B) being sufficient to provide from 0.2 to 1.0 silicon-bonded vinyl radicals for every silicon-bonded mercaptoalkyl radical in the composition.

4,052,530

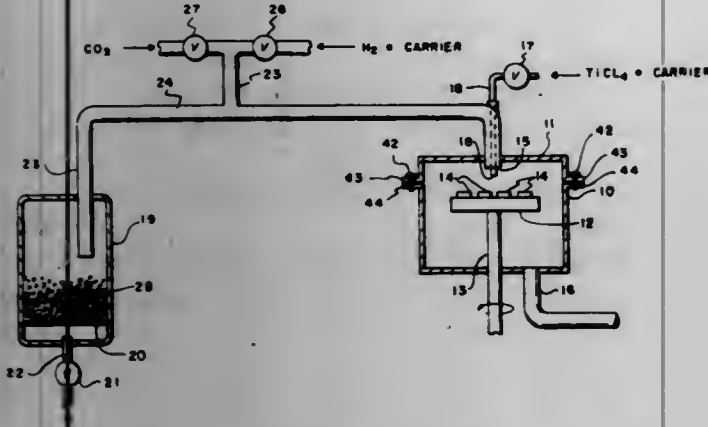
CO-DEPOSITED COATING OF ALUMINUM OXIDE AND TITANIUM OXIDE AND METHOD OF MAKING SAME

Frank Forzi, Cedar Hill, Tex., assignor to Materials Technology Corporation, Dallas, Tex.

Filed Aug. 9, 1976, Ser. No. 712,481
Int. Cl.² B32B 9/04, 15/04

U.S. Cl. 428-552

6 Claims



1. An article of manufacture comprising:
 - a. a substrate having a wear surface, and
 - b. a dense continuous composite coating of aluminum oxide and titanium oxide adherently bonded to and covering at least a portion of said wear surface.

4,052,531 INDIUM-CONTAINING SILVER-COPPER-ZINC BRAZING ALLOY

Hans T. Steine, Crissier; Wolfgang Simm, Lausanne, both of Switzerland, and Joseph F. Quana, Island Park, N.Y., assignors to Eutectic Corporation, Flushing, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,831
Int. Cl.² B32B 15/20; B23K 3/00; C22C 5/08

U.S. Cl. 428-673

3 Claims

1. A brazed joint comprising at least a pair of metal parts joined together by a filler metal comprising an indium-containing silver brazing alloy consisting essentially by weight of about 40% to 65% Ag, about 6 to 12% In, about 6 to 12% Zn, up to about 0.5% Si and the balance essentially copper ranging from about 23% to 36%.

4,052,532

ELECTROLYTE-ELECTRODE ASSEMBLY FOR A COMBUSTIBLE BATTERY

Helmut Tannenberger, Geneva, and Paul van den Bergh, Satigny, both of Switzerland, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Nov. 18, 1975, Ser. No. 633,075

Claims priority, application Switzerland, Nov. 19, 1974, 15356/74

Int. Cl.² H01M 8/10

U.S. Cl. 429-33

4 Claims

1. In an electrolyte-electrode assembly for a combustible battery comprising a ceramic solid electrolyte conductive to oxygen ions and impermeable to gas, an electrode comprising a porous layer of indium oxide doped with tin, said layer being composed of dendrites which form trunks having a diameter between 500 and 10,000 Å and whose principal axes are perpendicular to the surface of the electrolyte, an improvement comprising a continuous layer of ceramic material, conductive to oxygen ions and electrons, interposed between the electrolyte and the electrode and united therewith to form a composite layered assembly, said ceramic material being a solid solution of mineral oxides comprising zirconium oxide, uranium oxide and at least one oxide selected from the group consisting of calcium oxide, magnesium oxide, barium oxide, strontium oxide, scandium oxide, yttrium oxide, ytterbium oxide and oxides of rare earths.

4,052,533

PRESSURE RELIEF FLAPPER VALVE FOR GALVANIC CELLS

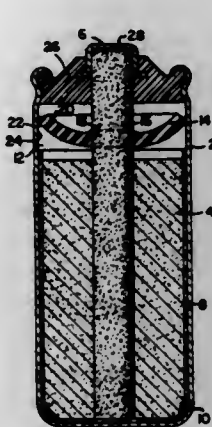
Henry Heinz, Jr., Berea, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,673

U.S. Cl. 429-54

Int. Cl.² H01M 2/12

13 Claims



1. A galvanic cell comprising a container having an open end and an inner disposed anode; a depolarizer-cathode within said container; a porous separator disposed between said anode and said cathode; an electrolyte wetting said depolarizer-cathode; a current collector rod embedded within and projected

above said depolarizer-cathode; and a resealable flapper vent valve disposed concentrically about the current collector rod over the depolarizer-cathode and contacting the inner wall of the container so as to provide a vent at the valve-container interface for releasing excessive gas pressure within the container, said resealable flapper vent valve comprising a resilient, deformable cupped annulus having an opening at its center through which the top of the current collector rod passes, contacts and projects above, and having its peripheral edge segment deflected upwardly such that at least the bottom peripheral edge of the annulus contacts the inner wall of the container.

4,052,534

BATTERY VENT PLUG

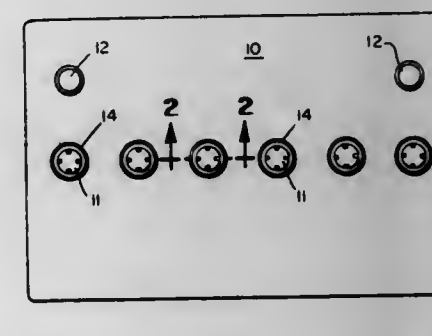
John L. Devitt, Denver, Colo., assignor to General Battery Corporation, Reading, Pa.

Filed May 3, 1973, Ser. No. 356,826

Int. Cl.² H01M 2/12

U.S. Cl. 429-86

1 Claim



1. A battery vent plug for insertion into at least one battery vent well to vent and otherwise seal said well, comprising: a hollow upper cylindrical member having a top surface with at least one vent aperture defined therein; a hollow lower cylindrical member having an upper surface defining at least one aperture in said upper surface, at least a portion of said lower cylindrical member being fitted within and matingly engaging the interior surface of said upper cylindrical member; a gas permeable diaphragm sealingly engaging said upper surface of said lower cylindrical member at least around said aperture defined therein, said diaphragm being retained between generally opposing surfaces of said cylindrical members; an o-ring gasket positioned around the outer cylindrical surface of said lower cylindrical member for engaging the interior walls of the battery case vent well to provide a gas-tight seal against said battery case vent well when said plug is disposed therein, said o-ring gasket having a greater diameter than that of said vent well so that upon insertion of said plug into said vent well said o-ring is compressed between said vent well and the remainder of said plug; and a retaining means for retaining said gasket with respect to said plug comprising an annular ridge formed on the exterior surface of said lower cylindrical member, said ridge cooperating with the lower end of said upper cylindrical member to retain said o-ring gasket therebetween.

4,052,535

SODIUM-SULPHUR CELLS

Graham Robinson, Chester; Michael Patrick Joseph Brennan, Warrington, and Ivor Wynn Jones, Chester, all of England, assignors to Chloride Silent Power Limited, England

Filed Aug. 19, 1976, Ser. No. 715,800

Claims priority, application United Kingdom, Aug. 20, 1975, 34680/75

Int. Cl.² H01M 10/39

U.S. Cl. 429-104

15 Claims

1. In a sodium-sulphur cell having a solid electrolyte and a cathode current collector with a porous conductive matrix in the region between the electrolyte and the current collector, the improvement in combination therewith comprising the matrix being formed of a plurality of discrete elements with

electronically conductive material of a higher bulk conductivity than the matrix elements positioned between the elements



and extending across the region between the current collector and the electrolyte to increase the conductivity across that region.

4,052,536

ELECTROLYTES WHICH ARE USEFUL IN SOLAR ENERGY CONVERSION

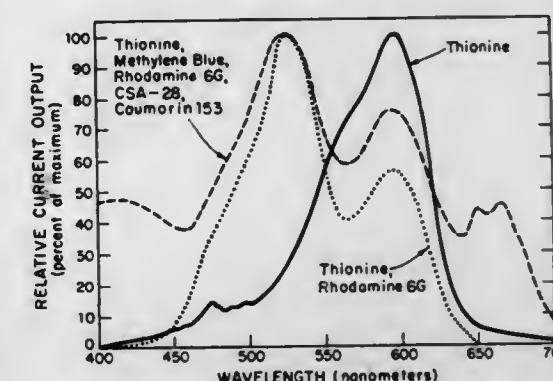
Norman N. Lichtin, Newton Center, and Peter D. Wildes, Belmont, both of Mass., assignors to The Trustees of Boston University, Boston, Mass.

Filed June 24, 1976, Ser. No. 699,725

Int. Cl.² H01M 4/36

U.S. Cl. 429-105

7 Claims



1. An electrolyte for use in a photogalvanic cell comprising a solvent having a thiazine dye and a photosensitizing dye dissolved therein, said photosensitizing dye being selected from the group consisting of Rhodamine 6G, CSA-28, and a combination of both.
4. In an electrolyte solution useful in the photochemical conversion of solar energy, said electrolyte containing a photo-reducible thiazine dye and a redox couple, the improvement of including in said electrolyte solution a photosensitizing dye selected from the group consisting of Rhodamine 6G, CSA-28, and a combination of both.

4,052,537

ELECTRICAL DEVICE

Henry Rogers Mallory, Greenwich, Conn., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Oct. 1, 1976, Ser. No. 728,672

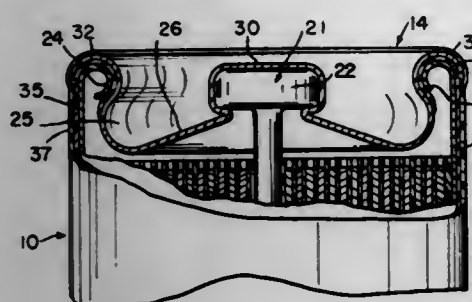
Int. Cl.² H01M 2/04

U.S. Cl. 429-174

15 Claims

1. An electrochemical cell comprising a pressurized container having a cylindrical can body with a cylindrical side wall, a closed bottom end and an open upper end, the upper open end of said can body being curled to the shape of a torus,

the innermost portion of which has a diameter not greater than the diameter of said can body; a closure for said container, said closure comprising a metallic element having a curved lip crimped against said torus; means to insulate said can body



from said cover; an anode, a cathode and an electrolyte operatively positioned within said container, one of said anode or cathode being electrically connected to said can body and the other being electrically connected to said cover.

4,052,538

METHOD OF MAKING SODIUM BETA-ALUMINA POWDER AND SINTERED ARTICLES

David S. Eddy, Romeo, and James F. Rhodes, Hartland, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1976, Ser. No. 678,063
Int. Cl.² H01M 6/18; C04B 35/64

U.S. Cl. 429—193

6 Claims

1. A method of making a powdered precursor material containing a uniform mixture of constituents for producing a sodium beta-alumina comprising dispersing an alpha-alumina monohydrate in a dilute acidic aqueous solution, the alumina monohydrate having sufficient surface area to form a colloidal solution (sol), adding an aqueous solution containing an inorganic oxygen-containing sodium salt to said sol to form a uniform mixture of the sodium salt and alumina, and spray drying the mixture to form a powder which is convertible as is upon calcination at a suitable elevated temperature to a desired sodium beta-alumina composition or which can be blended with one or more powder compositions prepared by the same process steps, the resulting blend being convertible upon calcination to a desired sodium beta-alumina.

4,052,539

ELECTROCHEMICAL CELL WITH A GRAPHITE INTERCALATION COMPOUND CATHODE

Joseph A. Shropshire, and Gerald H. Newman, both of Westfield, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 17, 1977, Ser. No. 760,156
Int. Cl.² H01M 6/14

U.S. Cl. 429—194

9 Claims

1. A battery comprising:
a. an alkali metal anode;
b. a cathode containing as the cathode-active material a compound of graphite formed by reacting ClF_3 and a Lewis acid fluoride of an element selected from B, Si, Ge, Sn, Pb, P, As, Sb, Bi, Ti, Zr, Hf, V, Nb and Ta in the presence of liquid HF whereby said graphite compounds contain from about 30 wt. % to about 55 wt. % carbon;
c. a nonaqueous electrolyte which does not chemically react with said anode or said cathode and which will permit the migration of ions from said anode-active material to said cathode-active material.

4,052,540 SUBSTANTIALLY NON-GASSING ALKALI RESISTANT BATTERY SEPARATOR AND METHOD OF PRODUCING SAME

Joseph S. Smatko, Santa Barbara, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Nov. 16, 1970, Ser. No. 89,865
Int. Cl.² H01M 2/16

U.S. Cl. 429—229

8 Claims

1. A substantially non-gassing high alkali resistant battery separator when employed with a zinc electrode, and having low resistivity, and inhibiting effect on zinc dendrite formation, in the form of a porous member consisting essentially of sintered particles of a single phase solid solution of about 60 to about 99 mol percent magnesium silicate and about 1 to about 40 mol percent zinc silicate.

4,052,541

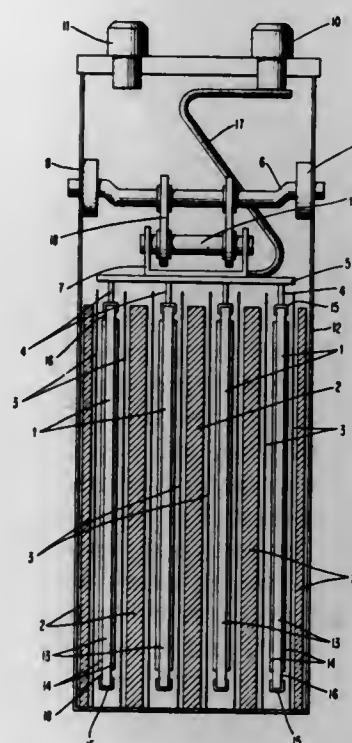
ELECTRIC ACCUMULATOR CELL WITH AT LEAST ONE DISSOLUBLE ELECTRODE

Otto von Krusenstierna, Taby, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Continuation-in-part of Ser. No. 422,591, Dec. 6, 1973, Pat. No. 3,923,550, which is a continuation of Ser. No. 186,219, Oct. 4, 1971, abandoned. This application Dec. 1, 1975, Ser. No. 636,656
Claims priority, application Sweden, July 15, 1975, 7508111
Int. Cl.² H01M 4/70

U.S. Cl. 429—233

14 Claims



1. In an electric accumulator cell including at least one electrode formed of an inert conducting material insoluble in said electrolyte and an active metal which on discharge formed a chemical compound soluble in the electrolyte, the improvement which comprises forming said electrode of a central conducting layer having an outer layer disposed on both planar sides thereof, the planar sides of the outer layers being smaller than the planar sides of the central layer so that the central layer has a bare portion about its periphery, at least part of the bare portion being covered with an electrically insulating material, the width of the bare portion between the insulating material and the outer layer being at least twice the thickness of the outer layer, each layer being composed of an inert conducting material insoluble in said electrolyte.

4,052,542

HALO-ACETYL HIGH GREEN STRENGTH RUBBERS

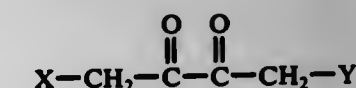
Yung-Kang Wei, and Zbigniew Jack Lobos, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Mar. 26, 1976, Ser. No. 670,967
Int. Cl.² C08F 8/18, 8/00

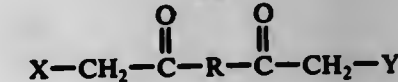
U.S. Cl. 526—46

13 Claims

1. A process of preparing a synthetic rubber composition of improved green strength, which comprises reacting an emulsion polymerized rubbery polymer of a C_4 - C_6 conjugated diolefin or a rubbery polymer thereof with a C_8 - C_{10} vinyl or vinylidene substituted aromatic hydrocarbon or with a C_3 - C_5 vinyl compound having a nitrile group, the rubbery polymer having from about 0.5 to about 10 millimoles per 100 grams of polymer of bound tertiary amine groups incorporated therein by copolymerization with a monomer selected from dimethylaminoethyl acrylate, dimethylaminoethyl methacrylate, diethylaminoethyl acrylate and diethylaminoethyl methacrylate, with a halogen compound, characterized in that the halogen compound has a general formula selected from the group consisting of

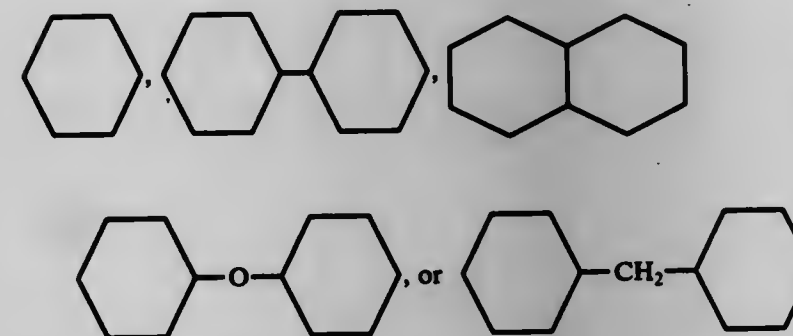


and

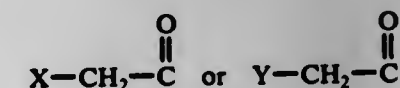


wherein X and Y each represent one of chlorine, bromine or iodine and wherein R represents

- an alkylene group selected from $-\text{CH}_2-$, $-\text{CH}_2-\text{CH}_2-$, $-\text{CH}(\text{CH}_3)-$ and $-\text{C}(\text{CH}_3)_2-$, or
- an aromatic group selected from



each of which may additionally contain one or more C_1 to C_4 alkyl substituents on any of the aromatic nuclei, and the location of each



group is at any of the ortho, meta or para-positions of the aromatic nucleus and in separate aromatic nuclei except where R represents



4,052,543

VULCANIZABLE AND VULCANIZED COMPOSITIONS CONTAINING POLYPEROXIDE

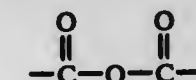
Wilbur H. McKellin, St. Louis, Mo.; Orville L. Mageli, and Antonio Joseph D'Angelo, both of Buffalo, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 285,857, June 6, 1963. This application Sept. 30, 1969, Ser. No. 866,420
Int. Cl.² C08F 8/06, 8/42

U.S. Cl. 526—48

16 Claims

1. A vulcanizable composition comprising an intimate mixture of a polymeric compound capable of being cross-linked to form a thermoset material, and cross-linking agent in an amount sufficient to afford about the desired degree of cross-linking, which agent is a polyperoxy compound having at least two peroxy groups, one of the oxygens of each of two of said peroxy groups being linked to a common carbon atom and each of the other oxygens being linked to a tertiary atom of an organo member which tertiary atom is selected from the class consisting of carbon and silicon and said common carbon atom being part of an aliphatic group selected from those having 2-3 or 5-6 carbons plus at least one carboxy group and those having 4 carbons plus at least one carboxy group selected from $-\text{COOH}$, $-\text{COOM}$ and



where M is a metal ion.

4,052,544

ETHYLENE POLYMERIZATION CATALYSTS

William L. Kehl, Pittsburgh, Pa., and Thomas J. Lynch, Orange, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed July 6, 1976, Ser. No. 702,565
Int. Cl.² C08F 4/02, 4/12, 4/24, 10/00

U.S. Cl. 526—102

7 Claims

1. A process for preparing an olefin polymerization catalyst which consists essentially of depositing a chromium compound upon an inorganic carrier containing aluminum and arsenate moieties and activating the catalyst by heating the material to a temperature of at least about 350°C , the inorganic carrier being selected from the group consisting of:

- an amorphous precipitate of aluminum arsenate,
- an amorphous coprecipitate containing aluminum and arsenate moieties in proportions such that the aluminum and arsenic are present in an atomic ratio of between 5:1 and 1:1, and
- mixtures of (a) and (b);

said carrier having been prepared by neutralizing a strongly acidic solution containing aluminum and arsenic ions in proportions such that the aluminum and arsenic are present in an atomic ratio in the range of 5:1 to 1:1 to form a solid precipitate containing aluminum and arsenate moieties, and recovering the precipitate.

4,052,545

PROCESS FOR POLYMERIZING CONJUGATED DIENES

Adel Farhan Halasa, Bath, and Richard Gutierrez, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 458,951, April 8, 1974, Pat. No. 3,948,869. This application Feb. 11, 1976, Ser. No. 657,123
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.

Int. Cl.² C08F 4/64, 236/04, 236/06, 236/08

U.S. Cl. 526—140

19 Claims

1. A process for the hydrocarbon solution polymerization of a monomer composition consisting essentially of 10-95 percent by weight of a conjugated diene and 5-90 percent by weight of

an alpha olefin having 2-8 carbon atoms to produce a copolymer having 5-90 percent of the alpha olefin in the resultant copolymer comprising the steps of maintaining said monomer composition at a temperature of -10° to 70° C. in intimate contact with a catalyst composition consisting essentially of:

- A metal halide compound having the formula $TiBr_nCl_{4-n}$ or VBr_mCl_{5-m} wherein n has a value of 0-4 and m has a value of 0-5;
- An aluminum hydrocarbon compound having the formula R_2AlX or AlX_3 wherein X is Cl, Br or H, and R is a hydrocarbon group having 1-8 carbon atoms selected from alkyl, aryl and cycloalkyl groups, and
- CS_2 ;

the proportion of said metal halide compound being 1-10 millimoles per 100 grams of said monomer composition; the proportion of said aluminum compound being 0.9-3 moles per mole of metal halide compound; and the proportion of said CS_2 being 0.01-0.5 mole per mole of said metal halide compound, said polymerization being conducted for a period of at least 1 hour.

4,052,546

PROCESS FOR THE PRODUCTION OF VINYL HALIDE POLYMERS

Robert J. Stanaback, Gladstone, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Oct. 29, 1976, Ser. No. 736,920

Int. Cl.² C08F 14/06

U.S. Cl. 526-206

7 Claims

1. In the process for the polymerization of a monomer component selected from the group consisting of vinyl halides and mixtures of vinyl halides with at least one ethylenically-unsaturated monomer that is copolymerizable therewith, said mixtures containing at least 70% by weight of the vinyl halide, in an aqueous medium at a temperature in the range of 40° to 80° C. in the presence of a free radical generating polymerization initiator, the improvement that consists of conducting the polymerization in the presence of from 0.05 percent to 2.0 percent by weight, based on the weight of the monomer component, of a polybromobutene having the formula $C_4Br_nH_{4-n}$, wherein n represents a number in the range of 4 to 8.

4,052,547

PROCESS FOR POLYMERIZING DIOLEFIN COPOLYMERS EMPLOYING A CATALYST MIXTURE OF HYDROPEROXIDES

Howard K. Foley, Cayahoga Falls; David A. Hutchings, Stow, and Terry C. Neubert, Ravenna, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 1, 1976, Ser. No. 691,967

Int. Cl.² C08F 4/38, 2/00, 4/42, 236/00

U.S. Cl. 526-212

2 Claims

1. In a method of producing a polymeric material comprised of polymerizing at least one unsaturated organic compound, selected from a mixture of 1,3-butadiene and styrene or a mixture of isoprene and styrene, in an aqueous emulsion in the presence of a free radical generating redox catalyst comprised of a reducing component and an oxidizing component, said oxidizing component is a composite prepared by (A) obtaining the oxidation product of reacting p-diisopropylbenzene with oxygen under relatively harsh temperature conditions at a temperature in the range of about 100° to about 120° C. comprised of a mixture of p-diisopropylbenzene hydroperoxide and byproducts comprised at least about 90 weight percent of phenols, enols and ketones, and unreacted p-diisopropylbenzene and (B) removing by separation a major portion of said p-diisopropylbenzene dihydroperoxide and unreacted p-diisopropylbenzene and a minor portion of said p-diisopropylbenzene hydroperoxide to effect a concentration of the remainder of the mixture as a distilland having an equivalent monohydroperoxide content by ASTM No. E-298-68 in the range of about 70 to about 90 percent comprised, by weight of about 45 to about 65 percent p-diisopropylbenzene monohydroperoxide

about 5 to about 15 percent p-diisopropylbenzene dihydroperoxide and about 10 to about 30 percent said byproducts containing primarily phenols, enols and ketones, where said remainder distilland mixture is enhanced by (C) diluting with at least one alcohol selected from methanol, ethanol and isopropanol, to render the composite a free flowing liquid having hydroperoxide equivalent concentration according to ASTM No. E-298-68 in the range of about 40 to about 60 percent.

4,052,548

PROCESS FOR THE POLYMERIZATION OF VINYL HALIDES IN THE PRESENCE OF AN ALKYLENE BIS-(MERCAPTOALKANOATE)

Robert J. Stanaback, Gladstone, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

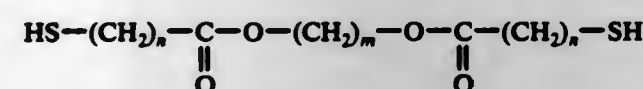
Filed Oct. 29, 1976, Ser. No. 736,921

Int. Cl.² C08F 14/06

U.S. Cl. 526-214

7 Claims

1. In the process for the polymerization of a monomer component selected from the group consisting of vinyl halides and mixtures of vinyl halides with at least one ethylenically-unsaturated monomer that is copolymerizable therewith, said mixtures containing at least 70% by weight of vinyl halide, in an aqueous medium at a temperature in the range of 40° C. to 80° C. in the presence of a free-radical generating polymerization initiator, the improvement that consists of conducting the polymerization in the presence of from 0.5 percent to 1.0 percent by weight, based on the weight of the monomer component, of an alkylene bis-(mercaptoalkanoate) having the structural formula



wherein m represents a number in the range of 1 to 6 and each n represents a number in the range of 1 to 3.

4,052,549

PROCESS FOR PREPARING TERPENE POLYMER COMPOSITIONS

James William Booth, Panama City, Fla., assignor to Arizona Chemical Company, Wayne, N.J.

Continuation-in-part of Ser. No. 549,233, Feb. 12, 1975, abandoned, which is a continuation of Ser. No. 422,394, Dec. 6, 1973, abandoned. This application May 24, 1976, Ser. No. 689,421

Int. Cl.² C08F 4/14; C07C 13/28

U.S. Cl. 526-237

6 Claims

1. A process for the preparation of low softening point resinous terpene polymer having a softening point in the range of approximately 0° C. to 85° C. which comprises: polymerizing 20 to 80 parts, by weight, of a terpene hydrocarbon monomer or mixtures of the same with 80 to 20 parts, by weight, of an oligomer of a cyclic monoterpene hydrocarbon in the presence of a Friedel-Crafts catalyst, and recovering a resinous terpene polymer having a softening point in the range of 0° C. and 85° C.

4,052,550

POLY(VINYLLIDENE FLUORIDE) YARNS AND FIBERS

Pierre Chlon, Bron, and Robert Caidard, Ecully, both of France, assignors to Rhone-Poulenc-Textile, France

Division of Ser. No. 474,585, May 30, 1974, Pat. No. 3,965,232. This application Jan. 29, 1976, Ser. No. 653,654

Claims priority, application France, June 6, 1973, 73.20666 Int. Cl.² C08F 14/22, 114/22

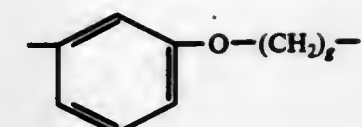
U.S. Cl. 526-255

3 Claims

1. Polyvinylidene fluoride yarns and fibers having a dry tenacity of at least 33 g/tex and an improved structure as

measured by their secondary swelling values of up to 20% prepared by

spinning a solution of polyvinylidene fluoride having a fluidity index at 250° C of at least 10 into a coagulating bath containing 45 to 60% by weight of an aprotic polar organic solvent and 40 to 55% by weight of water maintained at a temperature between 15° and 40° C, stretching the filaments in air at a temperature between 15° and 40° C to a ratio of between 1.5X and 5X, then stretching the filaments in boiling water to a ratio of between 1.5X and 4X, the overall stretch ratio being between 3X and 6.5X, and then washing the filaments with water maintained at a temperature between 15° C and 40° C at room temperature.



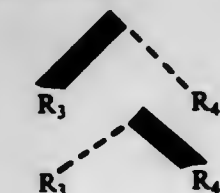
wherein g is 1, 2, or 3; wherein X_1 is

- $-\text{CH}_2\text{OH}$, or
- $-\text{COOR}_1$, wherein R_1 is alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one or two chloro, fluoro, or alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation;

wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein Y_1 is trans-CH=CH- or $-\text{CH}_2\text{CH}_2-$; wherein M_1 is



wherein R_5 is hydrogen or methyl; wherein L_1 is



or a mixture of

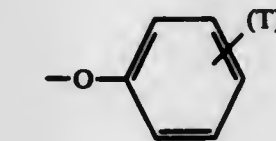


and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl; wherein R_7 is

- $-(\text{CH}_2)_m-\text{CH}_3$,



4,052,551

FLAMEPROOFED MODACRYL COPOLYMERS, FIBERS AND FILAMENTS CONTAINING CARBOXY PHOSPHINIC ACID DERIVATIVES HAVING IMPROVED THERMOSTABILITY

Bernad Huber, Hofheim, Taunus; Hans-Jerg Kleiner, Kronberg, Taunus, and Hubert Neumaier, Knapsack, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 17, 1975, Ser. No. 623,336

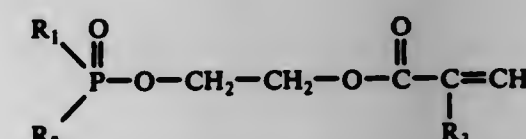
Claims priority, application Germany, Oct. 19, 1974, 2449468; Oct. 19, 1974, 2449467

Int. Cl.² C08F 30/03, 230/02, 26/06, 4/30

U.S. Cl. 526-278

3 Claims

1. A modacrylic copolymer of 35 to 85% by weight of acrylonitrile, 5 to 45% by weight of vinyl chloride, vinyl bromide, vinylidene chloride or a mixture thereof and 5 to 30% by weight of a carboxy phosphinic acid of the formula



where R_1 is lower alkyl having up to 8 carbon atoms, or $\text{CH}_2\text{Cl-}$, R_2 is lower alkyl having up to 8 carbon atoms in which a hydrogen atom may be substituted by a halogen atom in case of R_2 being $\text{CH}_2\text{Cl-}$, and R_3 is hydrogen or methyl, and from 0 to 15 weight % of other unsaturated compounds having an activated double bond the weight percentages being relative to the total amount of monomers.

4,052,552

THROMBOXANE B ANALOGS

William P. Schneider, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

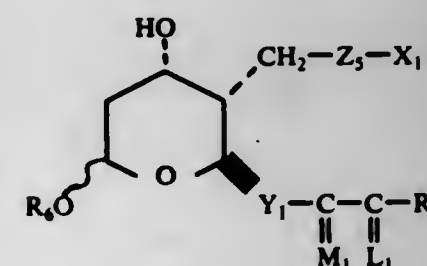
Filed Aug. 20, 1976, Ser. No. 716,446

Int. Cl.² C07D 309/10, 309/36, 309/38

U.S. Cl. 542-413

49 Claims

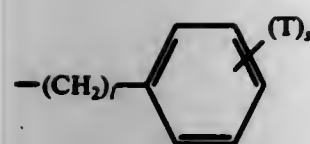
1. A thromboxane analog of the formula



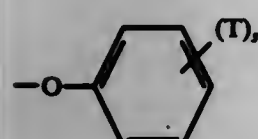
wherein Z is

(2)

or

wherein m is 0, 1, 2, or 3,

wherein m is 1 to 5, inclusive, T is alkyl of 1 to 3 carbon atoms, inclusive, alkoxy of one to 3 carbon atoms, inclusive, chloro, fluoro, or trifluoromethyl, and s is 1, 2, or 3, the various T 's being the same or different, with the proviso that not more than two T 's are other than alkyl, with the further proviso that R_7 is



only when R_3 and R_4 are hydrogen or methyl, being the same or different.

4,052,553

5-BENZYL PYRIMIDINES INTERMEDIATES

THEREFORE, AND METHOD

Ronald M. Cresswell, Scarsdale; John W. Mentha, Hartsdale, and Russell L. Seaman, Chappaqua, all of N.Y., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

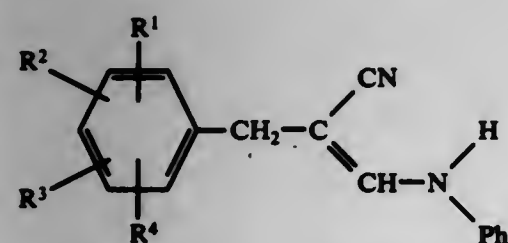
Division of Ser. No. 16,606, March 4, 1970, Pat. No. 3,697,512.

This application June 15, 1972, Ser. No. 263,204

Int. Cl.² C07C 87/24; C09B 23/00

U.S. Cl. 542-469

1. Compound according to formula I



in which Ph is aryl of 6 to 12 carbon atoms which may be

substituted in one, two or three positions with lower alkyl, lower alkoxy, or halogen, a compound in which R^1 , R^2 , R^3 and R^4 are the same or different, and each is a hydrogen or halogen atom, lower alkyl, lower alkoxy or benzyloxy, or R^3 and R^4 taken together may be methylenedioxy group when both R^1 and R^2 are hydrogen atoms and wherein lower alkyl and lower alkoxy contain 1 to 4 carbons in the above.

4,052,554

OXOPYRIDAZINYLTTHIOMETHYL DERIVATIVES OF UREIDOCEPHALOSPORINS

Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 611,041, Sept. 8, 1975, Pat. No. 3,996,218.

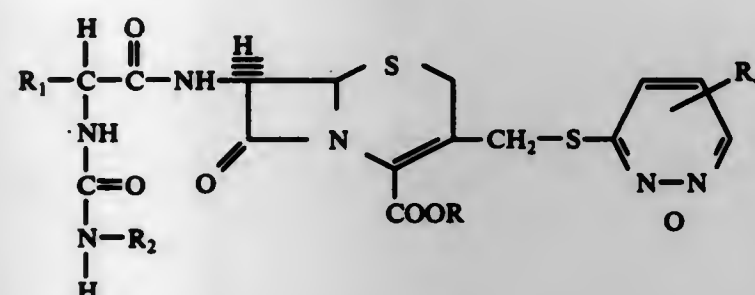
This application Aug. 16, 1976, Ser. No. 714,890

Int. Cl.² C07D 501/36; A61K 31/545

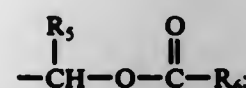
U.S. Cl. 544-26

12 Claims

1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, a salt forming ion, or



I

R_1 is phenyl, phenyl-lower alkyl, substituted phenyl, or substituted phenyl-lower alkyl wherein said substituent is one to three members selected from the group consisting of halogen, lower alkyl, lower alkoxy, and hydroxy; R_2 is hydrogen or lower alkyl; R_3 is hydrogen, halogen, lower alkyl of 1 to 4 carbons, or lower alkoxy of 1 to 4 carbons; R_4 is hydrogen or lower alkyl; and R_6 is lower alkyl, phenyl, or phenyl-lower alkyl.

ELECTRICAL

4,052,555

GASEOUS DIELECTRIC COMPOSITIONS

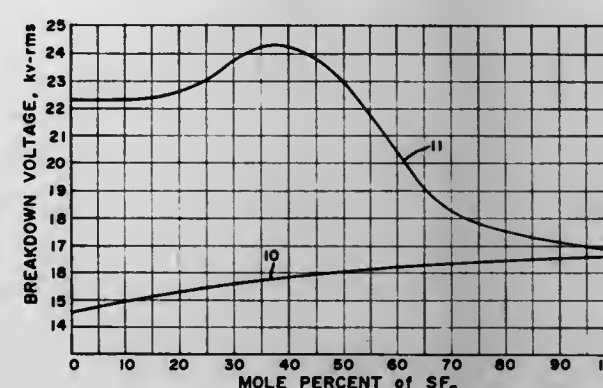
Whitney H. Mears, Buffalo, and Sabatino R. Orfeo, Orchard Park, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed July 23, 1975, Ser. No. 596,303

Int. Cl.² H05K 5/00; H01B 3/56

U.S. Cl. 174-17 GF

12 Claims



1. A process for substantially eliminating carbon tracking formation in a dielectric fluid during an electrical discharge from an electrical conductor which comprises maintaining in contact with the electrical conductor during operation a gaseous dielectric composition consisting essentially of a mixture of at least one perfluorinated ether with from about 1 to 99 mole percent of SF_6 and/or with from about 1 to 75 mole percent of CO_2 , said perfluorinated ether containing from 2 to 6 carbon atoms and having a vapor pressure of at least of about 100 Torr at 20° C.

4,052,556

CIRCUIT ARRANGEMENT FOR BALANCING A TWO WIRE FULL DUPLEX DATA TRANSMISSION SYSTEM

Adolf Haass, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

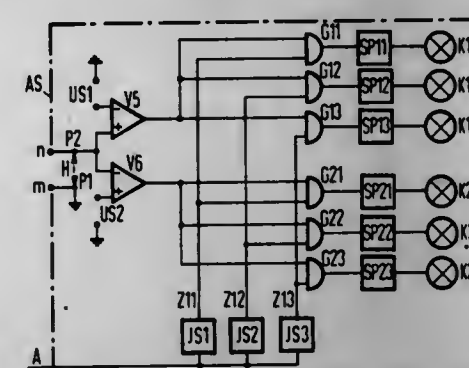
Filed Oct. 28, 1975, Ser. No. 625,869

Claims priority, application Germany, Nov. 14, 1974, 2454108

Int. Cl.² H04L 5/14

U.S. Cl. 178-60

11 Claims



1. In a two wire, full duplex data transmission system wherein a transmitter and receiver in one station are connected by two wires to a transmitter and receiver in another station, the transmitter in each station being connected by means of a balancing apparatus to the receiver therein for adjusting the value of the current from the transmitter flowing through said two wires to the receiver in the same station to be equal to current flowing from the transmitter directly to the receiver in said another station, the balancing apparatus comprising:

a plurality of parallel-connected current paths, each comprising a series combination of a time stage and an amplitude stage,

said parallel-connected current paths being connected to received current from the transmitter in the same station, a plurality of subsidiary currents flowing through said parallel current paths to a common output terminal which

couple a sum current of said subsidiary currents to the receiver in the same station, each said time stage being constructed to produce predetermined, but different, timing signals in relation to a data signal being transmitted from the station, said amplitude stages being constructed to adjust the values of said subsidiary currents flowing therethrough and said time and amplitude stages having a connected relationship such that each said amplitude stage is effective for a duration determined by the timing signal from the associated time stage.

4,052,557

PHASE-JUMP DETECTOR AND CORRECTOR METHOD AND APPARATUS FOR PHASE-MODULATED COMMUNICATION SYSTEMS THAT ALSO PROVIDES A SIGNAL QUALITY INDICATION

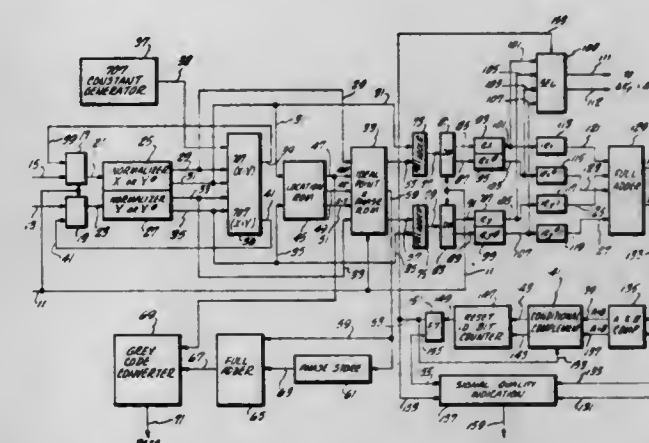
Ran-Fun Chiu, Miami; James Bryon Sherman, North Miami, and Judson Truman Gilbert, Haileah, all of Fla., assignors to Milgo Electronic Corporation, Miami, Fla.

Filed July 31, 1975, Ser. No. 600,608

Int. Cl.² H04L 27/24

U.S. Cl. 178-67

28 Claims



1. A method for detecting the occurrence of phase-jumps in a phase-modulated voice-band communication system wherein received phase symbols are converted into binary X and binary Y components, said method comprising: generating an error X and error Y indication that represents the difference between the binary X and binary Y components of a received symbol and the ideal binary X and binary Y components of that symbol; generating a rotated error X and rotated error Y indication that represents the difference between the binary X and binary Y components of and received symbol rotated by N degrees and the ideal binary X and binary Y components of the rotated symbol; and comparing the magnitude of the error X and error Y indication with the rotated error X and rotated error Y indication.

4,052,558

DATA TRANSMISSION SYSTEM

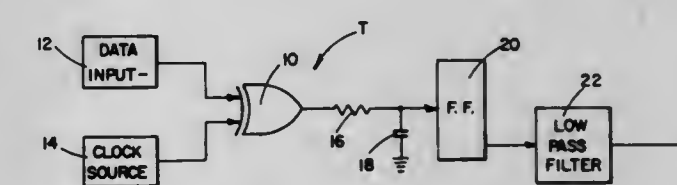
Colin Davey Patterson, 65 Downsview Crescent, Ottawa, Ontario, Canada

Filed Dec. 9, 1974, Ser. No. 530,710

Int. Cl.² H04B 1/00

U.S. Cl. 178-68

24 Claims



1. A modem adopted for phase modulated digital data trans-

mission over information communication links without the necessity of a carrier signal, said modem comprising:

- a. input means for receiving input data in a digital binary format,
- b. clocking means for generating a series of clock pulses based on one-half time intervals with respect to the bit rate of the input data,
- c. an exclusive OR gating means operatively connected to said input means and said clocking means to receive the data and clock pulses and generate an output pulse train in encoded waveform and where the pulses in said train have widths which are a function of the binary data and are bandwidth constrained,
- d. a bistable dividing circuit comprised of a first bistable flip-flop operatively connected to said exclusive OR gating means to reduce the number of pulses in said output pulse train to a lesser number of pulses, said lesser number of pulses being directly related to the pulses in said output pulse train, but which have greater bandwidth and which are also bandwidth constrained in order to reduce the frequency spectrum occupied by a phase transition,
- e. signal generating means operatively associated with said dividing circuit to receive the output thereof to thereby provide a two level phase modulated sinusoidal varying frequency signal which lies between one-fourth and one-half of the bit rate of the data and where the phase is related to the data and a previous phase state and with data information contained in a time interval between zero crossings of the sinusoidal varying signal,
- f. said demodulating means operatively connected to said signal generating means operatively associated with said dividing circuit for separating the clock pulses from the binary data to enable recovery of the binary data, said demodulating means comprising a second bistable flip-flop to divide the frequency signal at a rate of one-half of the clock pulse frequency.

18. A receiver circuit for use in modulator-demodulator devices which transmit and receive data with respect to information communication links, said circuit comprising:

- a. input means to receive a phase modulated sinusoidal varying frequency signal containing information representing both binary data and clock pulses and which signal lies between one-fourth and one-half of the bit rate of the data,
- b. polarity detection means operatively connected to said input means to determine the polarity of certain portions of the signal existing between selected zero crossings thereof and generating a digital pulse train where the pulses of said pulse train have widths which are a function of the binary data,
- c. differential phase detection means including at least one first bistable device operatively connected to the output of said polarity detection means to measure the instantaneous time change of phase of the frequencies and compare same to a recovered phase reference based on a previous phase change and to thereby generate a serial clock output,
- d. and at least one second bistable device operatively connected to the output of said differential phase detection means to generate a binary data output.

4,052,559

NOISE FILTERING DEVICE

James E. Paul, Anaheim, and Visvaldis A. Vitols, Orange, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

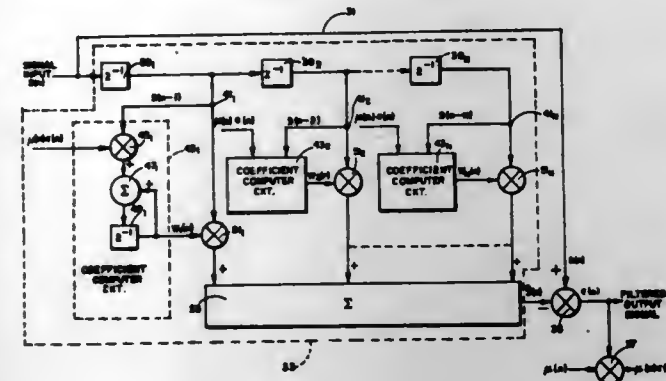
Filed Dec. 20, 1976, Ser. No. 752,711
Int. Cl.² H04B 1/12

U.S. Cl. 179—1 P

12 Claims

1. A device for removing undesired correlated components from an input degraded audio signal, said device comprising: filter means responsive to the input audio signal for substantially estimating only the undesired correlated components of the input audio signal; and

a combiner for subtracting the input audio signal from the estimate of the undesired correlated components to develop an output audio signal containing substantially no undesired correlated components.



velop an output audio signal containing substantially no undesired correlated components.

4,052,560

LOUDSPEAKER DISTORTION REDUCTION SYSTEMS

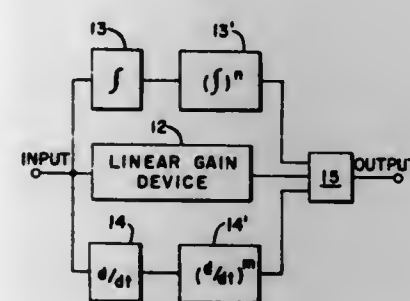
John Bryant Santmann, 66 Cedar Lane, Babylon, N.Y. 11702

Filed June 3, 1976, Ser. No. 692,302

Int. Cl.² H04R 3/04

U.S. Cl. 179—1 D

10 Claims



1. An electrical circuit unit arranged to be connected between a source of a time-varying electrical signal composed of frequency components extending across the audio frequency range and a loudspeaker having an electrical signal input to cause the sound output of the loudspeaker to constitute an accurate representation of the electrical signal, comprising: means defining an input terminal for receiving the electrical signal from such source; means defining an output terminal arranged to be connected to the loudspeaker signal input; means defining a signal transmission path connected between said input terminal and said output terminal for supplying to said output terminal a signal component proportional to the electrical signal; and distortion compensating means having an input connected to said input terminal and an output connected to said output terminal for producing, at its output, a signal component constituting a function of at least one of the time derivative and the time integral of the signal appearing at its input, said distortion compensating means comprising integrator means and function generator means connected for supplying to said distortion compensating means output a signal proportional to a predetermined non-linear function of the time integral of the signal appearing at its said input, at least with respect to signal components whose frequencies extend over the lower portion of the audio frequency range.

6. An electrical circuit unit arranged to be connected between a source of a time-varying electrical signal composed of frequency components extending across the audio frequency range and a loudspeaker having an electrical signal input to cause the sound output of the loudspeaker to constitute an accurate representation of the electrical signal, comprising: means defining an input terminal for receiving the electrical signal from such source; means defining an output terminal arranged to be connected to the loudspeaker signal input; means defining a signal transmission path connected between said input terminal and said output terminal for supplying to said output terminal a signal component proportional to the

electrical signal; and distortion compensating means having an input connected to said input terminal and an output connected to said output terminal for producing, at its output, a signal component constituting a function of at least one of the time derivative and the time integral of the signal appearing at its input, wherein said distortion compensating means comprise differentiator means and function generator means connected for supplying to said distortion compensating means output a signal proportional to a predetermined non-linear function of the time derivative of the signal at said distortion compensating means input, at least with respect to signal components whose frequencies extend over the upper portion of the audio frequency range.

4,052,561

LECTERN WITH DETENT-HINGED SHELF FOR PORTABLE SOUND SYSTEM

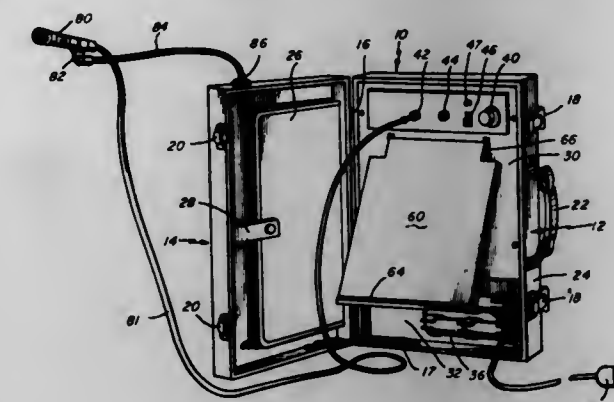
Ira Molay, Wenham, Mass., assignor to Audiophones Corporation, Beverly, Mass.

Filed Apr. 5, 1976, Ser. No. 673,663

Int. Cl.² H04R 27/00

U.S. Cl. 179—1 AT

9 Claims



1. For a portable sound system having a carrying case and circuit means disposed in the carrying case including an amplifier circuit and speaker, the improvement comprising: plate means forming at least part of a lectern having a lower edge flange permitting papers or the like to be held on the plate means when the plate means is in a tilted position, a panel fixedly mounted in the carrying case, and means for supporting the plate means in the case in either of two positions, said plate supporting means comprising tabs extending from the panel and pivot pins engagable with slots in the tabs, said plate means having on opposite sides at its top end extensions passing through respective holes in the panel with the pivot pins also engaging with the extensions.

4,052,562

SYSTEM FOR CONTROL OF SPEECH DIRECTION IN DUPLEX TELEPHONE CIRCUITS

Bjorn Andersen, Osteras, Norway, assignor to Maxman AG, Chur, Switzerland

Filed Oct. 20, 1975, Ser. No. 624,250

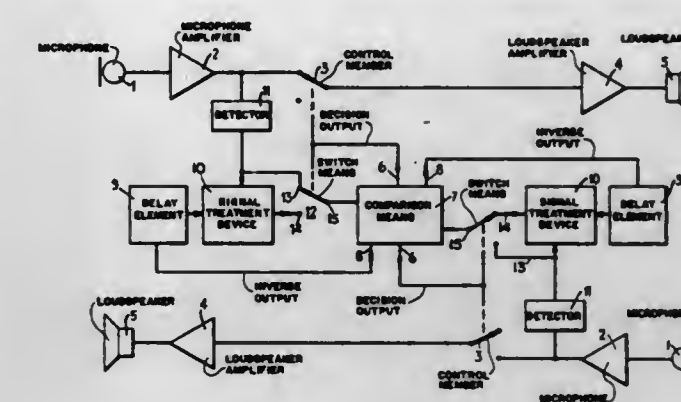
Claims priority, application Norway, Oct. 29, 1974, 743893
Int. Cl.² H04M 1/60

U.S. Cl. 179—1 HF

5 Claims

1. In apparatus for control of the speech direction in a duplex telephone system having at least a pair of stations interconnected by a single telephone line wherein each station includes a transmitting channel for transmitting a signal representative of the acoustic signals detected at the other channel at each station and includes a transmitting switch means for selectively connecting the transmitting channel to the telephone line, a receiving switch means for selectively connecting the receiving channel to the telephone line and duplex control means connected to the transmitting switch means and the receiving switch means for permitting only one of the channels to be connected with the telephone line to prevent feedback of signal from the receiving channel to the transmitting channel at

each station; the improvement in which said duplex control means includes signal treating means connected to said transmitting channel for calculating and storing a regulating value dependent upon the envelope curve of the signal from the transmitting channel wherein the regulating value is equivalent to the factor by which the transmitting signal must be multi-



plied at any given time to be equal to the receiving signal when the transmitting signal is representative substantially of an acoustic feedback of the signal being received by the receiving channel, said signal treating means including means for adjusting the stored regulating value whenever said regulating value is changing at a rate which is less than a predetermined rate.

4,052,563

MULTIPLEX SPEECH TRANSMISSION SYSTEM WITH SPEECH ANALYSIS-SYNTHESIS

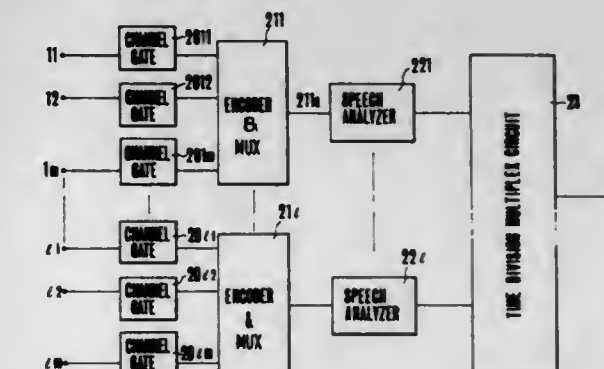
Ken-ichi Noda, Tokyo, and Shuzo Saito, Tama, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Oct. 7, 1975, Ser. No. 620,384

Claims priority, application Japan, Oct. 16, 1974, 49-119599
Int. Cl.² G10L 1/00; H04J 3/00

U.S. Cl. 179—1 SA

11 Claims



1. A multiplex speech transmission system comprising a transmitting apparatus and a receiving apparatus, said transmitting apparatus including means for multiplexing respective speech signals of a plurality of speech channels constituting at least two groups thereof by subjecting said speech signals to pulse code modulation, speech analyzing means for extracting a feature parameter signal including a partial autocorrelation coefficient and an excitation source signal from each of said multiplexed pulse code modulation speech signals, time division multiplexing means for further multiplexing said extracted feature parameters from the signals of one of said groups with the feature parameters from the signal of at least one other of said groups, and means for transmitting said further multiplexed feature parameter signals over a transmission line; and said receiving apparatus including means for separating said received further multiplexed feature parameter signals into said at least two respective groups, means responsive to said separated feature parameter signals for restoring the speech signals that have been multiplexed by time division control and means for distributing the restored signals among respective

speech channels thereby producing speech signals in respective speech channels.

4,052,564

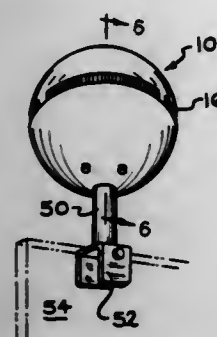
MASKING SOUND GENERATOR

Robert L. Probst, Ann Arbor, and Michael A. Wodka, Ypsilanti, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Sept. 19, 1975, Ser. No. 614,917
Int. Cl.² H04K 1/00

U.S. Cl. 179—1.5 M

9 Claims



1. In combination with a room having a ceiling and being adapted for use by adult persons of average height, sound generating apparatus for producing sound signals which mask other sounds present in said room, said apparatus comprising a hollow enclosure having a top opening and a side opening through which sound signals are emitted, a speaker mounted in said enclosure intermediate said top opening and said side opening, said speaker being positioned to face outwardly from said enclosure through said top opening, circuit means disposed in said hollow enclosure for developing an electrical signal that is converted to an audible sound signal emitted by said speaker, said apparatus being positioned at a height intermediate the head of a standing adult person and the ceiling so that said top opening faces in an upwardly direction.

4,052,565

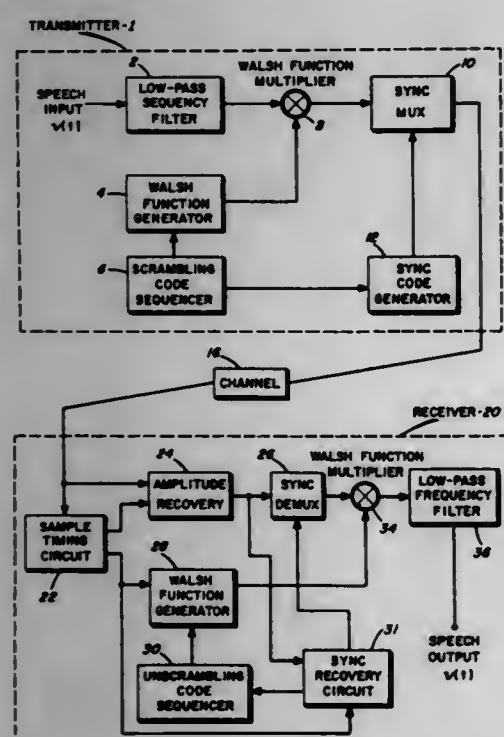
WALSH FUNCTION SIGNAL SCRAMBLER

Denner Dix Baxter, Orlando, Fla., and Charles Michael Reeves, Dalton, Mass., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed May 28, 1975, Ser. No. 581,695
Int. Cl.² H04K 1/00

U.S. Cl. 179—1.5 S

19 Claims



1. An information signal scrambler comprising:
a. means for sampling an analog information signal to de-

velop a series of amplitude samples of the information signal,
b. means for generating a plurality of Walsh function signals
c. sequencer means for causing the said means for generating a plurality of Walsh function signals to periodically and cyclically change the generated Walsh function signal, and
d. means for multiplying the said samples with each of the generated Walsh function signals.

4,052,566

MULTIPLEXER TRANSMITTER TERMINATOR

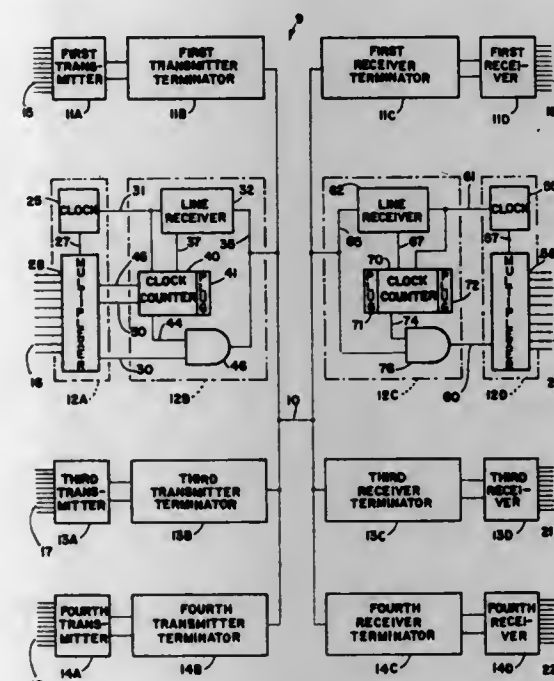
William Allan MacKay, Richmond Hill, Canada, assignor to D.D.I. Communications, Inc.

Filed Dec. 24, 1975, Ser. No. 644,101

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.
Int. Cl.² H04J 3/04

U.S. Cl. 179—15 A

17 Claims



1. A device for a multiplexer unit in a system having a plurality of multiplexer units each being connected on a common communication line wherein each multiplexer unit has an operating period relative to a multiplexer time clock, comprising in combination:

a. counter circuit having an input connected to the multiplexer time clock for providing a counter output upon registering a preselected clock count which corresponds to the time period of the multiplexer unit;
a. line receiver connected to the communication line for providing a line receiver output upon detecting a predetermined period of signal absence on the communication line;
means connecting said line receiver output to said counter circuit for resetting said counter circuit after said period of signal absence on the communication line;
and means connecting said counter circuit output of the multiplexer unit to transfer information through the communication line only at the time period of the multiplexer unit.

4,052,567

MULTIPLEXER RECEIVER TERMINATOR

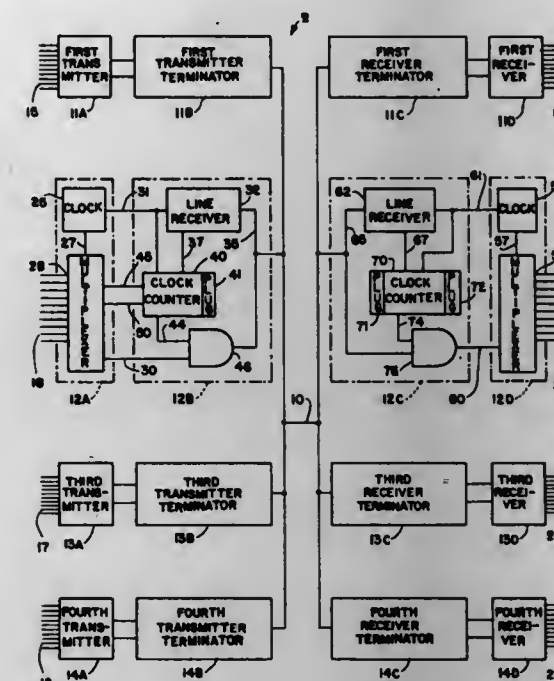
William Allan MacKay, Richmond Hill, Canada, assignor to D.D.I. Communications, Inc.

Filed Dec. 24, 1975, Ser. No. 644,102

The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.
Int. Cl.² H04J 3/08

U.S. Cl. 179—15 AL

14 Claims



1. A device for a multiplexer receiver in a system having a plurality of multiplexer receivers connected on a common communication line wherein each multiplexer receiver has a time period for reception relative to a multiplexer time clock, comprising in combination:

a. counter circuit connected to the multiplexer time clock for providing a counter output upon registering a clock count between two preselected clock counts which correspond to the time period of the multiplexer receiver;
a. line receiver connected to the communication line for providing a line receiver output upon detecting a predetermined period of signal absence on the communication line;
means connecting said line receiver output to said counter circuit for resetting said counter circuit after said predetermined period of signal absence;
and means connecting said counter circuit output to the multiplexer receiver for enabling reception from the communication line only during a counter output of said counter circuit.

4,052,568

DIGITAL VOICE SWITCH

Joseph Albin Jankowski, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Apr. 23, 1976, Ser. No. 679,588

Int. Cl.² G10L 1/04

U.S. Cl. 179—15 AS

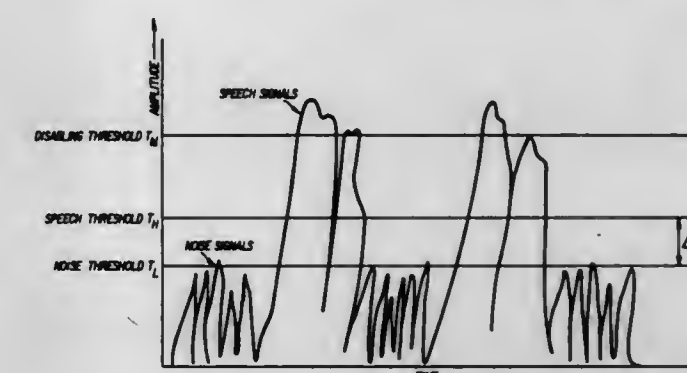
5 Claims

1. A digital voice switch for detecting speech signals in the presence of noise signals on a communication channel, where the signal in said channel is periodically sampled and encoded, comprising:

a. threshold adjustment means having sources of speech threshold signals and noise threshold signals and means for adjusting said speech and noise threshold signals;
b. speech detector means connected to receive said encoded signal samples and said speech threshold signal from said threshold adjustment means for comparing the magnitude of said samples with said speech threshold signal and for providing an output signal when said speech signals are determined to be present in said communication channel;
c. noise detector means connected to receive said encoded

signal samples and said noise threshold signal from said threshold adjustment means for comparing the magnitude of said samples with said noise threshold signal and for providing an output signal developed from comparison of the magnitude of said encoded signal with said noise threshold signal indicating the level of said noise signals in said communications channel;

d. logic means connected to receive said output signal from said noise detector means and having a first state and a second state for applying command output signals to said threshold adjustment means when said logic means is in the first state and for not applying said command signals when said logic means is in the second state, said logic means being in the first state when the level of said noise signals exceeds a predetermined noise level or is less than a second predetermined noise level, and said command



output signals causing said threshold adjustment means to adjust the values of said speech and noise threshold signals according to the level of said noise signals;

e. a source of a disabling threshold signal;
f. disabling detector means connected to receive said encoded signal samples and said disabling threshold signal from said source for providing an output signal when said encoded signal sample exceeds said disabling threshold signal; and
g. disabling circuit means connected to receive said output from said disabling detector means and said output signal from said speech detector means for triggering said logic means to the second state when said sample exceeds said disabling threshold signal and when said output signal from said speech detector means indicates the presence of speech signals in said communication channel.

4,052,569

EMERGENCY CALL ANSWERING SYSTEM

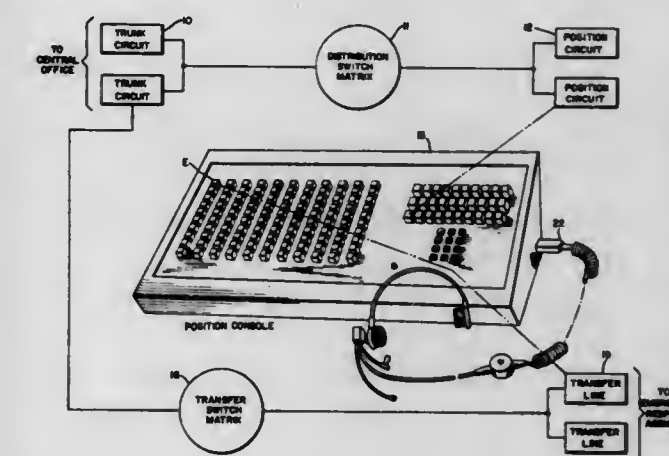
Robert M. Pirnie, III, Montgomery, Ala., assignor to Communication Equipment & Contracting Co., Inc., Union Springs, Ala.

Filed July 9, 1976, Ser. No. 701,551

Int. Cl.² H04M 3/50

U.S. Cl. 179—27 FH

1 Claim



1. In an emergency call answering system having a plurality

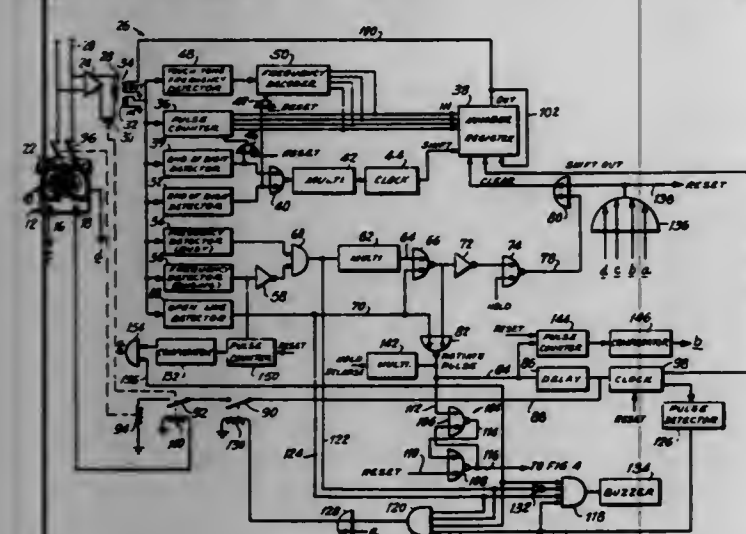
of incoming trunk circuits connected through a distribution switch matrix to a plurality of answering position circuits; the improvement comprising a position console selectively connectable to a line transfer circuit through a selectable switch connectable to the answering position circuit and through a transfer line and transfer switch matrix to a selected emergency response agency, said single switch establishing a signal and audio circuit through said switch matrices from the incoming trunk circuit to said transfer line circuit to select and ring on a line to an emergency response agency so that upon answer by an emergency response agency it is connected directly to the incoming trunk circuit initiating the call and to the console operator.

4,052,570 TELEPHONE SYSTEM

Paul J. Sutton, 300 Central Park West, New York, N.Y. 10024
Filed Dec. 22, 1975, Ser. No. 643,322
Int. Cl.² H04M 1/50

U.S. Cl. 179-90 B

22 Claims



1. An attachment for a telephone set which dials telephone numbers onto a telephone line, or the like, said attachment comprising:

- storing means coupled to said telephone set for storing a telephone number at the same time as it is initially dialed and transmitted onto the telephone line;
- signal detector means coupled to said telephone set for detecting the receiving of a busy signal in response to the initial dialing of said telephone number and in the absence thereof clearing said storing means; and
- control means coupled to said signal detector means; and responding to the receipt of a busy signal and the releasing of the telephone line for causing the number stored to be re-dialed onto the telephone line, said control means comprising release means coupled to the telephone set for terminating the operation of said control means and clearing said storing means when the handset is subsequently removed from the cradle of the telephone set.

4,052,571

HEARING AID WITH AMPLITUDE COMPRESSION ACHIEVED BY CLIPPING A MODULATED SIGNAL

Richard Langton Gregory, and Ian Alexander Low, both of Bristol, England, assignors to National Research Development Corporation, London, England

Filed Oct. 29, 1976, Ser. No. 737,162

Claims priority, application United Kingdom, Nov. 7, 1975, 46190/75

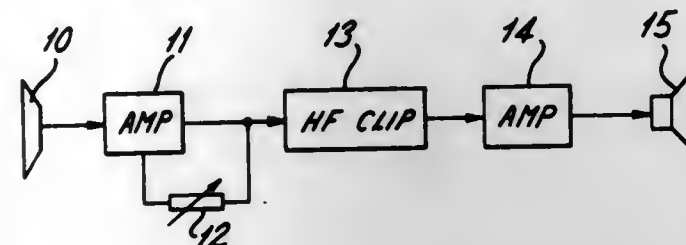
Int. Cl.² H04R 25/00

U.S. Cl. 179-107 R

10 Claims

1. A hearing aid comprising: means responsive to sound waves to produce an electrical input signal in the audio-frequency band; means for transposing said input signal to a high-frequency band to produce a transposed signal; limiting means for limiting the peak amplitude of said trans-

posed signal to a predetermined value to produce a peak-limited signal;



means for restoring said peak-limited signal to the audio-frequency band to produce a restored signal; and means for audio reproduction of said restored signal.

4,052,572

HEARING AID

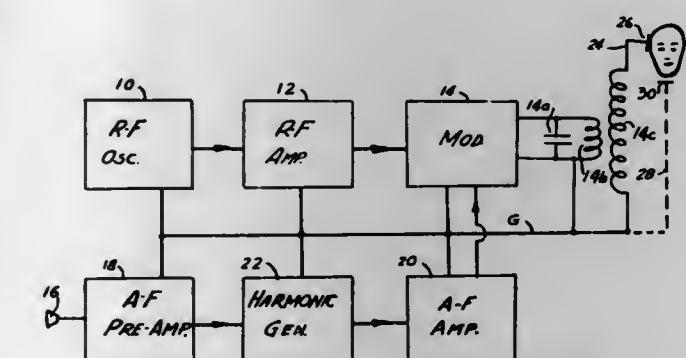
Curtiss R. Schafer, Newtown, Conn., assignor to Electro-Physical Research, Inc.

Filed Apr. 29, 1976, Ser. No. 681,429

Int. Cl.² H04R 25/00

U.S. Cl. 179-107 R

10 Claims



7. The method of enabling a person to effect cortical sensing and recognition of a variety of sounds including speech and music, including the steps of providing an electrical signal having a spectrum of audio frequencies, providing a carrier-frequency signal, modulating the carrier-frequency signal with said electrical signal, impressing the output of the modulator on an electrode coupled to the person's head so as to effect cortical sensing of the spectrum of audio frequencies, said method including the step of imposing harmonic distortion of at least 5% on said electrical signal.

4,052,573

ROTARY OR SLIDE TYPE SWITCH ASSEMBLY HAVING RECESSED PRINTED CIRCUIT SUBSTRATE, INTERPOSED RESILIENT BRIDGING CONTACT AND MOVABLE PRINTED CIRCUIT DISC

Tatsuo Kojima, Kyoto, and Yoshio Kawai, Kawasaki, both of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Feb. 11, 1976, Ser. No. 657,059

Claims priority, application Japan, Feb. 17, 1975, 50-20024; Nov. 28, 1975, 50-161921[U]; Nov. 28, 1975, 50-161922[U]; Nov. 28, 1975, 50-161923[U]

Int. Cl.² H01H 19/08, 15/04, 9/00

U.S. Cl. 200-11 DA

9 Claims

1. An electrical switch assembly which comprises in combination:

- a substantially plate-like substrate made of electrically insulating material and having first and second surfaces opposed to each other;
- a plurality of elongated, fixed contact elements made of electrically conductive material and embedded in said substrate in spaced relation to each other with a plane of

each of said fixed contact elements lying substantially intermediately of the thickness of said substrate, each of said fixed contact elements having an outer end extending outwardly from a periphery of said substrate for external electrical connection;

at least one first socket defined in said substrate and opening on either one of said first and second substrate surfaces, said first socket extending from the opening on said either one of the first and second substrate surfaces into the substrate substantially halfway the thickness of said substrate and terminating at and in alignment with one of respective inner ends of said fixed contact elements thereby exposing said one of the inner ends of the fixed contact elements to the outside of said substrate through the opening on said either one of said first and second substrate surfaces;

a plurality of second sockets defined in said substrate in spaced relation to each other and also to said first socket and opening on said either one of the first and second substrate surfaces, said second sockets extending from the respective openings on said either one of the first and second substrate surfaces into the substrate substantially halfway the thickness of the substrate and terminating at

the additional contact pieces within substantially all of the second sockets.

4,052,574

PRESSURE SWITCH WITH SNAP-TOGGLE ADJUSTING MEANS

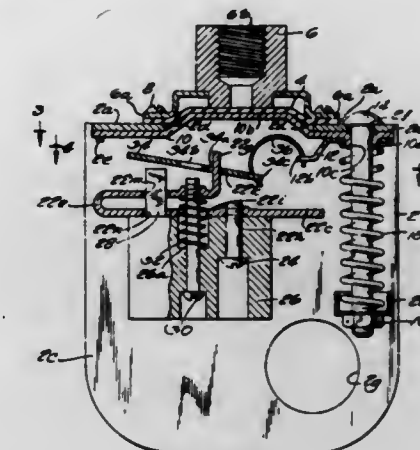
Harry W. Brown, Big Bend, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 17, 1976, Ser. No. 697,210

Int. Cl.² H01H 35/34

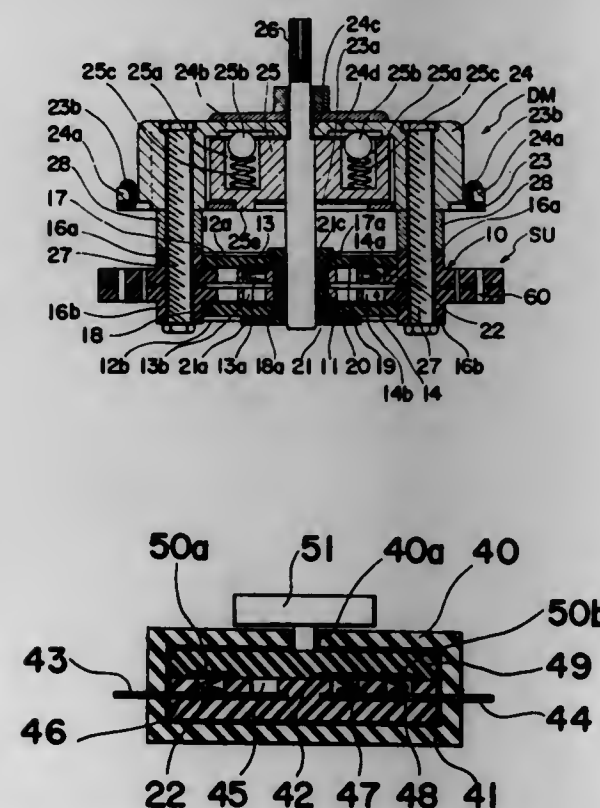
U.S. Cl. 200-83 P

8 Claims



1. A pressure switch comprising:

- a housing;
- pressure responsive means mounted to said housing for movement relative thereto in response to pressure;
- actuator means mounted in said housing and movable by said pressure responsive means;
- a bearing movably mounted in said housing;
- a lever pivotally mounted between its ends at said bearing;
- contact means mounted in said housing for actuation by one end of said lever in response to pivoting thereof;
- a toggle spring biased between said actuator means and the other end of said lever to cause snap-action pivoting of said lever as said toggle spring passes through an overcenter force-reversing toggle point in response to movement of said actuator means; and
- adjusting means for moving said bearing relative to said actuator means, thereby varying the toggle point of said toggle spring relative to movement of said actuator means whereby to adjustably control the pressure at which said contact means is actuated.



and in alignment with associated portions adjacent the inner ends of the remaining fixed contact elements thereby exposing the portions adjacent the inner ends of the remaining fixed contact elements to the outside of the substrate through the respective openings on either one of the first and second substrate surfaces;

removable intermediate contact pieces made of electrically conductive material, one of said intermediate contact pieces being removably accommodated within the first socket and additional contact pieces being removably accommodated within substantially all of the second sockets;

at least one movable contact element movably supported on said either one of said first and second substrate surfaces; means carrying said movable contact element for positioning said movable contact element to any one of a plurality of switching positions; and

said movable contact element being so shaped that, depending upon the position of said movable contact element, said one of said respective inner ends of the fixed contact element is electrically connected to any one of said portions adjacent the inner ends of some or all of the fixed contact elements through said movable contact element by means of said contact piece within said first socket via

4,052,575

METAL-CLAD GAS-TYPE HIGH-POWER CIRCUIT-BREAKER CONSTRUCTIONS INVOLVING TWO ARC-EXTINGUISHING ASSEMBLAGES

Richard E. Kane, Monroeville, Pa.; Frank L. Reese, deceased, late of Monroeville, Pa., by Blanche C. Reese, executrix, Lansford, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 6, 1975, Ser. No. 575,103

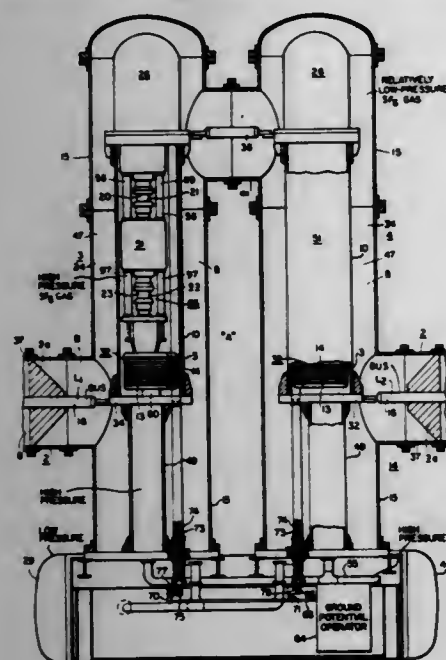
Int. Cl.² H01H 33/28

U.S. Cl. 200-145

13 Claims

1. A high-power, high-voltage metalclad compressed-gas circuit-interruptor structure including two laterally-spaced-apart metalclad circuit-breaker assemblies (3, 4), at least one circuit-breaker unit (8, or 9) having a pair of separable contacts (23, 25) disposed interiorly within each metalclad circuit-breaker assembly (3, 4), each metalclad circuit-breaker assembly (3, 4) having an outer-disposed metallic casing (15), an interiorly-disposed supporting insulating high-pressure gas-containing tube structure (49) at least partially supporting each circuit-breaker unit (8 or 9) in spaced radial inward fixed relationship away from the outer metallic grounded casing (15), pressurized interconnecting metallic gas-conducting means (41) disposed adjacent one end of the two laterally-

spaced-apart metalclad circuit-breaker assemblies (3, 4) and pneumatically interconnecting the gas spaces therein (24) about the circuit-breaker units (8 or 9), an electrical connection (38) disposed centrally within said interconnecting metallic gas-conduit means (41) and electrically interconnecting said circuit-breaker assemblies (3, 4) in electrical series relationship for interrupting high-voltage circuits, a pressurized terminal (16) within a metalclad casing structure (2) connecting to each metalclad circuit-breaker assembly (3, 4) adjacent the mid-portion thereof, a high voltage power conductor in each



said latter-mentioned pressurized terminal metalclad casing structure (2), a grounded metallic supporting frame structure for at least partially supporting said circuit-breaker assemblies (3, 4), at least one gas-reservoir tank also at least supported by said metallic frame structure for storing arc-extinguishing gas, and operating means at high voltage disposed adjacent said one end of the two-laterally-spaced-apart circuit-breaker assemblies (3, 4) comprising two high-voltage operators (26) for simultaneously actuating the two circuit-breaker assemblies (3, 4) in their opening and closing movements.

4,052,576

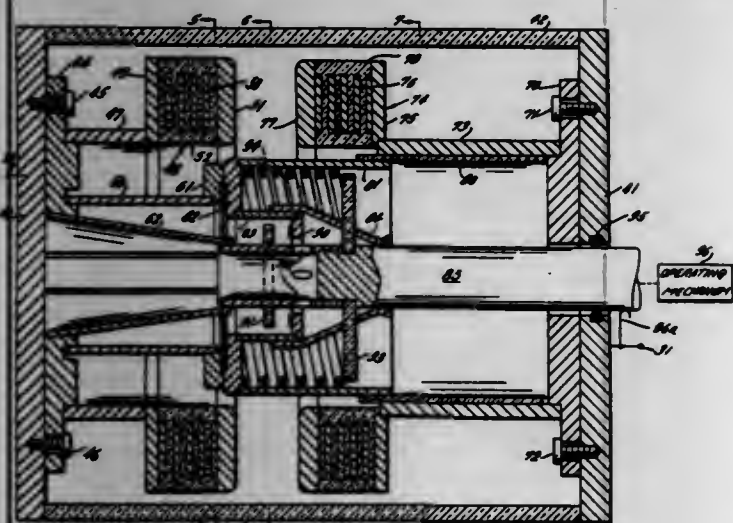
CONTACT STRUCTURE FOR SF₆ ARC SPINNER

Robert Kirkland Smith, Ambler, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Sept. 2, 1975, Ser. No. 609,559
Int. Cl.² H01H 33/18

U.S. Cl. 200-147 R

17 Claims



1. A circuit interrupter comprising an elongated cylindrical housing filled with dielectric gas at a single pressure, first and second cooperable conductive rings operable to define an arcing gap between their opposing surfaces and composed of high conductivity material, and an electrical winding closely

magnetically coupled to said first conductive ring; said first conductive ring defining a short-circuited turn; said electrical winding being operable with said first conductive ring to produce a magnetic field which is out of phase with the arc current to be interrupted by said circuit interrupter for rapidly spinning an arc around said arcing gap even near instantaneous current zero, first and second terminals fixed to said circuit interrupter; said first terminal, said winding, said first conductive ring, said second conductive ring and said second terminal being connected in electrical series; said first and second conductive rings and said winding being coaxial with the axis of said cylindrical housing; first and second interrupter contacts connected to said first and second terminals respectively and relatively movable parallel to the said axis of said cylindrical housing between an open and a closed position; said first conductive ring and said electrical winding having internal diameters; said first and second interrupter contacts being concentrically disposed within the interior of said internal diameters of said first conductive ring and said electrical winding; said first and second interrupter contacts engaging in a region axially aligned with said arcing gap.

4,052,577

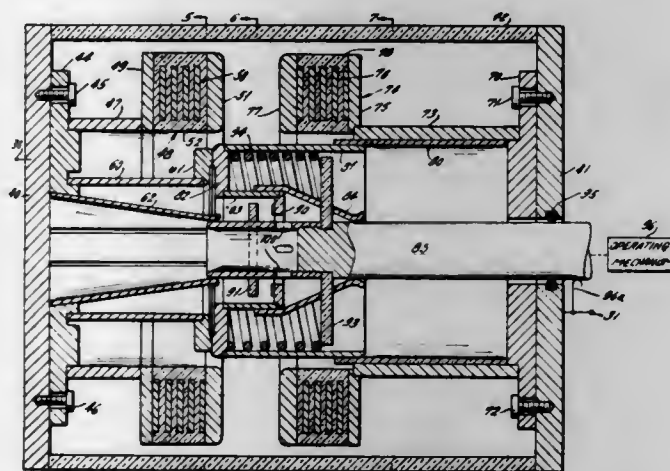
MAGNETICALLY DRIVEN RING ARC RUNNER FOR CIRCUIT INTERRUPTER

Gerald A. Votta, King of Prussia, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Sept. 2, 1975, Ser. No. 609,231
Int. Cl.² H01H 33/18

U.S. Cl. 200-147 R

15 Claims



1. A circuit interrupter comprising first and second parallel coaxial rings of conductive material; said first and second rings having first respective confronting surfaces which are operable to define an arcing gap; at least said first ring comprising a high conductivity short-circuited turn; an electrical winding having a given number of turns disposed coaxially with said first and second rings and being positioned adjacent a surface of said first ring which is opposite to its said first surface; first and second electrical terminals for said circuit interrupter respectively connected to one end of said electrical winding and to said second ring; the other end of said electrical winding being connected to said first ring; first and second cooperable contacts connected to said first and second terminals, respectively, whereby, after said first and second contacts open, an arc is produced in said arcing gap between said first and second rings, and said arc between said first and second rings is rapidly rotated around said gap; and a sealed housing filled with a static dielectric gas under pressure greater than atmospheric pressure for housing said circuit interrupter; said gap between said first and second rings being at least large enough to withstand the maximum voltage to be applied across said gap after said arc is extinguished; said first and second rings being relatively massive, thereby to serve as good heat sinks to the localized heat generated by the arc therebetween; said electrical winding being closely magnetically coupled to said first ring whereby, when arc current flows in series with said winding, a

high current is induced in said ring, thereby to produce a magnetic field which is phase-shifted from the arc current, thereby to cause rapid rotation of said arc in said gap, even at low instantaneous current; said first ring and said winding being rigidly immersed in a potted insulation ring, thereby to be rigidly supported against electrodynamic forces of repulsion between said closely spaced first ring and winding.

4,052,578

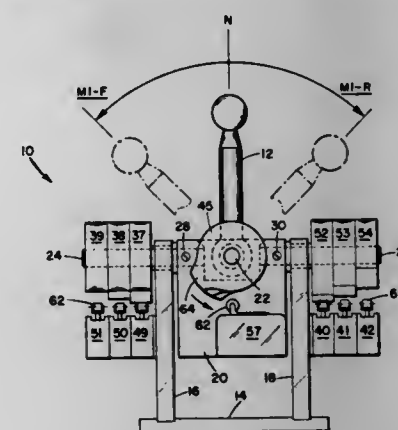
MULTIPLE CAM, MULTIPLE POSITION SWITCH CONTROL MECHANISM WITH JOY-STICK TYPE OPERATOR OPERABLE IN X-Y PLANES

William A. Hoke, 517 Overdale Road, Baltimore, Md. 21229

Filed Jan. 6, 1976, Ser. No. 649,685
Int. Cl.² H01H 3/32, 25/04; G05G 9/00

U.S. Cl. 200-153 L

3 Claims



1. A control mechanism for controlling a plurality of multiple-operation motive devices either separately or simultaneously comprising:

a control handle means operable by the user of said mechanism;

a pivot means connected to the control handle means at one end thereof;

a coupling means for coupling said pivot means to said control handle means, said coupling means having a channel provided therein;

a housing means, said coupling means being disposed interiorly of said housing means, said housing means having a slot provided in a surface thereof for receiving said control handle means therethrough and further having at least two pairs of aligned apertures in other surfaces thereof;

shaft means pivotally connected to said pivot means, said shaft means including at least one shaft unit which is received within said channel in said coupling means and positioned within one pair of said aligned apertures in said housing, said shaft means further including aligned separate shaft elements received and fixedly held within the other of said pair of aligned apertures of said housing, said shaft elements being pivotally mounted in said pivot means;

camming means fixed to portions of the ends of each of said shaft elements and said one shaft unit; and switch means interfaced with said motive device, movement of said control handle means in a plane perpendicular to said aligned longitudinal axes of said shaft elements and one of said shaft unit causing said shaft elements to rotate about their longitudinal axes and thereby to rotate at least certain of said camming means into contact with at least certain of said switch means.

4,052,579

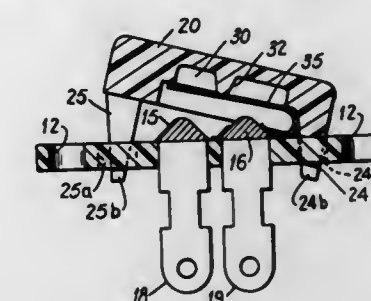
MOMENTARY CONTACT SWITCH HAVING PIVOTING ACTUATOR MOUNTED ON SWITCH BASE

Ronald H. Arthur, Fort Lauderdale, Fla., assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 15, 1976, Ser. No. 667,244
Int. Cl.² H01H 3/12

U.S. Cl. 200-159 A

10 Claims



1. A momentary contact switch for selectively establishing electrical connection between stationary contacts, said switch comprising

a thin insulator base member having aligned on one face thereof a plurality of dome shaped stationary contacts which extend upwardly from said face,

a first pair of notches or voids extending through said base member beyond one end of said aligned stationary contacts and a second pair of notches or voids extending through said base member beyond the other end of said aligned stationary contacts, the notches of each pair being on opposite sides of the aligned contacts,

an elongated actuator of insulating material extending transversely across said stationary contacts and extending longitudinally beyond both ends of the aligned stationary contacts,

said actuator including four downwardly extending yieldable legs each located to be inserted through a respective one of said notches or voids,

a barb element on the bottom portion of each leg for engaging the underside of said base member and thereby releasably holding said legs within said notches or voids,

a spring contact member formed of elongated, yieldable, conductive material and having a reverse bend intermediate its ends to form first and second legs,

the first leg of the spring contact member having a pocket formed therein which is generally complementary in shape to a dome shaped contact for receiving therein an end one of the aligned stationary contacts,

said actuator having a recess in its underside to receive and position the second leg of the spring contact member therein,

the reverse bend of the spring contact member being located longitudinally beyond said end one of the aligned stationary contacts.

4,052,580

MOMENTARY CONTACT PUSHBUTTON TYPE SWITCH HAVING FLEXIBLE, MOUNTED HOUSING

Ronald J. Stanish, Hollywood, Fla., assignor to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 583,466, June 3, 1975, Pat. No. 3,983,341. This application Sept. 24, 1976, Ser. No. 726,095
Int. Cl.² H01H 13/52

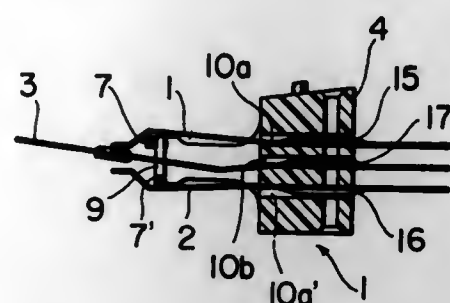
U.S. Cl. 200-159 R

12 Claims

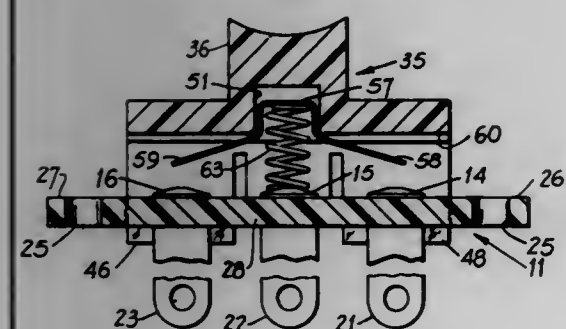
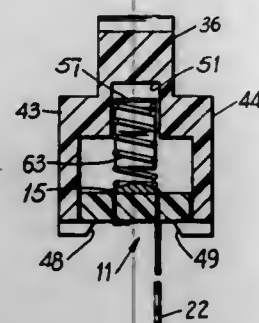
1. A momentary contact push switch comprising a thin insulator terminal board having two end regions and an intermediate region therebetween, a plurality of stationary contacts on one surface of the terminal board in said intermediate region, terminal means for said stationary contacts, a housing member formed as a unitary plastic piece having a top portion that extends transversely across the intermedi-

ate region of the terminal board and including yieldable side skirts that extend downwardly below opposite side edges of the intermediate region of the terminal board, one or more barbs or latch elements at the lower portions of the skirts, said barbs extending inwardly of the side edges of the intermediate region for releasably engaging the underside of the terminal board, a bridging contact disposed against the underside of the top portion of said housing member for establishing electrical connection between given stationary contacts on the terminal board, spring means extending between said terminal board and housing member for maintaining the top portion of the

disposed between said free ends of said fixed and movable members and said supporting member for positioning said



fixed and movable members for movement into and out of contact.



housing member raised above the terminal board and for maintaining the bridging contact above and out of contact with the stationary contacts, said barbs on the skirts holding the housing member on the terminal board and limiting the separation of the top portion of the housing member above the terminal board, the top portion of said housing member and said bridging contact being movable toward said terminal board upon application of a force thereto that is directed substantially normal to the surface of the terminal board, all of said barbs becoming disengaged from the underside of the intermediate region of the terminal board and said bridging contact engaging said given stationary contacts after a given distance of motion of the housing member toward the terminal board.

4,052,581

SWITCH WITH MOVABLE AND FIXED CONTACTS

Shigeru Matsui, Hamamatsu, Japan, assignor to Nippon Gakki Seisaku Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 28, 1975, Ser. No. 626,557

Claims priority, application Japan, Oct. 29, 1974, 49-130685[U]

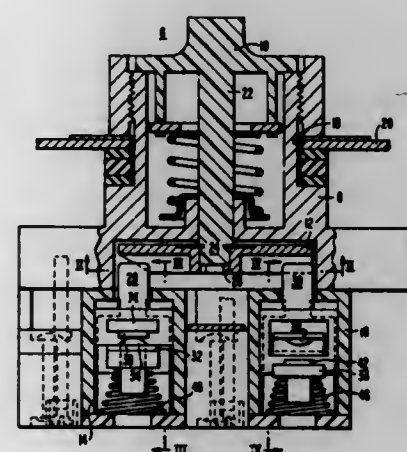
Int. Cl.² H01H 50/56

U.S. Cl. 200—283

14 Claims

1. A switch comprising:
a. at least one springy fixed contact member having a free end;
b. a springy movable contact member having a free end and capable of being moved by application of force to its free end into and out of contact with said fixed member;
c. a supporting member supporting said fixed and movable members with the free end of said movable member extending beyond the free end of said fixed member; and
d. a positioning means fixed to said supporting member and

1. A rotary selector switch comprising a rotatable actuating unit and two switch structures, a housing, the rotatable unit in the housing and comprising a rotatable selector mechanism, said mechanism comprising a detachably mounted cam, means limiting rotation of the cam to about 180°, each switch structure having a reciprocable contact operating member to effect opening and closing of a circuit through the switch structure, the mechanism and the cam having mutually inter-fitting means to enable removal and repositioning of the cam in an alternate mode of operation with respect to the contact operating members, the cam having camoperating surface means for actuating the contact operating members and comprising a number of operating positions for the operating members including in sequence two adjacent up positions, two adjacent down positions, a single down position, and a single up position.



4,052,582

ROTARY SELECTOR SWITCH

John H. Mullen, and Glenn R. Taylor, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1976, Ser. No. 665,139

Int. Cl.² H01H 3/42

U.S. Cl. 200—330

7 Claims

4,052,583

METHOD OF AND APPARATUS FOR ELECTRICAL-DISCHARGE MACHINING WITH A TRAVELING-WIRE ELECTRODE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Inc., Yokohamashi, Japan

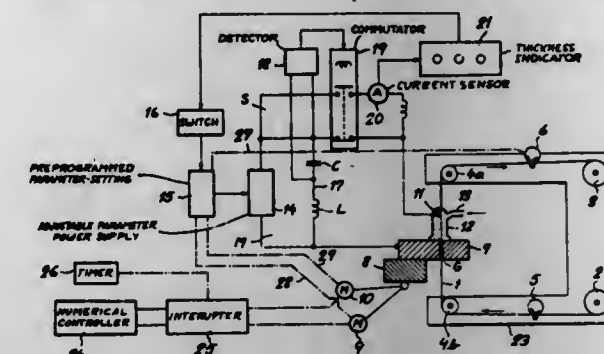
Filed June 23, 1976, Ser. No. 699,206

Claims priority, application Japan, June 24, 1975, 50-78825

Int. Cl.² B23P 1/08

U.S. Cl. 219—69 W

11 Claims



1. In a method of electrically machining a conductive workpiece in which:

a traveling-wire electrode and the workpiece are relatively displaced transversely to the length of the traveling-wire electrode and define a machining gap between them, a machining liquid is supplied to said gap, and a series of electrical pulses are applied across the workpiece and the electrode to generate machining discharges in the gap to remove material from the workpiece, the improvement which comprises:

a. temporarily interrupting said relative displacement of said electrode and said workpiece;
b. continuing the application of said pulses during the interruption until the discharges across the gap substantially cease; and
c. when said discharges across the gap substantially cease, measuring the leakage current across said gap for at least one further applied pulse, said leakage current providing an indication of workpiece thickness.

9. In an apparatus for the electrical machining of a conductive workpiece including:

a traveling-wire electrode, means for relatively displacing said traveling-wire electrode and a workpiece in accordance with a predetermined program while maintaining a machining gap therebetween,

means for supplying a machining liquid to said gap, and means for applying electrical pulses across said workpiece and said electrode to effect material-removal machining discharges across said gap, the improvement which comprises:

a. means for temporarily halting said relative displacement while permitting continued application of said pulses; and
b. means effective to the substantial termination of said discharges for measuring leakage current across said gap upon application of at least one further electrical pulse, the magnitude of said leakage current being an indication of the thickness of said workpiece.

4,052,584

METHOD AND APPARATUS FOR CUTTING INSULATING MATERIAL

Kurt Reznicek, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 29, 1976, Ser. No. 681,754

Int. Cl.² B23P 1/08

U.S. Cl. 219—69 M

11 Claims

1. Apparatus for cutting insulating material comprising:
a base for supporting the insulating material, said material

having a conductive layer proximate to the surface thereof;

displacement-control means coupled to the base for selectively moving said base;

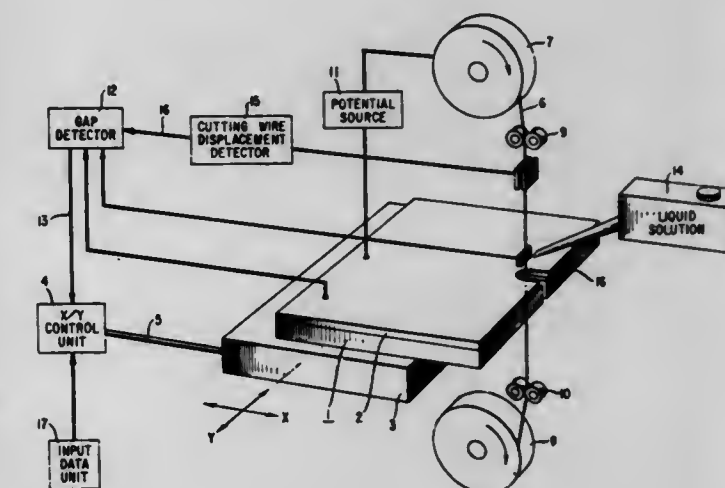
a cutting member adapted to be positioned against said insulating material in contacting relationship therewith in a direction substantially perpendicular to said base;

means for moving said cutting member along said direction thereby abrasively cutting said insulating material;

means adapted to be connected to a voltage source for imposing a potential difference between said cutting member and said conductive layer;

means for supplying a liquid solution at the cutting site between said cutting member and said conductive layer thereby causing a gap to be formed between said member and said layer at the cutting site by electro-erosion machining;

means for generating control signals in response to distance variations of said gap between said cutting member and said conductive layer at the cutting site for controlling said displacement means; and



means for detecting tensions on said cutting member for controlling said generating means.

6. Method for cutting insulating material comprising the steps of:

coating a surface of the insulating material with a conductive layer;

mounting said insulating material on a base coupled to displacement means;

positioning a cutting member against said insulating material in contacting relationship therewith in a direction substantially perpendicular to the base;

imposing a potential difference between the cutting member and the conductive layer;

moving the cutting member along said direction thereby abrasively cutting said insulating material;

supplying a liquid solution at the cutting site between the cutting member and the conductive layer thereby causing a gap to be formed between said member and said layer at the cutting site by electro-erosion machining; and

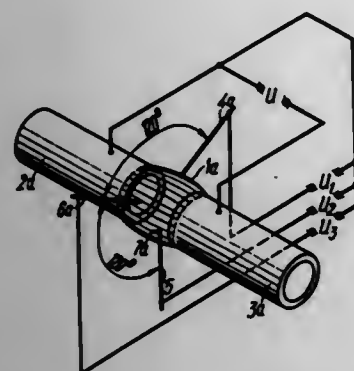
monitoring said cutting member deviations proximate the cutting site during said moving step for controlling said displacement means.

4,052,585

BUTT WELDING PROCESS AND APPARATUS FOR EFFECTING SAME

Vitaly Alexandrovich Sidiyakin, ulitsa Fabritsiusa, 44, korpus 2, kv. 126; Alexandr Nikolaevich Sabantsev, ulitsa Bagritskogo, 3, korpus 1, kv. 70; Evgeny Mikhailovich Lapin, Davydkovskaya ulitsa, 38, kv. 57, and Evgeny Alexeevich Machnev, Premezsky val, 7, kv. 2, all of Moscow, U.S.S.R.
Filed Aug. 11, 1975, Ser. No. 603,254
Int. Cl.² B23K 11/04

U.S. Cl. 219—100



1. A butt welding process comprising the steps of:
 - a. positioning the butt ends or portions of the articles to be welded in proximate spaced relation to each other;
 - b. placing said butt ends in a shielding medium at a predetermined low pressure;
 - c. firstly heating the butt ends by a glow discharge initiated in the gap therebetween;
 - d. secondly heating the butt ends by a low-pressure arc uniformly distributed over the entire butt end surfaces of the articles being welded until a molten layer is formed thereon; and
 - e. upsetting the articles to be welded to cause their plastic deformation and produce a weld joint.

4,052,586

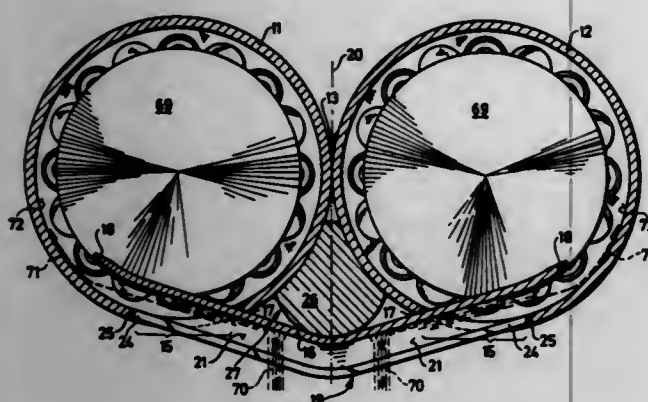
WATER-JET ELECTRODE STEAM GENERATOR AND ELECTRODE THEREFORE

Alfred Branner, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Nov. 21, 1975, Ser. No. 634,059
Claims priority, application Switzerland, Nov. 26, 1974, 15456/74

Int. Cl.² H05B 3/60; F22B 1/30

U.S. Cl. 219—284

11 Claims



1. An electrode for a water-jet electrode steam generator comprising:
 - a. a water-collecting box including at least one vertically disposed cylindrical tube having a vapor outlet in upper portion, a water outlet at a bottom thereof and a slot in a wall thereof for passage of a flow of water into said tube; and
 - each said tube having a deflecting plate extending through said slot and disposed to deflect a flow of water impinging

thereon into said tube and tangentially of said wall, said plate being mounted in sealed relation to one side of said slot and disposed to pass between the center of said tube and the opposite side of said slot to form a free opening, said plate having a free end located within said tube downstream of the flow of water.

4,052,587

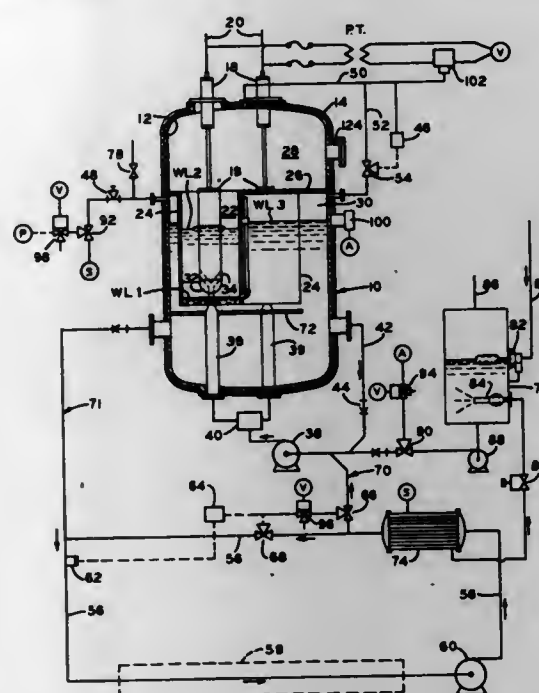
HTW HEATING SYSTEM HAVING AN ELECTRODE STEAM BOILER AS THE DIRECT SOURCE OF HTW

Milton Eaton, 363 Ninth St., Shawinigan, Quebec, Canada
Continuation-in-part of Ser. No. 559,981, March 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 505,995, Sept. 16, 1974, abandoned. This application Sept. 20, 1976, Ser. No. 725,033

Int. Cl.² H05B 3/60; F22B 1/16; F24D 3/02

U.S. Cl. 219—295

11 Claims



1. In an HTW space heating system in which the direct source of HTW is an automatic electrode steam boiler including a pressure vessel having at least one steam generating compartment surrounded by a control compartment, at least one electrode in said vessel and adapted to be connected in an electrical distribution system, said at least one electrode being positioned in a corresponding at least one steam generating compartment surrounded by a control compartment, a corresponding at least one water spout in said vessel for directing water toward the tip of said at least one electrode and said boiler including means for maintaining a predetermined minimum HTW level in said vessel, the improvement in said HTW heating system including:
 - a. means providing for limited steam output for the at least one steam generating compartment of said boiler, such limited steam output being utilized for control purposes by control means associated with said boiler;
 - b. means, including a boiler water pump, for mixing HTW water taken from the boiler with water from an outside source and pumping the mixed water through said at least one water spout with sufficient velocity for the water to flow up the surface of said at least one electrode to the water level in said at least one steam generating compartment;
 - c. a heated spaces circuit having pumping means for continuously circulating HTW through said heated spaces circuit;
 - d. an HTW supply circuit connecting said boiler with said heated spaces circuit and providing for unrestricted flow of HTW from said boiler to said heated spaces circuit so that said boiler serves as a pressurized expansion tank for said heating system;
 - e. said boiler water pump having an inlet connected to the HTW in said boiler and an outlet connected to said at least

one water spout, a diversion circuit connecting said heated spaces circuit with said boiler water pump inlet; and

- f. control means responsive to a condition associated with the heated spaces for selectively diverting a controlled amount of HTW from said heated spaces circuit through said diversion circuit to said boiler water pump inlet; such diverted HTW constituting water from an outside source, and the HTW diverted from said heated spaces circuit being replaced with HTW from said boiler through said HTW supply circuit.

4,052,588

ELECTRIC HEATER PANEL

Tatsuji Nakamura, Tokyo; Kenji Fukuda, Asaka; Toshihiko Tsuji, Tokyo; Takeo Maruyama, Yono; Ryouji Sakai; Shohei Sawada, both of Tokyo, and Haruki Miyoshi, Toda, all of Japan, assignors to Nippon Kinzoku Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 378,654, July 12, 1973, abandoned.

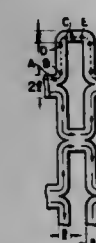
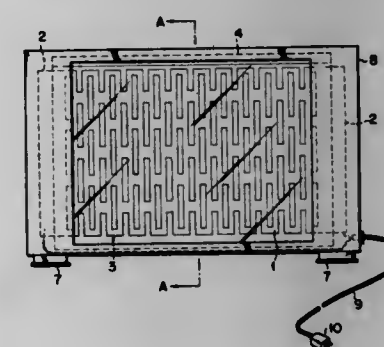
This application Mar. 21, 1975, Ser. No. 560,710

Claims priority, application Japan, July 29, 1972, 47-89480; Apr. 4, 1973, 48-40845; Apr. 4, 1973, 48-40846; Apr. 13, 1973, 48-44424

Int. Cl.² H05B 1/00, 3/22; F24D 13/00; H01C 3/17

U.S. Cl. 219—345

2 Claims



1. A panel heater comprising: a flat metal sheet of substantially even thickness of from 0.06 to 0.2 mm; having electrode terminals at two opposite ends of said sheet and a mesh-like radiation section formed in the central portion of said sheet, said mesh-like radiation section being composed of a plurality of units of wave-like current passageways, each unit having a uniform width of approximately 2mm from one end to the other, said units being arranged parallel to each other and connected to each other at the crests of said wave-like current passageways so that the combined width of said passageways at said crests is twice said uniform width; a pair of heat resistant boards between which said metal sheet is sandwiched; and a frame assembly joining together said heat resistant boards.

4,052,589

HEATED FOOD SERVICE SYSTEM

William B. Wyatt, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 508,091, Sept. 23, 1974, abandoned. This application Aug. 4, 1975, Ser. No. 601,286

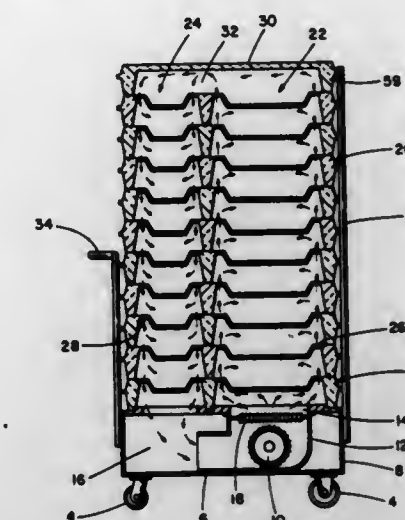
Int. Cl.² F27D 11/02

U.S. Cl. 219—400

11 Claims

1. A food service system comprising a closed base structure having an inlet and an outlet provided therein, means to change the air temperature from the ambient means in said base structure for supplying forced air other than at ambient temperature through said outlet, a stack of matched separable trays

each having compartments thermally insulated from each other disposed on top of said base structure, one compartment in each tray positioned over a corresponding compartment in a tray below to form a first column of compartments, another compartment in each tray positioned over a corresponding compartment in a tray below to form a second column of



compartments, said trays disposed on said base structure with said first column positioned over said outlet and said second column positioned over said inlet, openings around said compartments in said first and second columns permitting air to flow upward in said first column from said outlet and downward in said second column to said inlet and means having a closed passage connecting said first column to said second column.

4,052,590

ELECTRIC APPLIANCE WITH INTERMITTENTLY STAKED SHEATHED HEATING ELEMENT

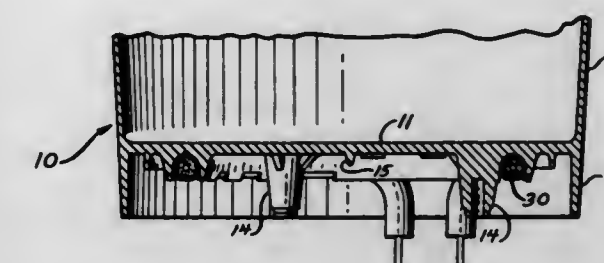
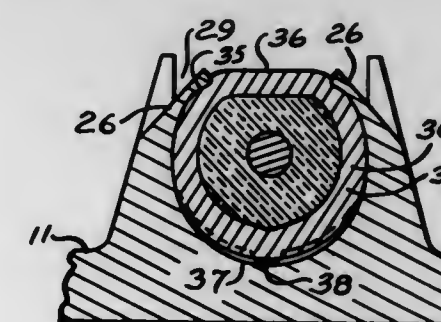
Richard F. Anderl, Chippewa Falls, and Lawrence J. Tienor, Eau Claire, both of Wis., assignors to National Presto Industries, Inc., Eau Claire, Wis.

Filed Oct. 28, 1976, Ser. No. 736,449

Int. Cl.² F27D 11/02

U.S. Cl. 219—438

13 Claims



1. An electrically heated appliance having a heat-conductive metal wall containing a channel and a sheathed electric heater element intermittently staked in said channel, the sheath of said electric heater element having longitudinally spaced indentations in the material of its outer side into which correspondingly spaced segments of the outer edge of the opposed channel sides are pressed, intervening portions of said outer edges

and second frame support members and defining a light chamber having side walls of selectable disassociatable nature, and means to releasably retain said light diffusing and directing member on said first and second frame support members.

4,052,608

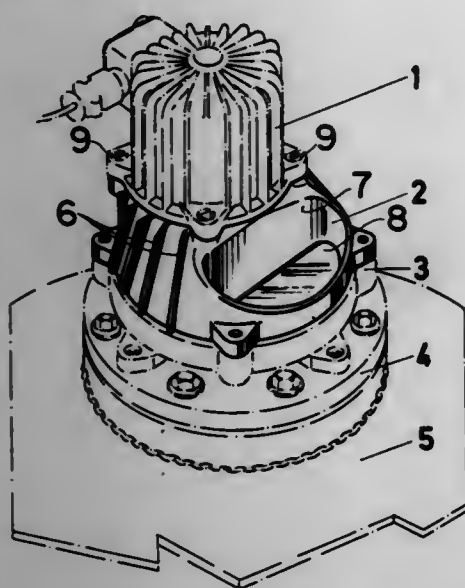
INSPECTION GLASS LIGHT

Horst Papenmeier, Talweg 2, 584, Schwerte, Germany
Filed Feb. 9, 1976, Ser. No. 656,197

Claims priority, application Germany, Feb. 13, 1975, 2506084
Int. Cl.² F21L 1/00

U.S. Cl. 362—368

6 Claims



1. A combination inspection glass light assembly for simultaneous illumination and observation, adapted to be mounted on an inspection glass flange of an observation chamber, comprising: an intermediate housing including side-by-side ducts through said housing from one end to the other end, one duct constituting a light duct and the other duct constituting a viewing duct, one end of said intermediate housing having a mounting flange surrounding the associated ends of both ducts and providing means for mounting said intermediate housing on an inspection glass flange, the other end of said housing having a connecting flange portion surrounding only the associated other end of said light duct; lamp means including a housing having a mounting flange; means connecting said lamp housing mounting flange to said connecting flange; and the other end of said viewing duct adjacent said lamp housing constituting a viewing window.

4,052,609

MOTOR VEHICLE WITH HEADLAMP TILTING MECHANISM

Frederick Raymond Patrick Martin, Bromley, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed Mar. 21, 1975, Ser. No. 560,879

Claims priority, application United Kingdom, Mar. 30, 1974, 18218/74

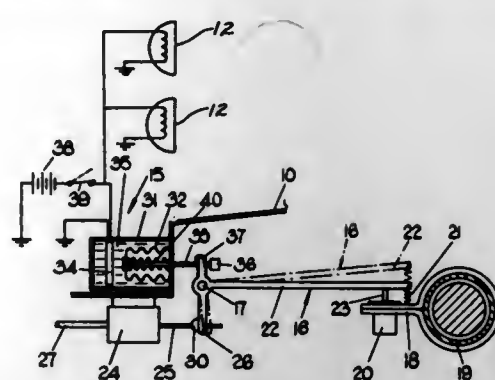
Int. Cl.² B60Q 1/10

U.S. Cl. 362—71

4 Claims

1. A motor vehicle including a vehicle body, wheels upon which said vehicle body is mounted, headlamps mounted on said body for tilting movement, and means for tilting said headlamps in response to changes in the attitude of the vehicle body relative to the wheels, said tilting means including a sensor device having a lever pivotally mounted on a sprung part of the motor vehicle and engaging a member mounted on an unsprung part of the motor vehicle, said tilting means also including a transmission for transmitting movements of said lever to said headlamps, continuously so that changes in the attitude of the vehicle body relative to the wheels are transmitted continuously to said headlamps by said transmission, and means connected directly to said lever and disposed, when

operated, to move said lever out of engagement with said member whereby said tilting means can be rendered inoperative when desired, said means being manually operable from a remote location.



4,052,610

FLASHLIGHT CASE ASSEMBLY AND FLASHLIGHT

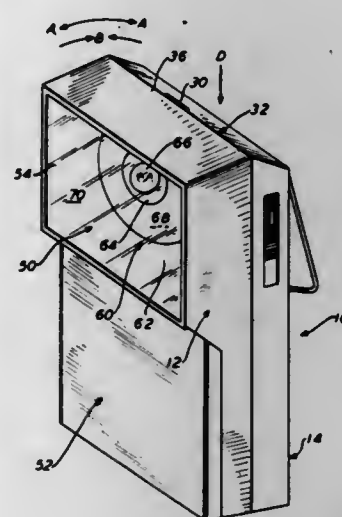
Mark Sternlicht, Stamford, Conn., assignor to Wonder Corporation of America, Stamford, Conn.

Filed Apr. 2, 1976, Ser. No. 673,000

Int. Cl.² F21L 7/00

U.S. Cl. 362—200

13 Claims



1. A flashlight case assembly comprising:

- a. a first body assembly of first predetermined configuration;
- b. a second body assembly of second predetermined configuration;
- c. said first predetermined configuration and said second predetermined configuration, of said first and said second body assemblies respectively, being such that when said first body assembly is disposed adjacent said second body assembly a component cavity of predetermined configuration is formed therebetween;
- d. connecting means interconnecting said first body assembly and said second body assembly for relative movement with respect to each other to establish either a closed condition or an open condition therefore;
- e. detent means carried by said first body assembly and said secured body assembly to retain same in said closed condition;
- f. aperture means extending through a predetermined surface of said first body assembly;
- g. reflector means disposed in said component cavity in alignment with said aperture means;
- h. component mounting means disposed in said component cavity in alignment with said reflector means and formed to mount a light bulb for coaction with said reflector means so that when illuminated light from the light bulb coacts with a reflector surface formed on said reflector means to direct a beam of light of predetermined color through said aperture means;

- i. said component mounting means further carrying electrical conductor means for coaction with an on/off switch means also carried by said component mounting means, for coaction with a bulb when mounted on said component mounting means, and for coaction with a dry cell battery when disposed in said component cavity to provide power means for illuminating the light bulb;
- j. said component mounting means being formed of material which permits the passage of light therethrough and mounting the light bulb so that light emitted thereby can pass through said component mounting means; and
- k. said second body assembly being formed from material of a predetermined color and which also permits the passage of light therethrough in at least an area thereof proximate said component mounting means so that light emitted from a bulb and which passes through said component mounting means will illuminate said area of said second body assembly which permits light to pass therethrough.

4,052,612

ANALOG-TO-DIGITAL ENCODER UNIT EMPLOYING A PRE-ENCODED FILM WITH IMPROVED FILM TENSIONING MEANS

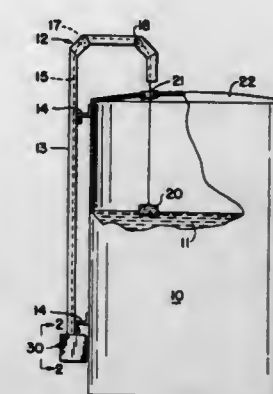
Kenneth A. Larkin, Modesto, Calif., assignor to E. & J. Gallo Winery, Modesto, Calif.

Filed Aug. 17, 1976, Ser. No. 715,071

Int. Cl.² H01J 3/14

U.S. Cl. 250—237 R

20 Claims



1. In an optical encoder unit for generating digital electrical signals defining the absolute position of a movable member from a rotatable shaft coupled to said movable member, said optical encoder unit comprising a support member; first and second film reels rotatably secured to said support member; motion translating means for transferring motion between said reels; guide means secured to said support member; a radiation detection station mounted adjacent said guide means, said station including a radiation source for generating a plurality of spaced radiation beams and a radiation detector assembly having a plurality of radiation sensitive means each associated to a different one of said beams for generating said electrical signals; a pre-encoded film strip received by said reels and guided by said guide means past said detection station, said film strip having a plurality of laterally spaced, longitudinally extending coded tracks, each arranged to occupy the radiation path between said source and a different one of said plurality of radiation sensitive means; a non-slip film drive means engageable with said film strip and having an input shaft adapted to be coupled to said rotatable shaft; and means for maintaining tension in said film strip as said strip is translated past said detection station from reel-to-reel in response to rotation of said film drive means; the improvement wherein said motion translating means comprises first and second hub means each rotatably secured to said support member for rotation about the axis of a different one of said first and second film reels, respectively, and each provided with a toothed peripheral portion for mutual driving engagement in an interference region; and

wherein said tension maintaining means comprises first and second spring members each coupled between a different one of said first and second film reels and said first and second hub means for providing intercoupling therebetween.

4,052,613

LOG-INJECT-LOG IN SAND CONSOLIDATION

Robert P. Murphy, and James W. Spurlock, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 8, 1976, Ser. No. 675,045

Int. Cl.² G01V 5/00

U.S. Cl. 250—259

6 Claims

1. A method for detecting the effect of a sand consolidation operation in a hydrocarbon formation penetrated by a well such that additional plastic injections can be used if required, said method comprising:

- a. logging an earth formation with a pulsed neutron log;
- b. injecting a plastic material together with a tracer having a

4,052,611

HIGH SPEED FIBER OPTIC COMMUNICATION LINK

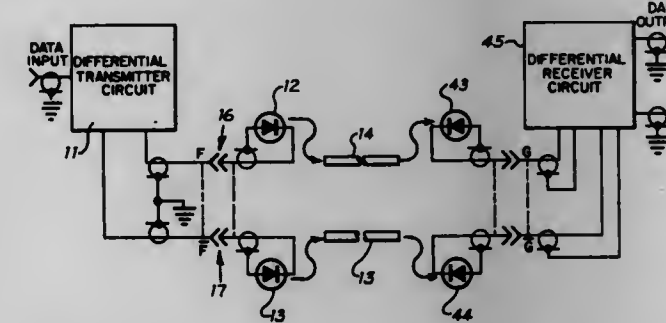
Franklin H. Fish, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 22, 1975, Ser. No. 570,927

Int. Cl.² H04B 9/00

U.S. Cl. 250—199

8 Claims



1. A high speed fiber optic communication link comprising, a differential transmitter circuit having first and second output terminals and having a single input terminal for receiving digital data and having logic means for providing output digital data on said first and second output terminals representing logic "one" and logic "zero" electrical signals, said output data representing a logic "one" signal being an output signal level on said first output terminal only and said output data representing a logic "zero" signal being an output signal level on said second output terminal only,

first and second electro-optic devices connected with said first and second output terminals, respectively, for converting said logic "one" and logic "zero" electrical signals to light signals, first and second optical waveguides for transmitting said light signals to another location, first and second photo-detectors at said another location connected with said first and second optical waveguides for converting said light signals to electrical signals, and a differential receiver circuit having first and second inputs connected one each with the outputs of said first and second photo-detectors for amplifying and combining said converted electrical signals into digital data corresponding to the digital data applied to the differential transmitter circuit.

4,052,620

METHOD AND APPARATUS FOR IMPROVED RADIATION DETECTION IN RADIATION SCANNING SYSTEMS

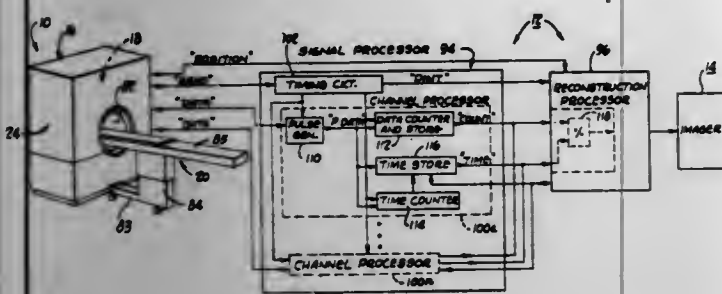
Carl J. Brunnett, Mayfield Heights, Ohio, assignor to Picker Corporation, Cleveland, Ohio

Filed Nov. 28, 1975, Ser. No. 636,212

Int. Cl.² G01N 23/08

U.S. Cl. 250-445 T

18 Claims



1. An X-ray scanning system comprising:
 - a. an X-ray source for producing a beam of X-rays;
 - b. beam receiving means disposed for receiving the X-ray beam and producing a train of pulses whose instantaneous repetition rate is indicative of the instantaneous intensity of the beams as it emerges from the object and impinges upon an receiving means;
 - c. means supporting at least one of said X-ray source and beam receiving means for motion along a predetermined path relative to the object with said beam being scanned through said object during said motion;
 - d. timer means for generating a time signal having a value representative of the time elapsing between selected pulses of said pulse train which occur during a predetermined interval of said scanning motion;
 - e. a counter for counting pulses of the pulse train occurring within said time interval and producing a count signal; and,
 - f. means for comparing the count signal with the time signal for generating an average intensity signal indicative of the average intensity of said X-ray beam impinging on said beam receiving means in said interval.

4,052,621

OBJECT VIEWING SYSTEM WITH RADIATION RESPONSIVE SCREEN SYSTEM

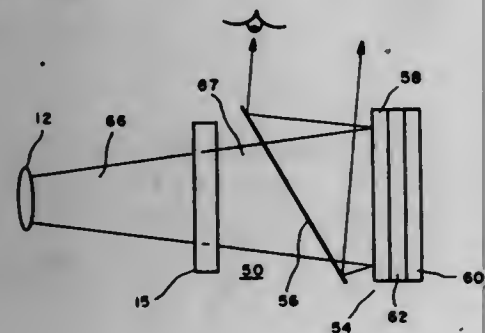
David J. Haas, Stamford, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,486

Int. Cl.² F21K 2/02; G01T 1/20

U.S. Cl. 250-458

11 Claims



1. An object viewing system, comprising:
 - a. a radiation source;
 - b. means for converting a radiation image to a light image, said means being spaced from said radiation source and comprising a fluorescent layer and a light reflective layer, said fluorescent layer being more proximate to said radiation source than said reflective layer and said reflective layer being disposed so as to reflect light from said fluorescent layer in the direction of a radiation permeable light reflector; and
 - c. said radiation permeable light reflector located between

said converting means and said source, said reflector comprising a light reflecting area that faces said fluorescent layer and being disposed so as to receive light from said converting means and reflecting said light toward an observer, said reflector being spaced from said radiation source such that said object can be located therebetween.

4,052,622

CHILD'S LAMP AND AUDIO DEVICE

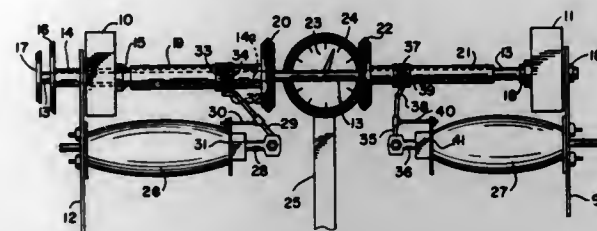
Michael Lorenz, 421 55th St., Downers Grove, Ill. 60515

Filed Dec. 3, 1976, Ser. No. 747,400

Int. Cl.² H01H 7/00

U.S. Cl. 307-112

3 Claims



1. An electromechanical control arrangement for regulating the sound and light levels of an audio device and a lamp including a timer mechanism in combination with a potentiometer and dimmer device, said potentiometer and dimmer device being mounted in operative association with coaxial shafts disposed therebetween whereby the potentiometer and dimmer device can be actuated separately, a potentiometer drive member and a drive member for the dimmer device slidingly mounted on said shafts, said timer mechanism having a driving member, a pair of solenoids adapted to move said drive members into operative engagement with said driving member, and an electrical circuitry having a source of current whereby the solenoids may be activated to connect the potentiometer and dimmer device with the timer mechanism or to disconnect one or both from the timer mechanism.

4,052,623

ISOLATED SEMICONDUCTOR GATE CONTROL CIRCUIT

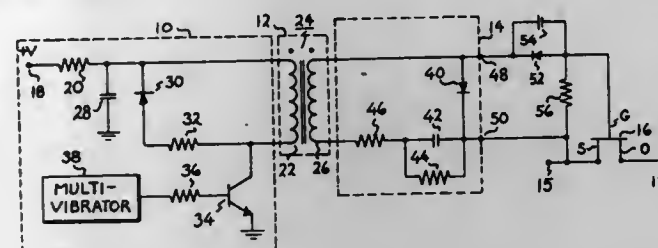
Hans O. Loberg, Northeast, Pa., assignor to General Electric Company, Erie, Pa.

Filed Aug. 10, 1976, Ser. No. 713,139

Int. Cl.² H03K 17/60

U.S. Cl. 307-251

5 Claims



1. An isolated gate control for a voltage controlled semiconductor device responsive to gate signals to be thereby alternately rendered conductive and nonconductive comprising:
 - a. pulse generating means to provide a train of pulses at a frequency corresponding to the desired operational rate of the semiconductor device;
 - b. a transformer having primary and secondary windings;
 - c. means for connecting said pulse generating means to said primary winding whereby a pulse is induced into said secondary winding; and,
 - d. an output circuit connected to said secondary winding, said circuit including means for alternately providing relatively positive and negative going output voltage signals serving as gate signals to the semiconductor device, each of said output signals having minimum pre-

scribed absolute voltage values during periods corresponding to, respectively, the period of the pulses of said train and the period of time between adjacent pulses.

4,052,624

RAMP AND PEDESTAL CONTROL CIRCUIT

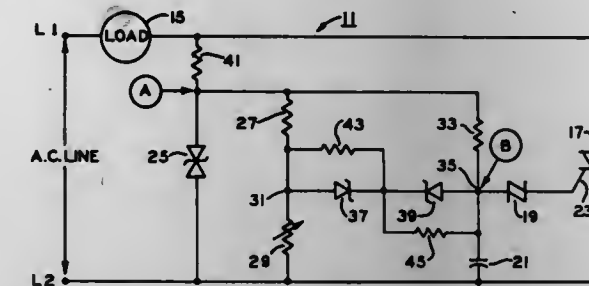
David C. Hamstra, Clinton, Iowa, assignor to General Electric Company, Fort Wayne, Ind.

Filed Apr. 7, 1976, Ser. No. 674,381

Int. Cl.² H03K 17/72

U.S. Cl. 307-252 B

6 Claims



1. A ramp and pedestal phase control circuit for controlling electrical energy supplied from an alternating current source to a load comprising:
 - a. a controllable alternating current switching device;
 - b. bilateral threshold means for enabling said switching device to conduct current from the source to the load when the magnitude of the voltage across said bilateral threshold means exceeds a predetermined value;
 - c. a first circuit for rapidly increasing the voltage across said bilateral threshold means to a value less than the predetermined value;
 - d. a second circuit for more slowly further increasing the voltage across said bilateral threshold means at least to the predetermined value so as to enable said switching device, said first and second circuits being effective on successive half cycles of the alternating current source to reverse the polarity of the voltage across said bilateral threshold means; and
 - e. means for minimizing the net direct current component of electrical energy supplied to the load, one of said first and second circuits including a resistive circuit element and a reactive circuit element in series relation and having a first circuit junction therebetween and the other of said first and second circuits including a pair of resistive circuit elements coupled in series relation and having a second circuit junction therebetween, said minimizing means comprising a pair of balancing resistors connected in series relation between said first and second circuit junctions.

4,052,625

MOTOR SPEED CONTROL CIRCUIT WITH OVERLOAD PROTECTION

George L. Cameron, 2961 Bostonian Drive, Los Alamitos, Calif. 90720

Filed Apr. 19, 1976, Ser. No. 678,181

Int. Cl.² H03K 17/08

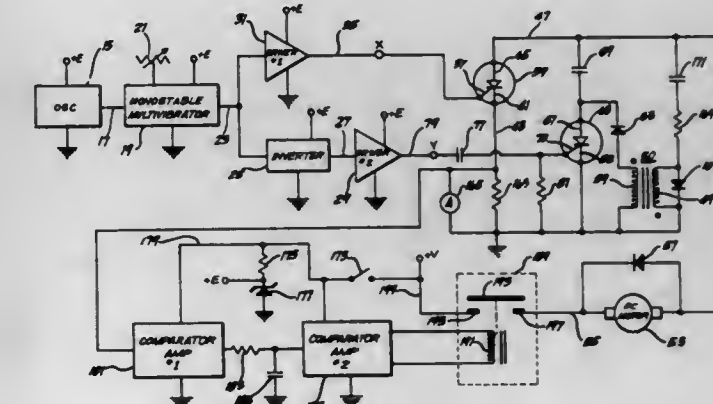
U.S. Cl. 307-252 K

4 Claims

1. A switching circuit responsive to two complementary constant frequency pulses of variable duration for the controlled application of direct current power through a load, comprising:
 - a. a first controlled rectifier having an anode, a cathode and a gate electrode, said cathode being adapted to be connected to a common circuit ground, said gate electrode and said common ground being adapted to be connected to a source of one of two complementary constant frequency pulses of variable duration for rendering said first controlled rectifier conductive;
 - b. a second controlled rectifier having an anode, a cathode and a gate electrode, said cathode being connected to said common circuit ground, said gate electrode and said

common ground being adapted to be connected to a source of the other of said two complementary constant frequency pulses of variable duration for rendering said second controlled rectifier conductive;

- a turn-off capacitor connected between the anodes of said first and second controlled rectifiers for rendering said first controlled rectifier non-conductive when said second controlled rectifier is rendered conductive;
- a transformer having primary and secondary windings, each of said primary and secondary windings having one end thereof connected to said common circuit ground, the polarity of the secondary winding being selected such that a current is conducted from the other end of said secondary winding in response to a current entering said one end of the primary winding;
- a charging diode having an anode and a cathode, said anode being connected to said other end of said secondary winding of said transformer, said cathode being connected to



said anode of said second controlled rectifier and to one end of said turn-off capacitor for conducting a current from said secondary winding to charge said turn-off capacitor when said first controlled rectifier is rendered conductive;

- a second diode having an anode and a cathode, said anode being connected to said other end of said primary winding of said transformer, said cathode being connected to said one end of said primary winding; and
- a charging capacitor being connected between said anode of said first controlled rectifier and the other end of said primary winding of said transformer, said charging capacitor being charged through said second diode when said second controlled rectifier is rendered conductive, said charging capacitor being discharged through said primary winding of said transformer and thereby inducing a current in said secondary winding to charge said turn-off capacitor when said first controlled rectifier is rendered conductive.

4,052,626

FREQUENCY DOUBLER

Alois Vaclav Tuma, Schlieren, and Jörg Schless, Stallikon, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,123

Claims priority, application United Kingdom, Dec. 8, 1975, 50278/75

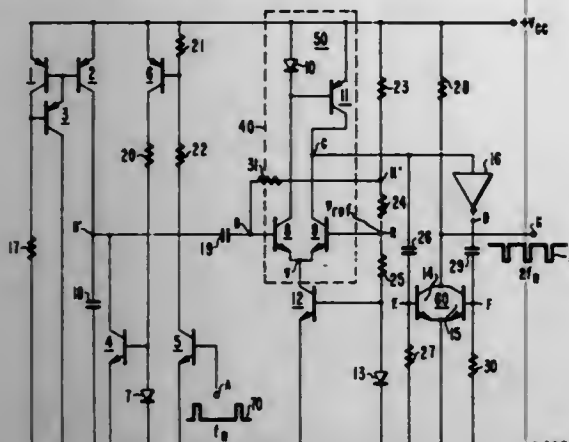
Int. Cl.² H03K 1/08, 1/16

U.S. Cl. 307-271

15 Claims

1. A frequency doubler comprising:
 - a. a differential amplifier including first and second input terminals and an output terminal;
 - b. first biasing means coupled to said differential amplifier for biasing said second input terminal at a first reference voltage level;
 - c. sawtooth means coupled to said first input terminal for providing a sawtooth voltage of a first frequency at said first input terminal for generating a first bilevel voltage at

said output terminal, said first bilevel voltage shifting levels when said sawtooth voltage equals said first reference voltage level;
second biasing means coupled to said first input terminal for biasing said first input terminal at a second reference voltage level, said second reference voltage level selected



to differ from said first reference voltage level by an offset voltage sufficient to equalize the duration of each of said first bilevel voltage levels; and
output signal producing means coupled to said output terminal for producing output signals when said first bilevel voltage shifts levels, thereby producing said output signals at twice said first frequency.

4,052,627

ULTRASONIC CERAMIC MICROPHONE

Daisiro Hayakawa, Neyagawa, and Kiaroku Tani, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

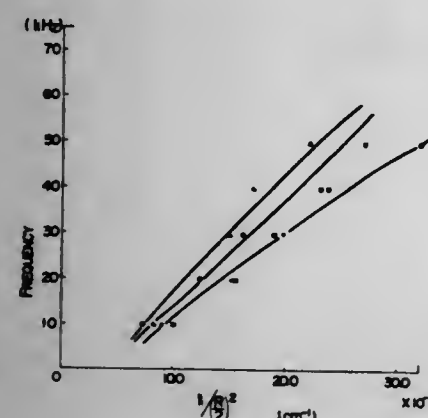
Filed Apr. 6, 1976, Ser. No. 674,239

Claims priority, application Japan, Apr. 11, 1975, 50-44559

Int. Cl.² H04R 17/02, 17/10

U.S. Cl. 310—322

4 Claims



1. An ultrasonic ceramic microphone comprising an electro-acoustic transducer including
a metal plate having a thickness t and a diameter R satisfying the relation

$$7.3 \times 10^{-3} \text{ cm}^{-1} < \left(\frac{t}{R}\right)^2 < 31.9 \times 10^{-3} \text{ cm}^{-1},$$

and a pair of piezoelectric ceramic plates disposed on the upper and lower surfaces of said metal plate, the diameters of said piezoelectric ceramic plates being less than the diameter of said metal plate, said ultrasonic ceramic microphone being operable in an operating frequency band including the fundamental frequency of the deflection vibration of said electro-acoustic transducer and at least two higher harmonics of said fundamental.

4,052,628 DYNAMIC, SHEAR-MODE PIEZOELECTRIC PRESSURE SENSOR

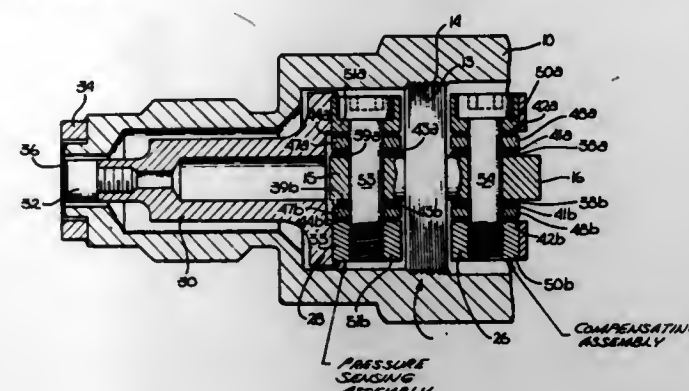
John R. Hayer, Yorba Linda, Calif., assignor to Gulton Industries, Inc., Metuchen, N.J.

Filed Apr. 19, 1976, Ser. No. 678,225

Int. Cl.² H01L 41/04

U.S. Cl. 310—333

7 Claims



1. A dynamic pressure sensor comprising:
 - a housing;
 - a support member comprising a base for engaging said housing, a first mounting member having two parallel surfaces and an aperture disposed between said surfaces and a second mounting member having two parallel surfaces and an aperture disposed between said surfaces;
 - a first piezoelectric electric unit for providing an electrical signal when subjected to a dynamic shear load, said first unit being disposed on one of said two parallel surfaces of said first mounting member and including an aperture in alignment with said aperture of said first mounting member;
 - a second piezoelectric unit for providing an electrical signal when subjected to a dynamic shear load, said second unit being disposed on said other surface of said first mounting member and including an aperture in alignment with said aperture of said first mounting member;
 - bolt means disposed through said apertures of said first mounting member and said first and second piezoelectric units for securing said units to said first mounting member;
 - coupling means for receiving dynamic pressure loads and for coupling said loads to said bolt means; and,
 - piezoelectric sensing means for sensing acceleration mounted to said second mounting member, said sensing means for providing compensation for acceleration;
 - whereby dynamic pressure sensed by said coupling means is coupled to said bolt means thereby placing shear loads on said first and second piezoelectric units.

4,052,629

ROTATING RECTIFIER ASSEMBLY

Heinrich Küter, Wattenscheid, and Gerhard Krieger, Mulheim, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Nov. 26, 1975, Ser. No. 635,674

Claims priority, application Germany, Dec. 5, 1974, 2457585

Int. Cl.² H02K 11/00

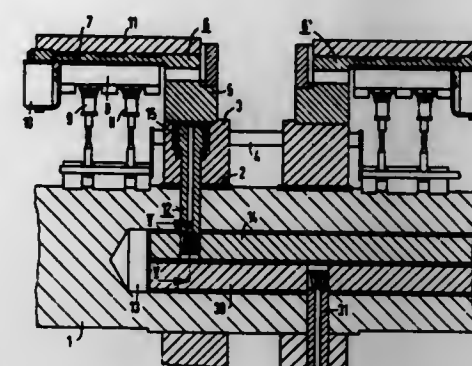
U.S. Cl. 310—68 D

7 Claims

1. In an electrical machine having a rotary shaft, a rotating rectifier assembly connected in a three-phase current bridge circuit and comprising two support wheels mounted on the shaft in insulated relationship with respect thereto and formed with respective annular flanges, active components of the rectifier assembly comprising heat sinks, rectifier cells and fuses disposed at the inner periphery of said annular flanges, said two support wheels forming direct current poles and comprising an intermediate ring formed of nonmagnetic material insulatedly mounted on the shaft and a support wheel hub directly shrink-fitted on said intermediate ring, the shaft being formed with an axial bore, direct current conductors disposed

in said axial bore, and at least one current connecting bolt radially passing through said intermediate ring and into the

said shaft, while the other of said pair of means and said coil means form part of a stator assembly.



shaft, said bolt having a head in contact with said support wheel hub and said intermediate ring, and a shank in contact with one of said direct current conductors.

4,052,630

SYNCHRONOUS MICROMOTOR

Tokuzo Inariba, c/o Room No. 906, Kamiyama Mansion, No. 2-9, Kamiyama 4-chome, Setagaya, Tokyo, Japan

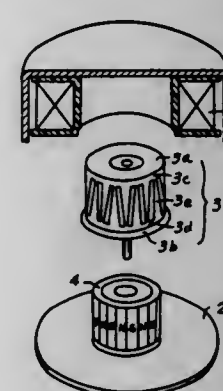
Filed Nov. 25, 1975, Ser. No. 635,094

Claims priority, application Japan, Nov. 25, 1974, 49-135758

Int. Cl.² H02K 21/14

U.S. Cl. 310—162

19 Claims



1. In a synchronous micromotor, outer coil means circumferentially surrounding a predetermined axis, a rotary rotor shaft extending along said axis and surrounded by said outer coil means, annular permanent magnet means surrounding said rotor shaft and situated coaxially between the latter and said coil means, said annular permanent magnet means having a series of north and south poles circumferentially distributed therealong with said north poles alternating with said south poles and all of said poles being directed outwardly toward said coil means, cylindrical wall means made of a soft magnetic material and circumferentially surrounding said annular permanent magnet means while being situated between the latter and said coil means, said cylindrical wall means having a pair of annular yoke portions spaced from each other along said axis and surrounding said axis, and said cylindrical wall means being formed between said yoke portions with a series of elongated separate apertures circumferentially spaced from each other and each extending from one to the other of said yoke portions up to but not beyond said yoke portions and said series of apertures being made up of two groups of apertures one of which is inclined helically in one direction with respect to said axis and the other of which is inclined helically in an opposite direction with respect to said axis and the apertures of said one group alternating with the apertures of said other group so that said annular yoke portions are bridged by and integral with a series of elongated tapered wall portions of said cylindrical wall means with said tapered wall portions alternately tapering in opposed axial directions, said cylindrical wall means and said annular permanent magnet means forming a pair of means one of which is connected with said rotor shaft for rotary movement therewith, to form a rotor assembly with

4,052,631

ROTARY RECTIFIER DEVICE FOR ELECTRIC MACHINES

Heinrich Küter, Wattenscheid, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

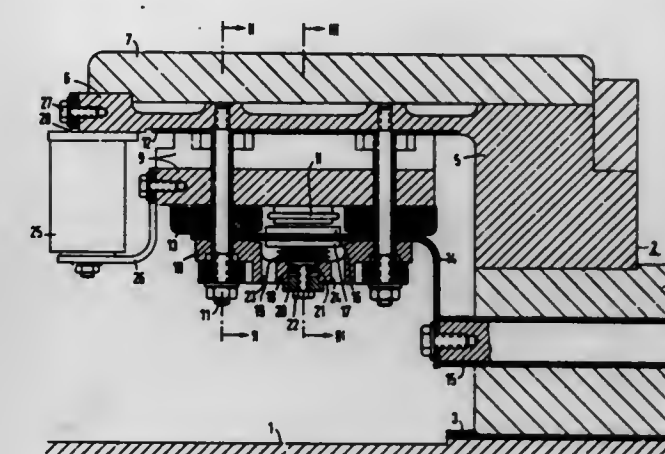
Filed Mar. 4, 1976, Ser. No. 664,050

Claims priority, application Germany, Mar. 17, 1975, 2511636

Int. Cl.² H02K 11/00

U.S. Cl. 310—68 D

9 Claims



1. A rectifier device for a rotary electrical machine having an electric terminal, comprising:

- a rotary shaft;
- a carrier wheel mounted on said shaft;
- a disc type rectifier;
- a first clamping member secured to said carrier wheel and disposed radially outward from said rectifier, said rectifier having a pair of faces and being mounted by one of said faces on said first clamping member;
- a second clamping member secured to said carrier wheel and disposed radially inwardly from said rectifier;
- mounting means resiliently secured between said second clamping member and the other face of said rectifier to resiliently urge contact between said rectifier and said clamping members, and a flexible lead connected between the terminal of the machine and said second clamping member, said resilient mounting means urging said lead into contact with said other face of said rectifier.

4,052,632

METHOD OF UNDERWATER WELDING

Hideo Sagara, Yasuhiro Nishio, Hirokazu Wada, and Yoshinori Hiromoto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Division of Ser. No. 384,897, Aug. 2, 1973, This application Aug. 12, 1974, Ser. No. 496,830

Claims priority, application Japan, Sept. 4, 1972, 47-87934

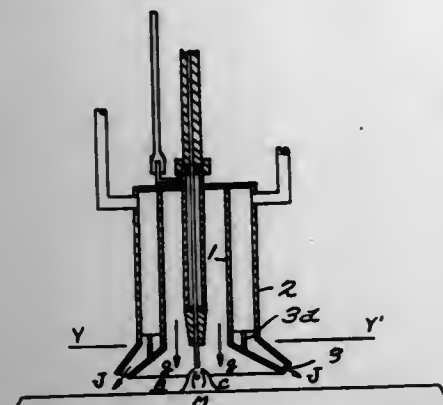
Int. Cl.² B23K 9/16

U.S. Cl. 219—137 R

3 Claims

1. A method of welding underwater, comprising:
feeding welding rod means to a region where a member is to be welded and heating the welding rod means to effect welding of said member in said region;
confining a first space extending down to close to said region;
confining a second space extending annularly of the first confined space,
said confining causing the first space to flare close to said region to define a cavity within which said welding is effected and causing the annular second space to define a flaring annular nozzle of decreasing width of cross-sectional area surrounding said cavity;
conducting a pressurized stream of weld-shielding gas down through the first space and into said cavity for expelling

water therefrom, for preventing the invasion of water into said cavity and for shielding said welding; and conducting a stream of water down through the second space and out said flaring annular nozzle with sufficient



force to prevent the invasion of water into said cavity during underwater welding and to assist in aspirating excess of said gas from said cavity in the form of small bubbles during underwater welding.

4,052,633

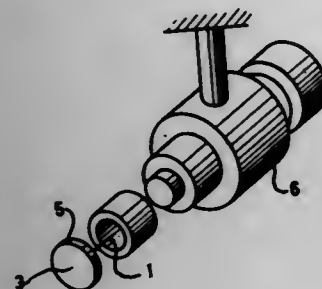
RESTORABLE COLD CATHODE IN A GAS DISCHARGE ELECTRON GUN

Theodorus Maria Berendina Schoenmakers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 8, 1975, Ser. No. 575,614

Claims priority, application Netherlands, May 30, 1974, 7407254

Int. Cl.² H01J 3/02, 7/24, 17/06

U.S. Cl. 313—146



1. A gas discharge electron gun for generating an electron beam by means of a glow discharge comprising an envelope, means to maintain a gaseous ionizable medium inside said envelope, at least an anode and a cathode between which the said glow discharge takes place, from which cathode electrons are released by secondary emission in such a quantity that the said electron beam consists mainly of said electrons and which cathode has a shape that reduces the erosion occurring at the cathode surface, and wire means for restoring the eroded material in the active part of the cathode surface at least partly during operation of the gas discharge electron gun, said wire means comprising a plurality of slideable concentric cylinders extending through an aperture in the active surface of the cathode.

4,052,634 HIGH-PRESSURE GAS DISCHARGE LAMP AND ELECTRON EMISSIVE ELECTRODE STRUCTURE THEREFOR

Johannis De Kok, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

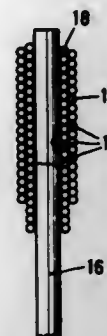
Filed June 17, 1976, Ser. No. 697,148

Claims priority, application Netherlands, June 20, 1975, 7507356

Int. Cl.² H01J 1/14, 61/073, 61/20

U.S. Cl. 313—184

7 Claims



1. A high-pressure gas discharge lamp having a radiation transmissive envelope containing electrodes and an ionizable medium in which the discharge is maintained, at least one of the electrodes consisting of a support of a high-melting metal provided with an electron emissive material which contains an alkaline earth metal and at least one of the metals tungsten and molybdenum, characterized in that the electron emissive material mainly consists of at least one oxitic compound containing at least one of the rare earth metal oxides, alkaline earth metal oxide in a quantity of 0.66 to 4 mole per mole of rare earth metal oxide and at least one of the oxides of tungsten and molybdenum in a quantity of 0.25 to 0.40 mole per mole of alkaline earth metal oxide, the alkaline earth metal oxide consisting of at least 25 mol.% of barium oxide.

4,052,635

ELECTRIC DISCHARGE LAMP

Cornelis Adrianus Joannes Jacobs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

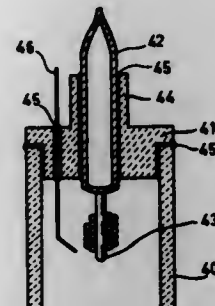
Filed Sept. 27, 1976, Ser. No. 727,035

Claims priority, application Netherlands, Sept. 29, 1975, 7511416

Int. Cl.² H01J 61/06

U.S. Cl. 313—217

4 Claims



1. An electric discharge lamp having a ceramic lamp vessel in the wall of which are incorporated cylindrical current lead-throughs of niobium or tantalum which are connected at one end to the electrodes and project at the other beyond the lamp vessel, means being present to protect the leadthroughs against attack by gas surrounding the lamp vessel, wherein the parts of the current leadthroughs which during operation have a temperature of more than 500° C are screened from the gas surrounding the lamp vessel by means of ceramic mouldings which are connected in a gas-tight manner to the current leadthroughs by means of sealing material.

4,052,636 HIGH PRESSURE SODIUM VAPOR LAMP STABILIZED FOR PULSE OPERATION

Jack M. Strok, Northfield, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1976, Ser. No. 710,487

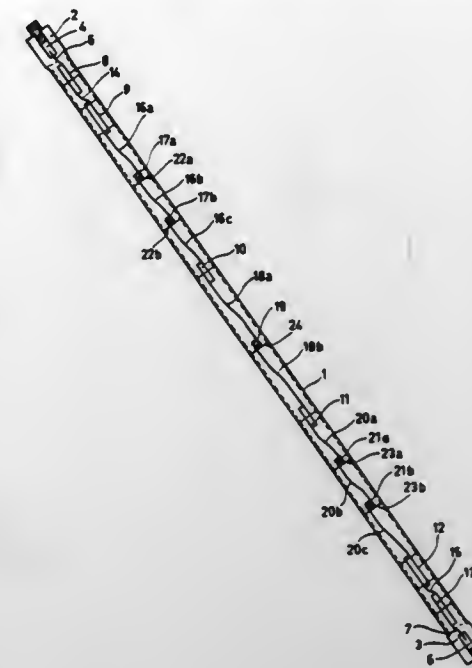
Int. Cl.² H01J 61/06

U.S. Cl. 313—217

11 Claims



1. A high pressure sodium vapor lamp arc tube for high frequency short duty cycle pulse operation comprising: an elongated light-transmitting ceramic tube having closures sealing its ends and containing a filling of sodium-mercury amalgam; a pair of electrodes supported from said closures at opposite ends of said tube, each comprising a body portion mounted on an axial tungsten shank, the insertion depth of said electrodes into the tube being at least 10% of the gas column length therein, and the ratio of the cross-sectional area of the body portion of said electrodes to the cross-sectional area of the bore of the tube being in the range of 0.3 to 0.4.



least 40 mm locally have helical turns short-circuited by a support connected thereto.

4,052,638

FLARE-WEDGE LAMP

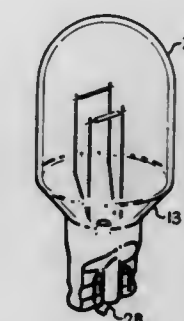
Robert J. Love, Lyndhurst, and James C. Graff, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 27, 1976, Ser. No. 661,976

Int. Cl.² H01J 5/48, 5/50

U.S. Cl. 313—318

16 Claims



1. An all-glass incandescent lamp comprising: a flare having a cylindrical portion and a conical portion; at least two conductive leads and an exhaust tube positioned within said flare; and wherein the cylindrical end of said flare is collapsed about said conductive leads and exhaust tube to form a base.

4,052,637

HALOGEN INCANDESCENT LAMP

Herbert Kamiel Maria Op de Beeck, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,489

Claims priority, application Netherlands, Dec. 8, 1975, 7514249

Int. Cl.² H01K 1/18

U.S. Cl. 313—222

6 Claims

1. A halogen incandescent lamp having (a) a tubular light-pervious lamp vessel provided at its ends with vacuum-tight seals in which current leadthrough conductors are incorporated, (b) a filament which extends longitudinally in the lamp vessel and is connected to current leadthrough conductors and has several helically wound filament sections separated spatially by connection conductors, and (c) supports in contact with the filament and with the wall of the lamp vessel which fix the filament in the transverse direction, characterized in that filament sections and connection conductors constitute

4,052,639

SPARK GAP FOR ACHIEVING ARC ELONGATION AND COMPRESSION WITHOUT THE USE OF SUPPLEMENTARY MAGNETIC MEANS

Francis V. Cunningham, Western Springs, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Jan. 13, 1976, Ser. No. 648,758

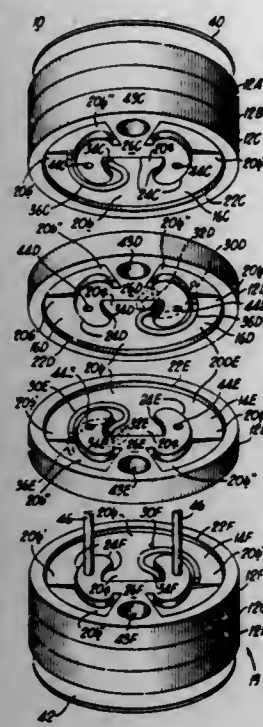
Int. Cl.² H01J 17/00, 21/00

U.S. Cl. 313—325

11 Claims

1. A spark gap comprising a first insulating gap plate, a second insulating gap plate, a third insulating gap plate, means for retaining said first and third gap plates contiguously disposed about said second gap plate in a vertical stack along a first vertically extending longitudinal axis,

facing surfaces of said first and second gap plates forming a first arc elongation chamber,
facing surfaces of said second and third gap plates forming a second arc elongation chamber,
a first plurality of electrodes disposed with a first horizontal orientation in said first arc chamber to form a first electrode gap and



a second plurality of electrodes disposed with a second horizontal orientation in said second arc chamber to form a second electrode gap,
said first and second horizontal orientations being substantially identical such that said first and second electrode gaps are disposed in said vertical stack in vertical alignment along a second vertically extending axis disposed parallel to said first axis.

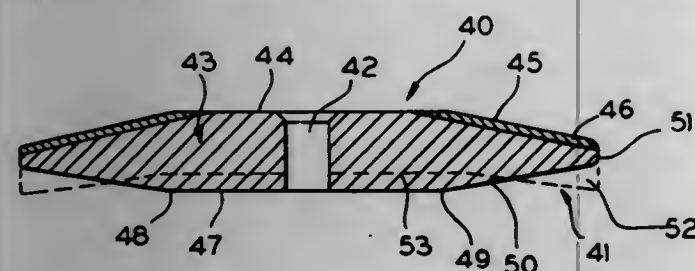
4,052,640

ANODES FOR ROTARY ANODE X-RAY TUBES
Robert E. Hueschen, Hales Corners, Wis., and John H. Port, Solon, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed June 21, 1976, Ser. No. 697,849
Int. Cl.² H01J 35/08

U.S. Cl. 313-330

5 Claims



1. An anode for use in a rotary anode x-ray tube, comprising: disc having an axis of rotation and comprised of a first metallic material, said disc having a front and a rear face and said first metallic material being of uniform composition and being uninterrupted from said front to said rear face,
said front face having a substantially unbeveled central region circumjacent said axis and an adjacent annular region which is beveled rearwardly at an acute angle relative to a plane to which said axis of rotation is perpendicular,
said rearwardly beveled annular region having a surface layer comprised of a second metallic material having a different coefficient of thermal expansion than said first metallic material, said surface layer providing a focal spot surface on which the electron beam of an x-ray tube im-

pings to produce x-radiation an incident of which is to produce a high temperature gradient in said disc in the region adjacent said front face,
said rear face having a substantially unbeveled central region circumjacent said axis and an adjacent annular region which is beveled forwardly at an acute angle relative to a plane to which said axis is perpendicular,
the configuration of said anode for minimizing distortion of said disc due to cyclical occurrence of said high temperature gradient being defined by the equation

$$\phi = \arctan \left[\frac{W - (r_2 - r_1) \tan \theta}{r_2 - r_0} \right]$$

where:

r_0 is the rear unbeveled surface radius;
 r_1 is the front unbeveled surface radius;
 r_2 is the total anode radius;
 $W = T - E$ where T is the total thickness of the anode and E is the thickness of the peripheral edge of the anode;
 θ is the angle between the front rearwardly beveled surface and a plane to which said axis of rotation is perpendicular; and
 ϕ is the angle between the rear forwardly beveled surface and a plane to which said axis of rotation is perpendicular.

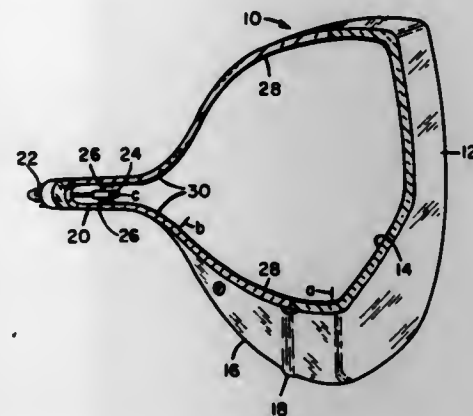
4,052,641

ELECTRICALLY CONDUCTIVE COATING IN CATHODE RAY TUBE

Ellen K. Dominick, and Dale R. Wexell, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Continuation-in-part of Ser. No. 558,276, March 14, 1975, abandoned. This application May 24, 1976, Ser. No. 688,977
Int. Cl.² H01J 29/00, 31/00

U.S. Cl. 313-450

8 Claims



1. In a cathode ray tube comprising a glass faceplate upon which a viewing screen is mounted, a glass neck portion within which an electron gun is mounted, and a glass funnel portion having an electrically conductive coating on at least a portion of its inner wall, the improvement comprising a coating mixture fired at 350°-525° C. to a hard, smooth, glassy, electrically conductive coating exhibiting good durability and resistance to weathering, said coating consisting essentially, in weight percent of total solids, of 5-25% total of at least one of the alkali metal oxides Na₂O, K₂O, and Li₂O, 20-80% SiO₂, 2-25% of at least one oxide selected from the group consisting of Ag₂O, CuO, CdO, CaO, SrO, BaO, CoO, PbO, MgO, HgO, NiO, ZnO, and MnO, 10-50% carbon, and 0-50% of a filler pigment, the total of silica and pigment being 45-85%.

4,052,642

APPARATUS FOR CONTROLLING CONTROLLED SYSTEMS WITH DEAD TIME

Winfried Speth, Ulm; Walter Dreiseitl; Klaus Böhm, both of Erlangen; Lothar Schleicher, Erlangen, and Herbert Polster, Spardorf, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

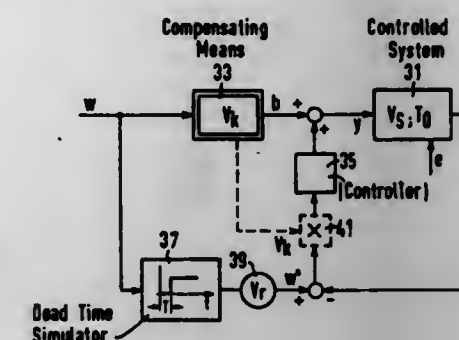
Filed Mar. 11, 1976, Ser. No. 665,873

Claims priority, application Germany, Mar. 12, 1975, 2510837

Int. Cl.² G05B 13/00

U.S. Cl. 318-561

7 Claims



1. In an apparatus for controlling a controlled system, including a final control element with dead time, said apparatus including a controller with an integral characteristic, the improvement comprising:

- means generating a reference value;
- a dead time simulator, the dead time of which corresponds approximately to the dead time of the controlled system, having as input said reference value and providing an output;
- means associated with said control system providing as an output an actual value of the controlled system;
- first summing means having as inputs the output of said dead time simulator and said actual value, the output of said summing means being coupled as an input to the controller with an integral characteristic whereby said controller will be supplied with a signal dependent upon the difference between the output signal of the dead time simulator and the actual value signal at its input, the output of said controller being coupled as an input to the final control element of said controlled system.
- means coupling said reference value in a bypass path around said dead time simulator and controller so that it forms a further input to the final control element of the controlled system.

4,052,643

ELECTRON GUNS FOR USE IN CATHODE RAY TUBES
Eiichi Yamazaki, Ichihara; Hiromi Kanai, and Toshio Hukukawa, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

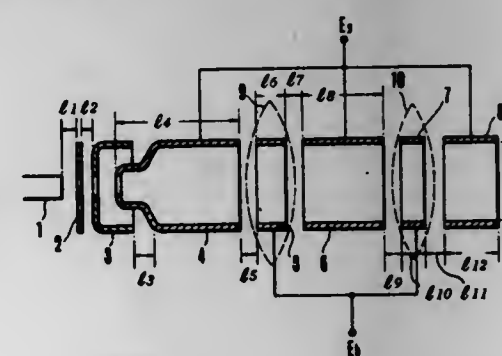
Division of Ser. No. 534,646, Jan. 23, 1975, Continuation of Ser. No. 349,065, April 9, 1973, This application Aug. 2, 1976, Ser. No. 710,590

Claims priority, application Japan, Apr. 12, 1972, 47-42438

Int. Cl.² H01J 29/46, 29/56

U.S. Cl. 315-16

7 Claims



1. In a cathode ray tube image system an electron gun in a

cathode ray tube comprising a single gun monobeam electron source and a main electron lens combination aligned on the axis of said gun which includes first and second axially aligned independent electron lens systems having a common electrode therebetween, each independent electron lens system including three electrodes including said common electrode arranged in sequence on substantially the same axis with said common electrode being the last electrode of said first lens system and the first electrode of the succeeding said second lens system, an intermediate electrode of said three electrodes in each said system having an applied voltage lower than that applied to the other electrodes of said electron lens system, and means including voltage supply means for said electrodes for making the beam focusing power of said first of said electron lens systems closest to said source greater than that of succeeding lens systems more remote from said source.

4,052,644

ELECTRONIC FLASH UNIT WITH OPERATIONAL SIGNAL

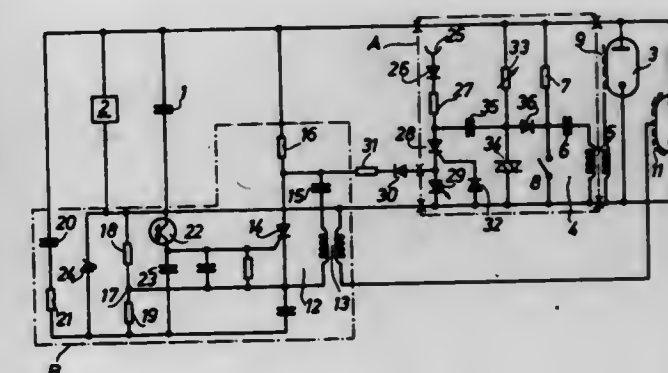
Stefan Borejko, Braunschweig-Broitzem, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Filed Mar. 15, 1976, Ser. No. 666,674

Claims priority, application Germany, Mar. 19, 1975, 2511910

Int. Cl.² H05B 41/32; G01J 1/16

U.S. Cl. 315-151

10 Claims



1. An electronic flash unit, comprising a flash tube, a storage capacitor dischargeable through said flash tube, flash measuring means responsive to the quantity of light emitted by the flash tube and reflected back from a photographic subject being photographed, a pulse generator circuit device, means for rendering said pulse generator circuit device operative to produce a pulse when an adjustable value of light has been measured by said measuring means, a flash tube quenching device, and means for rendering said quenching device operative in response to said pulse, characterized by a direct current source (25), an electronic switch, a light-emitting diode (29) connected to said direct current source (25) through said electronic switch, means for closing said electronic switch in response to a signal derived from one of said devices, and means for opening said electronic switch automatically after an adjustable closing period.

4,052,645

VERTICAL DEFLECTION CIRCUIT

Osamu Fujita, Chigasaki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 14, 1976, Ser. No. 695,402

Claims priority, application Japan, June 20, 1975, 50-76064; June 20, 1975, 50-76065; June 20, 1975, 50-76066; June 24, 1975, 50-79523; June 24, 1975, 50-79524; June 25, 1975, 50-79591

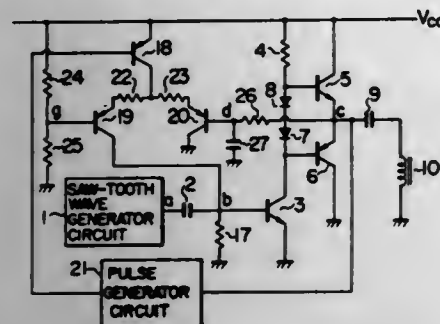
Int. Cl.² H01J 29/70, 29/72

U.S. Cl. 315-388

10 Claims

1. A vertical deflection circuit comprising a saw-tooth wave voltage generator circuit, a drive stage coupled to the output terminal of said saw-tooth wave voltage generator circuit

through an input coupling capacitor, a vertical amplifier stage directly coupled to said drive stage, and a vertical amplifier stage bias voltage stabilizing circuit including a differential amplifier circuit fed by a constant current source having a constant current circuit which operates only during a retrace period, a first input terminal of said differential amplifier cir-



cuit and a second input terminal of said differential amplifier circuit being connected to an output terminal of a circuit producing a mean voltage at the output terminal of said vertical amplifier stage, an first output terminal of said differential amplifier circuit being connected to the junction of said input coupling capacitor and the input terminal of said drive stage.

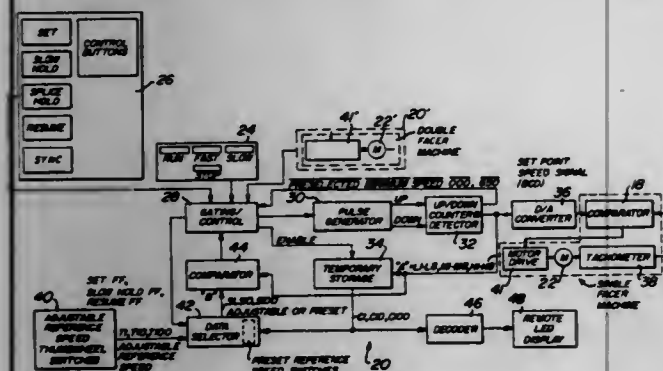
4,052,646

SPEED CONTROL SYSTEM FOR A CORRUGATOR
William A. Massey, Mount Holly, and Donald J. Evans, Cherry Hill, both of N.J., assignors to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Feb. 24, 1976, Ser. No. 660,891
Int. Cl.² H02P 5/46

U.S. Cl. 318—39

16 Claims



1. An improved speed control for a corrugator having at least one single facer machine operatively associated with a double facer machine, each of said machines including a motor, comprising:

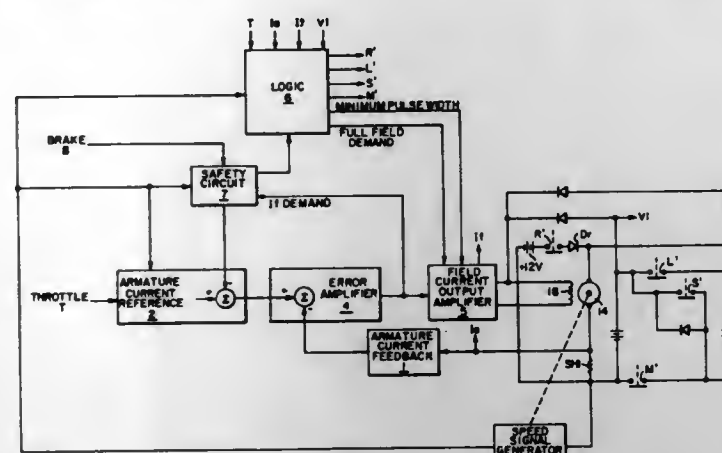
- digital means for automatically generating a preselected digital set point signal indicative of a preselected minimum speed for the single facer machine motor;
- digital means for generating first and second digital set point signals indicative of first and second speeds for said single facer machine motor, said first and second speeds being not less than said preselected minimum speed;
- digital means for selectively storing said first digital set point signal while the speed of the single facer machine motor is varied;
- means for automatically bringing the single facer machine motor speed up to said preselected minimum speed in response to said preselected digital set point signal and for varying the speed of the single facer machine motor between said first and second speeds in response to said first and second digital set point signals; and
- means for automatically restoring the single facer machine motor speed to said first speed in response to said stored digital set point signal.

4,052,647 OPTIMUM BATTERY RECONNECT FOR A FIELD CONTROLLED ELECTRIC VEHICLE

Francis T. Thompson, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 28, 1974, Ser. No. 437,405
Int. Cl.² H02D 7/06

U.S. Cl. 318—139

20 Claims



1. An electric vehicle comprising: a direct current drive motor; a separately excited field winding disposed within said direct current drive motor; a plurality of electric batteries connectable in a high voltage connection and a low voltage connection for supplying power to the armature of said direct current drive motor; a throttle connected to control current flow through said separately excited field winding which regulates armature current and output torque of said direct current drive motor; switching means for changing the connection of said plurality of batteries as a function of drive motor speed, armature current, battery voltage and throttle setting; and, current limiting means for regulating the maximum armature current which can flow through said direct current drive motor to prevent damage to said electric vehicle components.

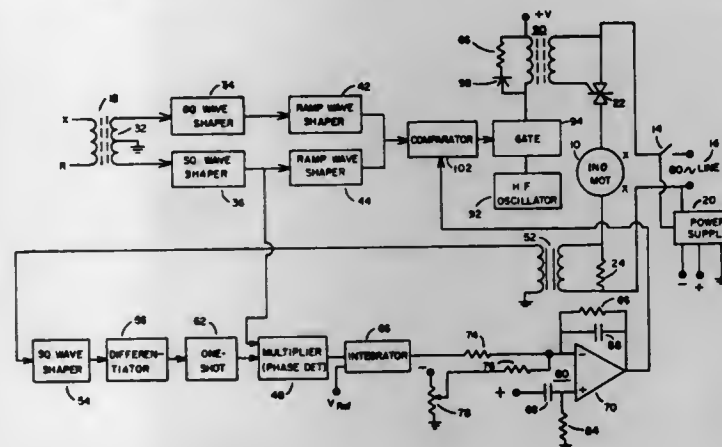
4,052,648

POWER FACTOR CONTROL SYSTEM FOR AC INDUCTION MOTORS

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed July 19, 1976, Ser. No. 706,425
Int. Cl.² H02K 17/04

U.S. Cl. 318—200

5 Claims



1. A power factor control system for an AC induction motor comprising: current sampling means including means adapted to be placed in circuit with each phase winding of a said motor

for providing an AC output signal in phase with the current through said winding; voltage sampling means adapted to sense the voltage of an electrical input applied to said winding and for providing an output signal in phase with said voltage across said winding;

phase detection means responsive to the outputs of said current sampling means and said voltage sampling means for providing an output which varies in accordance with the difference in phase between said current and said voltage; and

a control means adapted to be electrically connected in series with each said winding of said motor, and responsive to the output of said phase detection means for varying the duration of "on" time of each cycle of input power to said winding inversely proportional to the difference in phase between said current and said voltage; whereby an increase in difference between the magnitude of said voltage and the magnitude of load applied to said motor is compensated for by a reduction in power to said motor, generally improving its efficiency.

4,052,649

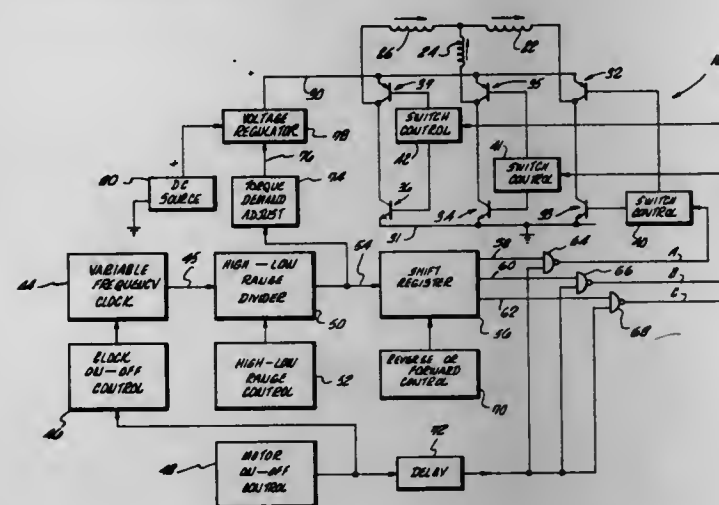
HAND HELD VARIABLE SPEED DRILL MOTOR AND CONTROL SYSTEM THEREFOR

Jack E. Greenwell, and Alexander Prokop, both of Reno, Nev., assignors to Lear Motors Corporation

Filed June 18, 1975, Ser. No. 588,010
Int. Cl.² H02P 3/24

U.S. Cl. 318—212

21 Claims



1. In a hand held dental drill and control system therefor, the combination which comprises: an induction motor having a three phase stationary winding and a rotor; a chuck carried by said rotor of the motor for releasably securing a dental drilling tool; a source of direct current; a pair of power supply conductors; an inverter, the inverter including a plurality of solid state switching devices connected across said power supply conductors, a junction intermediate each pair of said switching devices connected to respective phase windings of the motor; a variable frequency clock signal generator; switch control means coupled between said clock signal generator and said switching devices for alternately rendering one switching device of each pair conducting and the other switching device nonconducting in a predetermined phase sequence to provide three phase current for said stationary winding to cause the motor to rotate in a first direction at a speed proportional to the frequency of the clock signal from said clock signal generator; and voltage regulating means responsive to the clock signal from said clock signal generator and connected between the source of direct current and the power supply conductors for providing a direct current voltage across the supply

conductors which varies in accordance with the frequency of the clock signal from said clock signal generator over a pre-established range.

4,052,650

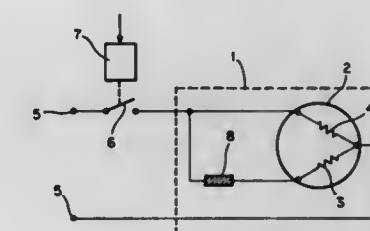
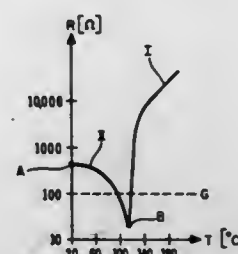
STARTING DEVICE FOR A SINGLE-PHASE MOTOR

Asger Gramkow, Gammelgaard, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Continuation of Ser. No. 275,159, July 26, 1972. This application Nov. 16, 1973, Ser. No. 416,527
Int. Cl.² H02P 1/44

U.S. Cl. 318—221 H

3 Claims



1. A single-phase motor assembly including circuit means, a first branch of said circuit means containing a main winding, a second branch of said circuit means in parallel with said first branch containing winding means for starting and a starting resistor, said resistor having sequential NTC and PTC characteristics, said NTC characteristic having an ohmic range which extends from a first value above to a second value below a predetermined critical ohmic value at which a current sufficient for starting the motor flows in said starting winding means, said first value being on the order of approximately ten times said second value and being at least several times said critical value, said PTC characteristic having an ohmic range which extends from a value below to a value above said critical ohmic value.

4,052,651

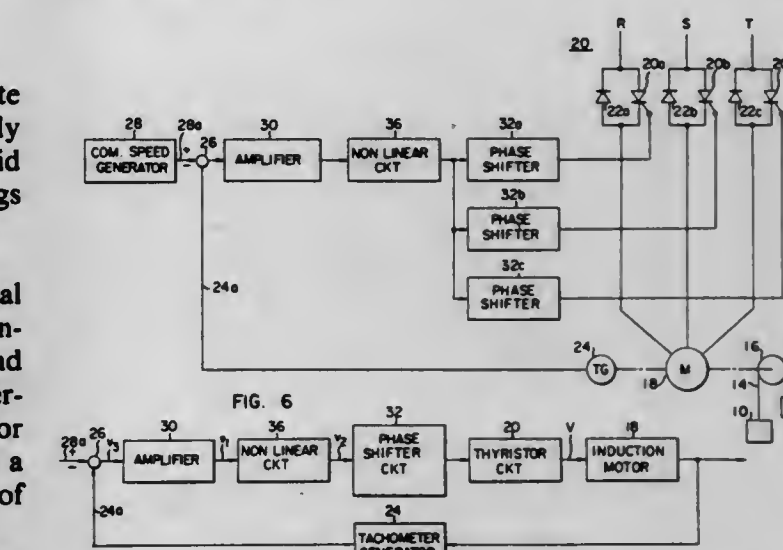
ELEVATOR SPEED CONTROL SYSTEM

Hiroshi Kamaike, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 645,295
Claims priority, application Japan, Dec. 27, 1974, 49-3901
Int. Cl.² B66B 1/30

U.S. Cl. 318—230

5 Claims



1. An elevator speed control system for controlling the rotational speed of an induction motor for driving an elevator

car, comprising an induction motor, a thyristor means for controlling the voltage applied to said induction motor, a command speed signal generator for generating a command speed signal for the rotational speed of said induction motor, a tachometer generator coupled to said induction motor to generate a speed signal representing the actual rotational speed of said induction motor, a subtracter coupled to both said command speed signal generator and said tachometer generator to produce a difference signal between the output signals from both said generators, phase shifter means coupled between said subtracter and said thyristor means and responsive to said difference signal from said subtracter to produce firing signals for said thyristor means, said induction motor, said tachometer generator, said subtracter, said phase shifter means and said thyristor means being coupled in a closed loop circuit, and a nonlinear circuit connected in said closed loop circuit for producing an output voltage approximately proportional to the square root of the input voltage applied thereto and offsetting the nonlinear characteristic of the induction motor, whereby the loop gain of said closed loop circuit is maintained constant regardless of the input thereto.

4,052,652

APPARATUS FOR TIGHTENING AND RELEASING A PRESSURE VESSEL CLAMPING NUT

André Simmonec, Herne; Martin Wiebe, Hattingen, and Willi Berndt, Herne, all of Germany, assignors to Schwing Hydraulik Elektronik KG, Herne, Germany

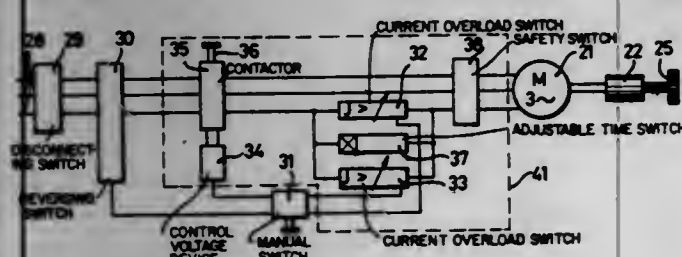
Filed Sept. 24, 1975, Ser. No. 611,610

Claims priority, application Germany, Oct. 15, 1974, 2449009

Int. Cl.² H02H 7/08

U.S. Cl. 318-476

6 Claims



1. In a pressure vessel having a flange containing bolts held and pretensioned therein, said bolts having nuts which are tightened to maintain pre-established pressure-tight sealing of the vessel and released electromechanically, the apparatus comprising a clamping nut threadedly engaging a bolt and movable axially in one direction to effect pressure-tight clamping and to effect release in the opposite direction, longitudinally extending spur teeth formed on the outside of said nut in circular form, means providing limited longitudinal movement of said nut between tightening and releasing positions, a pinion engaging said spur teeth, a three-phase reversible electric motor driving said pinion, reduction gearing interposed between said motor and pinion, a connecting lead for said motor, a current sensing means disposed in one phase of said connecting lead and arranged to provide an output signal when the sensed current exceeds a pre-selected threshold, reversing means disposed in said connecting lead, selector means for controlling the reversing means to reverse the direction of rotation of said motor, a contacting means disposed in said connecting lead and responsive to the output signal from said current sensing means to open-circuit said connecting lead for switching off the motor at a limit position of the nut, and an adjustable duration overriding means providing an override facility preventing said motor from being automatically switched off in response to current overload during a pre-selected period from switch-on of said motor and when the motor rotor has the smallest possible number of poles for a small moment of inertia and high speed of rotation.

4,052,653 ANALOG DATA RECORDING AND PLAYBACK SYSTEM FOR PATH CONTROL

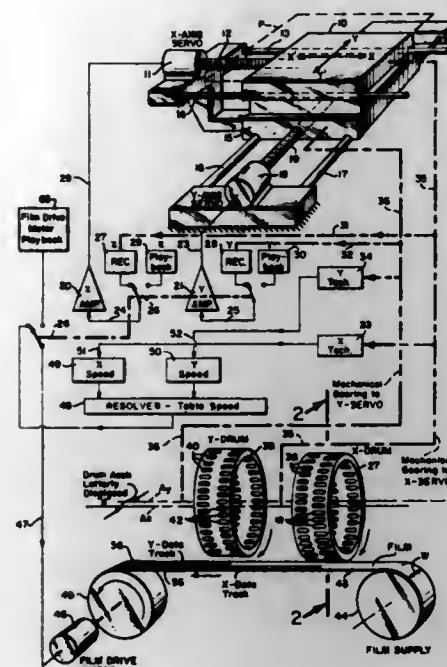
William E. Marantette, and Ruth B. Marantette, both of 20624 Earl St., Torrance, Calif. 90503

Filed Nov. 19, 1975, Ser. No. 633,484

Int. Cl.² G05B 19/42

U.S. Cl. 318-568

2 Claims



1. A method of recording and reproducing from such recording movement of a table along a selected path, comprising the steps of:

- moving said table along said selected path;
- simultaneously moving a photographic film in a longitudinal direction at a speed proportional to the speed of movement of said table;
- mechanically coupling a row of light apertures to said table to cause said light apertures to pass transversely across said film at a rate determined by the speed of movement of said table;
- passing a light beam through said apertures towards said film to thereby successively expose on said film bars of light images as said film moves, said bars being skewed relative to the direction of movement of said film in accordance with the relative rate of movement of said apertures and speed of movement of said film whereby there is optically recorded on said film a pattern of bars of light images defining the movement of the table along said selected path;
- moving said film in a longitudinal direction at a selected speed;
- providing a row of light apertures mechanically coupled to said table so that they will pass transversely across said film once said table moves, said light apertures being spaced relative to each other the same as the light apertures utilized in recording;
- passing light from two sources through two adjacent bars of light images on said film and two adjacent apertures overlying said film;
- detecting the relative intensities of the light from each of the two sources, and
- moving said table to thereby move said apertures in response to the difference in light intensities in a direction to minimize such difference so that the apertures will stay in synchronism with the bars of light images on the moving film and said table will follow said selected path defined by the pattern of bars of light images on said film.

4,052,654

GYRO STABILIZED INERTIAL REFERENCE SYSTEM WITH GIMBAL LOCK PREVENTION MEANS

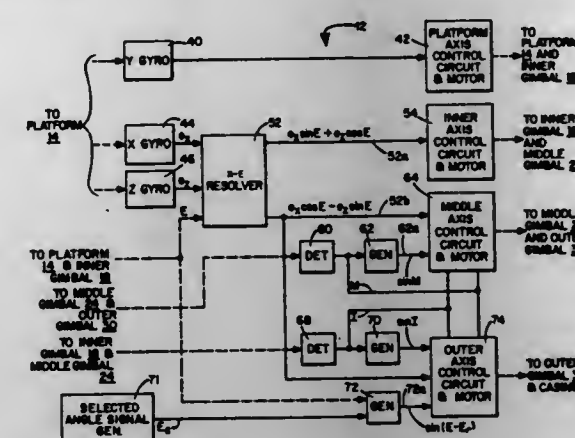
Manuel Kramer, Mountain-View, Calif., and Douglas J. Daprich, Watertown, Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sept. 22, 1975, Ser. No. 615,589

Int. Cl.² B64C 17/06

U.S. Cl. 318-649

12 Claims



1. A four axis gyro-stabilized inertial reference system comprising:

- a platform having an associated cartesian coordinate system with a fixed spatial orientation, said coordinate system including X, Y and Z axes,
- an inner gimbal, said inner gimbal being larger than and disposed about said platform and further being rotationally coupled to said platform about a platform axis,
- a middle gimbal, said middle gimbal being larger than and disposed about said inner gimbal and further being rotationally coupled to said inner gimbal about an inner gimbal axis, said inner gimbal axis being perpendicular to said platform axis,
- an outer gimbal, said outer gimbal being larger than and disposed about said middle gimbal and further being rotationally coupled to said middle gimbal about a middle gimbal axis, said middle gimbal axis being perpendicular to said inner gimbal axis,
- an outer casing, said outer casing being larger than and disposed about said outer gimbal and further being rotationally coupled to said outer gimbal about an outer gimbal axis, said outer gimbal axis being perpendicular to said middle gimbal axis,
- a platform stabilizing means for maintaining said platform in a fixed spatial orientation, wherein said stabilizing means comprises:
 - a platform axis control means including:
 - a Y-gyro having a first detection means for detecting angular displacement of said platform about said Y-axis, and means for generating an associated J error signal proportional thereto,
 - a platform axis motor and associated control circuit responsive to said J-error signal to displace said platform about said platform axis so as to null said J-error signal,
 - an inner axis control means including:
 - an X-gyro having a second detection means for detecting the angular displacement of said platform about said X-axis, and means for generating an associated X-error signal e_x proportional thereto,
 - a Z-gyro having a third detection means for detecting the angular displacement of said platform about said Z axis, and means for generating a Z-error signal e_z proportional thereto,
 - an x-z angular error resolver, said first resolver being responsive to said X and Z-error signals to the angular displacement, E, of said inner gimbal about said platform axis, to generate a V-error signal proportional to:

$$e_x \sin E + e_z \cos E$$

$$e_x \sin E + e_z \cos E$$

- an inner axis motor and associated control circuit responsive to said V-error signal to displace said inner gimbal about said inner gimbal axis so as to null said V-error signal,
- a middle axis control means including:
 - said X-gyro and Z-gyro,
 - said x-z angular error resolver, said resolver being further responsive to said X and Z-error signals and to the angular displacement, E, of said inner gimbal about said platform axis to generate a first control signal proportional to:

$$e_x \cos E - e_z \sin E$$

$$e_x \cos E - e_z \sin E$$

- means for detecting the angular displacement, M, of said outer gimbal about said middle gimbal axis, and associated first generating means for generating a second control signal proportional to:

$$\sin M$$

$$\sin M$$

- a middle axis motor and associated control circuit, said middle axis motor and circuit being responsive to said first control signal to:
 - displace said middle gimbal about said middle gimbal axis in a first direction, so as to null said first control signal when the current values of the I and M are in zones (1), (3), (5) and (6) of twelve predetermined I-M zones,
 - displace said middle gimbal about said middle gimbal axis in the other direction so as to null said first control signal when the current values of I and M are in zones (2), (4), (7) and (8) of said predetermined I-M zones,
- said middle axis motor and circuit being responsive to said second control signal to:
 - displace said middle gimbal about said middle gimbal axis in a first direction so as to null said second control signal when the current values of I and M are in zones (9) and (10) of said predetermined I-M zones,
 - displace said middle gimbal about said middle gimbal axis in the other direction so as to null said second control signal when the current values of I and M are in zones (11) and (12) of said predetermined I-M zones,
- an outer axis control means including:
 - said X-gyro, said Z-gyro, and said resolver,
 - means for generating a selected angle signal, E,
 - second generating means responsive to said selected angle signal and to the angular displacement, E, of said inner gimbal about said platform axis, for generating a third control signal proportional to:

$$\sin (E - E_0)$$

$$\sin (E - E_0)$$

- means for detecting the angular displacement, I, of said middle gimbal about said inner gimbal axis, and associated generating means for generating a fourth control signal proportional to:

$$\sin I$$

$$\sin I$$

- an outer axis motor means and associated control circuit, said outer axis motor means and circuit being responsive to said first control signal to:
 - displace said outer gimbal about said outer gimbal axis in a first direction so as to null said first control signal when the current values of I and M are in zones (9) and (12) of said predetermined I-M zones,
 - displace said outer gimbal about said outer gimbal axis in the other direction so as to null said first control signal when the current values of I and M are in zones (1) and (6) of said predetermined I-M zones,

signal when the current values of I and M are in zones (10) and (11) of said predetermined I-M zones,

said outer axis motor and circuit being responsive to said third control signal to:

i. displace said outer gimbal about said outer gimbal axis in a first direction so as to null said third control signal when the current values of I and M are in zones (1) and (4) of said predetermined I-M zones,

ii. displace said outer gimbal about said outer gimbal axis in the other direction when the current values of I and M are in zones (2) and (3) of said predetermined I-M zones,

said outer axis motor and circuit being responsive to said fourth control signal to:

i. displace said outer gimbal about said outer gimbal axis in a first direction so as to null said fourth control signal when the current values of I and M are in zones (5) and (7) of said predetermined I-M zones, and

ii. displace said outer gimbal about said outer gimbal axis in the other direction so as to null said fourth control signal when the current values of I and M are in zones (6) and (8) of said predetermined I-M zones,

where said twelve predetermined I-M zones are defined to be:

Zone (1):	$-a + 2\pi n < I < [+b + 2\pi m]$ radians
Zone (2):	$-q + 2\pi n < M < [+r + 2\pi m]$ radians
Zone (3):	$d + 2\pi n < I < [-c + 2\pi(m + 1)]$ radians
Zone (4):	$-q + 2\pi n < M < [+r + 2\pi m]$ radians
Zone (5):	$-a + 2\pi n < I < [+b + 2\pi m]$ radians
Zone (6):	$+t + 2\pi n < M < [-s + 2\pi(n + 1)]$ radians
Zone (7):	$+d + 2\pi n < I < [-c + 2\pi(m + 1)]$ radians
Zone (8):	$+t + 2\pi n < M < [-s + 2\pi(n + 1)]$ radians
Zone (9):	$-a + 2\pi n < I < [+b + 2\pi m]$ radians
Zone (10):	$+r + 2\pi n < M < [+t + 2\pi n]$ radians
Zone (11):	$-a + 2\pi n < I < [+b + 2\pi m]$ radians
Zone (12):	$-s + 2\pi n < M < [-q + 2\pi n]$ radians
Zone (13):	$+d + 2\pi n < I < [-c + 2\pi(m + 1)]$ radians
Zone (14):	$+r + 2\pi n < M < [+t + 2\pi n]$ radians
Zone (15):	$+d + 2\pi n < I < [-c + 2\pi(m + 1)]$ radians
Zone (16):	$-s + 2\pi n < M < [-q + 2\pi n]$ radians
Zone (17):	$-c + 2\pi n < I < [-a + 2\pi m]$ radians
Zone (18):	$-q + 2\pi n < M < [+r + 2\pi m]$ radians
Zone (19):	$+b + 2\pi n < I < [+d + 2\pi m]$ radians
Zone (20):	$-q + 2\pi n < M < [+r + 2\pi m]$ radians
Zone (21):	$-c + 2\pi n < I < [-a + 2\pi m]$ radians
Zone (22):	$+t + 2\pi n < M < [-s + 2\pi(n + 1)]$ radians
Zone (23):	$+b + 2\pi n < I < [+d + 2\pi m]$ radians
Zone (24):	$+t + 2\pi n < M < [-s + 2\pi(n + 1)]$ radians

and m and n are integers, where a , b , g , and r are greater than or equal to zero and less than $\pi/2$ radians, and c , d , s , and t are greater than $\pi/2$ radians and less than or equal to π radians.

4,052,655

BATTERY RECHARGING METER

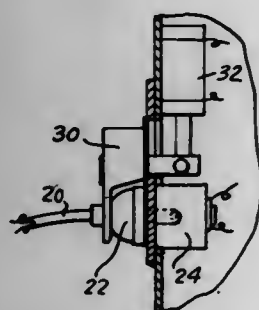
Joseph Vizza, 414 Broad Ave., Belle Vernon, Pa. 15012

Filed Sept. 10, 1975, Ser. No. 611,989

Int. Cl.² B65G 11/00

U.S. Cl. 320-2

3 Claims



1. A battery recharging meter stand for electric battery operated vehicles comprising a receptacle to which a battery

recharging cable from a vehicle is to be connected, a timing device operated by flow of battery charging current to the cable to indicate the time during which such battery charging current has flowed, a register operated by the flow of current to the cable to indicate the cost per unit time times the number of units of time of flow of the battery charging current, means to lock said battery recharging cable from said vehicle to said receptacle, said last named means comprising a fork shaped slideable element to overlie a male connector of said cable, solenoid means, said means to lock being operatively connected to said solenoid means, means upon actuation of said slideable element for making the actual connection between the source of electricity and said cable so that the electrical connection is turned off when the locking means moves to the unlocked position.

4,052,656

BATTERY CHARGING SYSTEM

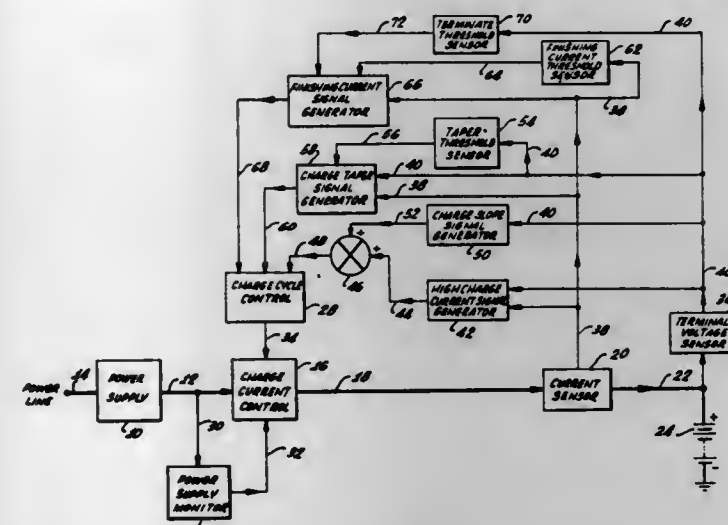
Maurice Lavell, 2117 Larkwood St., West Covina, Calif. 91790, and Donald P. Wilson, 1005 Riviera Drive, Pasadena, Calif. 91107

Continuation-in-part of Ser. No. 462,752, April 22, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,615

Int. Cl.² H02J 7/04

U.S. Cl. 320-23

17 Claims



1. A method of charging a battery comprising the steps of: sensing the charging current and terminal voltage of the battery, charging said battery with a relatively high and substantially constant current during a high current stage until said terminal voltage rises relatively rapidly indicating a transition phase; tapering the charging current from the relatively high value to a predetermined finishing current in a taper current stage, said tapering being at a rate which causes continual rise in said terminal voltage of said battery during said tapering; monitoring the total charge delivered to said battery during said high and taper current stages; further charging said battery with said finishing current for a time period based upon said total charge and thereafter terminating said charging of said battery.

4,052,657

DISTRIBUTION SYSTEM FOR A. C. ELECTRICAL ENERGY DERIVED FROM D. C. ENERGY SOURCES
Charles T. Kleiner, Fullerton, and Walter Hochwald, Downey, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 22, 1976, Ser. No. 679,271

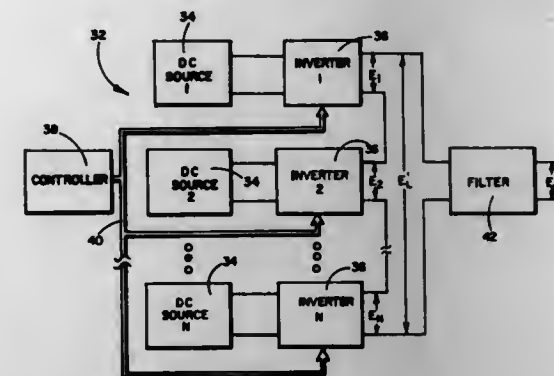
Int. Cl.² H02M 1/12

U.S. Cl. 363-43

16 Claims

1. Apparatus for distributing A.C. electrical energy to a load comprising:

inverter means responsive to gating signals for producing A.C. electrical energy having a waveform substantially that of a quasi-square wave; and controller means for providing said gating signals to said inverter means to cause said quasi-square wave to approxi-



mate a sine wave in phase with and having the same amplitude as said quasi-square wave in that the time integral of the difference between said quasi-square wave and said sine wave is caused to be substantially zero in each time interval between successive instants in time when said sine wave and said quasi-square wave have the same value.

4,052,658

INVERTER CIRCUIT FOR PRODUCING SYNTHESIZED SINUSOIDAL WAVEFORMS

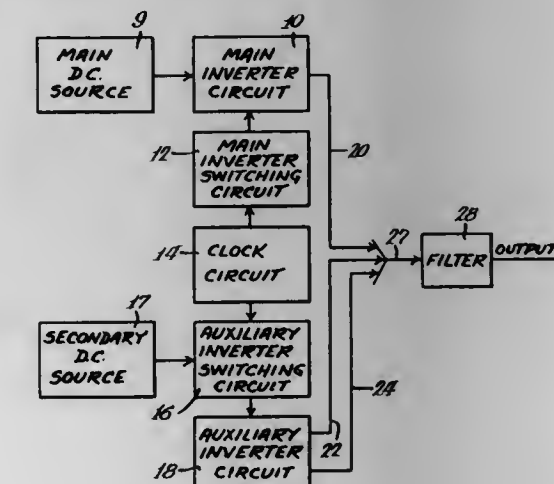
David J. Hucker, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 18, 1976, Ser. No. 733,106

Int. Cl.² H02M 1/12

U.S. Cl. 363-43

12 Claims



1. An inverter circuit for generating a synthesized sinusoidal output of a desired frequency comprising: means for generating a first, a second and a third fundamental rectangular waveform at a desired frequency wherein each of the first, the second and the third rectangular waveforms is out of phase with the other two by 120°; means for generating notched rectangular waveforms for each of the first, the second and the third fundamental waveforms; a first means for combining the notched rectangular waveforms for each of the first, the second and the third fundamental waveforms to provide a single rectangular triplex waveform having a frequency equal to three times the frequency of the desired frequency; and a second means for combining the first fundamental rectangular waveform, the notched rectangular waveforms for the first fundamental waveform and the single triplex waveform to provide the synthesized sinusoidal output in phase with the first fundamental waveform.

4,052,659

OVERLOAD PROTECTION SYSTEM FOR POWER INVERTER

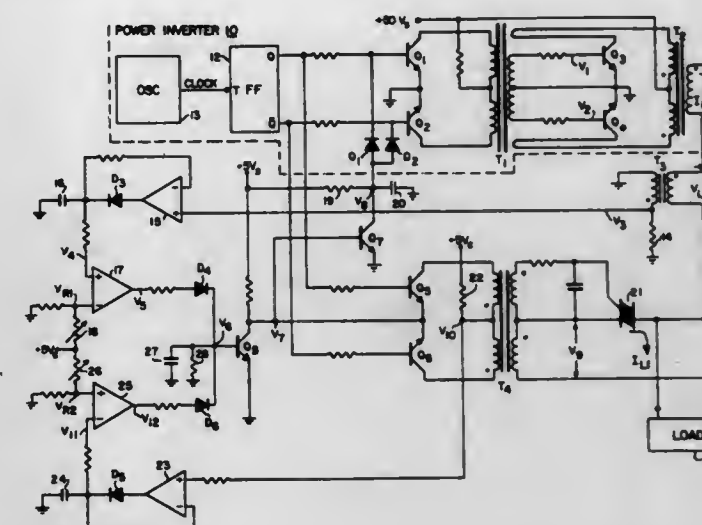
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Satoshi Nagano, Long Beach, Calif.

Filed Nov. 15, 1976, Ser. No. 742,034

Int. Cl.² H02M 1/18

U.S. Cl. 363-57

10 Claims



1. An overload protection system for a power inverter comprising means for producing a load signal proportional to current delivered by said inverter to a load, first comparing means for comparing said load signal with a first predetermined reference level specifying the onset of an overload condition, a signal inverter for producing a small monitoring current through said load, means for producing a monitoring signal proportional to said monitoring current through said load, second comparing means for comparing said monitoring signal with a second predetermined reference level specifying the continuation of an overload condition, and control means responsive to said first and second comparing means for shutting said power inverter off and turning said signal inverter on once said power signal exceeds said first predetermined reference level and thereafter while said monitoring signal exceeds said second predetermined reference level, and for shutting said signal inverter off and turning said power inverter on once said monitoring signal does not exceed said second predetermined reference level.

4,052,660

DC SERIES VOLTAGE REGULATOR WITH GATING MEANS FOR OUTPUT TO REMAIN OFF UNTIL REGULATION LEVEL IS REACHED

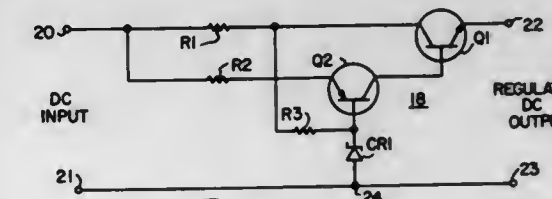
Kenneth C. Shuey, Cridersville, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 11, 1976, Ser. No. 713,560

Int. Cl.² G05F 3/08

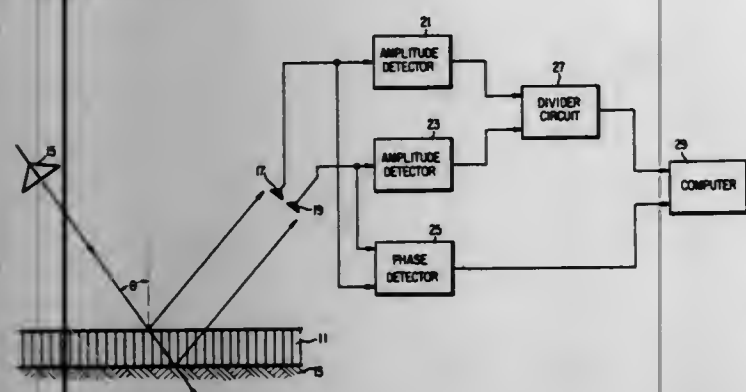
U.S. Cl. 323-19

2 Claims



1. A series voltage regulator for producing a regulated direct output voltage from a direct input voltage that is subject to variation, said regulator comprising:

ties I_p and I_s and in quadrature in the plane of incidence and normal to it; receiving the orthogonal components of the train of microwaves reflected from the layer of vegetation and the soil substrate; detecting the intensities I_p and I_s of the orthogonal components of the electric field of the received reflected train of microwaves;



determining the ratio I_p/I_s of the intensities of the detected orthogonal components of the electric field of the received reflected train of microwaves; measuring the phase difference $90^\circ + \Delta$ of the orthogonal components of the electric field of the received reflected train of microwaves; and computing the refractive index n_m of the soil substrate from the formula

$$\frac{r_p}{r_s} e^{i\Delta} = \frac{r_m}{r_m'}$$

wherein r_p and r_m are the Fresnel coefficients for the orthogonal components and are a function of θ , λ , and n_m ; and the refractive index of the soil n_m is given essentially by the moisture of the soil substrate.

4,052,667

MOISTURE METER CONSTRUCTION

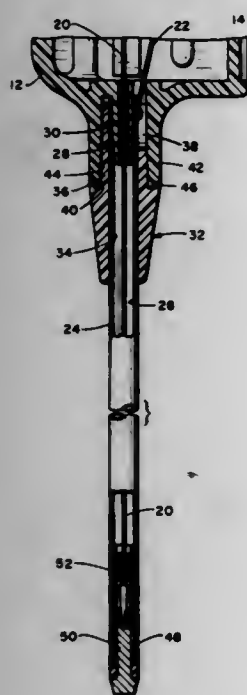
Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autometrics Corporation, Los Angeles, Calif.

Filed Sept. 8, 1976, Ser. No. 721,534

Int. Cl.² G01R 27/02

U.S. Cl. 324-65 P

3 Claims



1. A moisture meter construction wherein a probe assembly

is attached to a housing for the moisture meter, the improvement comprising:

- a tubular extension formed upon said housing having an internal access opening providing access to the interior of the housing;
- a first electrically conductive member tightly mounted upon said tubular section, said first electrically conductive member being tubular and having an elongated chamber therein;
- said housing having an annular extension surrounding said tubular section and being spaced therefrom forming an annular internal chamber;
- a plug member surrounding a portion of said first electrically conductive member with a portion of said plug member to tightly interfit within said internal chamber;
- an insulator located within the outer end of said first electrically conductive member; and
- a second electrically conductive member being tightly mounted within said insulator.

4,052,668

ARRANGEMENT COMPRISING A HIGH VOLTAGE MEASURING CAPACITOR

Reinhold Schmitt, Hans-Joachim Freygang, and Panajotis Margaritis, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

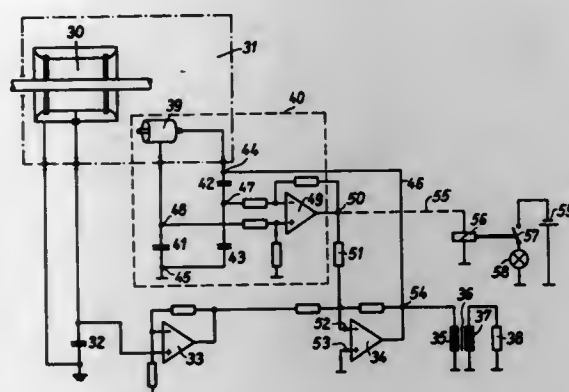
Filed Mar. 13, 1975, Ser. No. 558,175

Claims priority, application Germany, Mar. 20, 1974, 2413927

Int. Cl.² G01R 15/04, 5/00

U.S. Cl. 324-126

6 Claims



1. Apparatus for measuring voltage in a high-voltage conductor of a fully insulated, metal-encapsulated high voltage-switching installation wherein condition changes such as changes in pressure, temperature or the like can occur during the operation thereof, comprising:

- a surface electrode disposed adjacent said high-voltage conductor, said surface electrode and said high-voltage conductor cojointly defining a high-voltage measuring capacitor for detecting the voltage on said conductor, said measuring capacitor being susceptible to capacitance variations because of said condition changes in said installation;
- an auxiliary capacitor disposed within said high-voltage installation in the vicinity of said measuring capacitor and likewise susceptible to capacitance variations in response to said condition changes;
- evaluation circuit means incorporating said auxiliary capacitor for detecting variations in the capacitance of said auxiliary capacitor caused by said condition changes and for generating a signal indicative of said capacitance variations of said auxiliary capacitor thereby providing an indication that the capacitance of said measuring capacitor has likewise undergone a variation because of said condition changes;
- and compensating means responsive to said signal for varying the capacitance of said high voltage capacitor to compensate for the changes in capacitance of said high voltage capacitor caused by said condition changes.

4,052,669

LINEAR SCALE ELECTRIC METER WITH CYLINDRICAL INTERNAL MAGNET AND TWO ARC-SHAPED AUXILIARY YOKES

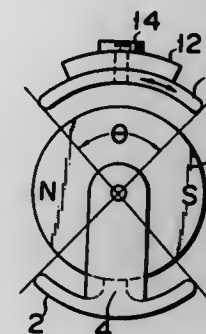
Susumu Yamaguchi, Kokubunji, Japan, assignor to Kizo Adachi, Tokyo, Japan

Filed Sept. 8, 1975, Ser. No. 611,417

Int. Cl.² G01R 5/06

U.S. Cl. 324-151 A

11 Claims



1. An electric meter providing a substantially linear scale, comprising:

- a cylindrical internal magnet having a central axis and being diametrically magnetized so as to have N and S poles which are oriented such that a straight line connecting both said N and S poles intersects with said central axis of said internal magnet at right angles thereto;
- first and second separated circular arc-shaped non-magnetized auxiliary yokes made of soft-iron and located opposite to each other about the outer periphery of said cylindrical internal magnet and oriented such that a straight line therebetween intersects the straight line connecting the N and S-pole arrangement of said cylindrical internal magnet, said non-magnetized auxiliary yokes being spaced a prescribed distance from the outer periphery of said cylindrical internal magnet;
- said non-magnetized auxiliary yokes each having first and second tip end portions, the first tip end portions of said yokes being spaced from each other and being located on one side of a further straight line passing through the central portions of said yokes and said central axis of said cylindrical internal magnet, and the second tip end portions of said yokes being spaced from each other and being located on the other side of said further straight line,
- a movable coil, and
- means for turnably supporting said movable coil so as to permit said movable coil to swing substantially in a yoke-free position in the spaces between said tip end portions of said non-magnetized auxiliary yokes about said central axis in a magnetic field produced in the space between said first tip end portions of said first and second non-magnetized auxiliary yokes and one pole of said cylindrical internal magnet and in the space between said second tip end portions of said first and second non-magnetized auxiliary yokes and the other pole of said cylindrical internal magnet.

4,052,670

SPACE DIVERSITY SYSTEM IN PCM-TDMA TELECOMMUNICATION SYSTEM USING STATIONARY COMMUNICATION SATELLITE

Tatsuo Watanabe, Mitaka; Hideki Saito, Tachikawa; Akira Ogawa, Machida, and Masahisa Yamaguchi, deceased, late of Tokyo, Japan, by Kazuko Yamaguchi, administrator and legal representative, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

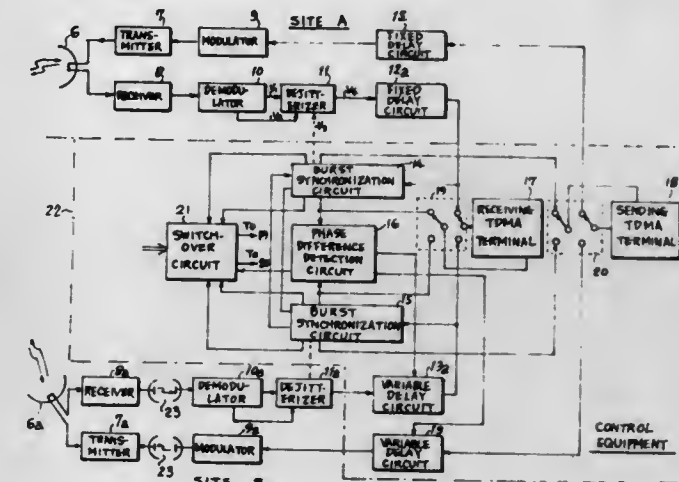
Filed Dec. 23, 1975, Ser. No. 643,708

Claims priority, application Japan, Dec. 24, 1974, 49-147601; Dec. 24, 1974, 49-147602

Int. Cl.² H04B 7/20

U.S. Cl. 325-4

3 Claims



1. A space diversity system with at least two signal routes in a PCM-TDMA telecommunication system utilizing a communication satellite generally stationary with respect to ground stations of the system, comprising:

- signal conversion circuits each inserted in the receiving side of a respective one of said at least two signal routes for converting the received PCM signals of burst mode at each route into PCM signals synchronized with consecutive clock pulses of a respective ground station for each route;
- phase difference detection means connected to said signal conversion circuits for establishing an arrival time difference between said PCM signals of said routes;
- fixed delay circuits inserted in at least one of said signal routes for correcting a fixed delay difference between said routes;
- variable delay circuits inserted in at least a remaining one of said signal routes and responsive to the output of said phase difference detection means for correcting the deviation of said arrival time difference between said PCM signals of said routes which occurs in accordance with any movement of said satellite, thereby equalizing respective electrical lengths of said routes to one another; and
- switchover means connected to said signal routes for selecting one of said signal routes in accordance with the quality of the signals received at each route.

4,052,671

ADAPTIVE EQUALIZER

Julius Lange, Sunnyvale, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 26, 1976, Ser. No. 735,231

Int. Cl.² H04B 1/10

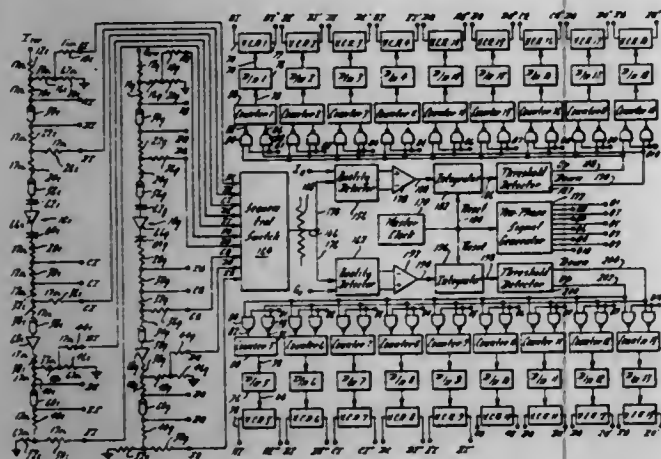
U.S. Cl. 325-42

4 Claims

1. An adaptive equalizer for improving the quality of digital data contained in an electrical input signal adapted to be supplied to said equalizer, said equalizer compensating for amplitude and delay distortion affecting the quality of the digital data contained in said electrical input signal and said equalizer comprising:

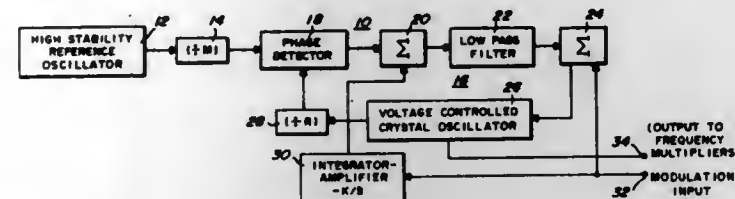
- a. a delay line, said delay line being adapted to be supplied

- with said electrical input signal, said delay line including a plurality of discrete time delay elements and a plurality of taps coupled to said time delay elements;
- b. means for generating a plurality of electrical clock signals of identical frequency but different phase;
- c. sequential switch means, coupled to said plurality of delay line taps, controlled by said clock signals, and having an output, for sequentially coupling said sequential switch means output to said delay line taps, thereby, to generate sequential-switch-means output signals;
- d. a plurality of voltage controlled amplifiers, each of said voltage controlled amplifiers having an input coupled to one of said delay line taps, an output and a control-voltage input;
- e. a plurality of binary number counters, one of said counters being provided for each of said voltage controlled amplifiers;
- f. circuit means for converting binary number counts in said counters to analog voltage respectively proportional to such binary number counts, said analog voltages being



means coupling said reference oscillator to said phase detector of said phase locked loop;

first modulation input means for applying modulation signal components to the input of said voltage controlled oscillator; and



second modulation input means for applying modified modulation signal components to said lowpass filter, said second modulation input means including integrating means having a gain constant substantially the reciprocal of said phase locked loop gain constant.

4,052,673

COMBINED CONTROLLED OSCILLATOR AND FREQUENCY MULTIPLIER

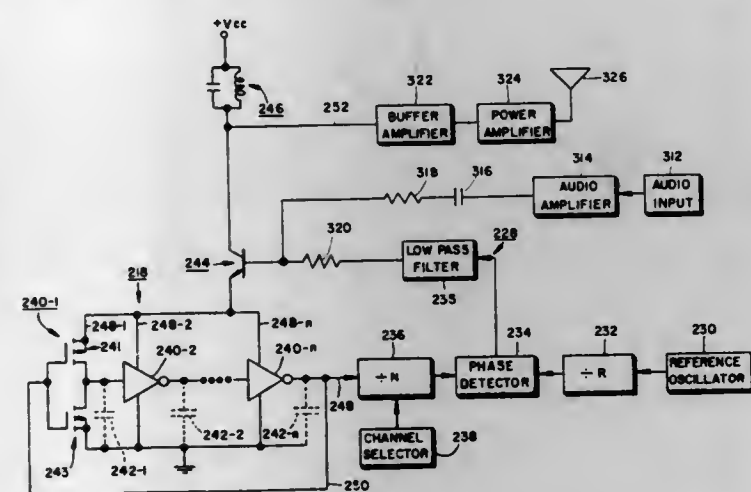
Gerald Bernard Herzog, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,802

Int. Cl.² H04B 1/04, 1/28; H03B 19/10, 25/00

U.S. Cl. 325-153

14 Claims



1. Apparatus comprising:
- means for coupling a first signal having a frequency f_1 to a circuit point;
- a number n of stages coupled in a cascaded configuration, said circuit point being an input to said cascaded configuration, each of said stages being, successively switched from a first state to a second state in response to said first signal each of said stages drawing power for a time duration shorter than the period of said first signal when it switches from one state to another;
- said number n of power coupling means for providing power to respective ones of said stages;
- a source of power;
- impedance means coupled between each of said power coupling means and said source of power for developing a second signal having at least a frequency component at nf_1 .

4,052,674

VHF TUNER DEVICE

Kunio Miyamoto, Kitano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 11, 1972, Ser. No. 270,841

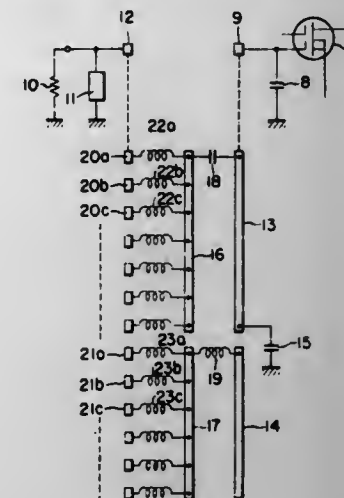
Int. Cl.² H04B 1/18

U.S. Cl. 325-374

3 Claims

1. In a tuner device having an input circuit comprised of capacitive reactance means in parallel with an antenna radiation impedance, an antenna circuit having an amplifier with an

input electrode, and capacitive means between said electrode and a point of reference potential, and frequency selecting means connected between said input circuit and said amplifier circuit; the improvement wherein said frequency selecting means comprises first and second groups of inductors, means selectively connecting said input circuit to an end of each of said inductors, capacitor means having one terminal connected



to the other ends of said inductors of the group of inductors corresponding to the higher tuning frequencies, inductor means having one terminal connected to the other ends of the inductors of the group of inductors corresponding to the lower tuning frequencies, means selectively connecting the other terminals of said capacitor means and inductor means to said electrode, and a capacitor connected between the other terminal of said capacitor means and a point of reference potential.

4,052,675

UHF TUNER ARRANGEMENT

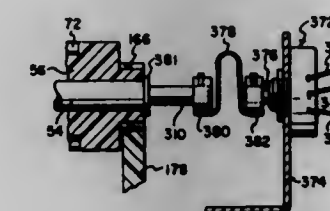
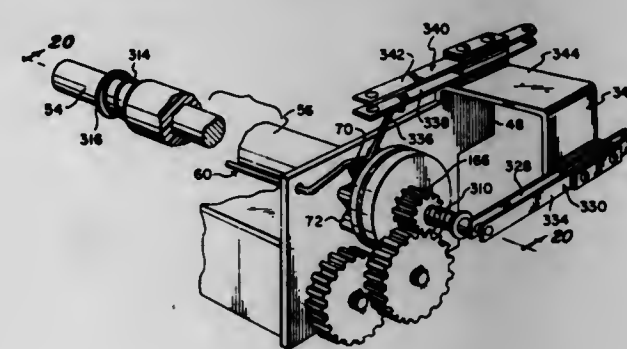
Alarico A. Valdetaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Continuation of Ser. No. 600,288, July 31, 1975, abandoned, which is a division of Ser. No. 515,220, Oct. 16, 1974, Pat. No. 3,972,241, which is a division of Ser. No. 350,742, April 13, 1973, Pat. No. 3,842,683, which is a continuation of Ser. No. 174,722, Aug. 25, 1971, abandoned. This application Jan. 7, 1977, Ser. No. 757,672

Int. Cl.² H04B 1/06; H03J 5/26

U.S. Cl. 325-465

12 Claims



1. The combination of a UHF tuner having a continuously variable main tuning shaft rotation of which is effective selectively to receive signals on all channels in the UHF television

band, a station selector shaft, gear means providing a step-down driving ratio on the order of 14:1 interconnecting said selector shaft and said main tuning shaft, detect means mounted directly on said selector shaft to establish a stop position of said main tuning shaft via said gear means for each of the television stations in the UHF television band, means for providing a unique indication of the channel to which the tuner is tuned, a vehicle impedance element electrically coupled to said UHF tuner, said variable impedance element being responsive to an electrical control signal for altering the tuning of said UHF tuner, a fine tuning shaft, and a control element mechanically coupled to said fine tuning shaft and responsive to the position of said fine tuning shaft for providing a control signal to said variable impedance element to effectively fine tune said UHF tuner independently of said main tuning shaft.

4,052,676

DIGITAL-ANALOG FREQUENCY ERROR SIGNALING

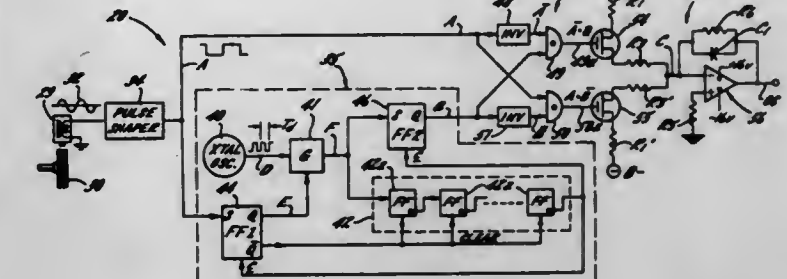
Bernard R. Crittenden, Rockford, Ill., assignor to Woodward Governor Company, Rockford, Ill.

Filed June 10, 1976, Ser. No. 694,770

Int. Cl.² H03D 3/02; G01R 25/08

U.S. Cl. 328-134

23 Claims



1. The method of producing a bipolar signal representing the analog of the error between a changeable frequency input signal and a set point frequency, comprising
- a. generating a first recurring signal [A] with each recurrence having a duration which varies inversely with changes in the frequency of the input signal,
- b. generating a second recurring signal [B] of constant predetermined duration, each cycle of such signal beginning substantially in synchronism with the start of each cycle of said first signal,
- c. producing a first pulse of predetermined amplitude and of one polarity whenever and so long as the first signal exists without the presence of the second signal,
- d. producing a second pulse of said predetermined amplitude and of the opposite polarity whenever and so long as the second signal exists without the presence of the first signal, and
- e. producing an output analog signal which varies as the time average of the algebraic sum of said first and second pulses.

4,052,677

NON-LINEAR FUNCTION GENERATOR WITH SWITCHED CHANNELS

James A. Hogan, Hatfield, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 29, 1976, Ser. No. 727,759

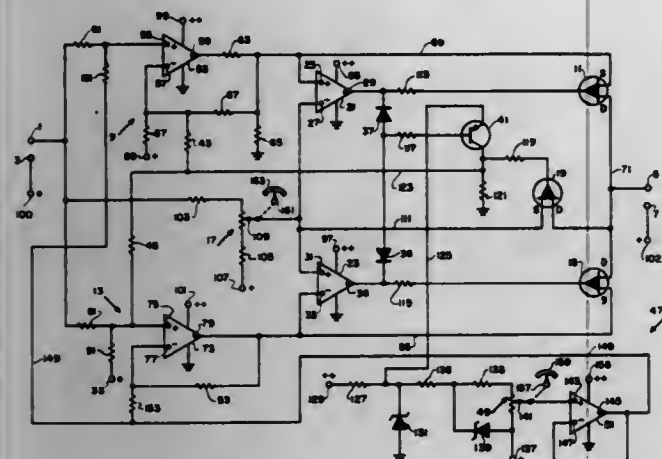
Int. Cl.² H03K 5/153; G06G 7/12

U.S. Cl. 328-143

6 Claims

1. Non-linear function generator apparatus comprising an input connection arranged to receive an input signal, an output connection,
- a first amplifier having an input connected to said input connection and to a source of a bias signal, and having an output in which said amplifier produces an output signal which follows said input signal with an offset determined by said bias signal,

- a second amplifier having an input connected to said input connection and to said source of bias signal, and having an output in which said second amplifier produces an output signal which follows said input signal with an offset determined by said bias signal and of the opposite sense with respect to the first-mentioned offset;
- a first semiconductor switch having a principle electrode path connected between said output of said first amplifier and said output connection and having a control electrode;
- a second semiconductor switch having a principle electrode



path connected between said output of said second amplifier and said output connection and having a control electrode, and

means connected to said control electrodes and responsive to said amplifier output signals and to a third signal which follows said input signal to turn on solely said first switch when said third signal lies on one side of both of said amplifier output signals, to turn on solely said second switch when said third signal lies on the opposite side of both of said amplifier output signals, and to apply said third signal to said output connection solely when said third signal lies between said amplifier output signals.

4,052,678

NOISE FLOOR INDICATIVE CIRCUIT

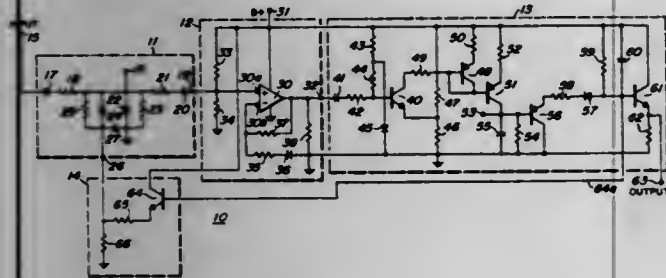
David Gordon Ramsland, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 14, 1975, Ser. No. 604,563

Int. Cl.² H03G 3/32

U.S. Cl. 330—281

8 Claims



1. An improved circuit for providing a floor indicative signal for input signals having floor levels varying over a large dynamic range, comprising:

amplifier means having a controllable predetermined gain for receiving an input signal having a first floor level and producing an output signal having a second floor level, said second floor level being related to said first floor level by the gain of said amplifier means;

detector means coupled to said amplifier means for receiving said output signal and producing a floor level indicative signal related to said second floor level, said detector means including a peak level detection means for receiving said output signal and producing a first signal corresponding to the peak magnitudes of said output signal, and said detector means including a minimum level detection

means for receiving said first signal and producing a second signal having a magnitude substantially corresponding to the minimum magnitude of said first signal, said second signal determining the magnitude of said floor level indicative signal; and

control means for inversely and nonlinearly varying the gain of said amplifier means directly in response to the magnitude of said second signal, said control means comprising a control feedback loop for said second signal coupled between said detector means and said amplifier means, whereby said feedback loop enables the circuit to produce corresponding floor level indicative signals for input signals with floor levels which vary over a large dynamic range.

4,052,679

PHASE SHIFTING CIRCUIT

Nobukazu Hosoya, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

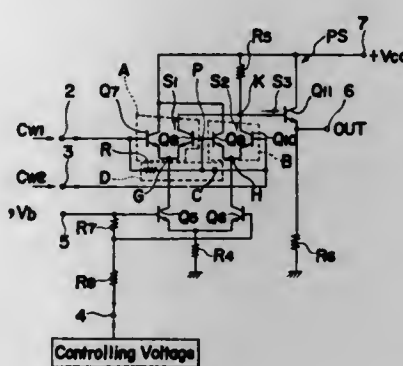
Filed Apr. 14, 1976, Ser. No. 678,637

Claims priority, application Japan, Apr. 14, 1975, 50-931[U]

Int. Cl.² H03K 1/12

U.S. Cl. 330—261

4 Claims



1. A phase shifting circuit for shifting the phase of an alternating signal applied to thereto said phase shifting circuit comprising:

a. a phase shifting means having two electrical elements connected in series, the phase characteristics of a first of the electrical elements being different from that of the second electrical element and wherein one of the electrical elements is a capacitive element, whereby the phase of said alternating voltage signal across the first electrical element is different from that across the second electrical element; and wherein input signals of opposite polarity are applied to each end of said serially connected electrical elements.

b. a first differential circuit including first and second transistors interconnected at a first common terminal, and having first and second input terminals connected with said first electrical element for amplifying a first signal which is obtained from the voltage drop across said first electrical element;

c. a second differential circuit including third and fourth transistors interconnected at a second common terminal, and having third and fourth input terminals connected with said second electrical element for amplifying a second signal which is obtained from the voltage drop across said second electrical element;

d. means for combining said first signal from said first differential circuit with second signal from said second differential circuit;

e. a constant current source means connected to each of said first common terminal and second common terminal, and connected to reference voltage point; and

f. means for controlling a conductivity of said constant current source.

4,052,680

METAL VAPOR LASER HAVING CATAPHORESIS MEANS

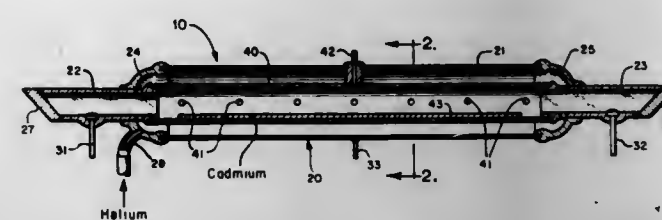
Shing Chung Wang, Temple City; Randolph W. Hamerdinger, Glendora, and William F. Hug, Pasadena, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed July 1, 1976, Ser. No. 701,476

Int. Cl.² H01S 3/22

U.S. Cl. 331—94.5 G

1 Claim



1. A device for stimulating the emission of radiation by the excitation of metallic material from an initial state to an excited state comprising:

a hollow, substantially cylindrical, electrically conductive member arranged to be employed as a cathode;

an envelope, substantially surrounding said cathode and being disposed substantially coaxially therewith, having a substantially cylindrical, electrically conductive body section, and a pair of substantially nonconductive end sections extending, respectively, from each end of said body section, each of said end sections terminating in a radiation transmission member; said envelope being adapted to substantially enclose a quantity of gaseous material and a quantity of unvaporized metallic material;

an anode terminal, coupled to said body section, for passing electrical energy to said device for heating said cathode and causing said metallic material to vaporize, and for further causing said gaseous material and said metallic material to interact to raise said metallic material from an initial state to a vaporized excited state characterized by a positive electric charge;

a cathode terminal, coupled to said cathode, for providing an electrical return path from said cathode to a point of low potential; and

a pair of cataphoresis terminals, one of said cataphoresis terminals being disposed along one of said end sections in advance of one of said radiation transmission members, and the other of said cataphoresis terminals being disposed along the other of said end sections in advance of the other one of said radiation transmission members; said pair of cataphoresis terminals being further adapted to establish an electrical field within said envelope for urging said vaporized metallic material away from the nearest of said radiation transmission members, thereby minimizing the condensation of said vaporized metallic material on said radiation transmission members.

4,052,681

GAS-DISCHARGE LASER

Kornelis Bulthuis, Bram Johan Derkema; Hendrik Tjalling Dijkstra, and Johannes van de Wal, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1975, Ser. No. 642,069

Claims priority, application Netherlands, Mar. 13, 1975, 7502973

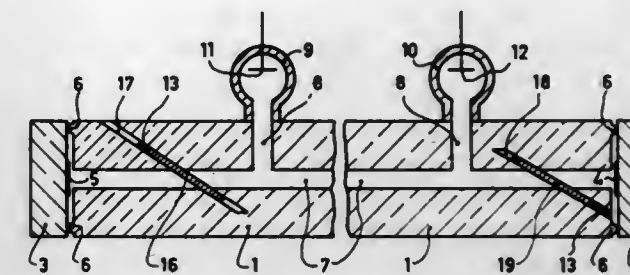
Int. Cl.² H01S 3/02

U.S. Cl. 331—94.5 D

3 Claims

1. A gas-discharge laser which comprises: Means for creating a population inversion, a laser medium and means for stimulating the emission of a laser beam and a gas-discharge tube, part of said tube being an elongated laser tube, said laser tube having secured directly to the two ends thereof respective reflectors, at least one of said reflectors passing a coherent light beam, said laser further having in the laser tube, near at least one of the reflectors, a plane-parallel transparent plate constituting a Brewster window the normal to which makes an angle

with the axis of the laser tube equal to the Brewster angle, said laser tube having a capillary bore, said Brewster window being secured with a major surface thereof substantially parallel to and engaging a slot in said laser tube, said slot being disposed



in oblique relationship to said axis of said laser tube and extends around at least a portion of said capillary bore, the normal to said surface of the tube making an angle equal to the Brewster angle with the axis of the laser tube.

4,052,682

MULTIPLE OSCILLATOR MODULATOR CIRCUIT

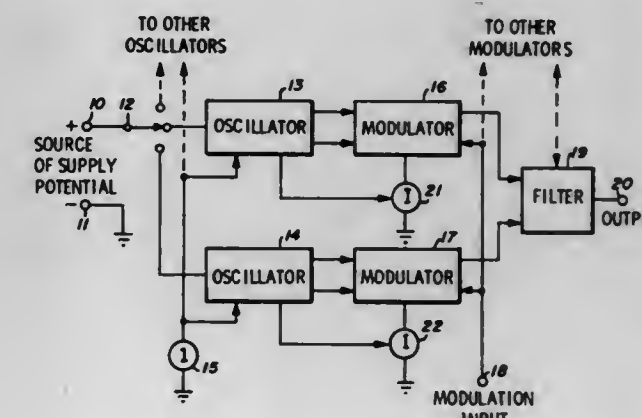
Milton E. Wilcox, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sept. 20, 1976, Ser. No. 724,441

Int. Cl.² H03C 1/00, 3/00

U.S. Cl. 332—16 R

8 Claims



1. A multiple oscillator modulator circuit suitable for construction in integrated circuit form and for generating one of a plurality of possible carrier signals and for impressing upon said one carrier a modulation signal wherein the switching of said one of said plurality of possible carrier signals is achieved without switching signal carrying currents, said circuit comprising:

means for coupling said circuit to a source of operating potential;

a plurality of oscillators;

switch means coupled between each oscillator of said plurality and said source of operating potential, said switch means operating to connect any single one of said plurality of oscillators at a time to said source of operating potential;

a plurality of modulators, one for each oscillator of said plurality of oscillators, said plurality of modulators being coupled in common to a modulating signal terminal adapted for coupling to a source of modulating signals, each of said modulators being coupled to an associated oscillator for the application of oscillator signal to said modulators, and each of said modulators including a separate source of current; and

means for controlling said separate source of current in response to the current flowing in said associated oscillator whereby said modulator is turned off when said oscillator is not energized.

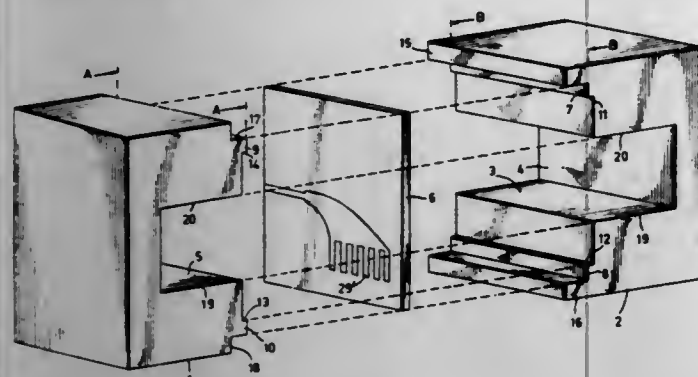
4,052,683 MICROWAVE DEVICE

Johannes Hendrik Cornelis van Heuven, and Frans Christiaan De Ronde, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 549,935, Feb. 14, 1975, abandoned.
This application Oct. 26, 1976, Ser. No. 735,320
Claims priority, application Netherlands, Feb. 28, 1974, 7401693

Int. Cl.² H01P 1/16, 5/10

U.S. Cl. 333—21 R

3 Claims



1. A microstrip to waveguide transition, comprising: a waveguide structure; a microstrip conductor structure including a substrate plate arranged in the longitudinal direction in the plane of symmetry and parallel to the electric field of the waveguide structure, an electrically balanced conductor structure including symmetrical conductor portions arranged on opposite sides of the substrate plate, an electrically unbalanced asymmetrical conductor structure including a conductive base plate and a strip-like conductor arranged on opposite sides of the substrate plate, said strip-like conductor being connected to the juxtaposed conductor portion and being reduced in width with respect thereto, and a symmetric-asymmetrical transformer formed by two slots provided in said base plate on both sides of said strip-like conductor and in alignment with the edges of said conductor portions for interconnecting said symmetrical and asymmetrical conductor structures to provide an impedance match there-between and between the symmetrical structure to earth and between asymmetrical structure to earth.

4,052,684 HELICAL RESONATOR

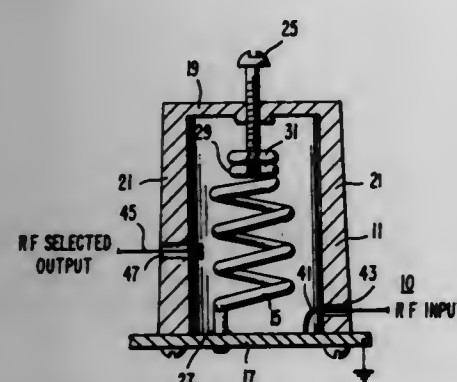
Peter Joseph Schmalz, Washington, Pa., assignor to RCA Corporation, New York, N.Y.

Filed July 6, 1976, Ser. No. 702,401

Int. Cl.² H01P 7/00

U.S. Cl. 333—82 R

2 Claims



1. A helical resonator comprising:
a conductive enclosure,
a helical coil of conductive windings mounted at one end to one wall of said enclosure and extending toward an opposite wall of said enclosure,
a cylindrical conductive member formed at the free end of said coil and forming with said opposite wall a capacitor, said conductive member having a substantially reduced

outside diameter with respect to the turn diameter of the coil, and
moveable conductive means electrically connected to and extending from said opposite wall of said enclosure into said cylindrical conductive member, said moveable conductive means being adjustable to vary the capacitance of said capacitor.

4,052,685 CURRENT TRANSFORMER

Tadeusz W. Kolator, Lucan, Canada, assignor to Westinghouse Canada Limited, Hamilton, Canada

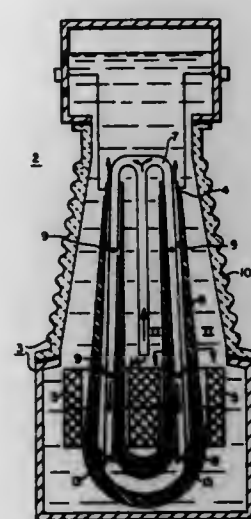
Filed Nov. 4, 1976, Ser. No. 738,810

Claims priority, application Canada, May 31, 1976, 253775

Int. Cl.² H01F 27/10

U.S. Cl. 336—60

4 Claims



1. A current transformer, comprising:
an enclosure;
an insulating fluid disposed in said enclosure;
a winding disposed in said enclosure, said winding including a substantially vertical oriented U-shaped tubular conductor having upwardly extending legs with open ends;
means for increasing the circulation of said insulating fluid, including a fluid conductor disposed within said U-shaped tubular conductor to define first and second substantially coaxial flow paths for said insulating fluid, with the first path being within said fluid conductor, and the second path being between said fluid conductor and said tubular conductor;
said first and second flow paths being interconnected at a point within said winding;
said fluid conductor including first and second downwardly extending legs joined in common adjacent one of said open ends of said U-shaped conductor, said first leg disposed within one of said upwardly extending legs of said U-shaped conductor, said second leg extending downwardly into the cooler insulating fluid removed from said open end of said U-shaped conductor.

4,052,686 FLEXIBLE POSITION PROBE ASSEMBLY

Johannes J. Schmitz, Catonsville, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 16, 1975, Ser. No. 622,918

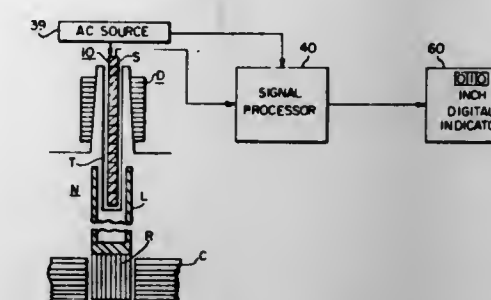
Int. Cl.² H01F 27/30

U.S. Cl. 336—65

3 Claims

1. A flexible probe assembly comprising a plurality of tubular transducer sections, an elongated flexible support member extending through said tubular transducer sections, said elongated flexible support member being a flat strip element which supports bending in two directions, the tubular passage through said tubular sections including grooves to accommodate said flat strip element such that said flat strip element

divides the tubular passage formed by said adjacent tubular transducer sections into two internal passages extending the length of said probe assembly, and means for maintaining



adjacent tubular transducer sections in mechanical contact, said means in combination with said elongated flexible support member permitting mechanical flexing of said probe assembly.

4,052,687 CIRCUIT BREAKER WITH PARALLEL SHORTING ELEMENT

Stephen F. Kimball, Georgetown, and Paul E. Gates, Danvers, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Sept. 12, 1975, Ser. No. 612,599

Int. Cl.² H01H 61/00

U.S. Cl. 337—25

2 Claims



1. A circuit breaker comprising a sealed glass envelope having two lead-in wires extending therethrough, a thermally sensitive bimetal within said envelope mounted on one of said lead-in wires and making electrical connection to the other at room temperature but separated therefrom at a predetermined elevated temperature, and an electrically conductive bypass element within said envelope across said lead-in wires in parallel with said bimetal, wherein said bypass element can be melted by a short duration pulse of high electric current.

4,052,688 FUSE CLIP ASSEMBLY

Ernest Gerard DeNigra, Colts Neck, and Albert John Tutko, Belle Mead, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. and Western Electric Company, Inc., New York, N.Y.

Filed Sept. 27, 1976, Ser. No. 726,966

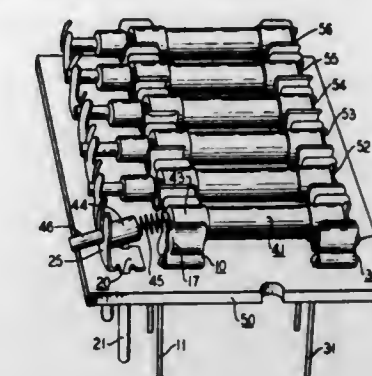
Int. Cl.² H01H 85/20

U.S. Cl. 337—213

11 Claims

1. A fuse clip mounting board assembly for use with tubular alarm type fuses, said mounting board assembly having a load spring clip terminal, a line spring clip terminal, and an alarm terminal,
said load spring clip terminal including means for applying spring tension to a rear terminal of an inserted fuse, said spring tension being applied both perpendicularly to the body of said fuse and longitudinally along the axis of said fuse body,
said line spring clip terminal including means for applying spring tension to a front terminal of an inserted fuse, said spring tension being applied perpendicularly to the body

of said fuse, said line spring clip terminal also including means for restricting the movement of said inserted fuse forward along said longitudinal axis, and



said alarm terminal including means for retaining an alarm contact extended axially from a front end of said fuse.

4,052,689 WIRE SPRING FUSE HOLDER WITH PIGTAIL LEADS

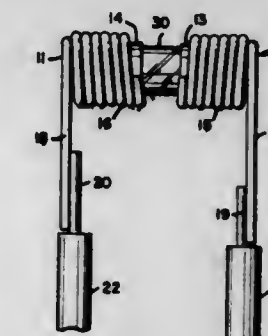
Dalton T. Smith, Sr., Meadville, Pa., assignor to Oneida Electronic Mfg. Co. Inc., Meadville, Pa.

Filed July 17, 1974, Ser. No. 489,091

Int. Cl.² H01H 85/50

U.S. Cl. 337—215

1 Claim



1. A fuse and pigtail wire combination comprising,
a hollow cylindrical fuse body made of non-conducting material having a hollow cylindrical cuplike terminal made of conducting material and disposed on each end of said cylindrical body,
said terminal and pigtail being made of a single wire wound into a spiral,
each said pigtail wire having a first part and a second part integrally connected to said first part,
said first part being wound to form a tight coil on said cuplike terminal made of conductive material comprising a plurality of turns of slightly smaller internal diameter than the outside diameter of said cuplike terminals whereby said coil will grip the caps and make electrical contact with said caps disposed in the form of a hollow cylinder receiving a said cuplike terminal,
said second part comprising a straight section of wire disposed parallel to a diameter of said coil and extending diametrically across one end of said coil and terminating a substantial distance from said coil,
each said cuplike terminal member receiving an end of said hollow body,
said second part of each said pigtail wire being soldered to a straight pigtail wire.

4,052,690

SENSITIVE FUSE FOR FIRE ALARM

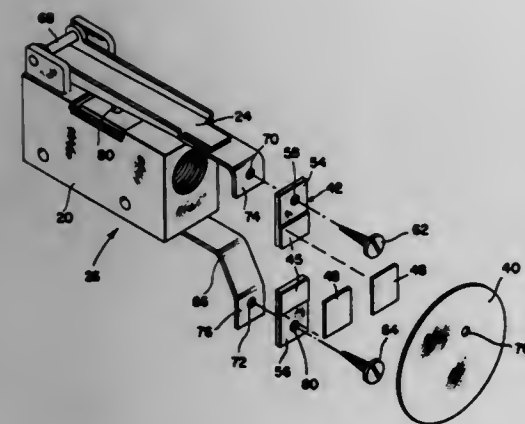
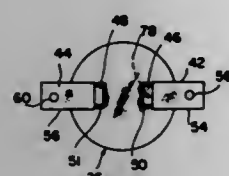
Sidney Jacoby, Philadelphia, Pa., assignor to Evergard Fire Alarm Company, Inc., Philadelphia, Pa.

Filed Jan. 8, 1976, Ser. No. 647,330

Int. Cl.² H01H 37/76

U.S. Cl. 337-405

11 Claims



1. In a sensitive fuse for a heat responsive device, the combination of
a thin metallic plate to collect heat from the environment;
an attachment strip removably connected to the plate
said attachment strip comprising a non-ferrous metal strip
and a non-metallic insulator laminated together; and
fusible means responsive to heat to disconnect the attachment strip from the plate, said fusible means affixing the non-ferrous metal strip to the plate in the absence of heat.

4,052,691

HUMIDITY SENSOR

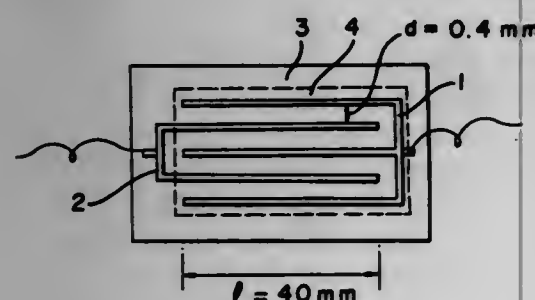
Kentarō Nagano, Kōji Nomaki, both of Yokohama; Yukinori Katsukake, Tokyo, and Junji Nanso, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed May 14, 1976, Ser. No. 686,293

Int. Cl.² H01L 7/00

U.S. Cl. 338-35

10 Claims



1. A humidity sensor for detecting condensed moisture, which comprises:
a pair of spaced electrodes disposed on an insulating substrate;
and a moisture sensitive membrane of an orthophosphate

which at least partially covers the gap between said electrodes.

4,052,692

ACCENTUATOR CIRCUIT FOR UNDERWATER ACOUSTICAL DEVICES

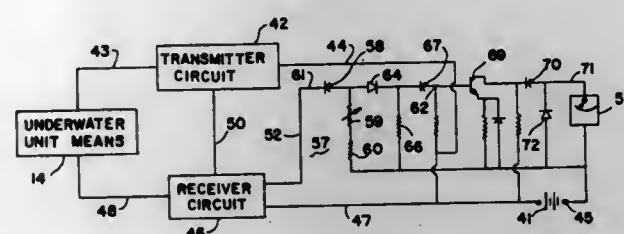
Arthur W. Freeman, 525 E. Hastings St., Vancouver 4, British Columbia, Canada

Filed Nov. 24, 1975, Ser. No. 634,917

Int. Cl.² G01S 9/70

U.S. Cl. 340-3 R

13 Claims



1. A circuit for an underwater device which detects the presence of an object in a body of water, comprising in combination:

- underwater unit means for interchanging electrical signals and acoustical wave fronts in the water;
- a transmitter circuit connected to said underwater unit means for transmitting an acoustical wave front through the water;
- a receiver circuit connected to said underwater unit means for providing receiver outputs in accordance with the distances traversed by said reflected wave fronts;
- the wave fronts reflecting from the bottom of the body of water producing a series of receiver outputs within a time interval thereby obliterating a receiver output which occurs within said time interval corresponding to an object under investigation;
- a detector connected to the output of said receiver circuit to have a detector output of one polarity;
- and an accentuator circuit including threshold means connected in series with said detector for modifying said receiver outputs to substantially reduce the obliteration due to said series of receiver outputs to resolve said receiver output corresponding to the wave front reflecting from the object under investigation from said wave fronts reflecting from the bottom of the body of water.

4,052,693

DEPTH SOUNDER

George A. Gilmour, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 3, 1976, Ser. No. 663,339

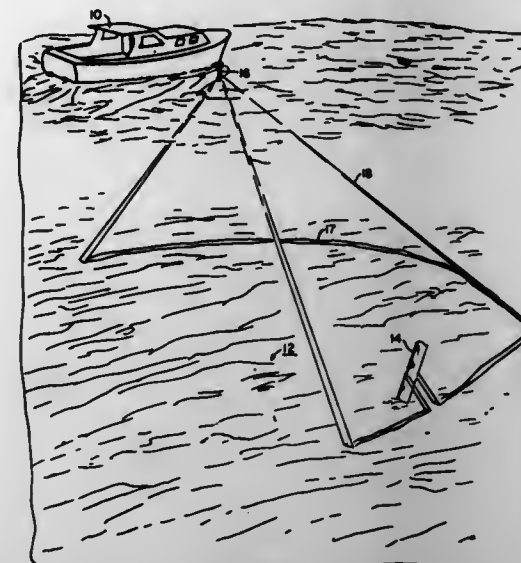
Int. Cl.² G01S 9/68

U.S. Cl. 340-3 R

12 Claims

1. Depth sounding apparatus, comprising:
- A. transducer means designed for operation over a target area;
 - B. means for periodically transmitting acoustic energy to impinge upon said target area;
 - C. means in cooperative association with said transducer means for forming, for each said transmission, a trans-

ducer beam which intersects said target area in an elongated curved area such that points in said intersection are



substantially equally distant from a predetermined point associated with said transducer means.

4,052,694

METHOD AND APPARATUS FOR DIAGNOSING FAULTS IN THE GEOPHONE GROUP OF A GEOPHYSICAL DATA ACQUISITION SYSTEM

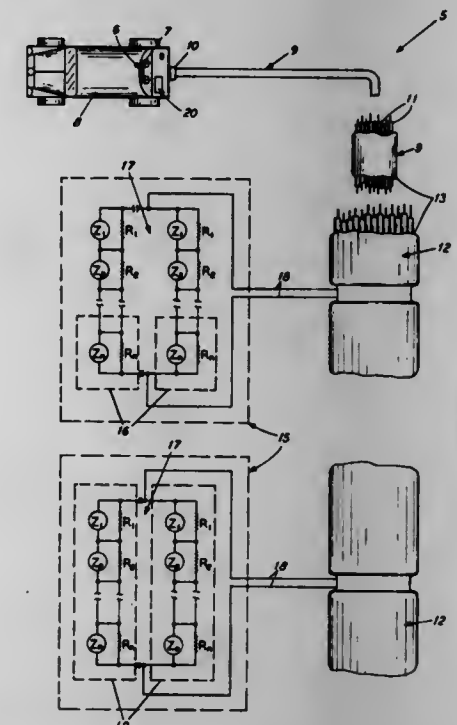
Oke A. Fredriksson, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 16, 1975, Ser. No. 587,463

Int. Cl.² G01V 1/16; G01C 27/00

U.S. Cl. 340-17 R

10 Claims



1. Apparatus for fault diagnosis of a geophone group within a geophone group-cable complex of a geophone data acquisition system which employs extensive series-parallel networks of geophones spread over the earth's surface and in which electrical signals from said groups must traverse along an extended geophone cable in order to be collected, detected and recorded, said apparatus looking electrically through said cable toward said group under test and yet compensating electrically for resistive effects of said cable to detect and possibly identify faults within said geophone group under test and among geophones within each group, comprising:

- a. means for injecting into an input of said group-cable complex a DC current of predetermined amplitude,
- b. means for injecting simultaneously into said input of said group-cable complex an AC current of peak absolute amplitude equal to said amplitude of said DC current, and
- c. means for detecting and measuring excess of (i) peak

voltage produced by injection of said AC current, over (ii) DC voltage generated by injection of said DC current at said input of said group-cable complex, said excess being a measure of a difference between AC and DC impedances of said geophone group under test independent of said cable through which said DC and AC currents are driven.

4,052,695

BREAKAWAY PROTECTION FOR ELECTRICALLY CONTROLLED TRAILER BRAKES

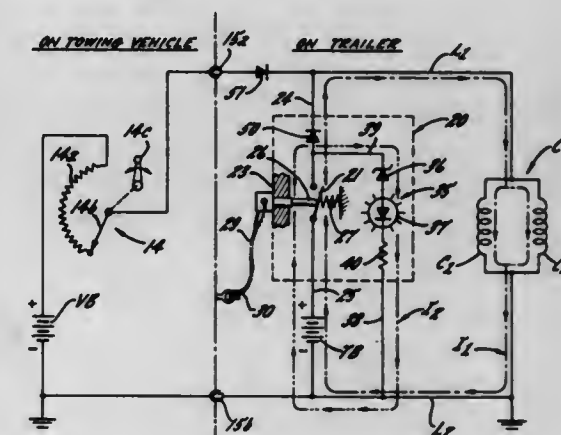
Philip E. Myers, Beloit, Wis., assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Feb. 17, 1976, Ser. No. 658,459

Int. Cl.² B60T 7/20; H01H 27/04

U.S. Cl. 340-52 D

8 Claims



1. A safety system for use with a trailer adapted to be removably hitched to a towing vehicle and having a brake which is engaged when an associated coil is energized by a battery carried by said trailer, said safety system including first and second separable parts which are normally connected to one another both when the trailer is hitched to and is intentionally unhitched from the towing vehicle, said first part being connected to the trailer, said second part being connected to the towing vehicle to remain with the latter and to separate from said first part when the trailer is accidentally unhitched but being manually releasable from the towing vehicle and capable of remaining connected to said first part when the trailer is intentionally unhitched, a switching device carried by said first part and physically actuated to a non-conductive state by virtue of being physically engaged by said second part when said parts are connected, said switching device being rendered conductive when said parts are separated, and means for connecting said switching device in a series path with said battery and said coil whereby current is supplied to said coil from said battery when said parts are separated and said switching device is conductive, the improvement in said safety system comprising:

- a. a voltage indicator which responds only when the voltage applied thereto equals or exceeds a predetermined threshold value adequate to energize said coil, and
- b. circuit connections placing said indicator electrically across said battery and said coil when said first and second parts are separated and said switching device is conductive,

whereby a user may manually separate said parts while the trailer is standing still and will be advised by the presence or absence of a response from said indicator that the battery is capable or incapable, respectively, of maintaining a predetermined value of voltage while the normally expected load current is drawn therefrom by said coil.

during a counting cycle; comparator circuit means for comparing at the end of each said counting cycle the count of said reference frequency counter means with the existing count stored by said storage means and for producing a first signal indicating identity between such counts and a second signal indicating non-identity between said counts; decoder circuit means connecting for receiving the count of said storage means to generate an output signal at an output of said receiver determined by said count; validation means selectively actuatable to transfer the count of said storage means to said decoder circuit means; control circuit means connected for receiving said first signals and said second signals and for applying an actuating signal to said validating means only after receipt of a predetermined number of said first signals and to apply a de-actuating signal to said validation means only after reception of a predetermined number of consecutive second signals; up/down counter means having n stages, where n is an integer, means connecting first and second outputs of said decoder circuit means to respective input gating means for controlling application of clock pulses to up and down inputs of said up/down counter; digital word to duty cycle converter means for receiving input pulses at a selected frequency, said converter means having n rate inputs, means connecting said n stages of said up/down counter means to respective ones of said n rate inputs to apply a digit word thereto to control the output duty cycle of said converter means as a function of the count of said up/down counter means.

4,052,702

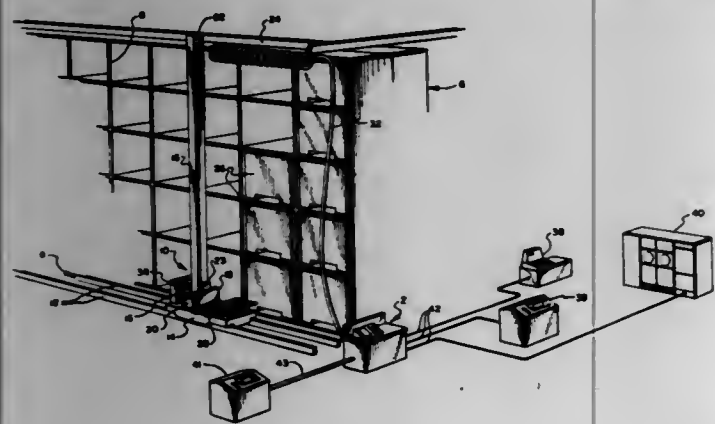
CIRCUIT FOR INTERFACING MICROCOMPUTER TO PERIPHERAL DEVICES

Kay D. Smith, Salt Lake City; Arjun S. Bachass, Kaysville, and Francis B. Black, Sandy, all of Utah, assignors to Kenway Incorporated, Bountiful, Utah

Filed May 10, 1976, Ser. No. 684,616
Int. Cl.² G06F 3/00, 5/04

U.S. Cl. 364-200

19 Claims



10. An interface circuit for interfacing a microcomputer having a CPU to a plurality of serial-channel peripheral devices and a plurality of parallel-channel peripheral devices, the interface circuit having a plurality of serial channels and a plurality of parallel channels and further comprising: means for generating a plurality of baud rates; an interface adaptor for each serial channel, the interface adaptor comprising means for receiving both output data and control data from the CPU in parallel format, said adaptor further comprising means for converting parallel format data to serial format data, and a clock generator electrically connected to said converting means, the clock generator gating serial format data through the converting means onto a selected serial channel at a preselected baud rate; a baud rate selection register; means for transmitting baud rate selection data from the CPU to the baud rate selection register; multiplexing means electrically connected to the baud rate generating means, baud rate selection register, and the clock generator, said multiplexing means responding to the data in the baud rate selection register so as to transmit

a selected one of the plurality of generated baud rates to the clock generator, thereby driving the clock generator at the selected baud rate; a parallel channel adaptor comprising means for receiving both output data and control data from the CPU in parallel format, said adaptor further comprising gating means electrically connected to said receiving means for gating parallel format data onto a selected parallel channel; means for communicating output data from the CPU to each adaptor; and means for communicating control data from the CPU to each adaptor, said control data comprising a preselected combination of address signals which will enable the data receiving means of only one adaptor at a time to receive output data from the CPU.

4,052,703

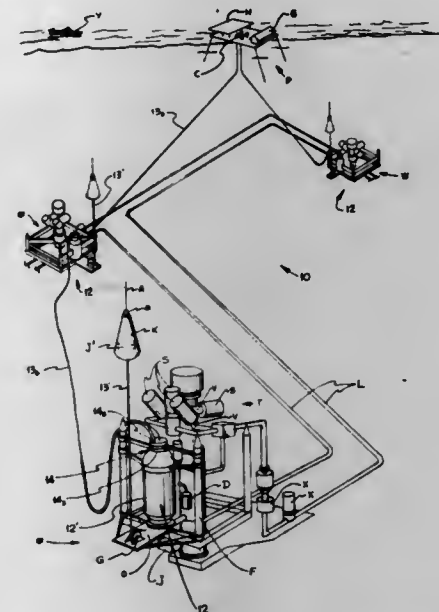
INTELLIGENT MULTIPLEX SYSTEM FOR SUBSURFACE WELLS

Jerry Alan Collins, Sr., and Robert Lynn Spaw, both of Houston, Tex., assignors to Automatic Terminal Information Systems, Inc., Houston, Tex.

Filed May 5, 1975, Ser. No. 574,519
Int. Cl.² E21B 7/12

U.S. Cl. 364-200

11 Claims



1. A system for operating and controlling a plurality of subsurface wells and well control equipment from a remote surface control location comprising: a. subsurface control and monitoring means including subsurface signal receiving means, subsurface signal generating means, subsurface signal transmitting means, and subsurface programmable logic control means for receiving signals from a remote surface control location, for generating monitor signals at subsurface well locations, and for transmitting said generated signals from said subsurface well locations according to a preprogrammed logical sequence independent of the receipt of surface generated signals from a remote surface control location; and b. surface control and monitoring means including primary power source means, surface signal receiving means, surface signal generating means, surface signal transmitting means, and surface programmable logic control means for receiving signals from a plurality of said subsurface control and monitoring means and from external surface signal sources, for generating surface signals for controlling and monitoring a plurality of said subsurface control and monitoring means, for transmitting said generated surface signals from a remote surface control location to a plurality of said subsurface control and monitoring means and for generating surface control signals in response to a preprogrammed logical sequence and in response to signals received from external surface signal sources.

4,052,704

APPARATUS FOR REORDERING THE SEQUENCE OF DATA STORED IN A SERIAL MEMORY

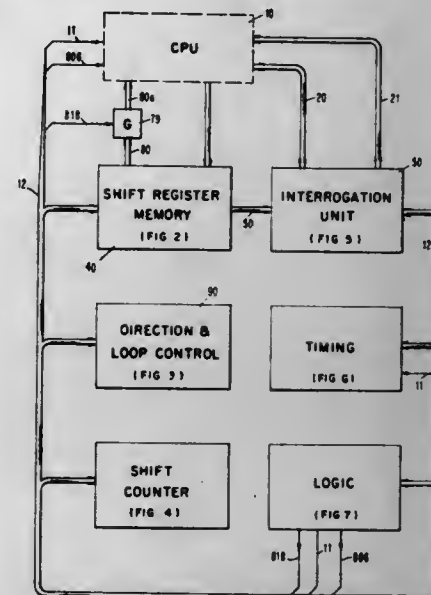
Peter Anthony Franaszek, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,752

Int. Cl.² G06F 7/04; G11C 19/00

U.S. Cl. 364-900

8 Claims



1. In a memory management system for a serial shift register type of memory having at least one station through which successive pages of data, including a page number, may be bidirectionally shifted for sensing of the data and operative to reorder the sequence of the stored pages to group the most recently accessed pages at the head of the file, the improvement comprising:

- register means for storing a plurality of page numbers for search;
- means operative when the head of the file resides at said station for initiating a data shift in a first direction through said shift register memory and for marking the page numbers in said register means with a first significant indicia;
- means operative to compare said stored page numbers with each of the page numbers as they are shifted in either direction through said station and producing an equality signal upon a match;
- means operative responsive to said equality signal for replacing the matching page number in said register and marking the replacement with a second significant indicia;
- means operative responsive to the presence of all said second indicia in said register for reversing the direction of search;
- means operative responsive to each of said equality signals for diverting the pages in said shift register memory whose page numbers matched those in said register means from a main shifting path into a parking means; and
- means operative to reinsert the parked pages from said parking means into the main shifting path when the head of the file is proximate said station.

4,052,705

MEMORY DEVICE FOR TWO-DIMENSIONAL RADIANT ENERGY ARRAY COMPUTERS

David H. Schaefer, Silver Spring, and James P. Strong, III, Upper Marlboro, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 468,614, May 8, 1974, Pat. No. 3,996,455.

This application Feb. 13, 1976, Ser. No. 657,996

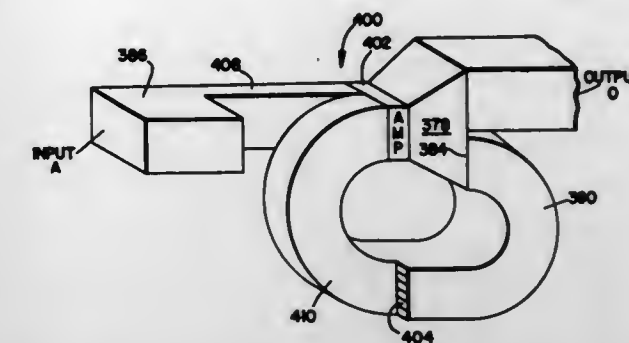
Int. Cl.² G11C 13/04, 11/42

U.S. Cl. 340-173 LM

11 Claims

1. A memory device for storing the digital information in an

input array of radiant energy digital signals characterized by ordered rows and columns comprising: radiant energy logic means having a pair of input surface locations for receiving a pair of separate radiant energy



digital signal arrays and an output surface location adapted to transmit a radiant energy digital signal array; means for coupling one of said input surface locations to said output surface location in a manner for causing regenerative feedback.

4,052,706

SYSTEM FOR READING AN OPTICAL RECORDING OF BINARY NUMERICAL DATA

Erich Spitz; Luigi d'Auria, and Jean-Pierre Huignard, all of Paris, France, assignors to Thomson-CSF, Paris, France

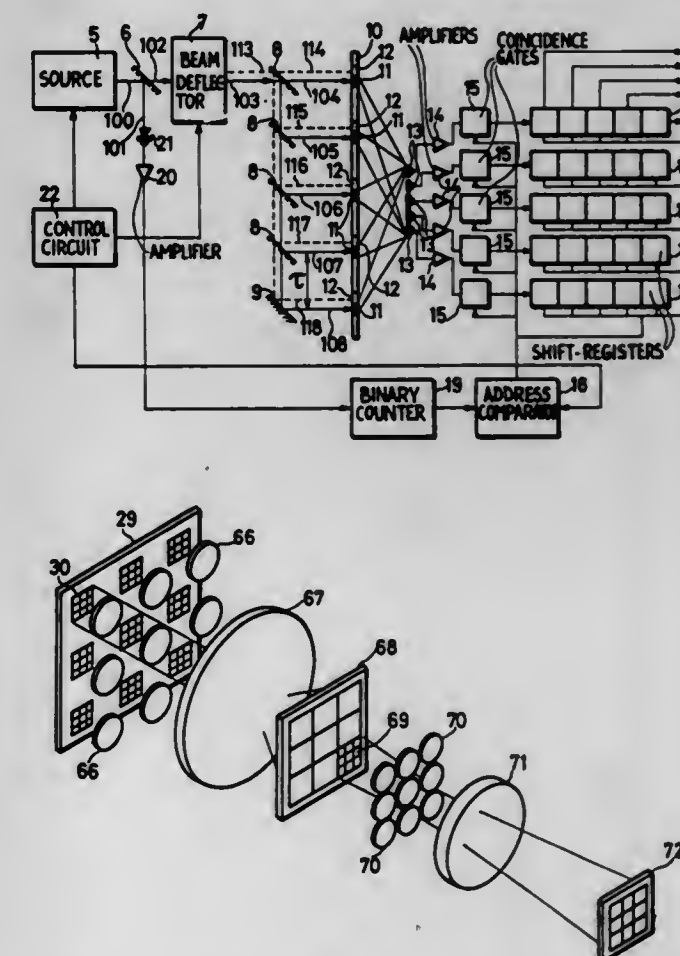
Filed Nov. 26, 1975, Ser. No. 635,773

Claims priority, application France, Nov. 26, 1974, 74.38734

Int. Cl.² G11C 13/04, 8/00

U.S. Cl. 340-173 LM

13 Claims



1. A system for reading optical recording of binary numerical data, said recording being composed of at least one group of M (M being greater than 1) storage areas, each of said storage areas being adapted for projecting, into a detection plane, radiation corresponding to the image of P bits 0 and 1 (P being greater than 1), said system comprising: a spatially coherent radiation source functioning by pulses for delivering an incident reading beam; delay action dividing optical means ensuring the splitting up of said incident reading beam into an assembly of M collateral beams which are respectively directed towards said M storage areas, each pulse emitted by said radiation

source being subdivided by said dividing optical means in order to successively illuminate said M storage areas; an assembly of P photoelectric detector elements located in said detection plane adapted for simultaneously detecting said P bits in said image projected by each of said storage area successively illuminated by said M collateral beams, and for furnishing P simultaneous binary electrical signals; and electrical memory means coupled to said detector elements for temporarily storing said binary electrical signals.

4,052,707

MAGNETIC DEVICE HAVING DOMAINS OF TWO DIFFERENT SIZES IN A SINGLE LAYER

Willem Frederik Druyvesteyn, and Harm Marinus Wilhelm Bopff, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

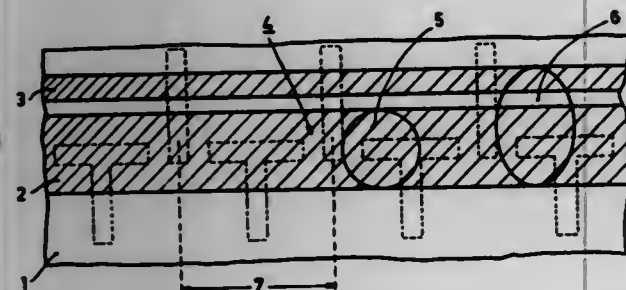
Continuation of Ser. No. 512,686, Oct. 7, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,654

Claims priority, application Netherlands, Oct. 6, 1973, 7313755

Int. Cl.² G11C 19/08

U.S. Cl. 340—174 TF

9 Claims



1. A magnetic bubble domain device comprising, a thin layer of magnetizable material having a preferred direction of magnetization approximately perpendicular to the surface of the layer and adapted to retain therein adjacently disposed magnetic domain regions, first and second strips of magnetic material spaced apart and arranged in substantially parallel relationship on said layer and defining a path of movement for magnetic domains in said thin layer, one of said strips having a width greater than the width of the second of said strips, means in cooperative engagement with said layer and said strips for maintaining successively arranged magnetic domains of a first size correlated to the width of said wider strip and of a second size correlated to the combined width of both of said strips, said second domain width having a value 15 to 125% greater than the said first domain width, along said path of movement, and means for moving the magnetic domains in said thin layer in said path of movement.

4,052,708

CIRCULAR MAGNETIC DOMAIN DEVICES

Russel John Fairholme, Daventry, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Apr. 29, 1975, Ser. No. 572,875

Claims priority, application United Kingdom, May 2, 1974, 19245/74

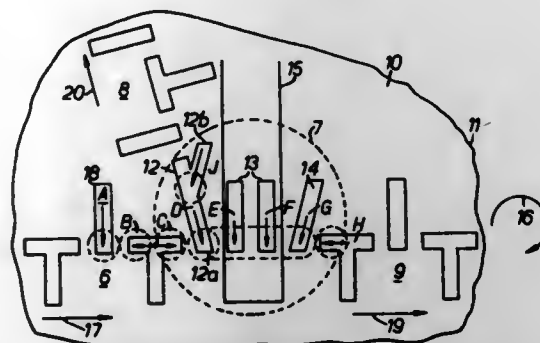
Int. Cl.² G11C 19/08

U.S. Cl. 340—174 TF

14 Claims

1. A cylindrical magnetic domain device which includes a layer of uniaxial magnetic material having a unique easy magnetization direction substantially normal to a major surface thereof; generating means for generating cylindrical magnetic domains within the said layer; propagation means which define at least three propagation paths in which the generated cylindrical magnetic domains can be caused to propagate; and switching means for effecting the transfer of the propagating cylindrical magnetic domains from one of the said propagation paths to at least another one of the said propagation paths, the switching means including at least three magnetically permeable elements formed on the said major surface and orientated relative to each other and the propagation paths in a manner such that expansion of the propagating cylindrical magnetic domains in the direction of domain propagation can be effected.

ble elements formed on the said major surface and orientated relative to each other and the propagation paths in a manner such that expansion of the propagating cylindrical magnetic domains in the direction of domain propagation can be effected.



fect, and magnetic field impulse generating means positioned to encompass at least the central element or elements of the switching means for generating a current pulse of the desired polarity, amplitude and width for modifying the characteristics of the propagating domain.

4,052,709

ACCESSING INFORMATION IN A LATTICE ARRAY BY DISLOCATION PUNCHING

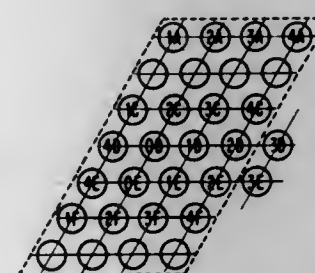
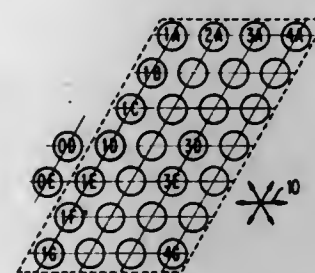
Praveen Chandhari, Briarcliff Manor, and Geoffrey Richard Woolhouse, Montrose, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 27, 1975, Ser. No. 608,366

Int. Cl.² G11C 11/02

U.S. Cl. 340—174 TF

12 Claims



1. A method of accessing and moving at least a columnar portion of information from a magnetic bubble domain lattice array arranged in rows and columns and having a substantially perfect geometrical order, comprising:
a. establishing an elongated dislocation in the lattice array at the same row height as the desired columnar portion, and
b. propagating the dislocation across the array toward the desired columnar portion to thus displace the corresponding columnar portions of each column by one column in the direction of propagation and expel the corresponding columnar portion of the last column in the direction of propagation from the array.

4,052,710

SYSTEMS USING LATTICE ARRAYS OF INTERACTIVE ELEMENTS

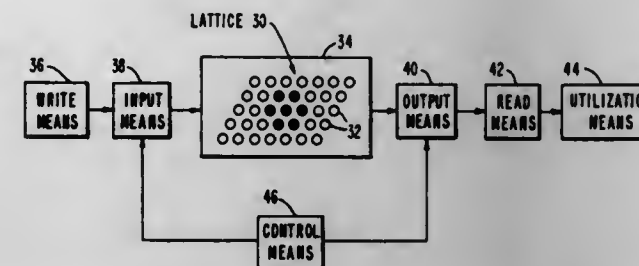
Bertram A. Calhoun, Saratoga, Calif.; John C. Slonczewski, Katonah, N.Y., and Otto Voegeli, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 395,336, Sept. 7, 1973, abandoned. This application Nov. 14, 1975, Ser. No. 632,604

Int. Cl.² G11C 19/08

U.S. Cl. 340—174 TF

78 Claims



1. An apparatus comprising:
a lattice array of elements of diameter d spaced from one another by distances less than 3d, the positions and spacings of said elements in said lattice being substantially determined by interactions between said elements, access means for accessing selected elements within said array.

4,052,711

BUBBLE LATTICE FILE USING MOVABLE FIXED LATTICE

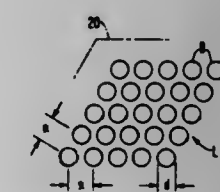
Yeong S. Lin, Mount Kisco, and Jackson E. Stanland, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,798

Int. Cl.² G11C 19/08

U.S. Cl. 340—174 TF

31 Claims



16. A method for reading information represented by coded interactive elements in a lattice of such elements, said method including the steps of
expanding the equilibrium spacing between the elements in said lattice to relax said lattice while maintaining the same number of elements in said lattice, and
detecting the information represented by said coded interactive elements after said lattice is relaxed.

4,052,712

APPARATUS FOR PHOTOGRAPHING ROAD RUTS

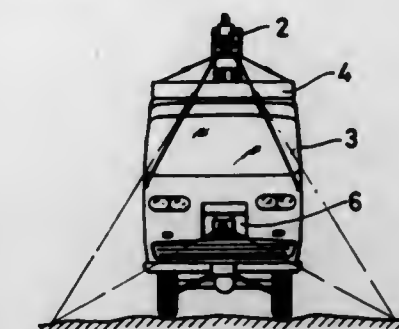
Masanori Ohama, Machida, and Yutaka Nakada, Soka, both of Japan, assignors to Pacific Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1975, Ser. No. 577,007

Int. Cl.² G01D 9/42

U.S. Cl. 346—107 R

3 Claims



1. Apparatus for photographing a road surface to evaluate the presence of ruts therein, said apparatus comprising a vehicle adapted for traveling along a road whose surface is to be evaluated for ruts, light projecting means on said vehicle for projecting a beam of light on the road surface to form a linear boundary between an illuminated and a non-illuminated portion of the road extending transversely thereof, said light projecting means being oriented on said vehicle to direct said beam of light onto said road at an acute angle thereto and camera means on said vehicle for photographing said boundary, said camera means being mounted on said vehicle such that the axis of the camera is perpendicular to the road surface and is at a predetermined angular position in relation to said light projecting means, said light projecting means comprising a light source including a flash lamp, a condensor lens in front of said flash lamp, a projection lens in front of said condensor lens and a shading plate interposed between said condensor lens and said projection lens, said shading plate including one portion opaque to the light source and another portion pervious to the light source.

4,052,713

UNIVERSAL SNAP MOUNTING FOR DISPOSABLE CHART PENS

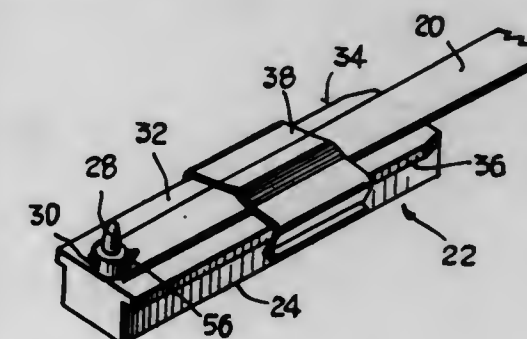
William F. Lytle, Orange, and Thomas E. Cathcart, Jr., Lyme, both of Conn., assignors to Waterbury Scroll Pen Corporation, Stratford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,495

Int. Cl.² G01D 15/16

U.S. Cl. 346—140 A

8 Claims



1. A universal, snap-on pen cartridge device for attachment to the moving pen arm of chart recorders, comprising in combination:
a. pen body containing an ink reservoir and a stylus connected therewith, adapted for engagement with the paper carried by the recorder,
b. said body having a raised portion adjacent the stylus, and having a substantially flat surface against which a corresponding flat part of the recorder arm can bear,

- c. a resilient metal clip attachable to said body, said clip having a generally U-shaped configuration, and including a pair of leg portions and a connecting web portion,
- d. means on said body located to be spaced from said body raised portion, defining a pair of oppositely located shoulders,
- e. detent means on the leg portions of said clip respectively for engagement with said opposite shoulders to thereby hold the clip captive on the body,
- f. said raised portion of the body being adapted for engagement with a cooperable end portion of the recorder pen arm to constitute a positioning device therewith.

4,052,714

ELECTROGRAPHIC RECORDING HEAD HAVING AN INTEGRAL RECORDING ELECTRODE CLEANING MEANS

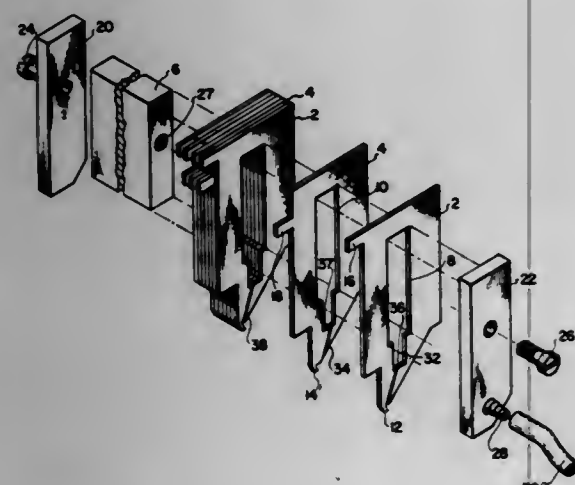
Dean M. Peterson, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 2, 1976, Ser. No. 654,565

Int. Cl.² G03G 15/048, 17/00

U.S. Cl. 346—155

9 Claims



1. An electrographic recording head comprising an electrode support means, an electrode means mounted on said support means and including a plurality of electrode plates with each plate having a slot therein and said electrode support means including a common support bar fitting within said slot to mount said electrode means in a layered arrangement of said electrode plates thereon, each of said electrode plates having a recording pin and an electrical connection terminal as extensions thereof, said electrode means having an internal air plenum within said electrode plates and an air passage means from said air plenum to a location adjacent to said recording pin of each of said electrode plates and sealing means in contact with said electrode means for sealing said air plenum and for connecting said air plenum to an air source.

4,052,715

DIGITAL HALF-TONE GREY SCALE EXPANSION SYSTEM

William Streffer, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 25, 1976, Ser. No. 661,229

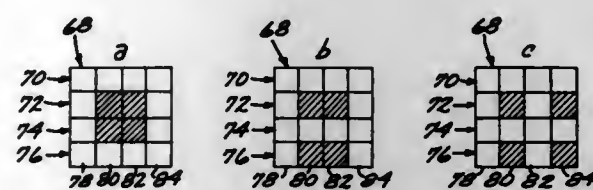
Int. Cl.² G03G 15/04

U.S. Cl. 346—160

2 Claims

1. A variable half-tone image generating system for use in a flying-spot scanning system comprising: an image surface having at least one unit cell which is divided into a plurality of elemental sub-cells of a given area, means for producing a light beam of high intensity,

means adapted to scan said light beam across each of said sub-cell areas of said at least one unit cell, and means for both (1) modulating the intensity of said light beam so that only a selected number of said sub-cell areas within said at least one unit cell are exposed to said scanning light beam and (2) varying the position of said se-



lected number of sub-cells within said at least one unit cell so that the ratio of the area of said selected number of sub-cells to the unexposed perimeter of said selected number of sub-cells varies to thereby provide a varying grey scale within said unit cell from a fixed number of exposed sub-cells.

4,052,716

FIRE AND INTRUDER DETECTION AND ALARM APPARATUS

Tag A. Mortensen, 904 Lake of the Forest, Bonner Springs, Kans. 66012

Filed Mar. 29, 1976, Ser. No. 671,267

Int. Cl.² G08B 21/00

U.S. Cl. 340—233

16 Claims

1. For use in alarm systems or the like wherein at least a pair of adjacent portions of a single space are under surveillance, apparatus for detecting changes in the nature of free-space radiations emanating from said adjacent portions resulting from an occurrence associated with an alarm condition including:

at least one pair of radiation responsive sensing means each having a pair of electrical connection points and characterized by presenting between said points an electrical parameter of variable level which changes in response to changes in the level of radiations being sensed, said one pair of said sensing means being operative to sense radiations emanating from said adjacent portions of said space; means for rendering each of said one pair of said sensing means respectively operative to receive and sense radiations emanating from corresponding ones of said adjacent portions of said space; electrical bridge circuit means having a pair of opposed reference terminals, a pair of opposed output terminals, and a plurality of electrically conductive bridge arms respectively extending to each of said output terminals respectively; means electrically coupling said points of each of said one pair of said sensing means respectively in electrical series with the respective ones of one adjacent pair of said bridge arms; and means for detecting changes occurring in an electrical parameter presented between said output terminals in excess of a prescribed rate of change of said parameter and indicative of an alarm condition, whereby changes including those due either to a fire or to the presence of an intruder in either of said adjacent portions of said space will be detected, while slow changes due to gradual alteration of radiation conditions such as the ambient temperature of said adjacent portions will be ignored.

4,052,717

BATTERY CONDITION MONITORING METHOD AND APPARATUS

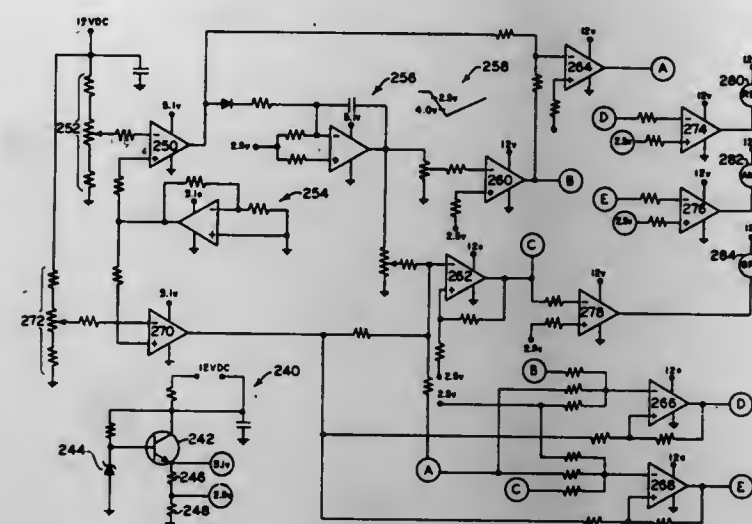
John B. Arnold, Seville; John M. Bowyer, Copley; Howard R. Hegbar, and Archie B. Shaefer, both of Akron, all of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Oct. 14, 1975, Ser. No. 622,200

Int. Cl.² G08B 21/00

U.S. Cl. 340—249

16 Claims



1. A battery condition monitoring device, comprising: an external load in selective engagement with the battery; first circuit means connected to the battery for creating an output voltage which is a function of battery terminal voltage; second circuit means connected to said first circuit means for receiving said output voltage and determining the time period necessary for the output voltage to change a predetermined amount after application of said external load to the battery; and third circuit means connected to said second circuit means for comparing said time period to preset reference values and grading the battery according to such time period.

4,052,718

ENCLOSURE ALARM SYSTEM

Domenick Tucci, 12 Ridge Road, Mount Kisco, N.Y. 10549, and Lewis Cantalupi, 79 Beaumont Circle, Yonkers, N.Y. 10710

Continuation of Ser. No. 511,353, Oct. 2, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 673,349

Int. Cl.² G08B 13/08

U.S. Cl. 340—274 R

5 Claims

1. An alarm system for association with an enclosure which is closed by the movement of a member of the enclosure relative to the remainder of the enclosure to give an audible alarm upon an improper entry into the enclosure by an opening movement of the enclosure member but will be silent upon a proper entry into the enclosure by an opening movement of the enclosure member, said alarm system comprising: a casing member for association with the enclosure, means mounted within said casing member for providing a source of direct current; audible alarm means mounted within said casing member and electrically connected in series to said direct current means; deactivating switch means operatively positioned on the casing member and available for actuation exteriorly from said enclosure and electrically connected in series with said alarm for interrupting the circuit from said direct current means to said alarm means to thereby permit authorized entry into the enclosure by an opening of the enclosure member when desired; and a pressure responsive switch means mounted on the enclosure for direct engagement with and depression by the enclosure member to open said pressure responsive switch means when the enclosure member is in a closed position, thereby placing said alarm means in a deactivated state, said pressure responsive switch means, upon an improper movement of the enclosure member to an open position, closing the circuit between said direct current means and

said alarm means, so that such improper opening movement of the enclosure member without a prior deactivating of the alarm by a positive actuation of said deactivating switch means will cause the activation of the audible alarm system to give and continuously maintain an audible noise until the deactivation thereof is initiated by a positive actuation of either the deactivating switch means or the pressure responsive switch means.

4,052,719

TELEVISION RECEIVER SYSTEM HAVING FACILITY FOR STORAGE AND DISPLAY OF CHARACTER INFORMATION SELECTED FROM DIGITALLY ENCODED BROADCAST TRANSMISSIONS

Peter Richard Hutt, Richmond; Alan Ronald Blake, London; Gunter von Cavallar, South Wonston, near Winchester; Brian Neil Douglas, London, and Philip John Dodds, Southampton, all of England, assignors to Independent Broadcasting Authority, London, England

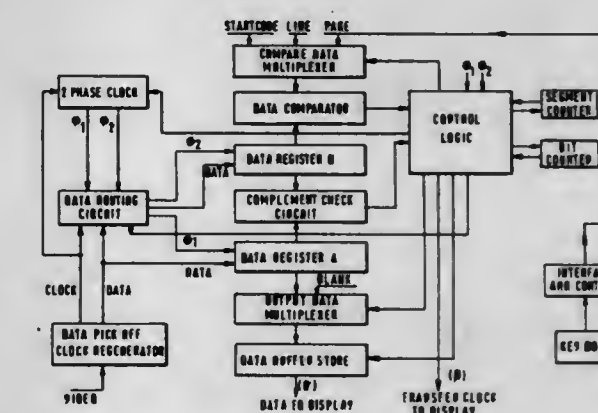
Continuation of Ser. No. 493,110, July 30, 1974. This application May 3, 1976, Ser. No. 682,370

Claims priority, application United Kingdom, July 30, 1973, 36206/73

Int. Cl.² G06F 3/14; H04L 7/08

U.S. Cl. 340—324 AD

21 Claims



1. A television receiver system having a memory device, a clocking device for actuating the memory device, an input for a set of pages of information received at said input in the form of digitized characters in a repeated cycle the form of which is such that the digitized characters for the set of pages are received in groups of the characters, and the whole of the information for the set of pages is received during each occurrence of the cycle, each group as received being preceded by a clock run-in signal, to which the clocking device is responsive for synchronization, followed by a known start code correct receipt of which indicates integrity of reception and also followed by a page address code, variable selector means for selecting a page from the set of pages and routing a group of digitized characters to the memory device when the preceding start code is received correctly and the preceding page address code corresponds with the selected page while disregarding digitized groups of characters preceded by an incorrectly received start code and groups of characters preceded by a page address code other than that selected, a reading device operable to read the digitized characters repeatedly from the memory device, and a character generator responsive to the digitized characters read by the reading device to provide output signals for visual display by an intensity modulated raster of the television reception type.

4,052,727

EXPOSURE CONTROL DEVICE FOR A SINGLE LENS REFLEX CAMERA

Takashi Ito; Fumio Ito, both of Yokohama; Soichi Nakamoto, Machida, and Yasuo Isobe, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

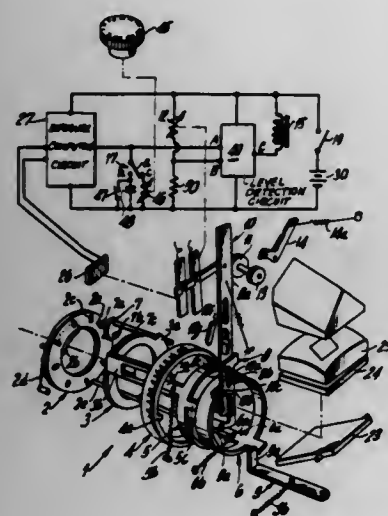
Continuation of Ser. No. 455,536, March 28, 1974, abandoned. This application Nov. 25, 1974, Ser. No. 527,016

Claims priority, application Japan, Mar. 30, 1973, 48-36287; Apr. 28, 1973, 48-48672; May 14, 1973, 48-53296; May 17, 1973, 48-54997; May 17, 1973, 48-54998; May 17, 1973, 48-54999; May 22, 1973, 48-57332

Int. Cl.² G03B 7/14

U.S. Cl. 354—29

7 Claims



1. An exposure control system for a single lens reflex camera comprising:

- a diaphragm device having an adjustable aperture; means for adjusting the diaphragm aperture of said diaphragm device, said means starting its action with initiation of shutter release operation of said camera;
- an exposure control device, including:
 - a photosensitive element for sensing the light passed through an objective lens at a fully opened diaphragm aperture, said element for converting the light passed through the objective lens to an electric signal;
 - means for memorizing the electrical signal of said photosensitive element; and
 - means for regenerating the electrical signal memorized in said memory means;
- a subsidiary diaphragm arranged in front of said photosensitive element to be variable in its aperture opening corresponding to the adjusted amount of said adjusting means;
- shutter speed setting means capable of being selectively adjusted by manual operation;
- means containing said regenerative means for setting a first level, said level setting means adapted to be set to a value corresponding to the adjusted value of said shutter speed setting means;
- means for setting a second level, said means being set to a value corresponding to photographing light conditions;
- diaphragm deciding means, said means being provided with a means for comparing the output level of said first level setting means with that of said second level setting means;
- means for locking said adjusting means responsive to the output of said comparison means;
- a shutter control means responsive to said regenerative means; and
- means for changing the connection of the regenerative means to the shutter control means from the first level setting means in association with the action of said locking means.

4,052,728

MODULAR PHOTOGRAPHIC SYSTEM ASSEMBLY

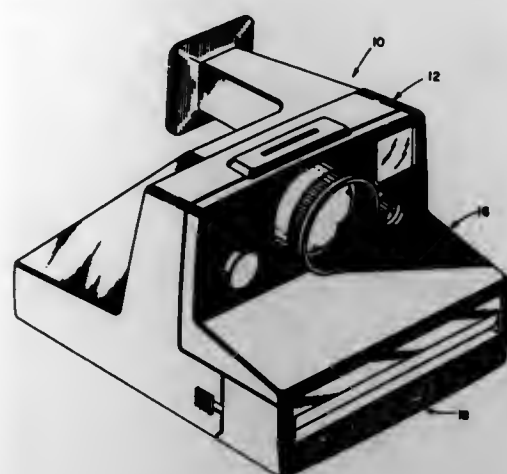
Donald H. Hendry, Rockland, and Bruce K. Johnson, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,769

Int. Cl.² G03B 17/50, 17/02

U.S. Cl. 354—86

29 Claims



1. A modular inner camera assembly comprising:

- a. a group of function providing modules each of which performs at least one of a series of photographic operations that attend the consecutive exposure and processing of a cassette of self-processable film units, said modules including:
 - 1. a shutter module for providing a regulated exposure of a film unit;
 - 2. a cassette loading door module including a pair of juxtaposed spreader rollers and a housing for processing an exposed film unit subsequent to its exposure; and
 - 3. a gear train module for driving said juxtaposed rollers and for advancing an exposed film between them for processing; and
- b. a structural member to which said modules are attached to form said assembly, said member including means for forming an open ended exposure chamber having an inlet aperture for admitting actinic radiation into said chamber and means for receiving and locating a cassette in an exposed plane located adjacent said chamber's open end, said structural member and said modules each, respectively, having positioned thereon complementary configured means for positioning said modules in a predetermined orientation with respect to each other and said cassette exposure plane in order to assure that proper spatial relationships are established and maintained between said modules and a cassette located in said exposure plane so that the photographic operations provided by said modules are properly carried out.

4,052,729

CAMERA WITH MOVABLE FILM DRIVE AND OPTICAL UNIT

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 2, 1976, Ser. No. 720,006

Int. Cl.² G03B 17/50

U.S. Cl. 354—86

11 Claims

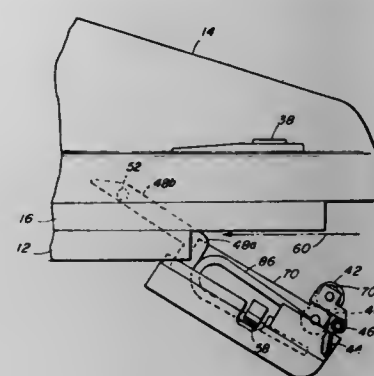
- 1. A photographic camera of the self-developing type for use with a substantially thin cassette containing a plurality of film units disposed therewithin in a stacked array extending across the thinnest portion of the cassette, the cassette having an exposure aperture overlying a forwardmost film unit, said camera comprising

- A. a housing structure defining an elongated opening through which the cassette can be slidably inserted end-

wise to position its forwardmost film unit at the focal plane of said camera,

B. means operative following the exposure of the forwardmost film unit for initiating the advancement of the forwardmost film unit from the cassette in the direction of said elongated opening, and

C. a cassette loading door module mounted on said housing structure for displacement between a first open position wherein it facilitates the insertion of the cassette into said housing structure through said elongated opening and a second closed position wherein it overlies said elongated opening to facilitate photographic operations of said camera, said module including an outer support member that forms the lower front end of said camera when said mod-



ule is disposed in its said second position, a frame connected to said outer support member, a pair of processing rollers mounted on said frame to receive therebetween, when said module is disposed in its said second position, the leading edge of the forwardmost film unit as it is advanced from the cassette by said advancement initiating means, a motor mounted on said frame, means mounted on said frame for drivingly connecting at least one of said rollers to said motor and means mounted on said frame for electrically coupling said motor to a battery positioned remote from said module, said electrically coupling means including a switch disposed to be actuated by the leading edge of the advancing forwardmost film unit as it approaches said rollers.

4,052,730

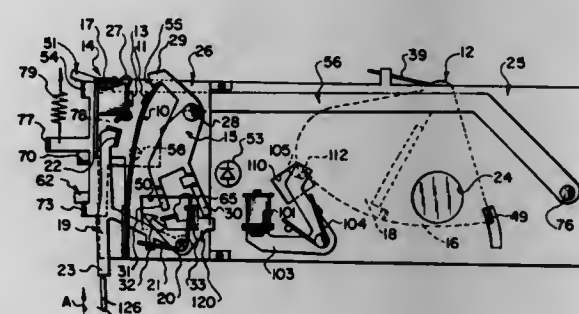
DOUBLE EXPOSURE PREVENTION DEVICE
William Thomas Hochreiter, and Fredric Alton Mindler, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 19, 1976, Ser. No. 678,271

Int. Cl.² G03B 15/03

U.S. Cl. 354—135

3 Claims



- 1. In a photographic apparatus, the combination comprising:
 - a. shutter means actuable for effecting an exposure;
 - b. flash firing means, including a piezoelectric generator and a firing spring biased to move in response to actuation of said shutter from a cocked position to a striking position to strike said generator to produce a pulse of electricity, for activating a flash device associated with the photographic apparatus; and
 - c. exposure prevention means associated with said shutter means and said flash firing means for preventing actuation

of said shutter means if said firing spring is not in said cocked position.

4,052,731

CASSETTE-LIKE DEVICE FOR ADVANCING AND WITHDRAWING A PREDETERMINED LENGTH OF FILM TO AND FROM A CAMERA

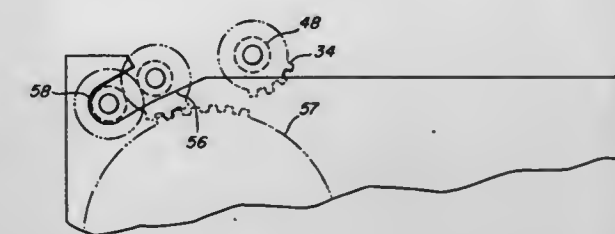
Robert H. Powers, Rochester, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 9, 1976, Ser. No. 675,390

Int. Cl.² G03B 17/26

U.S. Cl. 354—275

22 Claims



1. In a system for supplying and transporting photosensitive media across the exposure station of a camera, which system includes:

- a. a disposable cassette for containing said photosensitive media;
- b. a buffer box;
- c. means for detachably fastening said buffer box to said cassette at a position thereon so that said media may be driven through said buffer box into the exposure station of said camera;
- d. first drive means coupled to said buffer box for driving said photosensitive material emanating from said disposable cassette through said buffer box and into said camera;
- e. second drive means coupled to said camera at a position thereon for actuating said first drive means for transporting said photosensitive media with respect to said buffer box when said buffer box is properly seated with respect to said camera, the improvement comprising:
- f. seating means for properly seating said buffer box with respect to said camera and for causing said first drive means to be positioned with respect to said second drive means for enabling actuation of said first drive means by said second drive means and for producing limited controlled actuation of said first drive means in a first media feed out direction during the process of seating of said buffer box with respect to said camera and limited controlled actuation of said first drive means in a second media feed in direction during the process of unseating said buffer box.

4,052,732

APPARATUS FOR DEVELOPING AND FIXING HEAT SENSITIVE FILM

John W. Meadows, Los Altos, Calif., assignor to Quantor Corporation, Mountain View, Calif.

Filed July 21, 1975, Ser. No. 597,800

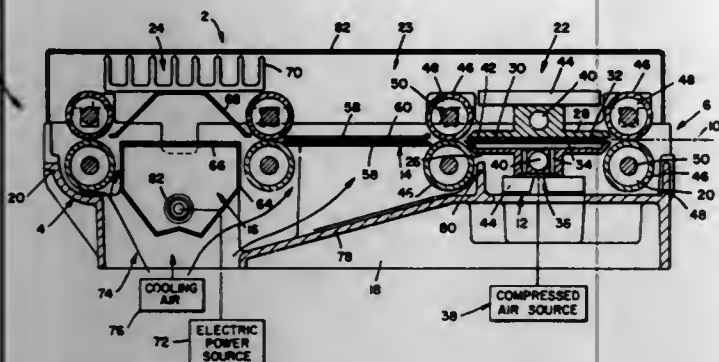
Int. Cl.² G03D 13/00

U.S. Cl. 354—297

17 Claims

- 1. Apparatus for developing and fixing exposed film having a light sensitive emulsion on a substrate of the film, the apparatus comprising: a developing station including first and second opposing platens defining therebetween a gap having a width greater than the thickness of the exposed film; transport means for continuously moving the exposed film past the developing station; means for heating the emulsion to its curing temperature as the film moves past the developing station; a fixing station disposed downstream of the developing station; means disposed between the developing station and the fixing station for cooling the film; the transport means including roller means

for transporting the film through the developing station, the cooling means and the fixing station; and means for driving the



roller means at a rate so that the film moves at a speed of at least about two inches per second.

4,052,733

PAL FOUR-FRAME SUBCARRIER PHASE DETECTOR
William Joseph Derenbecher, Jr., Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

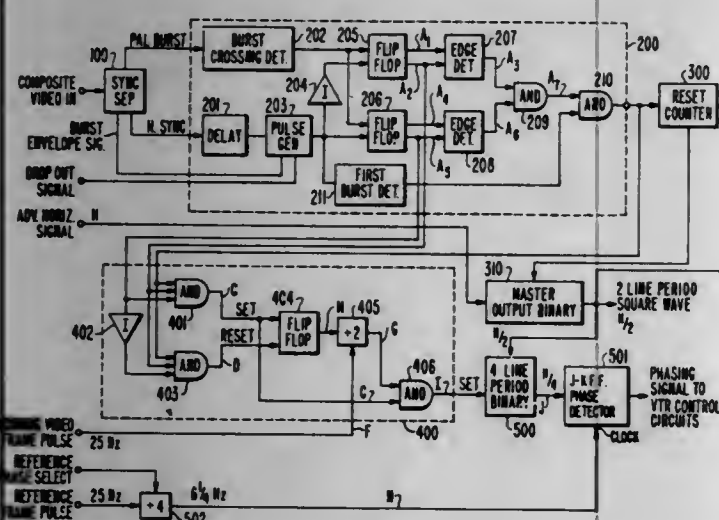
Filed Apr. 30, 1976, Ser. No. 682,029

Claims priority, application United Kingdom, May 20, 1975, 21547/75

Int. Cl.² H04N 9/62, 9/46, 5/785

U.S. Cl. 358—10

5 Claims



1. A PAL frame phasing system for developing a phasing signal synchronized to a system frame reference signal and a PAL composite video signal including at least color burst and horizontal synchronizing components, comprising:

a color burst detector for developing a color burst switching signal at a two-line period representative of the polarity of burst phasing with respect to said horizontal component and for developing a four-line rate signal;

a four-line rate detector coupled to said burst detector and responsive to said color burst switching signal and to said four-line rate signal for developing a four-line rate signal representative of the burst phasing repetition rate;

first means coupled to said color burst detector and said four-line rate detector and responsive to said color burst switching signal and to said four-line rate signal representative of said burst phasing repetition rate for developing a first signal at a four-line period switching rate to said four-line rate signal representative of said burst phasing repetition rate signal;

second means responsive to said system frame reference signal for developing a second signal at a four-frame rate; and

phase detecting means coupled to said first and said second means and responsive to said first and second signals for developing a third signal representative of the phasing status of said first signal with respect to said second signal.

4,052,734 GRGB LINE SEQUENTIAL COLOR TELEVISION SYSTEM

Walter Jaeger, Cureglia, Switzerland, assignor to GX-Holding AG., Basel, Switzerland

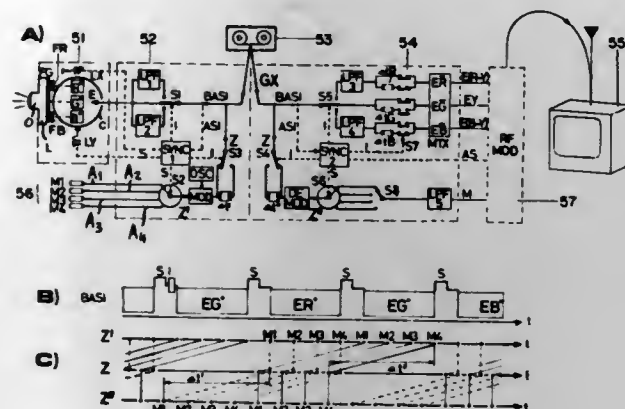
Filed Oct. 31, 1974, Ser. No. 519,742

Claims priority, application Switzerland, Oct. 31, 1973, 15306/73; Oct. 31, 1973, 15307/73; Oct. 31, 1973, 15308/73; Oct. 31, 1973, 15309/73; Oct. 31, 1973, 15310/73

Int. Cl.² H04N 9/34, 9/16

U.S. Cl. 358—12

3 Claims



1. In a television system, the combination of:

A. means for producing at a transmitter three color-video signals EG^o, ER^o and EB^o, in which the signal EG^o contains predominantly the information content present in the green component of a picture, the signal ER^o contains predominantly the information content present in the red component of a picture, and the signal EB^o contains predominantly the information content present in the blue component of a picture;

B. first switching means for supplying said three signals, one at a time, in a cyclic sequence of four successive scanning line time intervals, with the signal EG^o occurring in every other one of the four time intervals, and with the color signals ER^o and EB^o occurring alternately in the two time intervals which intervene between said every other one of the four time intervals;

C. means for supplying a synchronizing signal for each time interval;

D. means for supplying an identification signal for each fourth time interval;

E. means, under the control of said synchronizing signal and identification signal, for separating the signals EG^o, ER^o and EB^o, occurring in the time intervals of said cyclic sequence, and supplying the separated signals to three separate video color circuits, each individual to one of said signals, whereby the signals EG^o, ER^o and EB^o intermittently appear during their respective time intervals in their respective video color circuits; and

F. means for supplying three outputs, said means including time delay and second switching means under the control of said synchronizing signal and said identification signal for causing the intermittently appearing signal EG^o, ER^o, and EB^o in respective ones of said three video color circuits to be repeated, individually, in said respective ones of said three video color circuits during the time intervals in which said separating means does not supply a signal to the respective ones of said video color circuits, whereby each of said three video color circuits substantially continuously supplies to the respective one of the said three outputs a signal corresponding to the signals EG^o, ER^o, and EB^o.

4,052,735 MODULATED FLESH-TONE AND TINT CORRECTION CIRCUITRY

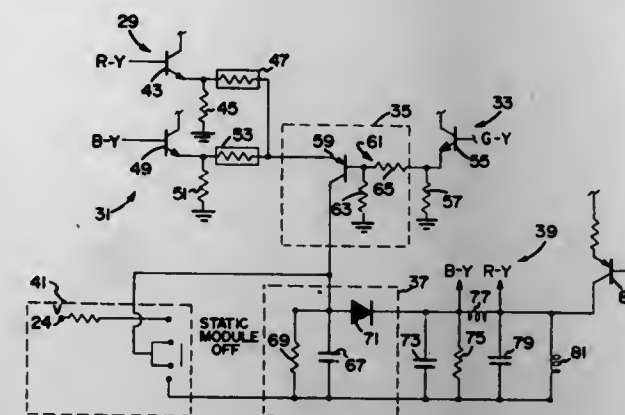
Robert Charles Wheeler, Elba, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 9, 1975, Ser. No. 584,939

Int. Cl.² H04N 9/535

U.S. Cl. 358—28

16 Claims



1. A flesh-tone and tint correction circuit for a color television receiver having chrominance and reference oscillator signal sources comprising:

first, second, and third color demodulator stages coupled to said chrominance and reference oscillator signal sources; phase angle modulator means coupled to said reference oscillator signal source for altering the phase angle of signals applied to at least two of said first, second, and third color demodulator stages; and

flesh-tone and tint correction detector means DC coupled to said first, second, and third color demodulator stages and to said phase angle modulator means, said detector means responding to the output from said demodulator stages to provide a control signal for altering the phase angle between at least two of said reference oscillator signals applied to said demodulator stages.

4,052,736

LINE-SEQUENTIAL COLOR TELEVISION ENCODING AND DECODING SYSTEM

Frank Anthony Griffiths, London, England, assignor to Decca Limited, London, England

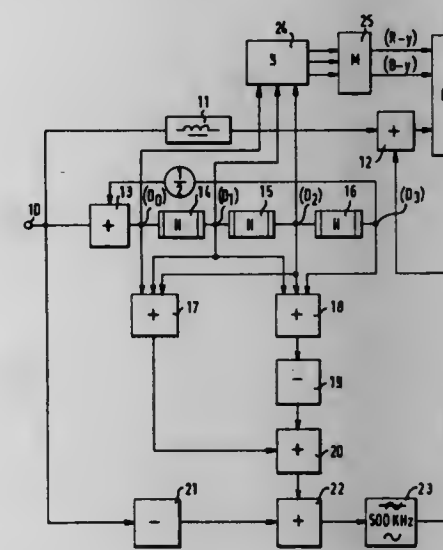
Continuation-in-part of Ser. No. 508,814, Sept. 24, 1974, abandoned. This application Dec. 31, 1975, Ser. No. 645,717

Claims priority, application United Kingdom, Nov. 7, 1975, 46202/75

Int. Cl.² H04N 9/40, 9/535

U.S. Cl. 358—37

47 Claims



1. A colour television signal decoder, comprising means for comparing each line of an input signal in the form of a luminance component combined with a line-sequential chrominance component of lesser band-width with a signal containing

an earlier line of corresponding chrominance so as to derive a signal denoting vertical luminance changes; means for averaging the input signal over a plurality of lines so as to derive a luminance signal of lower frequency; and means for reconstituting the luminance component from the derived signals in the frequency range of the associated chrominance component.

4,052,737

METHOD AND APPARATUS UTILIZING BAUDOT CODE FOR CATEGORIZING AND SELECTIVELY DISTRIBUTING INFORMATION TO A PLURALITY OF UTILIZATION UNITS

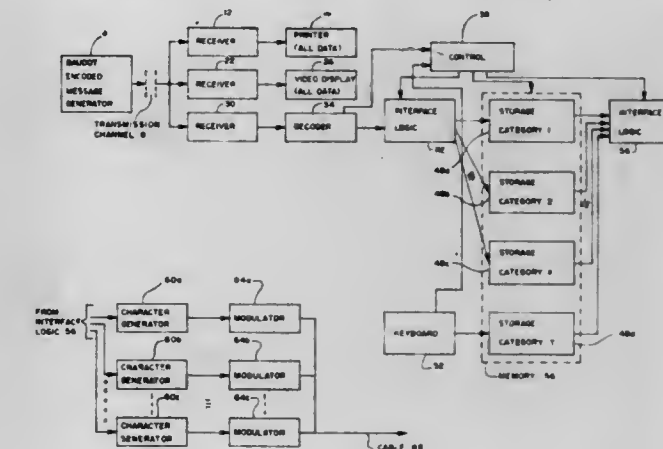
Bruce W. Robertson, Salt Lake City, and Pryce Neilson Hales, Centerville, both of Utah, assignors to Com Tel, Inc., Salt Lake City, Utah

Filed July 9, 1976, Ser. No. 703,953

Int. Cl.² H04N 7/10; H04L 15/00; G08B 23/00

U.S. Cl. 358—86

12 Claims



10. A method of selectively distributing information to a plurality of information utilization units including

a. receiving a Baudot encoded information sequence in which the sequence includes a coded combination of figure shift and/or letter shift Baudot characters for designating the subject matter of the information contained in the sequence, where such information relates to one of a plurality of different subject matters,

b. decoding the combination of figure shift and/or letter shift characters to determine the subject matter of the information contained in the sequence,

c. applying the information contained in the sequence to one of a plurality of storage means, said one storage means being dedicated to storing information of the subject matter determined in step (b), and

d. applying the information from said one storage means to one or more selected utilization units dedicated to receive information of the subject matter determined in step (b).

4,052,738

STYLUS FOR CAPACITIVE VIDEODISC

Fumio Hosomi, Moriguchi; Kiyotaka Wasa, Nara; Shigeru Eayakawa, Hirakata, and Takeshi Nagai, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 4, 1975, Ser. No. 565,259

Claims priority, application Japan, Apr. 4, 1974, 49-38600

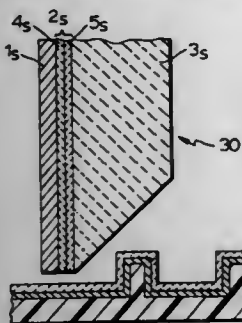
Int. Cl.² G11B 11/06

U.S. Cl. 358—128

3 Claims

1. A pick-up stylus for tracking in a groove in a recording disk having a conductive surface and a dielectric coating over said conductive surface for cooperating with said recording disk to provide capacitive variations between said stylus and said conductive surface when relative motion is established between said stylus and said recording disk, said stylus comprising an elongated bar of alumina having a conductive coating thereon, said coating comprising a conductive layer and a cementing layer sandwiched between said conductive layer

and the surface of said alumina bar, said cementing layer comprising an upper layer portion facing said conductive layer and a lower layer portion facing said alumina bar, said upper layer portion being an oxide of a material of said conductive layer and said lower layer portion being a solid solution of alumina and an oxide of a metal other than aluminum, the melting temperature of which is lower than the alumina, said solid solution being a member selected from the group consisting of



$Al_2O_3-SiO_2$, $Al_2O_3-GeO_2$, $Al_2O_3-SnO_2$, Al_2O_3-PbO , $Al_2O_3-B_2O_3$, $Al_2O_3-Ga_2O_3$, $Al_2O_3-In_2O_3$ and combinations thereof, alumina-soda glass, alumina-lead glass, alumina-borosilicate glass, alumina-silica glass, alumina-pyrex glass and alumina-vycor glass, said conductive layer being a member selected from the group consisting of a metal, a metal nitride, a metal silicide, a metal boride, a metal carbide and combinations thereof.

4,052,739

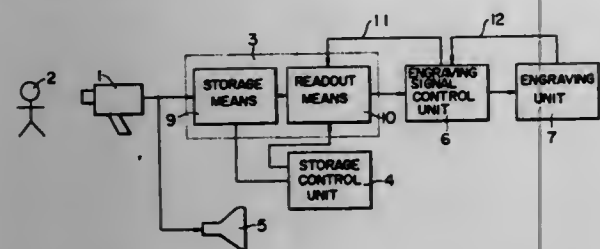
ELECTRONIC ENGRAVING SYSTEM

Masanobu Wada, Sendai; Yujiro Koike, Machida, and Yoshihisa Okuma, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Dai Nippon Printing Company, Ltd., Tokyo, both of Japan

Continuation-in-part of Ser. No. 360,050, May 14, 1973, abandoned. This application Jan. 30, 1976, Ser. No. 653,954
Claims priority, application Japan, May 19, 1972, 47-49135
Int. Cl.² H04N 1/28, 5/76

U.S. Cl. 358-299

7 Claims



1. An electronic engraving system comprising: an image pickup means for generating electric signals corresponding to an object;
- a signal storage and readout means of the scanning conversion type for storing said electric signals from said image pickup means at a high speed and reading out said stored electric signals at a low speed corresponding to an engraving speed in accordance with command signals;
- an engraving means for engraving a picture of the object on a material in response to said read out electric signals, said engraving means including an engraving head having an engraving style arranged to face an engraving table, means for reciprocating said engraving table or engraving style and means for shifting said engraving style transversely to the direction of the reciprocation of said engraving table or engraving style; and
- a command signal producing means for producing said command signals, said command signal producing means including a pulse producing means for producing pulses in response to the reciprocation of said engraving table or engraving style and a synchronizing pulse generating circuit for generating a synchronizing pulse in response to said pulses produced by said pulse producing means.

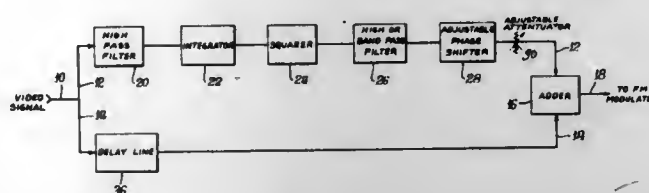
4,052,740
MOIRE INTERFERENCE REDUCING CIRCUIT FOR FM VIDEO RECORDERS

Charles Hubert Coleman, Jr., Belmont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,379
Int. Cl.² G11B 5/02

U.S. Cl. 360-30

18 Claims



1. A method of reducing a spurious interference component in a demodulated signal of a frequency modulated signal transmission system wherein a modulating signal having a fundamental frequency modulates a carrier signal, the spurious interference component being caused by interaction between the fundamental frequency and the carrier signal, comprising the steps of:

adding a second harmonic frequency of said modulating signal in a predetermined phase and amplitude to said fundamental modulating signal prior to frequency modulating said carrier signal; and, thereafter frequency modulating said carrier signal with said modulating signal having its second harmonic frequency added thereto at said predetermined phase and amplitude, the phase and amplitude of the second harmonic frequency being such that the interference component in the demodulated signal is reduced.

4,052,741

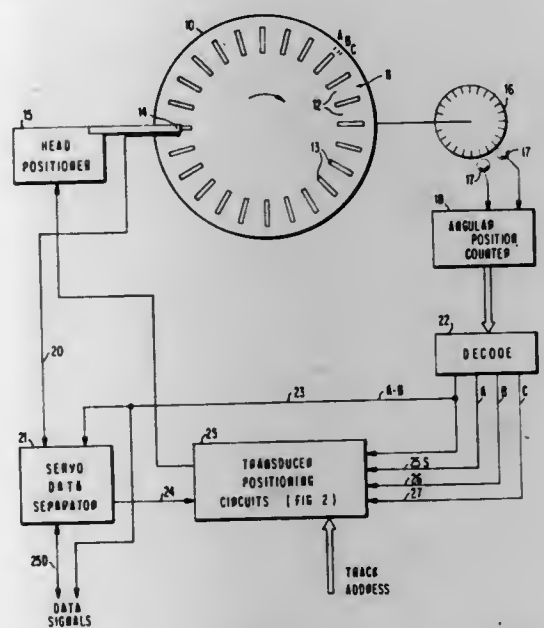
TRACK SEEKING AND FOLLOWING

Joseph Philip Baca, Longmont, and Peter Thomas Marino, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,900
Int. Cl.² G11B 21/10, 5/012

U.S. Cl. 360-77

21 Claims



1. The method of track seeking and following using a pattern of servo signals for grouping the tracks into bands with servo signal durations for each track within each band being in a unique combination, and a plurality of servo signals for each track disposed along a given sector length of each said track; the improvement including the following steps in combination: measuring durations of said servo signals for indicating track position within a band; and

measuring energy of each said servo signals and comparing same for indicating position error with respect to said indicated track.

4,052,742

MAGNETIC TAPE RECORDER DRIVE MECHANISM HAVING A LATCHING MEMBER WITH A PAUSE MODE AND A STOP MODE

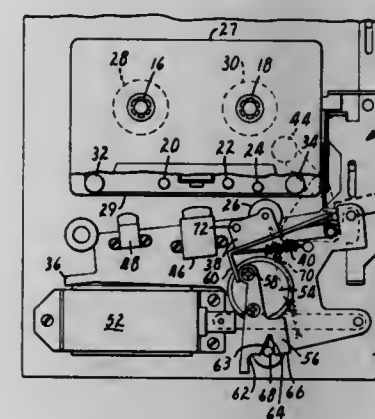
Sheldon Lee Pastor, St. Paul; Milton E. Erickson, North St. Paul, both of Minn., and Donald D. Kahn, Camarillo, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 28, 1975, Ser. No. 636,320

Int. Cl.² G11B 15/26, 15/24, 15/10, 5/54

U.S. Cl. 360-96

11 Claims



1. A driving mechanism of a magnetic tape recorder suitable for voice logging use comprising

a frame, a tape transport assembly mounted on the frame including a driven capstan and a pressure roller mechanically biased toward the capstan and movable between a run mode position at which the roller is positioned to press the tape against the capstan, and a record/playback head is in full contact with the tape, a pause mode position at which the roller is slightly withdrawn from the capstan and the head is in contact with said tape, and a stop mode position at which the roller is appreciably withdrawn from the capstan and the head is fully retracted from the tape, latching means for mechanically holding the roller in either the pause mode position or the stop mode position against the mechanical bias, and trigger means including a solenoid for releasing the latching means to allow the roller to quickly move into the run mode position to provide fast starting capability.

4,052,743

TRANSDUCER CARRIAGE TRANSPORT HAVING CYLINDRICAL BEARINGS AND A GROOVED GUIDE MEMBER

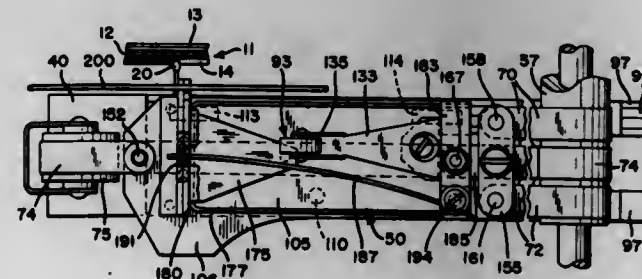
Boyd Lehman Stratton, Woodside, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Filed Nov. 3, 1976, Ser. No. 738,605

Int. Cl.² G11B 5/00

U.S. Cl. 360-99

5 Claims



1. A disc recorder comprising: a rotating disc,

a transducer for coacting with said disc, a guide member having a guide surface extending transversely of said rotating disc and including a groove extending parallel to said disc, a carriage means for mounting the transducer, positioned generally parallel to and movable along said guide surface, a friction reducing bearing pad mounted on said carriage means and movable along said guide surface, friction reducing cylindrical bearing means mounted on said carriage means in spaced relation to said pad and movable in said groove, a locating member having a locating surface positioned substantially parallel to said guide surface, loading means mounted on said carriage means and engaging said locating surface to bias said carriage means toward said guide surface such that said bearing pad engages said guide surface and said cylindrical bearing means engages said groove, and means for moving said carriage means along said guide surface, said carriage means being confined to move only in a direction substantially parallel to the plane of said rotating disc.

4,052,744

TEMPERATURE MONITORING OF SEMICONDUCTORS

David R. Boothman, Ennismore, and Everett C. Elgar, Peterborough, both of Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

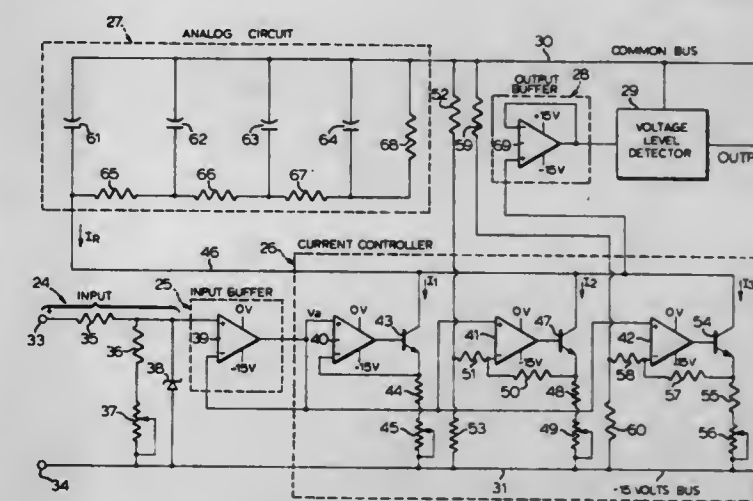
Filed Nov. 25, 1975, Ser. No. 635,141

Claims priority, application Canada, Dec. 2, 1974, 215024

Int. Cl.² H02H 7/20

U.S. Cl. 361-103

11 Claims



1. A circuit for monitoring the temperature of a junction of a semiconductor comprising:

a. means for producing a signal having a value which is a function of the current conducted by the semiconductor;

b. an electrical circuit analog of the thermal system of the semiconductor, said analog including electrical representations of the heat capacities of a total semiconductor structure including a heat sink and further including electrical representations of the thermal resistances from the junction to ambient;

c. a current controller in circuit with said analog for controlling the current of said analog, said analog and said controller together comprising an analog-controller circuit;

d. means for furnishing the current of said analog-controller circuit;

e. means for applying said signal to said controller for controlling the conduction thereof whereby the control of said controller by said signal is such that the relation of signal value to the analog current magnitude approximates the power dissipation characteristic of the semiconductor junction; and,

f. means connected to said analog for detecting a voltage thereof representative of junction temperature.

4,052,745

MAGNETIC HEAD ADJUSTMENT MEANS FOR A MAGNETIC TAPE MACHINE

Niro Nakamichi, Kodaira, Japan, assignor to Nakamichi Research Inc., Kodaira, Japan

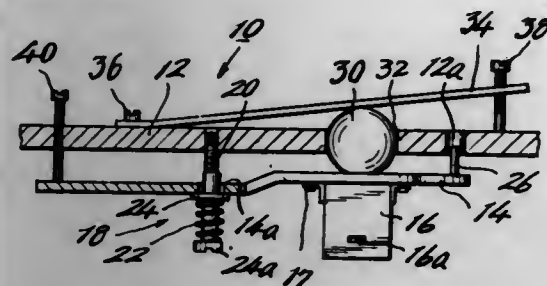
Filed Apr. 21, 1976, Ser. No. 679,027

Claims priority, application Japan, Apr. 26, 1975, 50-57119 U; May 1, 1975, 50-59328 U

Int. Cl.² G11B 21/24

U.S. Cl. 360-109

9 Claims



1. Magnetic head adjustment means for a magnetic tape machine, comprising a base plate a magnetic head mounting plate on which a magnetic head is securely mounted adjacent to one end thereof; support means provided adjacent to a middle portion of said magnetic head mounting plate to movably attach said magnetic head mounting plate to said base plate to permit a head gap of said magnetic head to incline in a magnetic tape running plane and so as to resiliently urge said magnetic head mounting plate toward said base plate; contact means to slidably extend through said base plate and to engage said magnetic head mounting plate as a fulcrum in the plane in which the head gap is contained and at two points of said magnetic head mounting plate spaced to each other along the direction perpendicular to said tape running plane so that the gap containing surface of said magnetic head is maintained parallel to said tape running plane whereby said magnetic head mounting plate is maintained substantially parallel to the direction perpendicular to said tape running plane as said magnetic head mounting plate pivotally moves about said fulcrum; depression means disposed on the other side of said base plate to depress said contact means against the urging force of said support means whereby said magnetic head is adjusted in a vertical manner while said magnetic head is maintained parallel to said base plate in the direction perpendicular to the tape running plane; vertical position adjusting screw means threadedly extending through said depression means to adjust the depression of said depression means whereby said magnetic head is properly positioned in its vertical position; and inclination adjusting screw means threadedly extending through said base plate to engage said magnetic head mounting plate at the other end and to pivotally move said magnetic head mounting plate about said fulcrum against the urging force of said support means whereby said magnetic head is properly positioned in its inclination in said magnetic tape running plane.

4,052,746

HEAD ASSEMBLY FOR MAGNETIC RECORDERS

Ivor Weller, San Lorenzo, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 2, 1976, Ser. No. 654,488

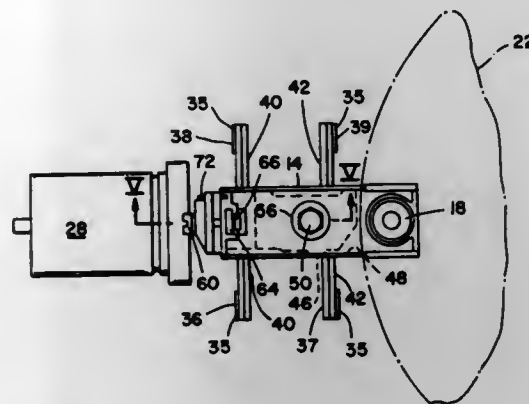
Int. Cl.² G11B 21/24, 21/08, 5/016

U.S. Cl. 360-109

7 Claims

1. A head assembly for a dual flexible disc magnetic recorder, each disc having defined on its recording surface a plurality of concentric recording tracks for the storage of information thereon, said head assembly comprising: mounting bracket means; a pair of head carriages, each including a recording head affixed thereto; means for releasably attaching each of said head carriages to said mounting bracket means, with its respective head

operatively abutting the recording surface of one of said discs; means connected to said mounting bracket means for moving said mounting bracket means radially with respect to the recording discs to enable the positioning of said head on any given track defined on its respective said recording disc; and adjustment means connected to each of said carriages for individually adjusting the radial position of each head carriage with respect to its associated disc independently of the movement of said mounting bracket means by said means for moving in order for said heads to be simultaneously positionable by said mounting bracket means on corresponding tracks on their respective discs, said adjust-



ment means for each head carriage comprising an adjustment screw disposed through a pair of first bores respectively defined in said mounting bracket means and said head carriage, means for limiting movement of said adjustment screw in said first bore of said mounting bracket means such that said adjustment screw is allowed to have only rotative movement with respect to said mounting bracket means, and a screw fastening means mounted in a second bore defined in said head carriage and fastened to said adjustment screw such that the turning of such adjustment screw causes said screw fastening means and thus the head carriage and head thereon to be moved in an inward or outward direction relative to said mounting bracket means and thus radially with respect to the recording disc corresponding to said head carriage.

4,052,747

DEVICE FOR THE MAGNETIC DOMAIN STORAGE OF DATA HAVING A SHIFT REGISTER FILLED WITH CODED SERIES OF DOMAINS

Jan Roos, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

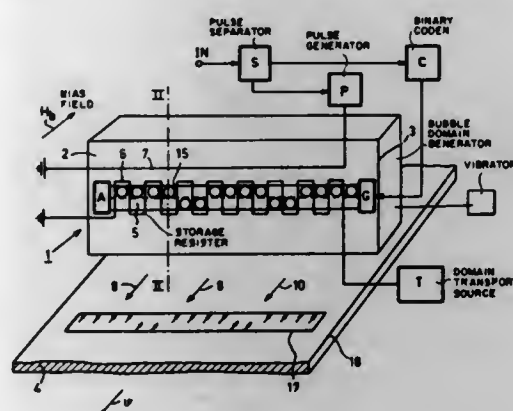
Filed Feb. 26, 1976, Ser. No. 661,735

Claims priority, application Netherlands, Mar. 3, 1975, 7502455; Aug. 15, 1975, 7509734

Int. Cl.² G11C 11/42

U.S. Cl. 360-110

26 Claims



1. A magnetic transducing device for recording information

in a magnetizable recording medium and for reproducing the information recorded therein, comprising a layer having a layer of magnetizable material, means for maintaining magnetic bubble domains in said layer including a main magnetic field generator, a field produced by said generator extending transversely to the layer, said layer being adapted to be coupled magnetically with the recording medium for transducing of information, means for generating magnetic bubble domains in the layer, an information input means, a bubble domain coding device connected to said information input means, and means to generate a magnetic transfer field having a field strength and orientation at which the required coupling between the bubble domain and the recording medium is effected, a first shift register for magnetic bubble domains, said magnetic bubble generator means being connected to said first shift register, said bubble domain coding device comprising means for filling the shift register with successive coded series of bubble domains, and means for effecting the coupling between at least one series of bubble domains and the recording medium at desired instants.

4,052,748

MAGNETORESISTIVE MAGNETIC HEAD

Karel Elbert Kuijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 560,164, March 20, 1975, abandoned.

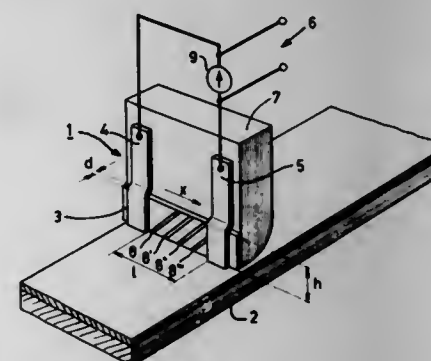
This application Oct. 4, 1976, Ser. No. 729,220

Claims priority, application Netherlands, Apr. 1, 1974, 7404362

Int. Cl.² G11B 5/30; H01C 7/16

U.S. Cl. 360-113

5 Claims



1. A magnetic head for detecting information representing magnetic fields on a magnetic recording medium and comprising an elongate magneto-resistive element of a magnetically anisotropic material which at its ends has contacts for the connection to a current or voltage source, the easy axis of magnetization thereof coinciding with the longitudinal axis of the element and said head further including means to force the current to travel at an angle of minimum 15° and maximum 75° with the longitudinal axis of said element said means including one readily conductive equipotential strip intermediate said current contacts in oblique relationship to said longitudinal axis.

4,052,749

THIN FILM MAGNETIC HEAD

Noboru Nomura, Kyoto; Kenji Kanai, Neyagawa; Nobuyuki Kaminaka, Moriguchi, and Norimoto Nouchi, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 19, 1976, Ser. No. 688,076

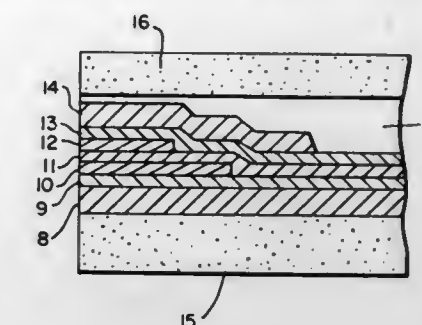
Int. Cl.² G11B 5/20, 5/14, 5/16

U.S. Cl. 360-123

12 Claims

1. A thin film magnetic head comprising: first and second magnetic layers forming magnetic cores, said first and second magnetic layers being magnetically connected at first ends thereof and forming a gap between second ends thereof; at least one conductor layer positioned between said first and

second magnetic layers, said conductor layer comprising winding means through which current flows during use of the magnetic head; said at least one conductor layer having on each of two



4,052,750

FLEXIBLE RECORDING DISK WITH IMPROVED SPINDLE MOUNTING MEANS

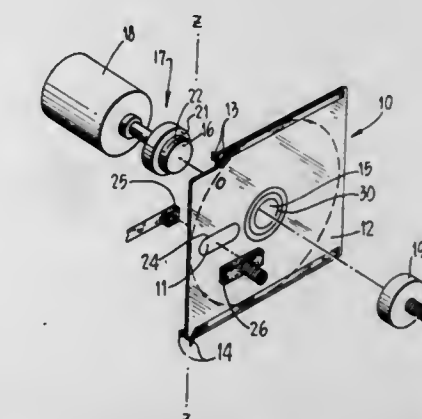
John A. Barber; C. Norman Dion, and Richard N. James, all of San Jose, Calif., assignors to Dysan Corporation, Santa Clara, Calif.

Filed Dec. 5, 1975, Ser. No. 637,915

Int. Cl.² G11B 5/82; B65D 85/02; G11B 5/016; H05F 3/00

U.S. Cl. 360-135

13 Claims



1. In a flexible disc assembly comprising a flexible disc having a pliant substrate and at least one recording layer on said substrate, said disc having a central aperture adapted to receive a rotatable drive spindle, and a jacket substantially enclosing said flexible disc and permitting rotation of said flexible disc therewithin, the improvement comprising reinforcement means adhered to at least one surface of said disc adjacent said central aperture for preventing deformation of said disc in the region of said central aperture and for protecting said recording layer, said reinforcement means being fabricated from a material having sufficient electrical conductivity to prevent accumulation of electrical charges on said disc.

4,052,751

GROUND FAULT INTERRUPTER CIRCUIT

Marshall Howard Shepard, Shrewsbury, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Apr. 12, 1976, Ser. No. 676,329

Int. Cl.² H02H 3/16

U.S. Cl. 361-50

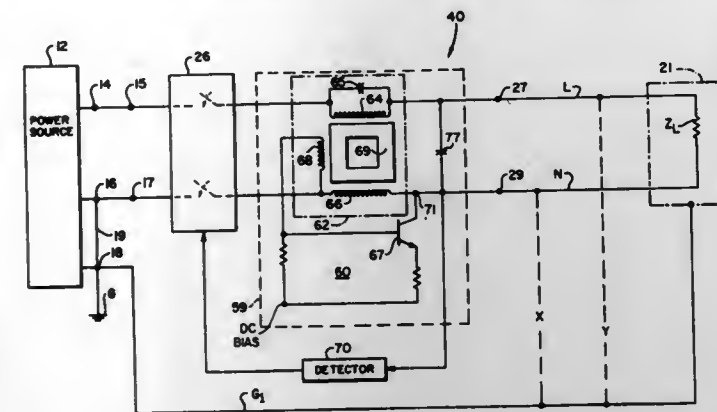
4 Claims

1. A ground fault interrupter circuit for interrupting signals at a first frequency conducted to a load from a source in the presence of a path to ground for leakage current, said ground fault interrupter circuit comprising:

oscillator means for generating signals at a second frequency, said oscillator means having feedback means including a parallel circuit with a predetermined Q at said second frequency, said parallel circuit being formed by a first capacitor coupled in parallel with first, second, and third conductors having an inductive impedance tuned to be resonant at said second frequency by said first capacitor, said first and second conductors having input terminals for receiving said signals at said first frequency and output terminals for coupling to said load;

a second capacitor coupled between said first and second conductors to provide a low impedance path for signals at said second frequency and a high impedance path for signals at said first frequency, said predetermined Q of said parallel circuit being reduced when signals at said second frequency are conducted along a continuous path including said first and second conductors, said second capacitor and a path for said leakage current from said first conductor to said ground; and

switching means coupled to said first and second conductors for interrupting signals conducted from said source to said



load when said predetermined Q of said resonant circuit is reduced.

DESIGNS

OCTOBER 4, 1977

245,946
SHOE

Tatsuo Fukuoka, No. 3, 3-Ban, 2-Chome, Shin-Minami-Fuku-shima, Tokushima, Japan

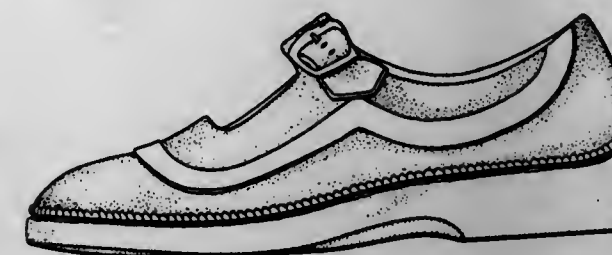
Filed Aug. 4, 1975, Ser. No. 601,843

Claims priority, application Japan, May 28, 1975, 50-21538

Term of patent 14 years

Int. Cl. D2-04

U.S. Cl. D2-308

245,949
OTTOMAN

Aubrey Amey, deceased, late of New York, N.Y., by Greta A. Beckner, administratrix, 1703 W. Case Road, Columbus, Ohio 43220

Division of Ser. No. 574,109, May 2, 1975. This application Aug. 27, 1976, Ser. No. 718,313

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-36



245,947

TENNIS BALL POUCH WITH BELT CLIP

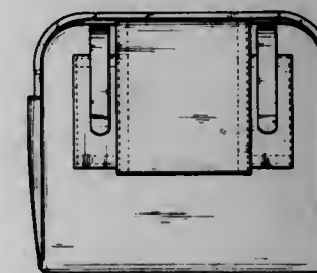
Betty Finley, 10 W. 66th St., New York, N.Y. 10023

Filed Oct. 8, 1975, Ser. No. 620,718

Term of patent 14 years

Int. Cl. D2-07

U.S. Cl. D2-400

245,950
CHAIR

Florence M. Mathur, 283 Mapledene Drive, Ancaster, Ontario, Canada

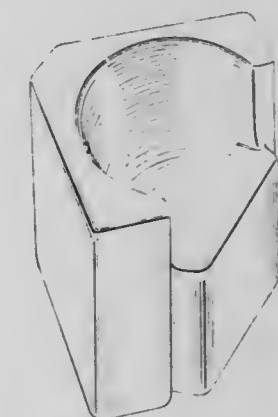
Filed Feb. 12, 1976, Ser. No. 657,402

Claims priority, application Canada, Jan. 29, 1976, 2901761

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-37



245,948

FACIAL CLEANING APPARATUS

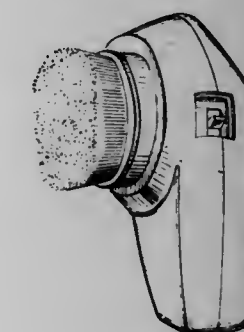
Martin J. Wolff, West Haven, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed Jan. 12, 1976, Ser. No. 648,375

Term of patent 14 years

Int. Cl. D4-02

U.S. Cl. D4-14



245,951

COMBINED SECTIONAL SOFA AND MULTIPLE TABLE UNIT

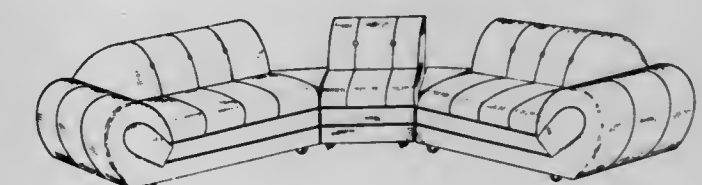
Gerald L. Lande, 3672 S. Newport St., Denver, Colo. 80237

Filed June 1, 1976, Ser. No. 692,007

Term of patent 14 years

Int. Cl. D6-01

U.S. Cl. D6-46



245,952
CHAIR

Ernst Lüthy, Klingnau, Switzerland, assignor to De Sede AG, Klingnau, Switzerland
Filed Dec. 19, 1975, Ser. No. 642,405
Claims priority, application Switzerland, June 24, 1975, Division of Ser. No. 574,109, May 2, 1975. This application Aug. 6, 1975

Term of patent 14 years
Int. Cl. D6—01

U.S. Cl. D6—56

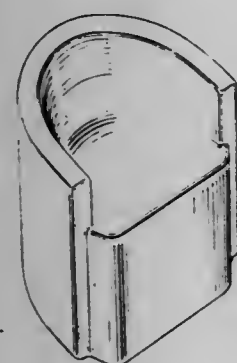


245,953
CHAIR

Florence M. Mathur, 283 Mapledene Drive, Ancaster, Ontario, Canada
Filed Feb. 12, 1976, Ser. No. 657,401
Claims priority, application Canada, Jan. 29, 1976, 2901762

Term of patent 14 years
Int. Cl. D6—01

U.S. Cl. D6—71



245,954
COMBINED STOOL AND PERISCOPE

Richard T. Tosaw, P.O. Box 888, Modesto, Calif. 95353
Filed May 28, 1976, Ser. No. 691,000

Term of patent 14 years
Int. Cl. D6—01

U.S. Cl. D6—74

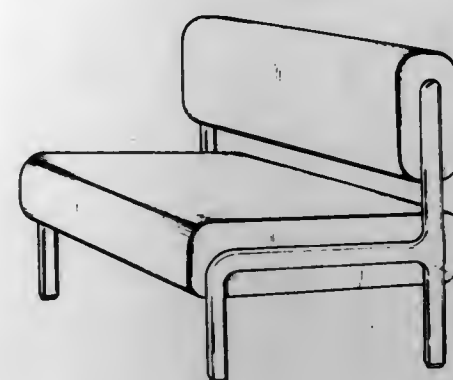


245,955
CHAIR

Aubrey Amey, deceased, late of New York, N.Y., by Greta A. Beckner, administratrix, 1703 W. Case Road, Columbus, Ohio 43220
Division of Ser. No. 574,109, May 2, 1975. This application Aug. 27, 1976, Ser. No. 718,312

Term of patent 14 years
Int. Cl. D6—01

U.S. Cl. D6—78

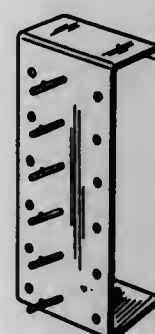


245,956
EYEGGLASS DISPLAY UNIT

Richard S. Dunchock, Farmington Hills, Mich., assignor to Optarac Corporation, Hollywood, Fla.
Division of Ser. No. 498,542, Aug. 19, 1974, Pat. No. D. 241,196.
This application Dec. 15, 1975, Ser. No. 640,831

Term of patent 14 years
Int. Cl. D20—02

U.S. Cl. D6—85



245,957
UTENSIL HOLDER OR SIMILAR ARTICLE

Peter Stein, 47 Stager St., Nutley, N.J. 07110
Filed Apr. 12, 1976, Ser. No. 675,988

Term of patent 7 years
Int. Cl. D6—04

U.S. Cl. D6—114

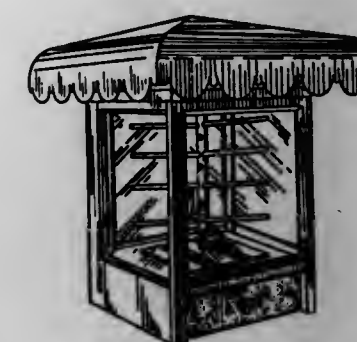


245,958
FOOD DISPLAY OVEN

Ronald R. Roderick, Evergreen, Colo., assignor to National Equipment Corporation, Denver, Colo.
Division of Ser. No. 434,446, Jan. 18, 1974, Pat. No. D.238,471.
This application Aug. 28, 1975, Ser. No. 608,674

Term of patent 14 years
Int. Cl. D20—02

U.S. Cl. D6—172



245,960
SPOON OR SIMILAR ARTICLE

Z. George Zephries, Roselle, Ill., assignor to American Home Products Corporation, New York, N.Y.
Filed Nov. 6, 1975, Ser. No. 629,312

Term of patent 14 years
Int. Cl. D7—03

U.S. Cl. D7—137

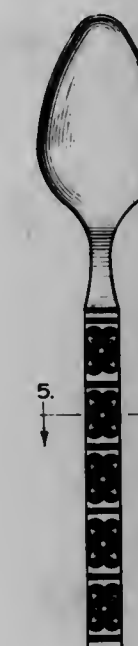


245,959
SPOON OR SIMILAR ARTICLE

Z. George Zephries, Roselle, Ill., assignor to American Home Products Corporation, New York, N.Y.
Filed Nov. 6, 1975, Ser. No. 629,311

Term of patent 14 years
Int. Cl. D7—03

U.S. Cl. D7—137



245,961
SPOON OR SIMILAR ARTICLE

Z. George Zephries, Roselle, Ill., assignor to American Home Products Corporation, New York, N.Y.
Filed Nov. 6, 1975, Ser. No. 629,313

Term of patent 14 years
Int. Cl. D7—03

U.S. Cl. D7—150



245,962

POUR SPOUT PERFORATING TOOL

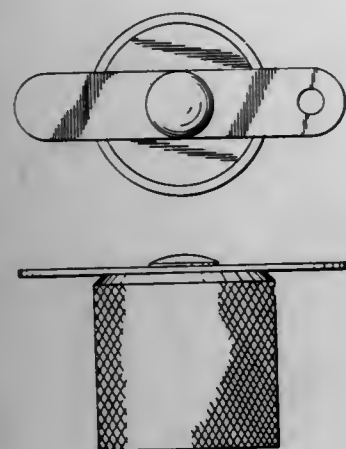
Michael W. Brandt, 1111 W. Mockingbird Lane, Suite 565, Dallas, Tex. 75247

Filed Feb. 2, 1976, Ser. No. 654,294

Term of patent 14 years

Int. Cl. D7-99

U.S. Cl. D8-41



245,964

CAN OR SIMILAR ARTICLE

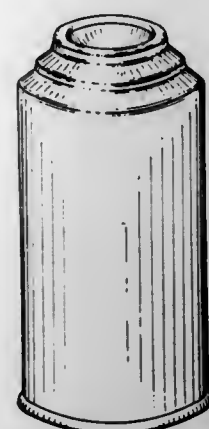
Edward William Sexton, Sr., 20 Collidge Ave., Cambridge, Mass. 02139, and Edward W. Sexton, Jr., 990 Massachusetts Ave., Arlington, Mass. 02174

Filed Nov. 12, 1975, Ser. No. 631,065

Term of patent 14 years

Int. Cl. D9-03

U.S. Cl. D9-218



245,965

OXYGEN ANALYZER HOUSING

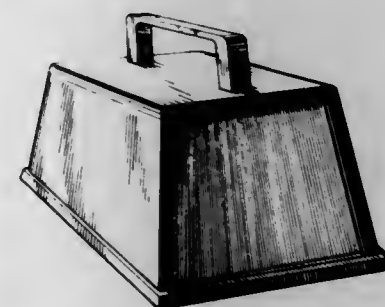
Harold R. Havstad, Eagle Point, Oreg., assignor to Hudson Oxygen Therapy Sales Company

Filed Mar. 26, 1976, Ser. No. 670,732

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-46



245,963

BOTTLE OR SIMILAR ARTICLE

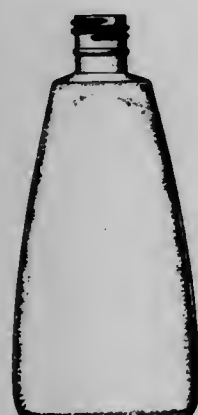
John W. Lewman, Blue Springs, Mo., assignor to Ethyl Development Corporation, Baton Rouge, La.

Filed May 17, 1976, Ser. No. 687,081

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-143



245,966

THERMOMETER

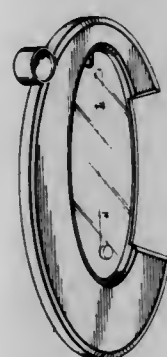
Henry Finkel, Westmount, Canada, assignor to International Business Relations Bureau Inc., Montreal, Canada

Filed Mar. 12, 1976, Ser. No. 666,572

Term of patent 7 years

Int. Cl. D10-04

U.S. Cl. D10-58



245,967

TRAMMEL GAUGE

Guy Norman Chartier, Toronto, Canada, assignor to Guy-Chart Tools Limited

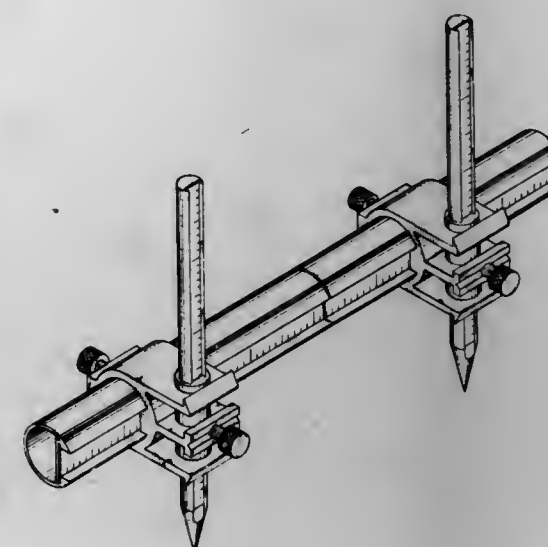
Filed Jan. 5, 1976, Ser. No. 646,483

Claims priority, application Japan, July 31, 1975, 50-31430

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-61



245,969

KITCHEN SCALE BALANCE

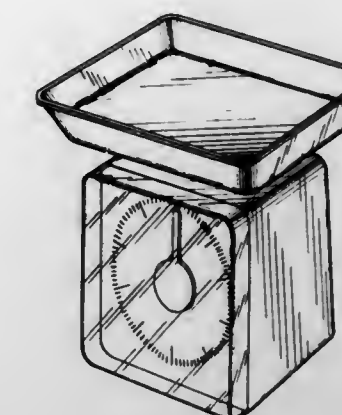
Dana W. Mox, Elk Grove Village, Ill., assignor to Hanson Limited, Sligo, Ireland

Filed Jan. 19, 1976, Ser. No. 650,527

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-91



245,970

ANEMOMETER TRANSDUCER

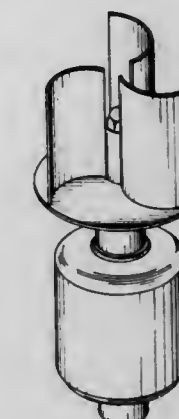
R. A. Simerl, 528 Epping Forest Road, Annapolis, Md. 21401

Filed Jan. 27, 1976, Ser. No. 652,763

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-103



245,971

COLLAPSIBLE CART

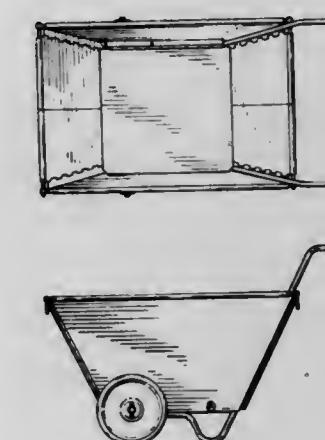
Melvin R. Martens, 406 N. Weaver, Hesston, Kans. 67062

Filed Aug. 13, 1976, Ser. No. 714,082

Term of patent 14 years

Int. Cl. D12-02

U.S. Cl. D12-24



245,968

HOUSEHOLD SCALE

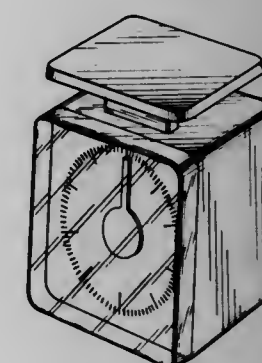
Dana W. Mox, Elk Grove Village, Ill., assignor to Hanson Limited, Sligo, Ireland

Filed Jan. 19, 1976, Ser. No. 650,526

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-91

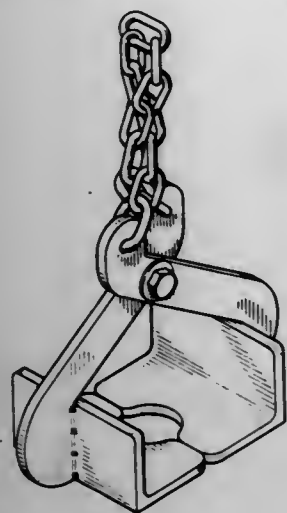


245,972

LIFTING TONGS

Gary Wayne Kifer, 1723 S. 9th East, Salt Lake City, Utah 84105
 Filed Apr. 29, 1976, Ser. No. 681,324
 Term of patent 14 years
 Int. Cl. D12—05

U.S. Cl. D12—54

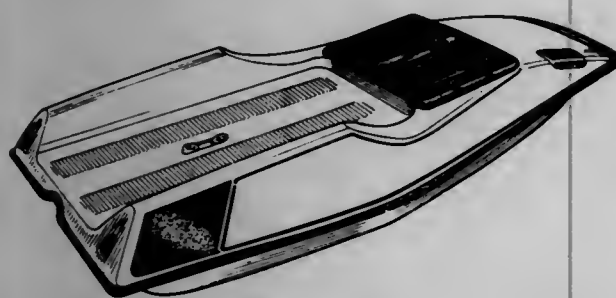


245,973

PERSONAL WATER CRAFT

Anastasios J. Vasilatos, and Albert L. Nagele, both of Wilmette, Ill., assignors to A.V./American Ventures, Inc.
 Continuation-in-part of Ser. No. 591,618, June 30, 1975, abandoned. This application Sept. 30, 1976, Ser. No. 728,441
 Term of patent 14 years
 Int. Cl. D12—06

U.S. Cl. D12—69

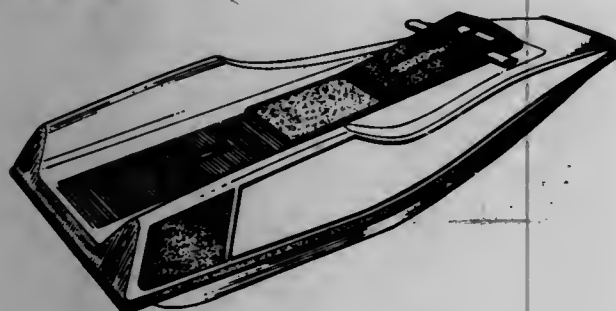


245,974

PERSONAL WATER CRAFT

Anastasios J. Vasilatos, and Albert L. Nagele, both of Wilmette, Ill., assignors to A.V./American Ventures, Inc.
 Continuation-in-part of Ser. No. 591,619, June 30, 1975, abandoned. This application Sept. 30, 1976, Ser. No. 728,442
 Term of patent 14 years
 Int. Cl. D12—06

U.S. Cl. D12—69

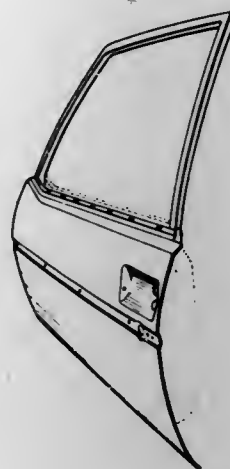


245,975

CAR FRONT SIDE DOOR PANEL

Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France
 Filed July 21, 1975, Ser. No. 597,872
 Claims priority, application France, Feb. 20, 1975, 75.73636
 Term of patent 14 years
 Int. Cl. D12—16

U.S. Cl. D12—196



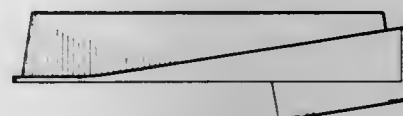
245,976

CHARGING UNIT FOR PORTABLE ELECTRONIC THERMOMETER

George H. Schmidt, Douglaston, N.Y., assignor to Arbrook, Inc., Arlington, Tex.

Filed Oct. 8, 1975, Ser. No. 620,900
 Term of patent 14 years
 Int. Cl. D13—02

U.S. Cl. D13—6



245,977

ELECTRICAL CONNECTOR

Leon Mouttet, Lonay, Switzerland, assignor to Interlemon Holding S.A., Coire, Switzerland
 Filed Oct. 9, 1975, Ser. No. 620,941
 Claims priority, application Switzerland, July 8, 1975, 61301/75

Term of patent 14 years
 Int. Cl. D13—03

U.S. Cl. D13—24



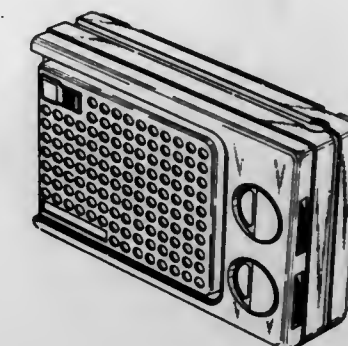
245,979

PORTABLE RADIO RECEIVER

Kiyoshi Fukuda, and Kimio Takano, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sept. 4, 1975, Ser. No. 610,369
 Claims priority, application Japan, Mar. 13, 1975, 50-10106
 Term of patent 14 years
 Int. Cl. D14—03

U.S. Cl. D14—68



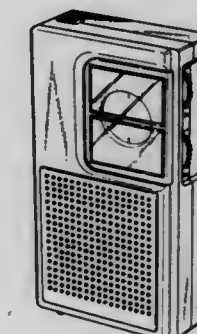
245,980

PORTABLE RADIO RECEIVER

Toshio Igo, Katano, and Hironosuke Koda, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 10, 1975, Ser. No. 639,506
 Term of patent 14 years
 Int. Cl. D14—03

U.S. Cl. D14—68

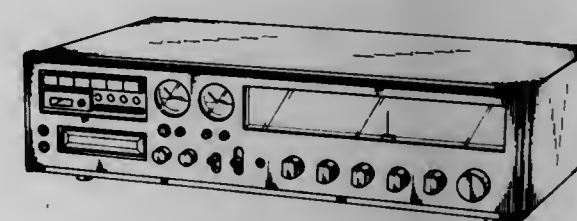


245,978

COMBINED TAPE RECORDER, TUNER AND AMPLIFIER

Toshimasa Akazawa, Yao, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
 Filed Mar. 17, 1976, Ser. No. 667,800
 Claims priority, application Japan, Sept. 19, 1975, 50-38370
 Term of patent 14 years
 Int. Cl. D14—01, 03

U.S. Cl. D14—5



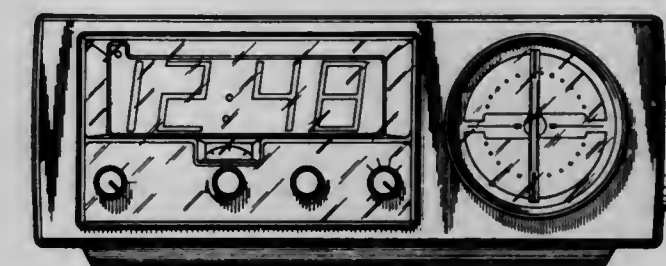
245,981

DIGITAL CLOCK RADIO

Ellen V. B. Ludwick, Mountain View, Calif., assignor to General Electric Company

Filed Mar. 18, 1976, Ser. No. 668,235
 Term of patent 14 years
 Int. Cl. D14—03; D10—01

U.S. Cl. D14—73



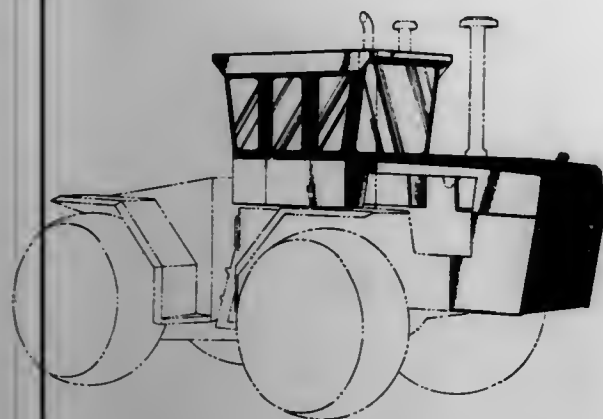
245,982

COMBINED TRACTOR CAB AND HOOD

Charles W. Pelly, Calabasas, Calif., assignor to Steiger Tractor Inc., Fargo, N. Dak.

Filed Aug. 9, 1976, Ser. No. 713,127
Term of patent 7 years
Int. Cl. D15—03

U.S. Cl. D15—23



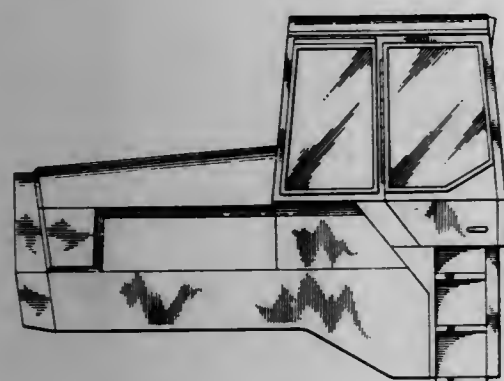
245,983

COMBINED TRACTOR BODY AND CAB

Lawrence J. Stone, Livonia, and Thomas M. Denny, Farmington, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed July 12, 1976, Ser. No. 704,596
Term of patent 14 years
Int. Cl. D15—03

U.S. Cl. D15—30



245,984

BALE CARRIER ATTACHMENT FOR TRACTORS OR THE LIKE

William D. Priefert, Mount Pleasant, Tex., assignor to Priefert Mfg. Co., Inc.

Filed Dec. 10, 1975, Ser. No. 639,357
Term of patent 14 years
Int. Cl. D15—03

U.S. Cl. D15—32



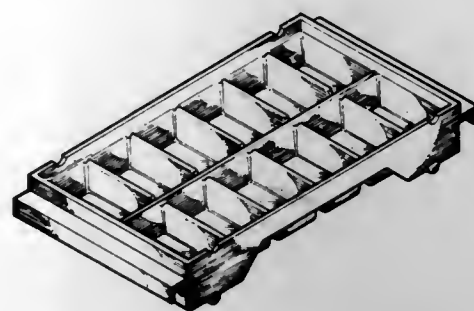
245,985

ICE CUBE TRAY

Delbert K. Talbert, 4214 W. 120th St., Apt. D, Hawthorne, Calif. 90250

Filed May 17, 1976, Ser. No. 686,752
Term of patent 14 years
Int. Cl. D15—07

U.S. Cl. D15—90



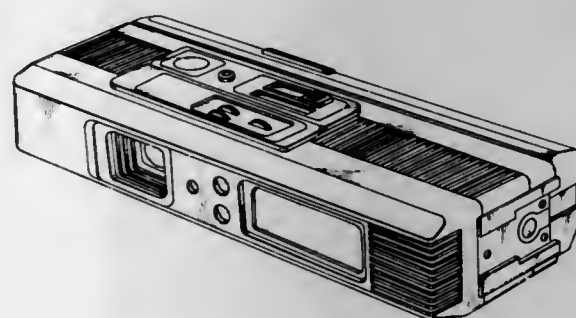
245,986

CAMERA

Hiroshi Fukuda, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 3, 1976, Ser. No. 682,870
Claims priority, application Japan, Feb. 4, 1976, 51-3293
Term of patent 14 years
Int. Cl. D16—01

U.S. Cl. D16—06



245,987

COPY TRAY

Richard Joseph Olson, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,868
Term of patent 14 years
Int. Cl. D16—03

U.S. Cl. D16—32



245,988

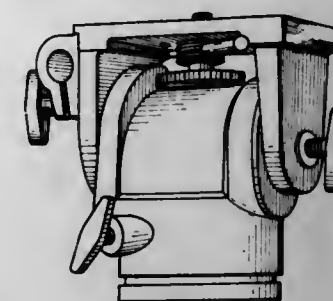
TRIPOD HEAD

Robert Eric Miller, Rose Bay, Australia, assignor to Miller-Universal (AUST) Pty. Ltd., Australia

Filed Sept. 11, 1975, Ser. No. 612,582
Claims priority, application Australia, Mar. 19, 1975, 66654/75

Term of patent 14 years
Int. Cl. D16—05

U.S. Cl. D16—46



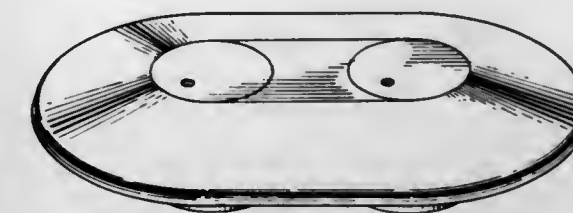
245,991

COLLAR FOR GAS TANK FILLING PIPES OF SERVICE STATIONS

Jean Guy Gravel, 263 boulevard Levesque, Apt. 2, Pont-Viau, Laval, Quebec, Canada

Filed July 2, 1976, Ser. No. 702,278
Term of patent 14 years
Int. Cl. D23—01

U.S. Cl. D23—41



245,989

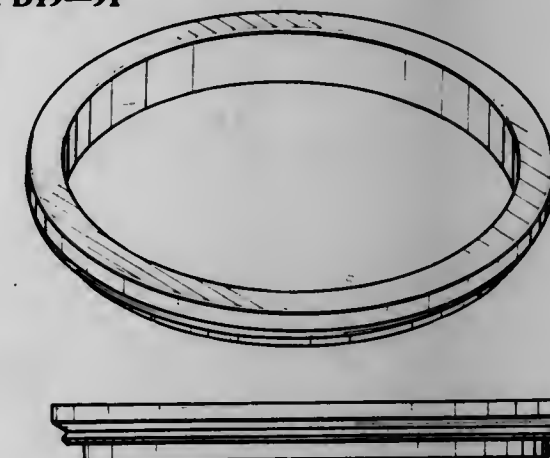
SHEET MATERIAL HOLDER

Geronimo A. Dango, 1226 S. Adams St., Glendale, Calif. 91209
Division of Ser. No. 398,580, Sept. 19, 1973, Pat. No. D.236,342.

This application June 5, 1975, Ser. No. 583,995

Term of patent 14 years
Int. Cl. D19—02

U.S. Cl. D19—91



245,992

INCENSE HOLDER

Morton A. Gruber, 188 Haypath Road, Old Bethpage, N.Y. 11804

Filed Aug. 20, 1976, Ser. No. 716,273
Term of patent 14 years
Int. Cl. D23—99

U.S. Cl. D23—78



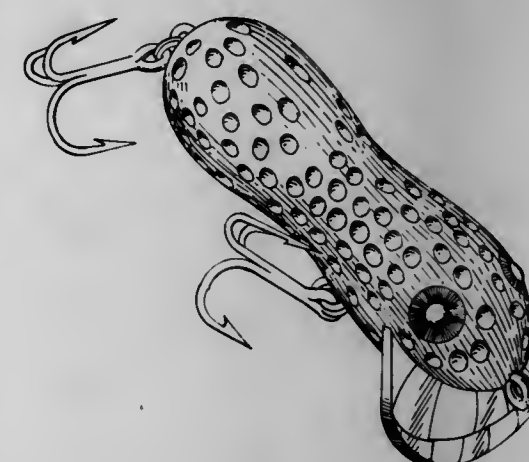
245,990

FISHING LURE

Carl R. Cordell, Jr., 215 Idlewood Drive, Hot Springs, Ark. 71901

Filed Jan. 28, 1977, Ser. No. 763,605
Term of patent 14 years
Int. Cl. D22—05

U.S. Cl. D22—28



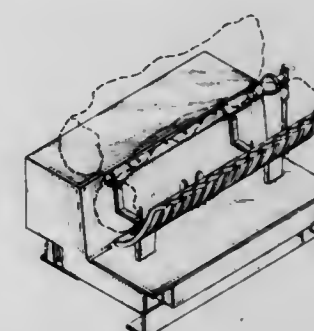
245,993

COMBINED BURNER BLOWER AND SUPPORT STAND FOR SIMULATED LOGS

Robert K. Anderson, and Richard L. Stuver, both of 1380 N. 380 West, Provo, Utah 84601

Filed July 25, 1975, Ser. No. 599,318
Term of patent 14 years
Int. Cl. D23—03; D7—08

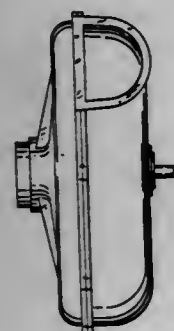
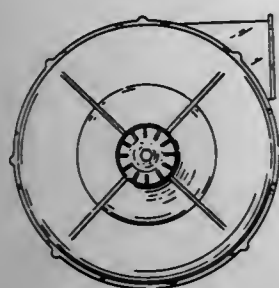
U.S. Cl. D23—93



245,994
BLOWER

Donald L. Olson, Minneapolis, Minn., assignor to Tennant Company, Minneapolis, Minn.
Filed Aug. 18, 1975, Ser. No. 605,405
Term of patent 14 years
Int. Cl. D23—99

U.S. Cl. D23—162

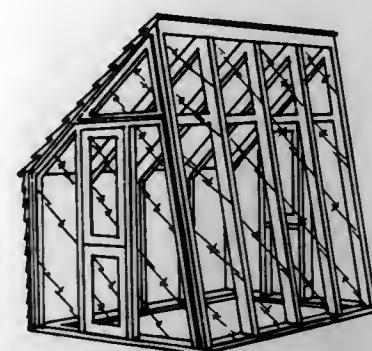


245,996
GREENHOUSE

William W. Lukens, 407 Mill Creek Road, Wynnewood, Pa. 19096

Filed Dec. 24, 1975, Ser. No. 644,062
Term of patent 14 years
Int. Cl. D25—03

U.S. Cl. D25—15



245,997
SOLAR BUILDING

Irwin R. Barr, Baltimore County, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 700,710
Term of patent 14 years
Int. Cl. D25—03

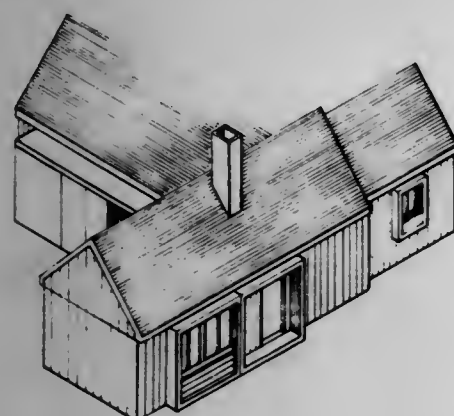
U.S. Cl. D25—21



245,995
CONVERTIBLE MODULAR MOBILE HOME

Earle Sumner Draper, Jr., 4630 Town & Country Drive, Charlotte, N.C. 28211
Filed Nov. 5, 1975, Ser. No. 629,045
Term of patent 3½ years
Int. Cl. D25—03

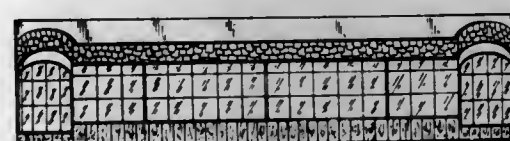
U.S. Cl. D25—17



245,998
FLORIST PARTITION STRUCTURE FOR THE INSIDE OF A SHOPPING CENTER COMPLEX

Richard L. Volkamer, 912 SE. 4th St., Ankeny, Iowa 50022
Filed Oct. 28, 1975, Ser. No. 625,945
Term of patent 14 years
Int. Cl. D25—02

U.S. Cl. D25—59

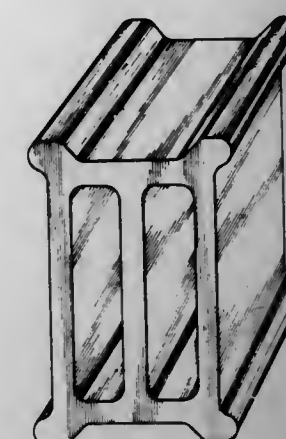


245,999
SUPPORT BLOCK FOR CHEMICAL TOWER PARKING

Ralph F. Strigle, Jr., Akron, and Frank D. Moore, Tallmadge, both of Ohio, assignors to Norton Company, Worcester, Mass.

Filed Feb. 12, 1975, Ser. No. 549,315
Term of patent 14 years
Int. Cl. D25—01

U.S. Cl. D25—91

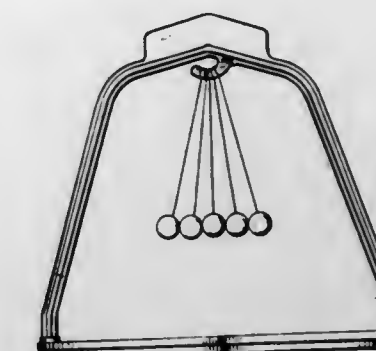


246,002
APPARATUS FOR PLAYING A GAME

Dieter Hahne, Munich; Jürgen Stöhr, Echting, and Hans-R. Ulrich, Wuppertal, all of Germany, assignors to Anjar, Inc., New York, N.Y.

Filed Oct. 2, 1975, Ser. No. 619,013
Term of patent 14 years
Int. Cl. D21—01

U.S. Cl. D34—5 BB



246,003
GOLF CLUB

Asao Shimada, 1021, Niihori, Hidaka-cho, Iruma, Saitama, Japan

Filed Jan. 2, 1976, Ser. No. 646,034
Term of patent 14 years
Int. Cl. D21—02

U.S. Cl. D34—5 GS

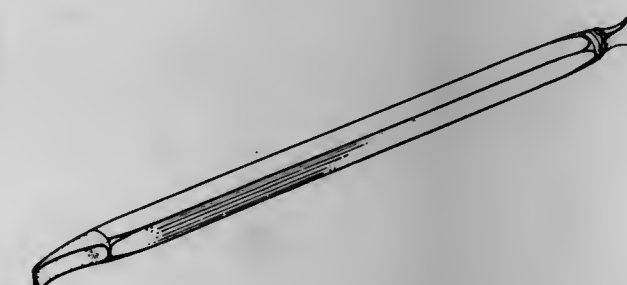


246,000
MANICURING IMPLEMENT

George J. Yacos, 1362 E. Bennett, Glendora, Calif. 91740

Filed Dec. 22, 1975, Ser. No. 643,148
Term of patent 14 years
Int. Cl. D28—03

U.S. Cl. D28—57

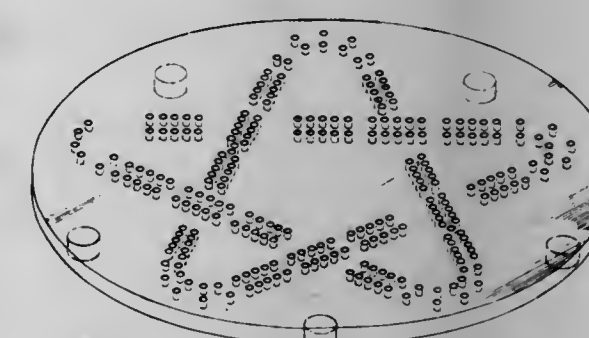


246,001
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Roy W. Montgomery, 7538 31st Ave. NW., Seattle, Wash. 98117

Filed Mar. 26, 1976, Ser. No. 670,634
Term of patent 14 years
Int. Cl. D21—01

U.S. Cl. D34—5 TT

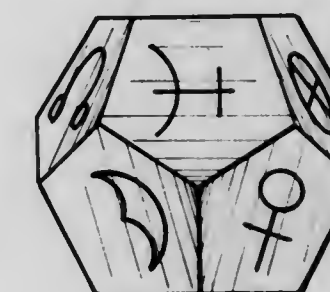


246,004
DODECAHEDRON ASTROLOGICAL DIE

Lois Goff, Santa Cruz, Calif., assignor to Astro-Die, Ltd., Santa Clara, Calif.

Filed Sept. 2, 1975, Ser. No. 609,742
Term of patent 14 years
Int. Cl. D21—01

U.S. Cl. D34—5 DT



246,005

CHILD RECREATION STRUCTURE

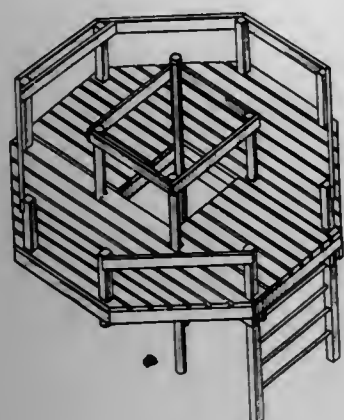
Robert L. Callecod, Long Lake, Minn., assignor to Recreation Systems Co., North Aurora, Ill.

Filed June 4, 1976, Ser. No. 693,112

Term of patent 14 years

Int. Cl. D21-03

U.S. Cl. D34-5 H



246,006

BALL ROLLING GAME STICK

Alvin L. Burr, and Virginia H. Burr, both of P.O. Box 461, Ridgefield, Wash. 98642

Filed Apr. 21, 1976, Ser. No. 678,945

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-5 HP



246,007

SERIAL PRINTER OR SIMILAR ARTICLE

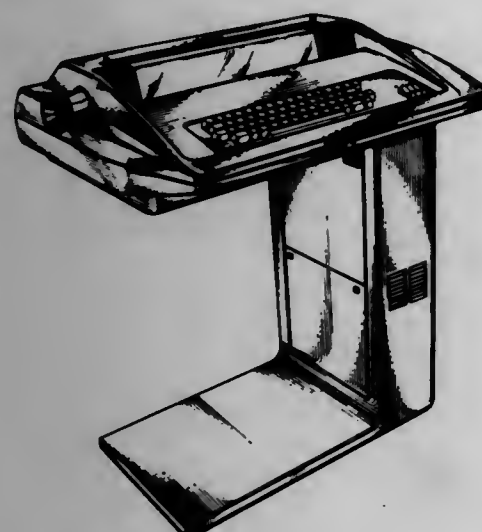
John Warren Carroll, Ames St., Pepperell, Mass. 01463

Filed Apr. 5, 1976, Ser. No. 673,766

Term of patent 14 years

Int. Cl. D18-02

U.S. Cl. D64-11 R



246,008

CANDLE

Masashi Tanikawa, Kameyama, Japan, assignor to Kameyama Candle Co., Ltd., Kameyama, Japan

Filed Nov. 12, 1975, Ser. No. 631,362

Term of patent 14 years

Int. Cl. D26-04

U.S. Cl. D73-1 R



246,009

CANDLE

Masashi Tanikawa, Kameyama, Japan, assignor to Kameyama Candle Co., Ltd., Kameyama, Japan

Filed Nov. 12, 1975, Ser. No. 631,363

Term of patent 14 years

Int. Cl. D26-04

U.S. Cl. D73-1 R



246,010

CANDLE

Masashi Tanikawa, Kameyama, Japan, assignor to Kameyama Candle Co., Ltd., Kameyama, Japan

Filed Nov. 12, 1975, Ser. No. 631,389

Term of patent 14 years

Int. Cl. D26-04

U.S. Cl. D73-1 R



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF OCTOBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. E. Staley Manufacturing Company: See—
Verbanac, Frank, 4,052,226, Cl. 127-29.000.
- A. J. Sackett & Sons Company, The: See—
Sackett, Walter James, Sr., 4,051,948, Cl. 198-550.000.
- A. P. Products Incorporated: See—
Tengler, John N.; Mesaros, Stephen A.; and Venaleck, John T., 4,052,117, Cl. 339-17.0CF.
- A-T-O Inc.: See—
Carter, Sidney T., 4,052,050, Cl. 271-18.300.
- Aaron, Gabrielle Leonie, to Anciens Etablissements Rene Aaron.
Diaper panties for babies. 4,051,854, Cl. 128-284.000.
- AB Casco: See—
Ohm, Gosta Arvid Valdemar, 4,051,635, Cl. 51-108.00R.
- Abbott Laboratories: See—
Herrin, Thomas Raymond; and Fairgrieve, John Scott, 4,052,439, Cl. 560-129.000.
- Abe, Iwao: See—
Sakakibara, Kouzou; Abe, Iwao; Yokoyama, Takushi; and Matuokadeclare, Kazuyuki, 4,052,462, Cl. 260-604.00R.
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- ACS Industries, Inc.: See—
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- Agency of Industrial Science & Technology: See—
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- Moll, Franz; and Rosenhahn, Lothar, 4,052,215, Cl. 96-84.00R.
- Sobel, Johannes; Klein, Alfons; Nittel, Fritz; and Wedemeyer, Karlfried, 4,052,216, Cl. 96-84.00V.
- Aiba, Masahiko: See—
Fujimoto, Isao; Kasubuchi, Takeshi; Aiba, Masahiko; and Shimazawa, Yoichi, 4,051,945, Cl. 197-176.000.
- Airco, Inc.: See—
Phillips, Wayne E.; and Scheuermann, Glen R., 4,051,695, Cl. 64-8.000.
- Aisin Seiki Kabushiki Kaisha: See—
Fukumoto, Ryoichi; and Igarashi, Toshiro, 4,051,632, Cl. 49-348.000.
- Aizenberg, Sergei Arnoldovich: See—
Baburin, Sergei Vyacheslavovich; Akimov, Vasily Ivanovich; Gorbushin, Vladimir Alexandrovich; Muraviev, Alexandr Petrovich; Nepein, Valery Nikolaevich; Frolov, Mikhail Vladimirovich; Aizenberg, Sergei Arnoldovich; Golovko, Evgeny Mikhailovich; Kamenev, Alexandr Fedorovich; and Sergeev, Igor Alexandrovich, 4,051,576, Cl. 19-156.000.
- Akimov, Vasily Ivanovich: See—
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Enger, Lars Sivert, 4,051,694, Cl. 62-490.000.
- Schwartz, Osten; and Vukotic, Milos, 4,051,727, Cl. 73-306.000.
- Aktiebolaget Tudor: See—
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- A.G. fur industrielle Elektronik AGIE Losone b. Locarno: See—
Pedinghaus, Gunther; Neumann, Harry; and Wittenstein, Horst, 4,051,747, Cl. 76-107.00R.
- Akulov, Evgeny Alexandrovich: See—
Borisov, Vasily Nikolaevich; Akulov, Evgeny Alexandrovich; and Solovoi, Alexei Ivanovich, 4,052,518, Cl. 426-482.000.
- Akzona, Incorporated: See—
Roskott, Lodewijk; and Schroeder, Arnold, 4,052,465, Cl. 260-610.00R.
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Griset, Ernest, Jr., 4,051,660, Cl. 57-140.0BY.
- Aladdin Industries, Incorporated: See—
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- Albers, Teunis. Locking stanchion for cattle. 4,051,813, Cl. 119-148.000.
- Alexa, Miloslav: See—
Reicht, Vaclav; Smalek, Josef; Pedlik, Miroslav; and Alexa, Miloslav, 4,052,151, Cl. 432-115.000.
- Allied Chemical Corporation: See—
Figiel, Francis J., 4,052,328, Cl. 252-171.000.
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- Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,052,470, Cl. 260-653.700.
- Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,052,468, Cl. 260-648.00F.
- Polk, Donald E.; Ray, Ranjan; and Davis, Lance A., 4,052,201, Cl. 75-124.000.
- Alps Electric Co., Ltd.: See—
Suzuki, Takeo; Inoue, Ikutaro; Tamai, Hideo; and Aoki, Masat-sugu, 4,051,942, Cl. 197-49.000.
- Aluminium Pechiney: See—
Sala, Jean-Marie, 4,052,288, Cl. 204-243.00R.
- Alza Corporation: See—
Dickson, Thomas David, Jr., 4,052,019, Cl. 242-47.000.
- Higuchi, Takeru; and Hussain, Anwar, 4,052,505, Cl. 424-14.000.
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- Amann, Charles A., to General Motors Corporation. Exhaust back pressure control. 4,051,821, Cl. 123-97.00B.
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Waldrum, John E., 4,051,805, Cl. 118-58.000.
- American Cyanamid Company: See—
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- Schrider, Michael Stanley; and Levy, Stephen David, 4,052,381, Cl. 260-206.000.
- Susi, Peter Vincent; and Oppelt, John Christian, 4,052,361, Cl. 260-45.80N.
- American Optical Corporation: See—
Chang, Lee; and Verburg, John A., 4,052,520, Cl. 427-164.000.
- AMF Incorporated: See—
Arthur, Ronald H., 4,052,579, Cl. 200-159.00A.
- Stanish, Ronald J., 4,052,580, Cl. 200-159.00R.
- Uhlinger, Charles E.; and Splittstoesser, Clair D., 4,051,648, Cl. 56-255.000.
- AMP Incorporated: See—
Scheingold, William Samuel; and Youngfleish, Frank Christian, 4,052,118, Cl. 339-17.0CF.
- Ampex Corporation: See—
Coleman, Charles Hubert, Jr., 4,052,740, Cl. 360-30.000.
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Aaron, Gabrielle Leonie, 4,051,854, Cl. 128-284.000.
- Anderl, Richard F.; and Tienor, Lawrence J., to National Presto Industries, Inc. Electric appliance with intermittently staked sheathed heating element. 4,052,590, Cl. 219-438.000.
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- Andersen, Hans Skov, to Danfoss A/S. Control device for a hydraulically operated consumer. 4,051,868, Cl. 137-596.130.
- Anderson, Clifford: See—
Mason, Leonard; and Anderson, Clifford, 4,051,696, Cl. 64-23.000.
- Anderson, Joseph W., to Corning Glass Works. Contouring glass seal edge. 4,052,184, Cl. 65-102.000.
- Anderson, Paul S.; Christy, Marcia E.; and Ponticello, Gerald S., to Merck & Co., Inc. Heterocyclic dihydroanthracene imines. 4,052,508, Cl. 424-258.000.
- Anderson, Robert L.: See—
McDermott, James A.; Anderson, Robert L.; and Loomans, Maurice E., 4,052,515, Cl. 424-343.000.

Anderson, Walter F., to Diamond International Corporation. Pump sprayer. 4,051,983, Cl. 222-321.000.

Andrews, Richard A.; and Noakes, Thomas E., to H. O. Trerice Co. Condition responsive indicating instrument. 4,051,730, Cl. 73-416.000.

Andrieu, Paul W.; and Carter, Ronald A., to Western Electric Co. Die stem heating. 4,051,705, Cl. 72-60.000.

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Anzai, Masayasu, to Hitachi, Ltd. Electrophotography. 4,052,206, Cl. 96-1.00R.

Aoki, Masatsugu. See—
Sazuki, Takeo; Inoue, Ikutaro; Tamai, Hideo; and Aoki, Masatsugu, 4,051,942, Cl. 197-49.000.

Aoyagi, Takaaki. See—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,052,449, Cl. 260-519.000.

Appley, Paul E.; Houck, Stanley J.; and Nash, Richard B., to Good-year Tire & Rubber Company, The. Closed torus tire. 4,052,237, Cl. 154-117.000.

Applied Power Inc.: See—
Peterson, Harold Severin, 4,051,881, Cl. 144-288.00A.

Applied Research & Development Company: See—
Rogers, Joe M., 4,051,918, Cl. 181-119.000.

Arai, Hajime; and Ohnuma, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid pressure control system for a hydraulic transmission with a lock-up clutch. 4,051,932, Cl. 192-3.300.

Arai, Yasuyuki. See—
Yamada, Tatsunori; Mori, Shigeru; Kato, Kaoru; Arai, Yasuyuki; and Sakitani, Katumi, 4,051,888, Cl. 165-1.000.

Araki, Kenji. See—
Nakaoka, Kazuhide; Araki, Kenji; Takada, Yoshikazu; Osaka, Shinobu; and Hirogami, Katsuhiko, 4,052,235, Cl. 148-156.000.

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Arizona Chemical Company: See—
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Armstrong, Leonard J.: See—
Kenny, Shaun J.; and Armstrong, Leonard J., 4,052,035, Cl. 251-14.000.

Arn, Robert M., to Hayden/Arn Productions Limited. Operating switch and retainer for digital watch cases. 4,051,665, Cl. 58-50.00R.

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Arthur, Ronald H., to AMF Incorporated. Momentary contact switch having pivoting actuator mounted on switch base. 4,052,579, Cl. 204-159.00A.

Arvanitakis, Kostas Savas. Method and apparatus for clarifying liquids by straining. 4,052,305, Cl. 210-79.000.

Arvin Industries, Inc.: See—
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Asahi Breweries, Ltd.: See—
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Asakura, Hideo. See—
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Ashley, Eugene, to General Electric Company. Liquid propellant weapon system. 4,051,762, Cl. 89-7.000.

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Atwood, John G.; Marshall, Hamilton W., Jr.; and Heinz, Peter H., to Perkins-Elmer Corporation, The. Kinetic analyzer. 4,052,161, Cl. 23-230.00R.

Andet, Francois. Bowel movement energizer system. 4,051,560, Cl. 4-1.000.

Androphonics Corporation: See—
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Ohmeis, Peter M.; Gehring, Robert L.; and Hahn, Roger A., 4,051,878, Cl. 141-82.000.

Ayers, Herbert D. Toothbrush. 4,051,571, Cl. 15-167.00R.

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Bachass, Arjun S.: See—
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Goad, Bobby F., 4,051,894, Cl. 166-73.000.

Baker, Thomas G.; and Shute, Raymond J., to Stepan Chemical Company. Process for the production of commercial alpha olefin sulfonates. 4,052,431, Cl. 260-513.00T.

Baker, William J.; and Galloup, Clifford L., to Gardner-Denver Company. Conductor wrapping bit. 4,051,875, Cl. 140-124.000.

Bale, Richard W., to General Electric Company. Methods for setting insulators and pressing end turns. 4,051,595, Cl. 29-596.000.

Balistreri, Thomas W.: See—
Manshot, James G.; Mather, Byron L.; and Balistreri, Thomas W., 4,051,578, Cl. 251-4.000.

Balkcom, Robby P., to Lawrence Peska Assoc., Inc., a part interest. Break down game racket. 4,052,060, Cl. 273-73.00R.

Balogh, Gyula: See—
Szantay, Csaba; Vedres, Andras; Thuranszky, Karoly; Balogh, Gyula; and Vedres nee Kozma, Maria, 4,052,403, Cl. 260-288.0CF.

Banker, William W., to General Signal Corporation. Fluid pressure brake system with electronically assisted application and release. 4,052,110, Cl. 303-36.000.

Banyaszati Kutato Intezet: See—
Meckl, Ferenc; and Piuk, Peter, 4,051,718, Cl. 73-71.200.

Bao, Frank W.; Hummendorf, James L.; and Parker, Stephen D., to Actus, Inc. Friction measuring and testing method and apparatus. 4,051,713, Cl. 73-9.000.

Barber, John A.; Dion, C. Norman; and James, Richard N., to Dyan Corporation. Flexible recording disk with improved spindle mounting means. 4,052,750, Cl. 360-135.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: See—
Burov, Burghard, 4,052,498, Cl. 264-261.000.

Lorenz, Hellmut; and Bunker, Heino, 4,051,655, Cl. 57-77.400.

Wahlen, Antonius; and Otten, Klaus-Detlef, 4,051,651, Cl. 57-35.000.

Barnes, Carl Kenneth; and Barnes, John Owen, to Jack Barnes Engi-

neering, Inc. Machine for printing measuring tapes. 4,051,774, Cl. 101-37.000.

Barnes, John Owen: See—
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Barrington, Clive Seymour, to Rolls-Royce (1971) Limited. Engine useful life measuring device. 4,051,720, Cl. 73-116.000.

Barta, Istvan: See—
Ambros, Gabor; Barta, Istvan; Mehesfalvi, Zsuzsanna, nee Vajna; and Horvath, Gyula, 4,052,407, Cl. 260-302.00R.

Bartling, Gerhard, to SKF Kugellagerfabriken GmbH. Open end spinning machine. 4,051,654, Cl. 57-58.890.

BASF Aktiengesellschaft: See—
Baumann, Hans, 4,052,374, Cl. 260-145.00A.

Dockner, Toni; Wallis, Albrecht; Fikentscher, Rolf; Thomas, Rainer; and Herzog, Reinhard, 4,052,384, Cl. 260-239.00E.

Fuerst, Ernst; Gerendas, Jozsef; Rokohl, Rudolf; Fikentscher, Rolf; and Helfert, Herbert, 4,052,159, Cl. 8-169.000.

Junge, Helmut; and Kurtz, Walter, 4,052,371, Cl. 260-154.000.

Junge, Helmut; and Kurtz, Walter, 4,052,377, Cl. 260-154.000.

Kast, Hellmut; and Dunkelmann, Guenter, 4,052,398, Cl. 260-256.40F.

Krabetz, Richard; Engelbach, Heinz; Lebert, Ulrich; Frey, Walter; Duemgen, Gerd; Thiessen, Fritz; and Willersinn, Carl-Heinz, 4,052,450, Cl. 260-533.00N.

Mayer, Kurt, 4,052,415, Cl. 260-343.400.

Schoenafinger, Eduard; and Leutner, Bernd, 4,052,326, Cl. 252-62.560.

BASF Farben + Fasern AG: See—
Heckl, Leonhard; Liedek, Egon; and Ruff, Wolfgang, 4,052,378, Cl. 260-155.000.

BASF Wyandotte Corporation: See—
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,052,345, Cl. 260-2.5AP.

Bastian, Jean-Michel, to Sandoz Ltd. Benzo cycloheptathiophene carboxylic acid derivatives. 4,052,412, Cl. 260-332.20A.

Battigelli, Jean A.: See—
Leveque, Marcel; and Battigelli, Jean A., 4,052,183, Cl. 65-3.00C.

Batzer, Hans: See—
Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, 4,052,366, Cl. 260-63.00R.

Baum, Walter; and Brendel, Hans Helmut, to USM Corporation. Leather softening machines. 4,051,701, Cl. 69-33.000.

Baum, Werner, to P.E.I. Incorporated. Turbine drill for drilling at great depths. 4,051,909, Cl. 175-93.000.

Baumann, Hans, to BASF Aktiengesellschaft. Unsymmetrical 1:2-chromium complexes containing an azo compound and an azomethine compound. 4,052,374, Cl. 260-145.00A.

Baxter, Denner Dix; and Reeves, Charles Michael, to Martin Marietta Corporation. Walsh function signal scrambler. 4,052,565, Cl. 179-1.50S.

Bayer Aktiengesellschaft: See—
Bein, Hans-Samuel; and Klauke, Erich, 4,052,386, Cl. 260-242.200.

Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, 4,052,409, Cl. 548-341.000.

Dickore, Karlfried; Engels, Hans Dieter; Kratzer, Hans; and Merz, Walter, 4,052,460, Cl. 260-593.00H.

Dieterich, Dieter; and Markus, Peter, 4,052,347, Cl. 260-2.5AK.

Ippen, Jakob; and Stuttgart, Friedel, 4,051,883, Cl. 152-324.000.

Mansmann, Manfred; and Brandel, Karl, 4,052,225, Cl. 106-302.000.

Neukam, Theo; Bentz, Francis; and Nischk, Gunther, 4,052,355, Cl. 260-30.200.

Schliebs, Reinhard; and Block, Hans-Dieter, 4,052,484, Cl. 260-927.00R.

Bayles, Wayne. Conversion kit for an automobile air conditioning unit. 4,051,768, Cl. 98-2.000.

Baylis, Anthony Basil: See—
Slinkard, William Earl; and Baylis, Anthony Basil, 4,052,417, Cl. 260-346.750.

Beal, Philip E. Educational world map game. 4,052,072, Cl. 273-134.0AC.

Beane, David J.; and Kaplan, Ronald M., to United Technologies Corporation. Forging method. 4,051,708, Cl. 72-354.000.

Beatrice Foods Co.: See—
Dian, Walter, 4,051,738, Cl. 74-217.00B.

Becker, August: See—
Namy, Gerald; Becker, August; and Trappe, Klaus, 4,052,196, Cl. 75-25.000.

Becker, Frederick R., III, to Metropolitan Wire Corporation. Bussing cart. 4,052,081, Cl. 280-79.300.

Beer, Henri Bernard, to Diamond Shamrock Technologies, S.A. Method of making an electrode having a coating containing a platinum metal oxide thereon. 4,052,271, Cl. 204-38.00A.

Behn, Rudolf: See—
Hoppe, Lutz; and Behn, Rudolf, 4,052,259, Cl. 162-164.0EP.

Behrens, Robert Nick, to Deere & Company. Neutral start and park brake safety interlock circuitry for a tractor. 4,051,915, Cl. 180-82.00A.

Behun, Eugene, to Xerox Corporation. Oil wetted fuser roll stripping apparatus. 4,052,150, Cl. 432-60.000.

Bein, Hans-Samuel; and Klauke, Erich, to Bayer Aktiengesellschaft. Reactive phthalocyanine dyestuffs containing a fluoropyrimidinyl group. 4,052,386, Cl. 260-242.200.

Beiter, Charles B.; and Hafner, Lee A., to M & T Chemicals Inc. Aqueous antifouling coating composition comprised of emulsified

water-insoluble polymer and triphenyltin derivative. 4,052,354, Cl. 260-29.60M.

Bell, Rex R.; and Sandstrom, John W., to Integral Corporation. Cable insulation stripping apparatus. 4,051,749, Cl. 81-9.510.

Bell Telephone Laboratories, Incorporated: See—
DeNigris, Ernest Gerard; and Tutko, Albert John, 4,052,688, Cl. 337-213.000.

Plewes, John Travis, 4,052,204, Cl. 75-154.000.

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Bender, Malcolm F.: See—
Harakas, Nicholas K.; Fulton, Kent H.; Tierney, Paul A.; and Bender, Malcolm F., 4,052,524, Cl. 428-383.000.

Bencke, Jene A.; Otsuka, Tsuruo; Otsuka, Steven R.; and Sarkisian, Samuel G., to Verson Allsteel Press Company. Low inertia clutch and brake system. 4,051,933, Cl. 192-18.00A.

Bengtson, Torsten R.; and Haselbeck, Joseph, to International Servisport Corporation Ltd. Eye protectors. 4,051,557, Cl. 2-430.000.

Benimetzki, Eliezer. Power transmission collar. 4,052,078, Cl. 279-93.000.

Bentz, Francis: See—
Neukam, Theo; Bentz, Francis; and Nischk, Gunther, 4,052,355, Cl. 260-30.200.

Berardinelli, Frank M.; and Edelman, Robert, to Celanese Corporation. Reinforced flame retardant polyester composition having non-drip characteristics. 4,052,360, Cl. 260-40.00R.

Berenbaum, Morris B.: See—
Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,052,470, Cl. 260-653.700.

Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,052,468, Cl. 260-648.00F.

Berge, Trygve. Mat conveyor. 4,051,565, Cl. 5-81.00B.

Bergen, Gary Richard, to Emhart Industries, Inc. Latch operating device including operating and latch connection improvements. 4,052,092, Cl. 292-172.000.

Berger, Irvin E. Quick release child's bicycle seat. 4,051,985, Cl. 224-32.00A.

Berger, Leo Joseph, Jr.; and Guequierre, Denis D., to Finite Filter Company. Composite coalescing filter tube. 4,052,316, Cl. 210-315.000.

Berggrin, Guntis Erikovich: See—
Giller, Solomon Aronovich; Venter, Karl Karlovich; Trushule, Margarita Aldonovna; Berggrin, Guntis Erikovich; Brinkmanis, Robert Avgustovich; Mikstais, Uldis Yanovich; and Stankevich, Paul Alexandrovich, 4,052,419, Cl. 260-347.400.

Bergstein Packaging Trust: See—
Bergstein, Robert M., 4,051,992, Cl. 229-21.000.

Bergstein, Robert M., to Bergstein Packaging Trust. Cylindrical display container formed from a flat blank. 4,051,992, Cl. 229-21.000.

Berkshire Leather Corporation: See—
Widdemer, John D., 4,051,552, Cl. 2-161.00A.

Berliner, Julius F. T., to Burnishine Products Inc. Sustained-release plant food. 4,052,190, Cl. 71-11.000.

Berly, Marcel, to H. Ernault-Somua. Machine tools. 4,051,750, Cl. 82-2.00R.

Bernard, Vincent E.: See—
Everman, Wayne F.; and Bernard, Vincent E., 4,051,753, Cl. 83-29.000.

Berndt, Willi: See—
Simnovec, Andre; Wiebe, Martin; and Berndt, Willi, 4,052,652, Cl. 318-476.000.

Berner, Klaus: See—
Rheinlander, Paul; Mahn, Gustav; Schulz, Klaus, deceased; Ruhland, Ingrid, legal representative; and Berner, Klaus, 4,052,043, Cl. 266-207.000.

Berry Metal Company: See—
Rymarchyk, Nicholas M., Jr., 4,052,005, Cl. 239-132.300.

Bertholet, Raymond: See—
Finot, Paul-Andre; Hirsbrunner, Pierre; and Bertholet, Raymond, 4,052,372, Cl. 260-112.50R.

Bessette, Richard P. Dual discharge hopper device for bulk cargo vehicles. 4,051,785, Cl. 105-280.000.

Bethlehem Steel Corporation: See—
Aylward, Paul T., 4,052,230, Cl. 148-2.000.

Leprohon, Louis C., Jr.; and Overdurf, John C., Jr., 4,051,661, Cl. 57-148.000.

Whiteley, Roger L.; and Boos, Roger T., 4,052,599, Cl. 364-469.000.

Biehler, Jean Marie: See—
Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, 4,052,487, Cl. 260-945.000.

Biggsby, Floyd W.: See—
Reed, William B.; and Biggsby, Floyd W., 4,051,856, Cl. 130-27.0HF.

Billion S.A.: See—
Momet, Bernard Leon, 4,052,497, Cl. 264-255.000.

Biocel Corporation: See—
Penque, Ronald A., 4,052,009, Cl. 241-1.000.

Biollaz, Michel; and Kalvoda, Jaroslav, to Ciba-Geigy Corporation. 13-Ethynyl-steroids and processes for their manufacture. 4,052,421, Cl. 260-397.500.

Biot, Bernard; and Blanc, Charles, to Rhone-Poulenc-Textile. Device for introducing a yarn into a pneumatic yarn texturizing means. 4,051,581, Cl. 28-272.000.

Bioware, Inc.: See—
Cawley, Leo P., 4,051,752, Cl. 83-5.000.

- Bird Oil Equipment, Ltd.: See—
Jones, Gomer W., 4,051,736, Cl. 74-41.000.
- Birkeland, Stephen P.: See—
Huffman, William A.; Birkeland, Stephen P.; and O'Leary, Kevin P., 4,052,209, Cl. 96-1.50R.
- Bishop, Richard Timothy, to Revertex (South Africa) (Proprietary) Limited. Soil treatment compositions. 4,051,630, Cl. 47-58.000.
- Black, Francis B.: See—
Smith, Kay D.; Bachass, Arjun S.; and Black, Francis B., 4,052,702, Cl. 364-200.000.
- Black, James A.; Farwell, Harry Russell; and Porth, Frank L., to Black, James A. Stencilling apparatus with flow through print and flow action. 4,051,777, Cl. 101-123.000.
- Blackwell, J. Thomas; Gupton, John T.; and Nabors, Jim B., to Ciba-Geigy Corporation. Process for the production of 2-alkyl or 2-cycloalkyl-4-methyl-6-hydroxypyrimidines. 4,052,397, Cl. 260-251.00R.
- Blake, Alan Ronald: See—
Hutt, Peter Richard; Blake, Alan Ronald; von Cavallar, Gunter; Douglas, Brian Neil; and Dadds, Philip John, 4,052,719, Cl. 340-324.0AD.
- Blakelock, Harold Dennis, to Morganite Modmor Limited. Production of carbon fibre. 4,051,659, Cl. 57-140.00R.
- Blanc, Charles: See—
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- Blanchette, Adrien Andre: See—
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- Blanchette, Lionel; and Blanchette, Adrien Andre. Cableless cage elevator. 4,051,923, Cl. 187-25.000.
- Block, Hans-Dieter: See—
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- Blume, John H.; and Bushnell, James D., to Exxon Research and Engineering Company. Method of solvent recovery in autorefrigerant/ke-tone dewaxing processes. 4,052,294, Cl. 208-33.000.
- Burton, Keith F.; and Sedlak, John M., to Energetics Science, Inc. Method for the detection and measurement of nitric oxide, nitrogen dioxide and mixtures thereof. 4,052,268, Cl. 204-1.00T.
- Bognar, Istvan; and Brassel, Peter, to Zellweger, Ltd. Cutting arrangement. 4,051,756, Cl. 83-389.000.
- Bohl, Thomas L.; and Vissdos, Leonard J., to Bailey Meter Company. Fluid sampling system. 4,051,731, Cl. 73-422.00R.
- Bohm, Klaus: See—
Speth, Winfried; Dreiseitl, Walter; Bohm, Klaus; Schleicher, Lothar; and Polster, Herbert, 4,052,642, Cl. 318-561.000.
- Bokeman, Gary N.; Colquhoun, Joseph A.; and Gordon, David J., to Dow Corning Corporation. Radiation-curable mercaptoalkyl vinyl polydiorganosiloxanes; method of coating there with and coated article. 4,052,529, Cl. 428-537.000.
- Boliken Aktiebolag: See—
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- Bom, Cornelis Johannes Gerardus: See—
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- Booij, Harm Marinus Wilhelm: See—
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- Boos, Roger T.: See—
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- Booth, James William, to Arizona Chemical Company. Process for preparing terpene polymer compositions. 4,052,549, Cl. 526-237.000.
- Boothman, David R.; and Elgar, Everett C., to Canadian General Electric Company Limited. Temperature monitoring of semiconductor. 4,052,744, Cl. 361-103.000.
- Boots Company Limited, The: See—
Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 4,052,514, Cl. 424-316.000.
- Boreiko, Stefan, to Rollei-Werke Franke & Heidecke. Electronic flash unit with operational signal. 4,052,644, Cl. 315-151.000.
- Borer, Werner J.; Kugler, Tibor; Schmidt, Walter; and Stahlin, Walter, to Prolienz AG. Heat resistant crucible. 4,052,153, Cl. 432-156.000.
- Borisev, Vasily Nikolaevich; Akulov, Evgeny Alexandrovich; and Solovoi, Alexei Ivanovich. Method for separating seed cover from endosperm of grain of various cereal crops. 4,052,518, Cl. 428-442.000.
- Boston University, The Trustees of: See—
Lichtin, Norman N.; and Wildes, Peter D., 4,052,536, Cl. 429-105.000.
- Botkin, Albert L. Canning closure and method. 4,051,972, Cl. 215-260.000.
- Botkin, Albert L. Canning closure and method. 4,051,973, Cl. 215-260.000.
- Botvin, George B., to ACS Industries, Inc. Method of making a scouring pad or the like. 4,052,238, Cl. 156-148.000.
- Boutne, Alan John; and Walton, Trevor John, to Dunlop Limited. Pneumatic tire containing gel lubricant. 4,051,884, Cl. 152-330.00L.
- Bouns, Inc.: See—
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- Boutshaw, Thomas P. Method of making reusable writing board and the product thereof. 4,051,609, Cl. 35-66.000.
- Bowden, Billy W., to T K Valve & Manufacturing, Inc. Coupling device. 4,052,091, Cl. 285-305.000.
- Bowles Fluidics Corporation: See—
Stouffer, Ronald D.; and Bray, Harry C., Jr., 4,052,002, Cl. 239-4.000.
- Bowyer, John M.: See—
Arnold, John B.; Bowyer, John M.; Hegbar, Howard R.; and Shaefer, Archie B., 4,052,717, Cl. 340-249.000.
- Boyadjieff, George I., to Varco International, Inc. File handling apparatus and methods. 4,051,587, Cl. 29-240.000.
- Boyesen, Eyvind, to Performance Industries, Inc. Engine valving and porting. 4,051,820, Cl. 123-73.00A.
- BP Chemicals Limited: See—
Mockett, Keith Henry George, 4,052,334, Cl. 252-429.00R.
- Bradley, Edward T., to Colorkrome, Inc. Treatment of electrophotographic toner compositions. 4,052,298, Cl. 209-5.000.
- Braid, Milton, to Mobil Oil Corporation. Reaction product of dialkyl alkanephosphonate, substituted imidazoline, and water in lubricant compositions. 4,052,324, Cl. 252-32.500.
- Brand, Wilhelm, to Hermann Berstorff Maschinenbau GmbH. Screw extruder for thermoplastics synthetic materials or elastomers. 4,052,038, Cl. 366-90.000.
- Brandenberger, Stanley G.: See—
McClure, James D.; and Brandenberger, Stanley G., 4,052,475, Cl. 260-672.00T.
- Brandenstein, Manfred: See—
Garrett, Roy Peter; Parkins, Derek Ray; Brandenstein, Manfred; and Olschewski, Armin, 4,051,937, Cl. 192-88.00A.
- Brandle, Karl: See—
Mansmann, Manfred; and Brandle, Karl, 4,052,225, Cl. 106-302.000.
- Brandon, Paul W.: See—
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- Brandt, Henry William, Jr.; and Sorlie, Donald Thomas, to Deere & Company. Structural orientation and protective apparatus for tillage assembly. 4,051,792, Cl. 111-85.000.
- Brassel, Peter: See—
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- Bray, Harry C., Jr.: See—
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- Breda, Antoine Georges Leon Jacques; and Brouard, Claude Marie Henri Emile, to Produits Chimiques Uguine Kuhlmann. Mixed chromiferous complex derived from two different aryl-azo-pyrazolone dyestuff. 4,052,376, Cl. 260-145.00B.
- Breit, Paul. Apparatus utilizing deep ocean nutrients. 4,051,810, Cl. 119-3.000.
- Breitenfellner, Franz; and Hrach, Josef, to Ciba-Geigy Corporation. Molding compounds based on polybutylene terephthalate. 4,052,356, Cl. 260-40.00R.
- Bremer, Noel J.: See—
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- Brendel, Hans Helmut: See—
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- Brennan, Michael Patrick Joseph: See—
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- Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Oxopyridazinylthiomethyl derivatives of ureidocephalosporins. 4,052,554, Cl. 544-26.000.
- Brewer, John A. Jet engine with compressor driven by a ram air turbine. 4,051,671, Cl. 60-262.000.
- Bridger, Victor Ernest: See—
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- Briles, Franklin S. Expanding head riveting method. 4,051,592, Cl. 29-509.000.
- Brinkmanis, Robert Avgustovich: See—
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- Brinkmann, Albert: See—
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- Briody, Robert G., to PPG Industries, Inc. Process for preparing aqueous slurries of tabular habit diperisophthalic acid. 4,052,443, Cl. 260-502.00R.
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- British Petroleum Company Limited, The: See—
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- Ells, John William; and Parker, Ian David, 4,051,688, Cl. 61-110.000.
- Brock, Michael; and Cooke, Brian Alfred, to Imperial Chemical Industries Limited. Phosphating process. 4,052,232, Cl. 148-6.15Z.
- Broken Hill Associated Smelters Proprietary Limited, The: See—
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- Brooks, John Langshaw; Eaton, David Crawford; and Williams, Barry, to Imperial Chemical Industries Limited. 2-Amino-4-chloro-6-(2'-hydroxy-phenoxy)-s-triazine. 4,052,392, Cl. 544-211.000.
- Broome, Larkey Wilburn. Tape cassette holder for vehicular use. 4,052,113, Cl. 312-11.000.

- Brother Industries, Ltd.: See—
Hanazono, Masami; Hishida, Yukio; Nakai, Toshio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, 4,051,943, Cl. 197-151.000.
- Brotzmann, Karl; Knuppel, Helmut; Rheinlander, Paul; and Mahn, Gustav, to Stahlwerke Peine-Salzgitter AG. Process for making steel from pig iron. 4,052,197, Cl. 75-60.000.
- Brouard, Claude Marie Henri Emile: See—
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- Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, to May & Baker Limited. Azapurinones. 4,052,390, Cl. 544-118.000.
- Brown, Harry W., to Cutler-Hammer, Inc. Pressure switch with snap-toggle adjusting means. 4,052,574, Cl. 200-83.00P.
- Brown, Kenneth G. Means for outside vending. 4,051,938, Cl. 194-1.00K.
- Brown, Michael Trevenen; and Rodway, William George, to Imperial Chemical Industries Limited. Finely divided, irradiated tetrafluoroethylene polymers. 4,052,278, Cl. 204-159.200.
- Bruce, Roger K.; and Marhold, Werner, to Sterigard Corporation. Face sealing valve applicator. 4,052,249, Cl. 156-513.000.
- Brunner, Alfred, to Sulzer Brothers Limited. Water-jet electrode steam generator and electrode therefor. 4,052,586, Cl. 219-284.000.
- Brunner, Josef Klemens. Separation of acids and esters in the processing of waste salt solution of cyclohexanone manufacture. 4,052,441, Cl. 560-179.000.
- Brunner, Russell K.: See—
Johnson, James L.; and Brunner, Russell K., 4,051,735, Cl. 74-25.000.
- Brunnett, Carl J., to Picker Corporation. Method and apparatus for improved radiation detection in radiation scanning systems. 4,052,620, Cl. 250-445.00T.
- Brunswick Corporation: See—
Russell, Owen Clarkson, 4,051,802, Cl. 115-17.000.
- Woodfill, William L.; and Ginnow, Edward F., 4,051,801, Cl. 115-12.00R.
- Buccicone, Dario, to Bucciconi Engineering Co., Inc. Magnetic conveyor. 4,051,946, Cl. 198-477.000.
- Bucciconi Engineering Co., Inc.: See—
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- Buckeck, David J.: See—
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- Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, to Bayer Aktiengesellschaft. Disubstituted triphenylmethylimidazoles. 4,052,409, Cl. 548-341.000.
- Buckeye International, Inc.: See—
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- Bunker Ramo Corporation: See—
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- Burkhart, Merle Keith; White, Bruce Lynn; Goossen, La Vern Roy; White, Allen Andrew; and Voth, Harold William, to Hesston Corporation. Combination stack mover and processor. 4,052,011, Cl. 241-30.000.
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- Burnishine Products Inc.: See—
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- C. G. Doris: See—
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- Caliri, Frank, to Peerless Industries Inc. Model railroad layout. 4,051,783, Cl. 104-151.000.
- Calvo, Fernando, to Fabrica de Productos Quimicos y Farmaceuticos Abello, S.A. Process for synthesizing codeine from thebaine. 4,052,402, Cl. 260-285.000.
- Cameron, George L. Motor speed control circuit with overload protection. 4,052,625, Cl. 307-252.00K.
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- Capurka, Zbynek Antonin; and Rumble, Ronald William, to Motorola, Inc. Selective threshold ignition circuit. 4,051,827, Cl. 123-148.00E.
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- Cardozo, Louis. Saw guide device. 4,051,597, Cl. 30-373.000.
- Cardwell, William Richard; and Queener, Carl Alan, to International Business Machines Corporation. Sequential load dual document feed. 4,052,054, Cl. 271-227.000.
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- Carroll Company, The: See—
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- Carpenter, John B., Jr., to Burlington Industries, Inc. Liquid ammonia mercerization. 4,051,699, Cl. 68-5.00D.
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- Carter, Cecil O.: See—
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- Carter, Sidney T., to A-T-O Inc. Rotary vacuum picker with mechanical assist. 4,052,050, Cl. 271-18.300.
- Casavant, Roger M., to Product Explorations Incorporated. Combination racket press and cover. 4,052,062, Cl. 273-74.000.
- Case, John Reginald; and Moore, Geoffrey James, to Imperial Chemical Industries Limited. Manufacture of 1,1'-dialkyl-4,4'-bipyridylium salts. 4,052,405, Cl. 260-294.80R.
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- Cassar, Luigi: See—
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- Castoldi, Alex J., Jr., to International Recreational Industries, Inc. Popcorn package for two users. 4,051,993, Cl. 229-22.000.
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- Cawley, Leo P., to Bioware, Inc. Process for gel cutting. 4,051,752, Cl. 83-5.000.
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- Hughes, Oscar Richard, 4,052,401, Cl. 260-340.700.
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- Cerberus AG: See—
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- Chang, I-Cheng, to Itek Corporation. Noncollinear tunable acousto-optic filter. 4,052,121, Cl. 350-149.000.
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- Chappelear, Robert N.: See—
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- Charles F. Kettering Foundation: See—
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- Charles Stark Draper Laboratory, Inc., The: See—
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- Charon, Clarence W.: See—
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- Chen, Henry T. Method and apparatus for making fiber reinforced tape. 4,052,239, Cl. 156-177.000.
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- Child, Edward T.; Schlinger, Warren G.; and Richter, George N., to Texaco Inc. Production of purified synthesis gas H₂-rich gas, and by-product CO₂-rich gas. 4,052,176, Cl. 55-32.000.
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- Chiulli, Robert D., to Medico Developments, Inc. Telescoping neurosurgical scalp retractor. 4,051,844, Cl. 128-20.000.
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Tingelers, Hubertus H.; and Chlod, Martinus P., 4,051,986, Cl. 226-114.000.
- Chloride Group Limited: See—
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- Chloride Silent Power Limited: See—
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- Cho, Boong Youn, to Industrial Nucleonics Corporation. Spherical cavity method and apparatus for measuring a sheet material property using infrared radiation. 4,052,615, Cl. 250-341.000.
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- Christina, Yari; Mauz, Otto; and Prinz, Eberhard, to Nobel Hoechst Chemie; and Hoechst Aktiengesellschaft. Bis(hydroxy-di-tert-butyl-phenyl)-alkanoic acid esters. 4,052,364, Cl. 260-45.85B.
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- Christy, Marcia E.: See—
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- Cincinnati Milacron, Inc.: See—
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- Gruber, Paul, 4,051,830, Cl. 125-11.00R.
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- Clark, Wallace. Two way earth boring fluid motor. 4,051,910, Cl. 175-103.000.
- Clark, William Eugene, to Federal-Mogul Corporation. Method for manufacturing bidirectional hydrodynamic polytetrafluoroethylene seals. 4,052,502, Cl. 264-293.000.
- Clarke, John Robin Paul, to Imperial Chemical Industries Limited. Monitoring device. 4,052,162, Cl. 23-253.00R.
- Clarke, Joseph A., Jr. Cushioned liner for a bath tub. 4,051,563, Cl. 4-173.00R.
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- Clement, Jean-Claude: See—
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- Coberley, Lavan E. Fluid injection apparatus for internal combustion engine. 4,051,815, Cl. 123-25.00A.
- Cocking, Glyn; and Jones, John Owen, to Saunders Valve Company Limited. Fluid flow control valves. 4,051,865, Cl. 137-556.000.
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- Collins, Robert F., to Kendall Company, The. Drape assembly with pouch and method. 4,051,845, Cl. 128-132.00D.
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- Container Corporation of America: See—
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- Cotton, Larry G., to Iowa Mold Tooling Co., Inc. Tire manipulating apparatus. 4,051,966, Cl. 214-332.000.
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- Crittenden, Bernard R., to Woodward Governor Company. Digital-analog frequency error signaling. 4,052,676, Cl. 328-134.000.
- Crookshank, Fred T., to Texaco Inc. Corrosion-inhibited grease compositions. 4,052,322, Cl. 252-18.000.
- CRYO-MAID Inc.: See—
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- Cunningham, Francis V., to Joslyn Mfg. and Supply Co. Spark gap for achieving arc elongation and compression without the use of supplementary magnetic means. 4,052,639, Cl. 313-325.000.
- Cunningham, Virginia L., to Rohm and Haas Company. Crosslinked, macroreticular poly(dimethylaminoethyl methacrylate) ion-exchange resins and method of preparation by aqueous suspension polymerization using trialkylamine phase extender. 4,052,343, Cl. 260-2.10E.
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- Damron, Wilbur T. Safety toe shield. 4,051,612, Cl. 36-72.00R.
- Danfoss A/S: See—
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- Gramkow, Asger, 4,052,650, Cl. 318-221.00H.
- D'Angelo, Antonio Joseph: See—
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- Daprich, Douglas J.: See—
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- Darr, Russell C.: See—
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- Daubert, Richard Francis, Jr.: See—
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- d'Auria, Luigi: See—
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- Davenport, Stanley; and Villari, Frank K., to Kendall Company, The. Chin strap for protective headgear. 4,051,556, Cl. 2-421.000.
- Davies, William Martin: See—
Pennell, Anthony Robin; Dover, Peter Leslie; and Davies, William Martin, 4,052,148, Cl. 432-1.000.
- Davila, Jose E.: See—
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- Davis, Lance A.: See—
Polk, Donald E.; Ray, Ranjan; and Davis, Lance A., 4,052,201, Cl. 75-124.000.
- Davis, Loren Roger, to Bourns, Inc. Mark reader with improved mark sensing heads. 4,052,594, Cl. 235-61.11E.
- Dawkins, Claude W. Air conditioning apparatus. 4,051,691, Cl. 62-236.000.
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- Decatur Electronics, Inc.: See—
Millard, Keith, 4,052,722, Cl. 343-8.000.
- Decca Limited: See—
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- Deere & Company: See—
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- Brandt, Henry William, Jr.; and Sortie, Donald Thomas, 4,051,792, Cl. 111-85.000.
- Deguchi, Hidetaka; Wada, Hajime; Endo, Takaya; Kikuchi, Shoji; and Hori, Haruo, to Konishiroku Photo Industry Co., Ltd. Photographic silver halide emulsion containing 2-equivalent cyan coupler. 4,052,212, Cl. 96-56.200.
- De Kok, Johannes, to U.S. Philips Corporation. High-pressure gas discharge lamp and electron emissive electrode structure therefor. 4,052,634, Cl. 313-184.000.
- Delo, William A.; and Nielsen, Raymond J., to 4 - Share, Inc. Parts washer. 4,052,227, Cl. 134-56.00R.
- DeLoach, Guessman L.; and Foster, Phillip H. Automatic animal feeding apparatus. 4,051,812, Cl. 119-51.110.
- DeLong, David C. Stadium riser individual seat, support and armrest with common seat-row backrest. 4,052,101, Cl. 297-243.000.
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- DeNigra, Ernest Gerard; and Tutko, Albert John, to Bell Telephone Laboratories, Incorporated; and Western Electric Company, Inc. Fuse clip assembly. 4,052,688, Cl. 337-213.000.
- Denton, Roy V.: See—
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- Derenbocher, William Joseph, Jr., to RCA Corporation. PAL four-frame subcarrier phase detector. 4,052,733, Cl. 358-10.000.
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- De Ronde, Frans Christiaan: See—
van Heuven, Johannes Hendrik Cornelis; and De Ronde, Frans Christiaan, 4,052,683, Cl. 333-21.00R.
- de Ruggeri, Pietro; and Signinolfi, Orazio, to Farmilla Farmaceutici Milano S.p.A. Tetrahydropyranil ethers of estrogens. 4,052,352, Cl. 260-239.55R.
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- Detonancourt, Maurice J., to Owens-Corning Fiberglass Corporation. Weft yarn carrier. 4,051,873, Cl. 139-440.000.
- Detroit Gasket and Manufacturing Company: See—
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- Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: See—
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- Deutsche Texaco Aktiengesellschaft: See—
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- Devitt, John L., to General Battery Corporation. Battery vent plug. 4,052,334, Cl. 429-86.000.
- DeWeese, Richard L.: See—
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- Diamond International Corporation: See—
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- Diamond Power Specialty Corporation: See—
Wesler, Norman Dean, 4,052,089, Cl. 285-47.000.
- Diamond Shamrock Corporation: See—
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- Diamond Shamrock Technologies, S.A.: See—
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- Dian, Walter, to Beatrice Foods Co. Single point resilient and adjustable mount for derrailer. 4,051,738, Cl. 74-217.00B.
- Diana, Guy D., to Sterling Drug Inc. 1-Phenyl-3-azacarbocyclic-ureas. 4,052,382, Cl. 260-239.0BE.
- Diassi, Patrick A.: See—
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- Dibelius, Gunter: See—
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- Dickey-John Corporation: See—
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- Dickore, Karlfried; Engels, Hans Dieter; Kratzer, Hans; and Merz, Walter, to Bayer Aktiengesellschaft. Production of 3,3-dimethyl-2-oxo-butyric acid salt. 4,052,460, Cl. 260-593.00H.
- Dickson, Thomas David, Jr., to Alza Corporation. Apparatus and method for winding elastomeric fiber. 4,052,019, Cl. 242-47.000.
- Dietrich, Dieter; and Markusch, Peter, to Bayer Aktiengesellschaft. Inorganic-organic compositions. 4,052,347, Cl. 260-2.5AK.
- Diggs, Richard E. High capacity loader blade. 4,051,614, Cl. 37-117.500.
- Dijkstra, Hendrik Tjalling: See—
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- Dingwall, John Grey: See—
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- Dion, C. Norman: See—
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- Disagra Industries, Inc.: See—
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- Dits, Herbert: See—
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- Dix, James S.; and Mathis, Ronald D., to Phillips Petroleum Company. Stabilization of olefin polymers. 4,052,351, Cl. 260-23.00H.
- Dixie Yarns, Inc.: See—
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- Dobson, John Vincent, to National Research Development Corporation. Ion selective electrodes. 4,052,285, Cl. 204-195.00G.
- Dockerty, Robert C., executor: See—
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- Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G. Textilmaschinenfabrik u. Stahlbau: See—
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- Dr. Johannes Heidenhain, GmbH: See—
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- Dodds, Philip John: See—
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- Dokoupil, Jiri, to Maschinenfabrik Turner GmbH. Processing of leather. 4,051,700, Cl. 69-33.000.
- Dominick, Ellen K.; and Wexell, Dale R., to Corning Glass Works. Electrically conductive coating in cathode ray tube. 4,052,641, Cl. 313-450.000.
- Donegan, Edward Alfred, to TRW Canada Limited. Extension rods used in percussive drilling. 4,051,906, Cl. 173-131.000.
- Donk, Daniel Lawrence; and Olson, Robert Hutchins, to Mobil Oil Corporation. Bag closure. 4,051,994, Cl. 229-65.000.
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- Dore, James E.: See—
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- Dorph, Thor, to Lie, Bjorn; and Lie, Gina, part interest to each. Automatic line release for spin fishing equipment. 4,051,617, Cl. 43-18.00R.
- Douglas, Brian Neil: See—
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- Douglas, Lawrence M., to Polaroid Corporation. Camera with movable film drive and optical unit. 4,052,729, Cl. 354-86.000.
- Douma, William L.: See—
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- Doust, David John. Method and apparatus for freezing fish. 4,051,690, Cl. 62-64.000.
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- Dow Chemical Company, The: See—
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- Mixan, Craig E.; and Pews, R. Garth, 4,052,394, Cl. 260-250.0BC.
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- Priddy, Duane B., 4,052,464, Cl. 260-610.00C.
- Dow Corning Corporation: See—
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- Marinik, James A., 4,052,357, Cl. 260-37.0SB.
- Uhlmann, John G.; and Colquhoun, Joseph A., 4,052,495, Cl. 264-216.000.
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- Dreiseitl, Walter: See—
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- Driver, W. B. Downhole drilling system. 4,051,908, Cl. 175-78.000.
- Druyvesteyn, Willem Frederik; and Booi, Harm Marinus Wilhelm, to U.S. Philips Corporation. Magnetic device having domains of two different sizes in a single layer. 4,052,707, Cl. 340-174.0TF.
- Duchess Mfg. Corporation: See—
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- Dudheker, Jay; and Isaacson, Charles E., to Lear Siegler, Inc. Atmospheric burner for heating furnaces. 4,052,141, Cl. 431-167.000.
- Duembgen, Gerd: See—
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- Dumoulin, Jean, to Rhone-Poulenc S.A. Surface active composition. 4,052,331, Cl. 252-312.000.
- Duncan, Ernest R. Teaching machine. 4,051,608, Cl. 35-48.00A.
- Dunkelmann, Guenter: See—
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- Dunlop Holdings Limited: See—
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- Goodfellow, Anthony Gerald, 4,052,496, Cl. 264-251.000.
- Dupeuble, Jean-Claude: See—
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- Duplex Products, Inc.: See—
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- Durham, Roger Owen. Audible enrichment bleed warning device for fuel-injected engines. 4,051,829, Cl. 123-198.00D.
- Dynecology Incorporated: See—
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- Dysan Corporation: See—
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- E. D. Bullard Company: See—
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- E. & J. Gallo Winery: See—
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- E M I Limited: See—
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- Cimarusti, Christopher M., 4,052,422, Cl. 260-408.000.
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- Stiller, Eric T.; Levine, Seymour D.; Principe, Pacifico A.; and Diassi, Patrick A., 4,052,436, Cl. 560-52.000.
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- Eastman Kodak Company: See—
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- Hassall, Stephen J. T.; and White, Neil S., 4,052,049, Cl. 270-58.000.
- Hochreiter, William Thomas; and Mindler, Fredric Alton, 4,052,730, Cl. 354-135.000.
- Hopfer, Clemens; and Ort, Wolfgang, 4,052,726, Cl. 354-29.000.
- Jakubowicz, Raymond F., 4,052,320, Cl. 210-516.000.
- Masurekar, Prakash S.; and Goodhue, Charles T., 4,052,263, Cl. 195-66.00R.
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- Eaton, David L.: See—
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- Eaton, Milton. HTW heating system having an electrode steam boiler as the direct source of HTW. 4,052,587, Cl. 219-295.000.
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- Ebert, Edward A. Device for heating thermoplastic eyeglass frames. 4,052,592, Cl. 219-521.000.
- Ebert, Edward A. Electric heating apparatus for heating thermoplastic articles. 4,052,593, Cl. 219-521.000.
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- Eckart, Erich. Safety ski binding. 4,052,086, Cl. 280-618.000.
- Eddy, David S.; and Rhodes, James F., to General Motors Corporation. Method of making sodium beta-alumina powder and sintered articles. 4,052,538, Cl. 429-193.000.
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- Egan, Francis L., Jr., to Colgate-Palmolive Company. Diaper with extensible fastener. 4,051,853, Cl. 128-287.000.
- Egerstrom, Bengt Gunnar Wilhelm; and Sternhoff, Bror Lennart Teodor, to Nitro Nobel AB. Tube feeding device for use in charging shotholes with explosive through a pipe or tube. 4,051,988, Cl. 226-162.000.
- Eggemont, Ludwig Desire Johan, to U.S. Philips Corporation. Interpolating non-recursive digital filter. 4,052,605, Cl. 364-724.000.
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- Eijnhoven, Ronald Karel; and van Kemenade, Johannes Trudo Cornelis, to U.S. Philips Corporation. Method for producing a voltage dependent resistor and a voltage dependent resistor obtained there-with. 4,052,340, Cl. 252-518.000.
- Elchlepp, Dale L.: See—
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- Elder, Hayden O., to Hay-Mar Corporation, The. Engine heater. 4,051,825, Cl. 123-142.50R.
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- Elgar, Everett C.: See—
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- Elliott, James I. Panelized structural system. 4,051,641, Cl. 52-262.000.
- Ellison, John E.; and Flink, Herbert M., to Skinner Precision Industries, Inc. Arrangement for connecting manifold blocks. 4,051,861, Cl. 137-315.000.
- Ells, John William, to British Petroleum Company Limited, The; and Saipem S.p.A. Pipeline laying method. 4,051,687, Cl. 61-110.000.
- Ells, John William; and Parker, Ian David, to British Petroleum Company Limited, The. Offshore structure and method. 4,051,688, Cl. 61-110.000.
- Embre, Hugh D., to Production Specialties, Inc. Positioning tool. 4,051,895, Cl. 166-117.500.
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- Engelbach, Heinz: See—
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- Engels, Hans Dieter: See—
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- Enger, Lars Sivert, to Aktiebolaget Electrolux. Evaporative precooler for an absorption refrigerating apparatus. 4,051,694, Cl. 62-490.000.
- Erdmann, David P.; and Kirschner, Dennis L., to Honeywell Inc. Automatic vehicle monitoring system. 4,052,595, Cl. 235-92.0TC.
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- Erickson, V. Robert. Soft ice cream machine. 4,052,180, Cl. 62-188.000.
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- Eschler, Hans; and Oberbacher, Rudolf, to Siemens Aktiengesellschaft. Techniques for producing an acousto-optical component or a wide-band ultrasonic component. 4,051,582, Cl. 29-25.350.
- Eslien, Dean R.; and Salmick, James, to Ultra Plating Corporation. Methods for manufacturing pellet sizing screen rods. 4,052,270, Cl. 204-25.000.
- Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Production of asphalt cement. 4,052,291, Cl. 208-8.000.
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- Estes, James D., to N L Industries, Inc. Selective firing system. 4,051,907, Cl. 175-4.550.
- Estrada, Otto, to Acevedo, Ignacio. Machine for generating surfaces of various characteristics on workpieces. 4,051,751, Cl. 82-12.000.
- Ethells, Sylvia, to Imperial Chemical Industries Limited. Process for producing conductive fiber. 4,052,493, Cl. 264-49.000.
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- Licke, George C., 4,052,437, Cl. 560-25.000.
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- Eutectic Corporation: See—
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Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkühlungs-Anlagen Kommanditengesellschaft: See—
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Gould Inc.: See—
Iwatsuki, Frank, 4,051,864, Cl. 137-504.000.
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Gourley, Robert Nicholas, to Eastman Kodak Company. Dyes from trifluoromethyl-2-aminobenzothiazole diazo components. 4,052,379, Cl. 260-155.000.
Gow Enterprises Limited: See—
Westerlund, G. Oscar, 4,052,287, Cl. 204-237.000.
Graf, Felix; and Moser, Louis, to Rieter Machine Works, Ltd. Apparatus for applying preparation agents to a bundle of filaments. 4,051,807, Cl. 118-401.000.
Graff, James C.: See—
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Graham-White Sales Corporation: See—
Frantz, Virgil L., 4,052,178, Cl. 55-212.000.
Gramkow, Asger, to Danfoss A/S. Starting device for a single-phase motor. 4,052,650, Cl. 318-221.00H.
Granger, Floyd Randolph; and Granger, Michael Gerard. Environmentally heated and cooled building. 4,051,999, Cl. 237-1.00A.
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Muller, Hans, 4,052,052, Cl. 271-157.000.
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Grass, Henry G., 4,052,006, Cl. 239-168.000.
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Grat, Felix R., to Hacker Instruments, Inc. Apparatus for sharpening blade edges. 4,052,174, Cl. 51-81.0BS.
Gray, Don N.; and Guilbault, George G., to Owens-Illinois, Inc. Solid sensor electrode. 4,052,286, Cl. 204-195.00R.
Green, John Richard: See—
Hauptmann, Edward G.; and Green, John Richard, 4,051,952, Cl. 209-73.000.
Greenwell, Jack E.; and Prokop, Alexander, to Lear Motors Corporation. Hand held variable speed drill motor and control system therefor. 4,052,649, Cl. 318-212.000.
Greenwood, Helen. Scouring mitten. 4,051,572, Cl. 15-227.000.
Gregory, Richard Langton; and Low, Ian Alexander, to National Research Development Corporation. Hearing aid with amplitude compression achieved by clipping a modulated signal. 4,052,571, Cl. 179-107.00R.
Griesemer, Douglas Earl, to RCA Corporation. Cathode-ray tube screening exposure method. 4,052,725, Cl. 354-1.000.
Griffith, Joseph W. Method and apparatus for purifying process waste emissions. 4,052,266, Cl. 201-15.000.
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Griset, Ernest, Jr., to Akzona Incorporated. Yarns and their method of manufacture. 4,051,660, Cl. 57-140.0BY.
Groth, Volker; Stradmann, Adolf; and Pelzel, Erich, to Rheinisches Zinkwerk GmbH & Co. KG. Process for producing sheets and strip of zinc-copper-titanium alloy. 4,051,887, Cl. 164-76.000.
Gruber, Paul, to Cincinnati Milacron, Inc. Wheel dressing apparatus and method. 4,051,830, Cl. 125-11.00R.
Gruenwald, Clifford F., to Snap-On Tools Corporation. Capacitive pickup device for pulsating high voltage measurements. 4,052,665, Cl. 324-54.000.
Grundmann, Edgar, to Volkswagenwerk Aktiengesellschaft. Sound-damping housing. 4,051,917, Cl. 181-200.000.
Grunthaner, Frank J.: See—
United States of America, National Aeronautics and Space Administration; Grunthaner, Frank J.; and Lewis, Blair F., 4,052,614, Cl. 250-310.000.
GTE Sylvania Incorporated: See—
Kimball, Stephen F.; and Gates, Paul E., 4,052,687, Cl. 337-25.000.
Wheeler, Robert Charles, 4,052,735, Cl. 358-28.000.
Gudea, Dumitru, to Triner Scale and Manufacturing Company. Electronic postage scale. 4,051,913, Cl. 177-25.000.
Gudish, Anthony. Portable convertible sofa-bunk beds. 4,051,564, Cl. 5-9.00R.
Guequierre, Denis D.: See—
Berger, Leo Joseph, Jr.; and Guequierre, Denis D., 4,052,316, Cl. 210-315.000.
Guglielmetti, Robert: See—
Samat, Andre; Guglielmetti, Robert; and Metzger, Jacques, 4,052,218, Cl. 96-114.100.
Guibert, Raul. Air curtain-projecting ventilator. 4,051,893, Cl. 165-125.000.
Guilbault, George G.: See—
Gray, Don N.; and Guilbault, George G., 4,052,286, Cl. 204-195.00R.
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Kehl, William L.; and Lynch, Thomas J., 4,052,544, Cl. 526-102.000.
Gulf Research & Development Company: See—
Kingelin, George F., 4,051,897, Cl. 166-125.000.
Montagna, Angelo Anthony, 4,052,296, Cl. 208-216.000.
Schulz, J. Gustav; and Sabourin, Edward T., 4,052,448, Cl. 260-515.00H.
Gulffiber AB: See—
Johansson, Jan-Olof; and Spacek, Karel, 4,051,742, Cl. 74-241.000.
Gulton Industries, Inc.: See—
Hayer, John R., 4,052,628, Cl. 310-333.000.

- Gumbinner, Robert; and Huang, Jen-Chi, to Polychrome Corporation. Process for electrolytic graining of aluminum sheet. 4,052,275, Cl. 204-129.950.
Gunn, Walter H., to Diamond Shamrock Corporation. Stable colloidal solution and method of making same. 4,052,231, Cl. 148-6.200.
Gupton, John T.: See—
Blackwell, J. Thomas; Gupton, John T.; and Nabors, Jim B., 4,052,397, Cl. 260-251.00R.
Gutierrez, Richard: See—
Halasa, Adel Farhan; and Gutierrez, Richard, 4,052,545, Cl. 526-140.000.
GX-Holding AG: See—
Jaeger, Walter, 4,052,734, Cl. 358-12.000.
Gyogyszerkutato Intezet: See—
Ambrus, Gabor; Barta, Istvan; Mehessfalvi, Zsuzsanna, nee Vajna; and Horvath, Gyula, 4,052,407, Cl. 260-302.00R.
H. Ernault-Somua: See—
Berly, Marcel, 4,051,750, Cl. 82-2.00R.
H. Koch & Sons, Inc.: See—
Gaylord, John A., 4,051,743, Cl. 74-242.800.
H. O. Terice Co.: See—
Andrews, Richard A.; and Noakes, Thomas E., 4,051,730, Cl. 73-416.000.
Haapala, Ray. Garland marker for fancy cakes. 4,051,600, Cl. 33-174.00T.
Haas, David J., to North American Philips Corporation. Object viewing system with radiation responsive screen system. 4,052,621, Cl. 250-458.000.
Haass, Adolf, to Siemens Aktiengesellschaft. Circuit arrangement for balancing a two wire full duplex data transmission system. 4,052,556, Cl. 178-60.000.
Habermeier, Jürgen; Batzer, Hans; and Porret, Daniel, to Ciba-Geigy Corporation. Polyglycidyl compounds containing N-heterocyclic structure. 4,052,366, Cl. 260-63.00R.
Hackbarth, Lowell E.; Pyle, Sterling W.; and Brandon, Paul W., to J. M. Huber Corporation. Spray dryer discharge system. 4,052,255, Cl. 159-4.00B.
Hacker Instruments, Inc.: See—
Grat, Felix R., 4,052,174, Cl. 51-81.0BS.
Hafner, Lee A.: See—
Beiter, Charles B.; and Hafner, Lee A., 4,052,354, Cl. 260-29.60M.
Hahn, Roger A.: See—
Ohmeis, Peter M.; Gehring, Robert L.; and Hahn, Roger A., 4,051,878, Cl. 141-82.000.
Haines, Ralph Warren: See—
Toal, Ted William; and Haines, Ralph Warren, 4,051,605, Cl. 35-30.000.
Hajos, Zoltan George, to Hoffmann-La Roche, Inc. Stereospecific total steroidal synthesis via substituted c/d-trans indanones. 4,052,413, Cl. 260-340.9AS.
Halasa, Adel Farhan; and Schulz, Donald Norman, to Firestone Tire & Rubber Company, The. Alkali metal aliphatic and aromatic hydrocarbon acetals and ketals and their use as polymerization initiators. 4,052,370, Cl. 260-77.5CR.
Halasa, Adel Farhan; and Gutierrez, Richard, to Firestone Tire & Rubber Company, The. Process for polymerizing conjugated dienes. 4,052,545, Cl. 526-140.000.
Hales, Pryce Neilson: See—
Robertson, Bruce W.; and Hales, Pryce Neilson, 4,052,737, Cl. 358-86.000.
Hall, Carroll D. Modified rankine cycle engine apparatus. 4,051,680, Cl. 60-689.000.
Halm Instrument Co., Inc.: See—
Harrison, Henry, 4,051,891, Cl. 165-54.000.
Halter, Richard F.; and DeWeese, Richard L., to Cincinnati Incorporated. Method for hot forging finished articles from powder metal preforms. 4,051,590, Cl. 29-420.500.
Hamada, Masa: See—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,052,449, Cl. 260-519.000.
Hamerdinger, Randolph W.: See—
Wang, Shing Chung; Hamerdinger, Randolph W.; and Hug, William F., 4,052,680, Cl. 331-94.50G.
Hammel, Ingeborg: See—
Spaeth, Claus; Wilhelm, Gunter; and Hammel, Ingeborg, 4,052,187, Cl. 65-160.000.
Hamstra, David C., to General Electric Company. Ramp and pedestal control circuit. 4,052,624, Cl. 307-252.00B.
Hanazono, Masami; Hishida, Yukio; Nakai, Toshio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, to Brother Industries, Ltd. Ribbon cartridge. 4,051,943, Cl. 197-151.000.
Hand, Ronnie D.; Chappelaar, Robert N.; and Mueller, Dale R., to Owens-Corning Fiberglass Corporation. Filament winding apparatus. 4,052,015, Cl. 242-18.00G.
Hankins, Dale. Propping material for hydraulic fracturing. 4,051,900, Cl. 166-250.000.
Hanna, Daniel C. Apparatus for waxing cars. 4,051,806, Cl. 118-63.000.
Harakas, Nicholas K.; Fulton, Kent H.; Tierney, Paul A.; and Bender, Malcolm F., to Monsanto Company. Method for improving adhesive bonding in steel/rubber composites and article. 4,052,524, Cl. 428-383.000.
Harbulak, Edward P.; and Lash, Ronald J., to M & T Chemicals Inc. Stripping of electroplated nickel-iron alloys from ferrous substrates. 4,052,254, Cl. 156-664.000.
Harcuba, Siegfried; and Dits, Herbert, to Harcuba, Siegfried. Heated cutter for plastics materials. 4,051,754, Cl. 83-124.000.
Hardy, Gilbert F. Spring loop key ring and method and apparatus for making same. 4,051,874, Cl. 140-88.000.
Harper-Wyman Company: See—
Sekera, George F., Jr.; and Cousins, Otto J., 4,052,591, Cl. 219-506.000.
Harris, Alva F.; and Shapras, Peter, to Monsanto Company. Molding compositions. 4,052,348, Cl. 260-5.000.
Harrison, Henry, to Halm Instrument Co., Inc. Heat transfer block means. 4,051,891, Cl. 165-54.000.
Hartman, Klaus: See—
Sick, Erwin; and Hartman, Klaus, 4,052,120, Cl. 350-6.000.
Hartman, Robert J.: See—
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,052,345, Cl. 260-2.5AP.
Hasegawa, Akira: See—
Ide, Fumio; Kishida, Kazuo; and Hasegawa, Akira, 4,052,482, Cl. 260-876.00R.
Ide, Fumio; Kishida, Kazuo; and Hasegawa, Akira, 4,052,525, Cl. 428-412.000.
Hasegawa, Kaichi; and Sanuga, Fumio, to Fuji Giken Kabushiki Kaisha. Stacker drum of sheet accumulating device. 4,052,053, Cl. 271-187.000.
Hashimoto, Tsutomu: See—
Takeichi, Yoshihiro; Hashimoto, Tsutomu; Takeda, Fumio; and Katagi, Takashi, 4,052,724, Cl. 343-786.000.
Haslbeck, Joseph: See—
Bengtson, Torsten R.; and Haslbeck, Joseph, 4,051,557, Cl. 2-430.000.
Hassall, Stephen J. T.; and White, Neil S., to Eastman Kodak Company. Card injecting apparatus. 4,052,049, Cl. 270-58.000.
Hastbacka, Albin A. Electro-optical liquid level indicator. 4,051,726, Cl. 73-290.00R.
Hattori, Tadashi; Nakase, Takamichi; and Nishida, Minoru, to Nippon Soken, Inc. Fuel injection system for an internal combustion engine. 4,051,817, Cl. 123-32.0EA.
Hattori, Yasuhiro: See—
Kato, Shiro; and Hattori, Yasuhiro, 4,051,583, Cl. 29-40.000.
Hauni-Werke Korber & Co. KG: See—
Schumacher, Peter; and Niemann, Helmut, 4,051,947, Cl. 198-478.000.
Hauptmann, Edward G.; and Green, John Richard, to Neptune Dynamics Ltd. Fish characteristic detecting and sorting apparatus. 4,051,952, Cl. 209-73.000.
Hauser, Raimund: See—
Freudenschuss, Otto; and Kittag, Gerd, 4,052,126, Cl. 352-84.000.
Hausmann, Erich. Steel boat hull salvaging assembly. 4,051,797, Cl. 114-51.000.
Hawkins, Harold M., deceased (by Hawkins, Marjorie W., executrix), to Phillips Petroleum Company. Method for preparation of alkyl-substituted butadienes. 4,052,478, Cl. 260-681.000.
Hawkins, Marjorie W., executrix: See—
Hawkins, Harold M., deceased, 4,052,478, Cl. 260-681.000.
Hay, Andrew George, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Hydraulic hammers hydraulically driven impactor. 4,052,107, Cl. 299-62.000.
Hay-Mar Corporation, The: See—
Elder, Hayden O., 4,051,825, Cl. 123-142.50R.
Hayakawa, Daishiro; and Tani, Kenroku, to Matsushita Electric Industrial Co., Ltd. Ultrasonic ceramic microphone. 4,052,627, Cl. 310-322.000.
Hayashi, Josaburo: See—
Yajima, Seishi; Hayashi, Josaburo; and Omori, Mamoru, 4,052,430, Cl. 260-448.20D.
Hayashi, Masaki; Kori, Seiji; and Wakatsuka, Hirohisa, to Ono Pharmaceutical Co., Ltd. Prostaglandin analogues. 4,052,512, Cl. 424-305.000.
Hayashida, Yoshihiro, to Tokico Ltd. Automatic shoe clearance adjusting device in shoe drum brake. 4,051,928, Cl. 188-79.50P.
Hayden/Arn Productions Limited: See—
Arn, Robert M., 4,051,665, Cl. 58-50.00R.
Hayer, John R., to Gulton Industries, Inc. Dynamic, shear-mode piezo-electric pressure sensor. 4,052,628, Cl. 310-333.000.
Haytayan, Harry M. Control valves. 4,051,862, Cl. 137-454.200.
Hayward, Alan Thomas Joseph, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Industry in Her Britannic Majesty's Government of the. Calibration apparatus for gas flowmeters. 4,051,711, Cl. 73-3.000.
Hazel, Patrick Michael; and Wells, Roberta Evans, to International Medical Corporation. Electrode and interfacing pad for electrical physiological systems. 4,051,842, Cl. 128-2.06E.
Head, Victor P.; and Herzl, Peter J., to Fischer & Porter Co. Force-type flowmeter. 4,051,723, Cl. 73-194.00E.
Headlee, Gordon C.: See—
Sedgwick, Jarvis D.; and Headlee, Gordon C., 4,051,967, Cl. 214-505.000.
Hebert, Donald G., to Xerox Corporation. Matrix print head with improved armature retainer. 4,051,941, Cl. 197-1.00R.
Heckl, Leonhard; Liedek, Egon; and Ruff, Wolfgang, to BASF Farben + Fasern AG. Red pigment obtained by coupling diazotized 4-aminonaphthalimide with 2,6-dihydroxy-3-cyano-4-methylpyridine. 4,052,378, Cl. 260-155.000.
Hectors, Adrianus M. P., to Oce-van der Grinten N.V. Electrophoto-

- graphic copying process and reproduction element. 4,052,210, Cl. 96-1.50R.
- Hedderich, Fred L.; and George, Curtis C. Cart for livestock. 4,052,080, Cl. 280.47.260.
- Hegbar, Howard R.: See—
Arnold, John B.; Bowyer, John M.; Hegbar, Howard R.; and Shaefer, Archie B., 4,052,717, Cl. 340-249.000.
- Hegemann, Karl-Rudolf; Finger, Gunther; Brinkmann, Albert; and Weibach, Helmut, to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrücklauf-Anlagen Kommanditengesellschaft. Apparatus for cleaning blast-furnace exhaust gases. 4,052,042, Cl. 266-89.000.
- Heimbach, Paul: See—
Wilke, Gunther; and Heimbach, Paul, 4,052,435, Cl. 560-128.000.
- Heimberger, Helmut, to Optilon W. Erich Heilmann GmbH. Slide fastener support and method of warp-knitting same. 4,051,579, Cl. 24-205.16R.
- Heine, Karlheinz, to Siemens Aktiengesellschaft. Method and apparatus for grinding turbine and compressor blades to dimension. 4,051,636, Cl. 51-145.00R.
- Heintz, Carlo: See—
Colling, Joseph; Heintz, Carlo; and Unbekand, Alfred, 4,052,044, Cl. 266-225.000.
- Heintz, Robert J. Removable enclosure for a swimming pool or the like. 4,051,618, Cl. 52-63.000.
- Heinz, Henry, Jr., to Union Carbide Corporation. Pressure relief flapper vent valve for galvanic cells. 4,052,533, Cl. 429-54.000.
- Heinz, Peter H.: See—
Atwood, John G.; Marshall, Hamilton W., Jr.; and Heinz, Peter H., 4,052,161, Cl. 23-230.00R.
- Helberg, Jürgen: See—
Klein, Rainer; and Helberg, Jürgen, 4,052,301, Cl. 210-51.000.
- Helbert, Herbert: See—
Fuerst, Ernst; Gerendas, Jozsef; Rokohl, Rudolf; Fikentscher, Rolf; and Helbert, Herbert, 4,052,159, Cl. 8-169.000.
- Heller, Lawrence Griffith; and White, James Merrill, to International Business Machines Corporation. Charge transfer device transversal filters. 4,052,606, Cl. 364-825.000.
- Hendry, Donald H.; and Johnson, Bruce K., to Polaroid Corporation. Modular photographic system assembly. 4,052,728, Cl. 354-86.000.
- Henkin, Melvyn Lane. Anesthesia rebreathing apparatus. 4,051,847, Cl. 128-144.600.
- Hensel, Jorg: See—
Schnyer, Gerd; Geiger, Friedhelm; and Hensel, Jorg, 4,052,445, Cl. 260-513.00R.
- Henstrom, Sten. Rotary block engine. 4,051,819, Cl. 123-44.00B.
- Herman Miller, Inc.: See—
Propp, Robert L., 4,052,084, Cl. 280-408.000.
Propp, Robert L.; and Wodka, Michael A., 4,052,564, Cl. 179-1.00M.
- Hermann Bernstorff Maschinenbau GmbH: See—
Brand, Wilhelm, 4,052,038, Cl. 366-90.000.
- Herrin, Thomas Raymond; and Fairgrieve, John Scott, to Abbott Laboratories. Carboxylic esters of phosphonoacetic acid. 4,052,439, Cl. 564-129.000.
- Herring, James A.: See—
Martin, William F., 4,052,311, Cl. 210-223.000.
- Herschler, Michael G.: See—
Shoop, John C.; Post, Roger L.; and Herschler, Michael G., 4,052,135, Cl. 417-295.000.
- Hertl, William; and Odstrebel, Gerald, to Corning Glass Works. Assay for thyroxine binding globulin. 4,052,504, Cl. 424-1.000.
- Herzer, William P.; and Cullen, Robert E., to Union Special Corporation. Automatic sewing machine. 4,051,794, Cl. 112-121.120.
- Herzl, Peter J.: See—
Head, Victor P.; and Herzl, Peter J., 4,051,723, Cl. 73-194.00E.
- Herzog, Gerald Bernard, to RCA Corporation. Combined controlled oscillator and frequency multiplier. 4,052,673, Cl. 325-153.000.
- Herzog, Reinhard: See—
Dackner, Toni; Wallis, Albrecht; Fikentscher, Rolf; Thomas, Rainer; and Herzog, Reinhard, 4,052,384, Cl. 260-239.00E.
- Hess, Howard V.: See—
Cok, Edward L.; Hess, Howard V.; and Franz, William F., 4,052,169, Cl. 44-1.00R.
- Heston Corporation: See—
Burkhart, Merle Keith; White, Bruce Lynn; Goossen, La Vern Roy; White, Allen Andrew; and Voth, Harold William, 4,052,011, Cl. 241-30.000.
- Hestily, Charles E., to Singer Company, The. Dustless routers. 4,051,880, Cl. 144-252.00R.
- Heusler, Karl; and Woodward, Robert Burns, to Ciba-Geigy Corporation. Oracyclic acid compounds and process for their manufacture. 4,052,408, Cl. 260-306.70C.
- Hewing, Gunter: See—
Foster, Siegfried; Dibelius, Gunter; Hewing, Gunter; and Singh, Jasbir, 4,052,260, Cl. 176-60.000.
- Hewlett-Packard Company: See—
Malland, David Steven; and Thayer, Billy E., 4,052,604, Cl. 364-786.000.
- Hicks, Robert E., to General Electric Company. Method and apparatus for manufacturing a helically finned heat exchanger. 4,051,586, Cl. 29-157.3AH.
- Higginbottom, Harold P., to Monsanto Company. Dilutable resin solutions having stabilized dispersed inert salts. 4,052,359, Cl. 260-17.500.
- Higgs, Edward Wilford. Contamination entrapment and cleaning de-
- vice for motor vehicle engine liquid cooling system coolant. 4,052,308, Cl. 210-167.000.
- Higham, Peter; and Hoult, Robert Alan, to Perkin-Elmer Corporation. The. Nuclear magnetic resonance probe. 4,052,661, Cl. 324-50R.
- Highley, John, to Coal Industry (Patents) Limited. Method of and apparatus for generating a hot gas. 4,052,140, Cl. 431-7.000.
- Higuchi, Takeru; and Hussain, Anwar, to Alza Corporation. Ocular therapeutic system manufactured from copolymer. 4,052,505, Cl. 424-14.000.
- Hilfiker Pipe Co.: See—
Hilfiker, William K., 4,051,570, Cl. 14-26.000.
- Hilfiker, William K., to Hilfiker Pipe Co. Road bridge construction with precast concrete modules. 4,051,570, Cl. 14-26.000.
- Hill, Albert Charles, to Girling Limited. Vehicle brakes. 4,051,737, Cl. 74-110.000.
- Hill, Homer G.; and Austin, Kenneth L., to Owens-Corning Fiberglass Corporation. Method of producing glass mats. 4,052,257, Cl. 162-156.000.
- Hilt Aktiengesellschaft: See—
Chromy, Franz; Winkler, Walter; Mahr, Manfred; and Mark, Fritz, 4,051,990, Cl. 227-10.000.
- Hinson-Rider, George. Solar heating pipe. 4,051,835, Cl. 126-271.000.
- Hintz, Ronald E. Pistol draw target. 4,052,058, Cl. 273-1.00R.
- Hirano, Satoru; Kubota, Atsushi; Yoshida, Mitsuru; Mizuno, Junzi; and Miyamoto, Nobutaka, to Kanebo, Limited. Method and apparatus for packaging yarn packages doffed from a yarn producing machine. 4,051,652, Cl. 57-52.000.
- Hirano, Yoshihiko: See—
Yoshida, Minoru; Yamaguchi, Susumu; and Hirano, Yoshihiko, 4,052,276, Cl. 204-130.000.
- Hirayama, Takanobu: See—
Hanazono, Masami; Hishida, Yukio; Nakai, Toshio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, 4,051,943, Cl. 197-151.000.
- Hirogami, Katsuhiko: See—
Nakaoka, Kazuhide; Araki, Kenji; Takada, Yoshikazu; Osaka, Shinobu; and Hirogami, Katsuhiko, 4,052,235, Cl. 148-156.000.
- Hiromoto, Yoshinori: See—
Sagara, Hideo; Nishio, Yasuhiro; Wada, Hirokazu; and Hiromoto, Yoshinori, 4,052,632, Cl. 219-137.00R.
- Hirsbrunner, Pierre: See—
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- Hishida, Yukio: See—
Hanazono, Masami; Hishida, Yukio; Nakai, Toshio; Watanabe, Tomoyoshi; Hirayama, Takanobu; and Asakura, Hideo, 4,051,943, Cl. 197-151.000.
- Hitachi, Ltd.: See—
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Yamazaki, Eiichi; Ogura, Iwao; Ueda, Toshio; Maruyama, Koichi; and Shimizu, Kenji, 4,052,122, Cl. 350-189.000.
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- Ho, Hoi, to Marigold Enterprises Ltd. Cover for a container. 4,051,984, Cl. 222-471.000.
- Hochreiter, William Thomas; and Mindler, Fredric Alton, to Eastman Kodak Company. Double exposure prevention device. 4,052,730, Cl. 354-135.000.
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Sahn, Wilfried, 4,052,433, Cl. 260-465.00E.
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- Hoffman, George John. Apparatus for draining fluid from a continuously evacuated space. 4,051,859, Cl. 137-154.000.
- Hoffmann-La Roche, Inc.: See—
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- Hofmann, Heinrich, to U.S. Philips Corporation. Wire cutter, particularly for cutting electrical connection wires. 4,051,596, Cl. 30-133.000.
- Hogan, James A., to Honeywell Inc. Non-linear function generator with switched channels. 4,052,677, Cl. 328-143.000.
- Hogan, John Paul. Homohedral module genus extender. 4,051,621, Cl. 46-26.000.
- Hoke, William A. Multiple cam, multiple position switch control mechanism with joy-stick type operator operable in x-y planes. 4,052,578, Cl. 200-153.00L.

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- Holzer, Franz; and Schmolzer, Gerhard, to Vianova Kunstharz, A.G. Process of electrodeposition of coating compositions containing an ammonia complex. 4,052,309, Cl. 204-181.000.
- Homanick, George, to PepsiCo Inc. Bulk distribution system. 4,051,969, Cl. 214-516.000.
- Honda, Keisuke: See—
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- Hogan, James A., 4,052,677, Cl. 328-143.000.
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- Honikman, Terence C., to Cooper, Allen K., a part interest. Solar energy augmented water heating system. 4,052,000, Cl. 237-1.00A.
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- Hooker Chemicals & Plastics Corporation: See—
Dannels, Bobby F.; and Geering, Emil J., 4,052,281, Cl. 204-159.220.
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- Hooper, George W.: See—
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- Hopfer, Clemens; and Ort, Wolfgang, to Eastman Kodak Company. Exposure control apparatus. 4,052,726, Cl. 354-29.000.
- Hoppe, Lutz; and Behn, Rudolf, to Wolff Walsrode Aktiengesellschaft. Manufacture and use of water-soluble auxiliary agents based on polyaminoamides for the production of paper. 4,052,259, Cl. 162-164.0EP.
- Hori, Haruo: See—
Deguchi, Hidetaka; Wada, Hajime; Endo, Takaya; Kikuchi, Shoji; and Hori, Haruo, 4,052,212, Cl. 96-56.200.
- Horie, Ikutaro: See—
Sera, Hidefumi; Yamamoto, Nobuo; Horie, Ikutaro; Nagao, Kameji; and Iwasaki, Nobuyuki, 4,052,373, Cl. 260-117.000.
- Horikoshi, Koki; and Ikeda, Yonosuke, to Rikagaku Kenkyusho. Preparation of an alkaline protease. 4,052,262, Cl. 195-66.00R.
- Horn, Robert; and Slovacek, Raymond J., to Forney Engineering Company. Load and radius indicating system. 4,052,602, Cl. 364-424.000.
- Hortigro, Inc.: See—
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- Horvath, Gyula: See—
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- Hosomi, Fumio; Wassa, Kiyotaka; Eayakawa, Shigeru; and Nagai, Takeshi, to Matsushita Electric Industrial Co., Ltd. Stylus for capacitive videodisc. 4,052,738, Cl. 358-128.000.
- Hosoya, Nobukazu, to Sanyo Electric Co., Ltd. Phase shifting circuit. 4,052,679, Cl. 330-261.000.
- Houck, Stanley J.: See—
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- Hoult, Robert Alan: See—
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- Hounsfield, Godfrey Newbold, to EMI Limited. Apparatus for examining a body by radiation such as X or gamma radiation. 4,052,618, Cl. 250-360.000.
- Hounsfield, Godfrey Newbold, to EMI Limited. Method and apparatus for measuring and analyzing radiation transmitted at plural angles. 4,052,619, Cl. 250-363.00S.
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- Howard, Arthur R. Hand protector. 4,051,553, Cl. 2-161.00A.
- Howard Machinery Limited: See—
Clary, Roger, 4,051,649, Cl. 56-330.000.
- Howard, Peter Barry, to Tioxide Group Limited. Treatment of pigment. 4,052,222, Cl. 106-300.000.
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- Howitt, Robert T., to Frem Corporation. Wall fixture. 4,051,789, Cl. 108-152.000.
- Howson-Algraphy Limited: See—
Watkinson, Leonard James, 4,052,217, Cl. 96-86.00R.
- Hrach, Josef: See—
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- Huang, Jen-Chi: See—
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- Huber, Bernd; Kleiner, Hans-Jerg; and Neumaier, Hubert, to Hoechst Aktiengesellschaft. Flameproofed modacryl copolymers, fibers and filaments containing carboxy phosphinic acid derivatives having improved thermostability. 4,052,551, Cl. 526-278.000.
- Huber-Emden, Helmut, to Ciba-Geigy Corporation. Perfluoro compounds containing phosphorus. 4,052,485, Cl. 260-928.000.
- Hucker, David J., to Sundstrand Corporation. Inverter circuit for producing synthesized sinusoidal waveforms. 4,052,658, Cl. 363-43.000.
- Hueschen, Robert E.; and Port, John H., to General Electric Company. Anodes for rotary anode x-ray tubes. 4,052,640, Cl. 313-330.000.
- Huffman, William A.; Birkeland, Stephen P.; and O'Leary, Kevin P., to Minnesota Mining and Manufacturing Company. Semiconductive and sensitized photoconductive compositions. 4,052,209, Cl. 96-1.50R.
- Hug, William F.: See—
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- Hughes, Oscar Richard, to Celanese Corporation. Production of 3-(1,3'-dioxane)-propionaldehyde compounds. 4,052,401, Cl. 260-340.700.
- Huignard, Jean-Pierre: See—
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- Hultsch, Gunther; Zeppenfeld, Kurt; Niedner, Peter; and Ostermeyer, Peter, to Krauss-Maffei AG. Method of operating a centrifugal filter and a filter centrifuge operating according to this method. 4,052,303, Cl. 210-78.000.
- Humbert, Kingsley E., Jr., to Wix Corporation. Universal filter mounting attachment. 4,052,307, Cl. 210-130.000.
- Hummeldorf, James L.: See—
Bao, Frank W.; Hummelford, James L.; and Parker, Stephen D., 4,051,713, Cl. 73-9.000.
- Hunter, Travis: See—
Hunter, Travis Lowell, 4,052,248, Cl. 156-511.000.
- Hunter, Travis Lowell, to Hunter, Travis. Paper dispensing apparatus for rolls of paper. 4,052,248, Cl. 156-511.000.
- Hurst, John W., to Chrysler Corporation. Bidirectional drive coupling. 4,051,934, Cl. 192-21.000.
- Hurukawa, Toshio: See—
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- Huser, Josef Paul, to Utilis Mulheim A.G., Firma. Cutting tool assembly. 4,051,584, Cl. 407-107.000.
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- Hutcheson, William Frank, to Rossville Yarn Processing Company. Process of producing slivers for open-end spinning. 4,051,575, Cl. 19-151.000.
- Hutchings, David A.: See—
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- Hutchinson, Ronald G., to Simmons Company. Mattress or cushion spring assembly. 4,051,567, Cl. 5-260.000.
- Hutson, Thomas, Jr.; and Carter, Cecil O., to Phillips Petroleum Company. Ethylfluoride production. 4,052,469, Cl. 260-653.600.
- Hutt, Peter Richard; Blake, Alan Ronald; von Cavallar, Gunter; Douglas, Brian Neil; and Dodds, Philip John, to Independent Broadcasting Authority. Television receiver system having facility for storage and display of character information selected from digitally encoded broadcast transmissions. 4,052,719, Cl. 340-324.0AD.
- Hycel, Inc.: See—
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- Hycom Incorporated: See—
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- I-T-E Imperial Corporation: See—
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- Ide, Fumio; Kishida, Kazuo; and Hasegawa, Akira, to Mitsubishi Rayon Co., Ltd. Multi-layer structure acrylic polymer composition. 4,052,525, Cl. 428-412.000.
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- Ikeda, Yonosuke: See—
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- Iley, James Dixon: See—
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- Illinois Tool Works Inc.: See—
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- IMC Chemical Group, Inc.: See—
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- Imperial Chemical Industries Limited: See—
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Brooks, John Langshaw; Eaton, David Crawford; and Williams, Barry, 4,052,392, Cl. 544-211.000.
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Clarke, John Robin Paul, 4,052,162, Cl. 23-253.00R.
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Bailey, Edward A., 4,052,047, Cl. 269-238.000.
Jung, Hans-Wolf: See—
Wehner, Wolfgang; Maul, Rudolf; and Jung, Hans-Wolf, 4,052,426, Cl. 260-429.700.
Junge, Helmut; and Kurtz, Walter, to BASF Aktiengesellschaft. Azo pigment or dye having a naphthyl-quinoxaline coupling component. 4,052,371, Cl. 260-154.000.
Junge, Helmut; and Kurtz, Walter, to BASF Aktiengesellschaft. Mono-azo dye having a β -hydroxynaphthoic acid amide coupling component. 4,052,377, Cl. 260-154.000.
K-D Manufacturing Company: See—
Ramsey, Keith E., 4,051,970, Cl. 214-670.000.
Kabushiki Kaisha Daini Seikoshu: See—
Ishikawa, Takehiro, 4,051,664, Cl. 58-50.00R.
Kabushiki Kaisha Hasegawa Haguruma: See—
Ishikawa, Shoichi, 4,051,745, Cl. 74-462.000.
Kabushiki Kaisha Sato Kenkyusho: See—
Sato, Yo, 4,051,780, Cl. 101-305.000.
Kabushiki Kaisha Seikoshu: See—
Oshima, Kenji, 4,051,744, Cl. 74-437.000.
Kabushiki Kaisha Suwa Seikoshu: See—
Chihara, Hiroyuki; and Numabe, Hitomi, 4,051,663, Cl. 58-26.00R.
Yoshino, Masahito; and Kawasumi, Kazuo, 4,051,666, Cl. 58-85.500.
Kabushiki Kaisha Taishin Seisakusho: See—
Sasahara, Yoshio, 4,051,709, Cl. 72-356.000.
Kaffka, Dietmar, to Lindemann Maschinenfabrik GmbH. Apparatus for changing containers at an ejection opening of a refuse press. 4,051,955, Cl. 214-1.0BB.
Kahn, Donald D.: See—
Pastor, Sheldon Lee; Erickson, Milton E.; and Kahn, Donald D., 4,052,742, Cl. 360-96.000.
Kaiser, Carl; Pendleton, Robert G.; and Setler, Paulette E., to Smith-Kline Corporation. Pharmaceutical compositions and method of producing anti-Parkinsonism activity. 4,052,506, Cl. 424-244.000.
Kaiser Gypsum Company, Inc.: See—
Kontny, Merle E.; and Morris, Dorsey J., 4,052,492, Cl. 264-6.000.
Kalaus, Gyorgy: See—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,052,404, Cl. 260-293.530.
Kallman, Robert A. Accessory holder for use on article of clothing. 4,051,554, Cl. 2-94.000.
Kalvoda, Jaroslav: See—
Biollaz, Michel; and Kalvoda, Jaroslav, 4,052,421, Cl. 260-397.500.
Kamaike, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Elevator speed control system. 4,052,651, Cl. 318-230.000.
Kamenov, Alexandr Fedorovich: See—
Baburin, Sergei Vyacheslavovich; Akimov, Vasily Ivanovich; Gorbushin, Vladimir Alexandrovich; Muraviev, Alexandr Petrovich; Nepein, Valery Nikolaevich; Frolov, Mikhail Vladimirovich; Aizenberg, Sergei Arnoldovich; Golovko, Evgeny Mikhailovich; Kamenov, Alexandr Fedorovich; and Sergeev, Igor Alexandrovich, 4,051,576, Cl. 19-156.000.
Kameya, Andrew M.: See—
Turner, Raymond J.; Kameya, Andrew M.; and Salman, Naif D., 4,052,598, Cl. 364-113.000.
Kaminaka, Nobuyuki: See—
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,052,749, Cl. 360-123.000.
Kamiyama, Setsuo: See—
Nishikawa, Eiichiroh; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, 4,052,337, Cl. 252-455.00Z.

Kamo, Takashi: See—
Wada, Moriyasu; Kumagai, Katuya; and Kamo, Takashi, 4,052,358, Cl. 260-40.00R.
Kanagawa, Shuichi; Tanimura, Shozo; and Sagawa, Seiji, to Sumitomo Chemical Company, Limited. Method of protection from ozone deterioration for rubber. 4,052,363, Cl. 260-45.9KA.
Kanai, Hiromi: See—
Yamazaki, Eiichi; Kanai, Hiromi; and Hurukawa, Toshio, 4,052,643, Cl. 315-16.000.
Kanai, Kenji: See—
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,052,749, Cl. 360-123.000.
Kane, Richard E.; Reese, Frank L., deceased; and by Reese, Blanche C., executrix, to Westinghouse Electric Corporation. Metal-clad gas-type high-power circuit-breaker constructions involving two arc-extinguishing assemblies. 4,052,575, Cl. 200-145.000.
Kanebo, Limited: See—
Hirano, Satoru; Kubota, Atsushi; Yoshida, Mitsuru; Mizuno, Junji; and Miyamoto, Nobutaka, 4,051,652, Cl. 57-52.000.
Kantrowitz, Adrian; and Freed, Paul S., to Sinai Hospital of Detroit. Dynamic aortic patch. 4,051,840, Cl. 128-1.00D.
Kapasi, Vikram C.; Lasman, Henry R.; Levenson, Robert J.; and Witsotzky, Reuben, to Pandel-Bradford, Inc. Method of preparing imitation sheet material. 4,052,236, Cl. 156-85.000.
Kaplan, Carl, to Plough, Inc. Stable topical anesthetic compositions. 4,052,513, Cl. 424-310.000.
Kaplan, Ronald M.: See—
Beane, David J.; and Kaplan, Ronald M., 4,051,708, Cl. 72-354.000.
Karasudani, Yasuo, to Tokico Ltd. Disc brake. 4,051,926, Cl. 188-73.300.
Karasudani, Yasuo, to Tokico Ltd. Disc brake. 4,051,927, Cl. 188-73.300.
Karlsen, Karl, to International Business Machines Corporation. Object positioning process and apparatus. 4,052,603, Cl. 364-120.000.
Karpati, Egon: See—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,052,404, Cl. 260-293.530.
Karpinsky, William J., to Container Corporation of America. Apparatus for heat sealing of container bodies. 4,052,154, Cl. 432-222.000.
Kast, Hellmut; and Dunkelmann, Guenter, to BASF Aktiengesellschaft. Diazarhodamine-lactones, their manufacture and their use as dye intermediates for copying processes. 4,052,398, Cl. 260-256.40F.
Kasubuchi, Takeshi: See—
Fujimoto, Isao; Kasubuchi, Takeshi; Aiba, Masahiko; and Shimazawa, Yoichi, 4,051,945, Cl. 197-176.000.
Katagi, Takashi: See—
Takeichi, Yoshihiro; Hashimoto, Tsutomu; Takeda, Fumio; and Katagi, Takashi, 4,052,724, Cl. 343-786.000.
Kato, Kaoru: See—
Yamada, Tatsunori; Mori, Shigeru; Kato, Kaoru; Arai, Yasuyuki; and Sakitani, Katumi, 4,051,888, Cl. 165-1.000.
Kato, Nobuyuki: See—
Sakamoto, Yoichi; Kato, Nobuyuki; and Ohtani, Tadao, 4,051,706, Cl. 72-253.00R.
Kato, Shiro; and Hattori, Yasuhiro, to Toyoda-Koki Kabushiki-Kaisha. Machine tool with a turret head for tool spindles. 4,051,583, Cl. 29-40.000.
Kawai, Hiroyuki: See—
Ohgida, Hidetoshi; Sakai, Yoshiharu; and Kawai, Hiroyuki, 4,051,975, Cl. 220-203.000.
Kawai, Yoshio: See—
Kojima, Tatsuo; and Kawai, Yoshio, 4,052,573, Cl. 200-11.0DA.
Kawasaki Heavy Industries, Ltd.: See—
Takagi, Izumi; and Yanagiuchi, Noboru, 4,051,739, Cl. 74-230.17E.
Kawashima, Hiroyuki: See—
Itani, Mituo; Kawashima, Hiroyuki; Inoue, Takasuke; and Maruyama, Mikio, 4,051,796, Cl. 114-44.000.
Kawasumi, Kazuo: See—
Yoshino, Masahito; and Kawasumi, Kazuo, 4,051,666, Cl. 58-85.500.
Kay, Edward Leo: See—
Crane, Grant; and Kay, Edward Leo, 4,052,344, Cl. 260-2.300.
Kehl, William L.; and Lynch, Thomas J., to Gulf Oil Corporation. Ethylene polymerization catalysts. 4,052,544, Cl. 526-102.000.
Keller, Hansjurg, to Cerberus AG. Infrared radiation-burglary detector. 4,052,616, Cl. 250-353.000.
Kemp, Klaus M. Process for the pyrolytic treatment of organic, pseudo-organic and inorganic material. 4,052,265, Cl. 201-2.500.
Kendall Company, The: See—
Collins, Robert F., 4,051,845, Cl. 128-132.00D.
Davenport, Stanley; and Villari, Frank K., 4,051,556, Cl. 2-421.000.
Villari, Frank K., 4,051,852, Cl. 128-278.000.
Kendall, Willard E.: See—
Frankel, Donald P.; Kendall, Willard E.; and Cooper, John F., 4,051,561, Cl. 4-131.000.
Kenney, John T. Basketball game. 4,052,064, Cl. 273-85.00R.
Kenny, Shaun S.; and Armstrong, Leonard J., to Conservocon, Inc. Remotely-controlled valve. 4,052,035, Cl. 251-14.000.
Kenway Incorporated: See—
Smith, Kay D.; Bachass, Arjun S.; and Black, Francis B., 4,052,702, Cl. 364-200.000.
Kern, Hobart Malcolm, Jr., to Struthers Scientific and International Corporation. Fluidized bed apparatus. 4,051,603, Cl. 34-57.00A.

- Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung: See—
 Former, Siegfried; Dibelius, Gunter; Hewing, Gunter; and Singh, Jasbir, 4,052,260, Cl. 176-60.000.
- Kewaco AB: See—
 Wallberg, Karl Erik, 4,052,096, Cl. 294-88.000.
- Kide, Leif, to Nea-Lindberg A/S. Electrostatic precipitator arrangements, 4,052,177, Cl. 55-139.000.
- Kiefer, Josef, to Sielaff GmbH & Co., Automatenbau Herrieden. Merchandise compartmenting arrangement for an automatic vending machine, 4,051,978, Cl. 221-197.000.
- Kiewert, Harold J.: See—
 Lott, George T.; and Kiewert, Harold J., 4,052,175, Cl. 51-96.000.
- Kikuchi, Shoji: See—
 Deguchi, Hidetaka; Wada, Hajime; Endo, Takaya; Kikuchi, Shoji; and Hori, Haruo, 4,052,212, Cl. 96-56.200.
- Kikuchi, Yasushi: See—
 Miyata, Junjiro; and Kikuchi, Yasushi, 4,051,771, Cl. 99-276.000.
- Kimball, Stephen F.; and Gates, Paul E., to GTE Sylvania Incorporated. Circuit breaker with parallel shorting element, 4,052,687, Cl. 337-25.000.
- Kimura, Senkichi. Method for the manufacture of an ornamental head lug of the single unit type for use in bicycles, 4,051,704, Cl. 72-58.000.
- Kimura, Tsuguo: See—
 Kuroishi, Shoji; Kimura, Tsuguo; Emoto, Masami; and Yamamoto, Shiro, 4,052,127, Cl. 355-3.0DD.
- Kindig, Alan L., to General Electric Company. Methods and apparatus for use in making electrical interconnections, 4,051,594, Cl. 29-594.000.
- King, Charles, to Flow Ezy Filters, Inc. Strainer magnets, 4,052,312, Cl. 210-213.000.
- Kingelin, George F., to Gulf Research & Development Company. Well testing tool, 4,051,897, Cl. 166-125.000.
- Kingzett, Thomas J., to Motorola, Inc. Semiconductor-oxide etchant, 4,052,153, Cl. 156-657.000.
- Kirk, Norbert A. Portable, pocket size ash tray, 4,052,179, Cl. 55-385.00G.
- Kishida, Kazuo: See—
 Ide, Fumio; Kishida, Kazuo; and Hasegawa, Akira, 4,052,482, Cl. 240-476.00R.
- Ide, Fumio; Kishida, Kazuo; and Hasegawa, Akira, 4,052,525, Cl. 428-412.000.
- Kittag, Gerd: See—
 Friedrichs, Otto; and Kittag, Gerd, 4,052,126, Cl. 352-84.000.
- Klauke, Erich: See—
 Behl, Hans-Samuel; and Klauke, Erich, 4,052,386, Cl. 260-242.200.
- Klein, Alfons: See—
 Sobhl, Johannes; Klein, Alfons; Nittel, Fritz; and Wedemeyer, Karlfried, 4,052,216, Cl. 96-84.0UV.
- Klein, Joseph F. M.; Stijfs, Petrus A. M. J.; and Thoma, Jozef A., to Stamcarbon B.V. Process for preparing 2-(1-cyclohexenyl)-cyclohexanone, 4,052,458, Cl. 260-586.00C.
- Klein, Rainer; and Helberg, Jürgen, to Hoechst Aktiengesellschaft. Process for purifying waste water, 4,052,301, Cl. 210-51.000.
- Kleine, Werner Kurt M., to Gerbruder Heller. Drill for percussion drilling machines, 4,051,905, Cl. 173-104.000.
- Kleiner, Charles T., and Hochwald, Walter, to Rockwell International Corporation. Distribution system for A. C. electrical energy derived from D. C. energy sources, 4,052,657, Cl. 363-43.000.
- Kleiner, Hans-Jerg: See—
 Finke, Manfred; and Kleiner, Hans-Jerg, 4,052,486, Cl. 260-970.000.
- Huber, Bernd; Kleiner, Hans-Jerg; and Neumaier, Hubert, 4,052,551, Cl. 526-278.000.
- Klesper, Hugo: See—
 Busse, Oswald; and Klesper, Hugo, 4,052,314, Cl. 210-230.000.
- Klingler, Thomas C.: See—
 Goralaki, Christian T.; Klingler, Thomas C.; and Wolf, Paul A., 4,052,258, Cl. 162-161.000.
- Klockner-Humboldt-Deutz Aktiengesellschaft: See—
 Suprunov, Vladimir; Kryczun, Alfred; and Manshausen, Theodor, 4,051,602, Cl. 34-10.000.
- Knapp, Philip B.; and Corey, Harold, to Hortigro, Inc. Apparatus for the improved dispensing of plant nutrimenta, 4,051,628, Cl. 47-48.500.
- Knight, Peter Charles, to Girling Limited. Disc brakes for vehicles including a screw-threaded draw bar assembly, 4,051,925, Cl. 188-72.400.
- Knox, Jon A. Computer tape reel, 4,052,020, Cl. 242-71.800.
- Knuettel, Helmut: See—
 Breyzmann, Karl; Knuettel, Helmut; Rheinlander, Paul; and Mahn, Gustav, 4,052,197, Cl. 75-60.000.
- Konishi, Katsue: See—
 Miyake, Takao; Koashi, Katsue; and Sawada, Masato, 4,052,018, Cl. 242-36.000.
- Kobayashi, Yasuhiro, to Yoshida Kogyo K.K. Pull tab attachment tool, 4,051,710, Cl. 72-410.000.
- Kohara, Minoru: See—
 Shohara, Tomoo; Kohara, Minoru; and Miyoshi, Hiroshi, 4,052,350, Cl. 260-23.0XA.
- Kohler General, Inc.: See—
 Pletzer, Jürgen R., 4,052,137, Cl. 425-577.000.
- Koike, Yujiro: See—
 Wada, Masamobu; Koike, Yujiro; and Okuma, Yoshihisa, 4,052,739, Cl. 358-299.000.
- Kojima, Tatsuo; and Kawai, Yoshio, to Murata Manufacturing Co., Ltd. Rotary or slide type switch assembly having recessed printed circuit substrate, interposed resilient bridging contact and movable printed circuit disc, 4,052,573, Cl. 200-11.0DA.
- Kokado, Hiroshi: See—
 Inoue, Eiichi; Kokado, Hiroshi; Yamaguchi, Takashi; Tokunaga, Yukio; Nakayama, Takao; and Yamase, Toshihiro, 4,052,211, Cl. 96-35.000.
- Kokusai Denshin Denwa Kabushiki Kaisha: See—
 Watanabe, Tatsuo; Saito, Hideki; Ogawa, Akira; and Yamaguchi, Masahisa, deceased, 4,052,670, Cl. 325-4.000.
- Kolakowski, Anthony, to PPG Industries, Inc. Method and apparatus for press bending glass sheets having rabbeted edges, 4,052,185, Cl. 65-106.000.
- Kolator, Tadeusz W., to Westinghouse Canada Limited. Current transformer, 4,052,685, Cl. 336-60.000.
- Komarov, Jury Ivanovich; Lukhmanov, Viktor Mikhailovich; and Kovalev, Gennady Ivanovich. Travelling-wave loom, 4,051,872, Cl. 139-436.000.
- König, Wolfgang, to Compur-Electronic Gesellschaft mit beschränkter Haftung. Apparatus for centrifugal separation and measurement of samples, 4,052,164, Cl. 23-259.000.
- Konishiroku Photo Industry Co., Ltd.: See—
 Deguchi, Hidetaka; Wada, Hajime; Endo, Takaya; Kikuchi, Shoji; and Hori, Haruo, 4,052,212, Cl. 96-56.200.
- Kontny, Merle E.; and Morris, Dorsey J., to Kaiser Gypsum Company, Inc. Method for producing preformed expansion joint fillers, 4,052,492, Cl. 264-6.000.
- Koppelman, Edward. Process for upgrading lignitic-type coal as a fuel, 4,052,168, Cl. 44-1.00G.
- Kori, Seiji: See—
 Hayashi, Masaki; Kori, Seiji; and Wakatsuka, Hirohisa, 4,052,512, Cl. 424-305.000.
- Korn, Volker: See—
 Franetzi, Manfred; Korn, Volker; and Prestele, Karl, 4,051,843, Cl. 128-2.080.
- Kotsuka, Tadashi; and Ohchi, Torao, to Tokyo Juki Kogyo Kabushiki Kaisha. Cloth guide mechanism in a sewing machine, 4,051,795, Cl. 112-153.000.
- Koval, Stephen F., to Jenmar Corporation. Method and apparatus for supporting a mine roof, 4,051,683, Cl. 61-45.00B.
- Kovalev, Gennady Ivanovich: See—
 Komarov, Jury Ivanovich; Lukhmanov, Viktor Mikhailovich; and Kovalev, Gennady Ivanovich, 4,051,872, Cl. 139-436.000.
- Kowalski, Frank V.: See—
 Schawlow, Arthur L.; and Kowalski, Frank V., 4,052,129, Cl. 356-106.00R.
- Koyama, Yasuto: See—
 Nagakura, Akira; Moroe, Michio; Koyama, Yasuto; and Kurihara, Haruki, 4,052,457, Cl. 260-586.00G.
- Koyano, Nobushige; and Inamori, Katsumi, to Iwatani Sangyo Kabushiki Kaisha, and Seimitsu Yodanki Kabushiki Kaisha. Automatic cutting torch assembly, 4,052,039, Cl. 266-57.000.
- Krabetz, Richard; Engelbach, Heinz; Lebert, Ulrich; Frey, Walter; Duembgen, Gerd; Thiessen, Fritz; and Willersinn, Carl-Heinz, to BASF Aktiengesellschaft. Catalytic oxidation of α -olefins, 4,052,450, Cl. 260-533.00N.
- Kraft, Inc.: See—
 Leonard, Edward C., 4,052,425, Cl. 260-413.000.
- Valek, John; Miller, Roland E.; and Scaletta, Joseph A., 4,051,707, Cl. 72-348.000.
- Kraftwerk Union Aktiengesellschaft: See—
 Kuter, Heinrich; and Krieger, Gerhard, 4,052,629, Cl. 310-68.00D.
- Kuter, Heinrich, 4,052,631, Cl. 310-68.00D.
- Kragen, Horst, to Ceca S.A. Agar-base gelling products, 4,052,264, Cl. 195-100.000.
- Kramer, Manuel; and Daprich, Douglas J., to Charles Stark Draper Laboratory, Inc. The gyro stabilized inertial reference system with gimbal lock prevention means, 4,052,654, Cl. 318-649.000.
- Kratzer, Hans: See—
 Dickore, Karlfried; Engels, Hans Dieter; Kratzer, Hans; and Merz, Walter, 4,052,460, Cl. 260-593.00H.
- Krauss-Maffei AG: See—
 Hultsch, Gunther; Zeppenfeld, Kurt; Niedner, Peter; and Ostermeyer, Peter, 4,052,303, Cl. 210-78.000.
- Kreahling, Robert P.; Casey, Donald J.; and Goldenberg, David Z., to American Cyanamid Company. Drawing isocyanate-treated polyester filaments, 4,052,500, Cl. 264-290.00T.
- Kreahling, Robert P.; Casey, Donald J.; and Goldenberg, David Z., to American Cyanamid Company. Treatment of polyester filaments with aromatic isocyanate mixture, 4,052,501, Cl. 264-290.00T.
- Krebs, Bonnie E. Mesh coffee filter, 4,052,318, Cl. 210-337.000.
- Krenzer, John, to Velsicol Chemical Corporation. 1-Thiadiazolyl-5-alkyl- and arylaminoimidazolidinones, 4,052,191, Cl. 71-90.000.
- Krenzer, John, to Velsicol Chemical Corporation. 1-(5-t-Butyl-1,3,4-thiadiazol-2-yl)-3-methyl-5-nonanoyloxy-1,3-imidazolidin-2-one herbicide, 4,052,192, Cl. 71-90.000.
- Krenzer, John, to Velsicol Chemical Corporation. 1-(5-t-Butyl-1,3,4-thiadiazol-2-yl)-3-methyl-5-octanoyloxy-1,3-imidazolidin-2-one herbicide, 4,052,193, Cl. 71-90.000.
- Krieger, Gerhard: See—
 Kuter, Heinrich; and Krieger, Gerhard, 4,052,629, Cl. 310-68.00D.
- Kryczun, Alfred: See—
 Suprunov, Vladimir; Kryczun, Alfred; and Manshausen, Theodor, 4,051,602, Cl. 34-10.000.
- Ku, Irene Lau: See—
 Ku, Paul; and Ku, Irene Lau, 4,051,692, Cl. 62-244.000.

- Ku, Paul; and Ku, Irene Lau. Cooling apparatus for automobile passenger compartment, 4,051,692, Cl. 62-244.000.
- Kubota, Atsushi: See—
 Hirano, Satoru; Kubota, Atsushi; Yoshida, Mitsuru; Mizuno, Junzi; and Miyamoto, Nobutaka, 4,051,652, Cl. 57-52.000.
- Kubushiro, Kanemitsu, to Mitsubishi Petrochemical Co., Ltd. Photocurable flexible orthopedic bandage, 4,052,282, Cl. 204-159.230.
- Kuelzer, Peter, to Siemens Aktiengesellschaft. Mosaic needle printer head using plunger armature solenoid arrangements, 4,051,940, Cl. 197-1.00R.
- Kugler, Tibor: See—
 Borer, Werner J.; Kugler, Tibor; Schmidt, Walter; and Stahlin, Walter, 4,052,153, Cl. 432-156.000.
- Kuijk, Karel Elbert, to U.S. Philips Corporation. Magnetostrictive magnetic head, 4,052,748, Cl. 360-113.000.
- Kukolja, Stjepan, to Eli Lilly and Company. Method of preparation of 3-methylenecephams, 4,052,387, Cl. 544-22.000.
- Kumagai, Katuya: See—
 Wada, Moriyasu; Kumagai, Katuya; and Kamo, Takashi, 4,052,358, Cl. 260-40.00R.
- Kuraray Co., Ltd.: See—
 Tamura, Masuhiko; and Yasui, Teruo, 4,052,442, Cl. 560-243.000.
- Kurashiki Boseki Kabushiki Kaisha: See—
 Miyake, Takao; Koashi, Katsue; and Sawada, Masato, 4,052,018, Cl. 242-36.000.
- Kurihara, Haruki: See—
 Nagakura, Akira; Moroe, Michio; Koyama, Yasuto; and Kurihara, Haruki, 4,052,457, Cl. 260-586.00G.
- Kurita, Masayuki: See—
 Yoshikawa, Toshio; Sakamoto, Nagayoshi; Kurita, Masayuki; Oh-e, Shunji; and Nagamori, Tomitada, 4,052,362, Cl. 260-45.9NC.
- Kuroishi, Shoji; Kimura, Tsuguo; Emoto, Masami; and Yamamoto, Shiro, to Ricoh Co., Ltd. Developing system, 4,052,127, Cl. 355-3.0DD.
- Kurschner, Dennis L.: See—
 Erdmann, David P.; and Kurschner, Dennis L., 4,052,595, Cl. 235-92.0TC.
- Kurtz, Walter: See—
 Junge, Helmut; and Kurtz, Walter, 4,052,371, Cl. 260-154.000.
- Junge, Helmut; and Kurtz, Walter, 4,052,377, Cl. 260-154.000.
- Kuter, Heinrich; and Krieger, Gerhard, to Kraftwerk Union Aktiengesellschaft. Rotating rectifier assembly, 4,052,629, Cl. 310-68.00D.
- Kuter, Heinrich, to Kraftwerk Union Aktiengesellschaft. Rotary rectifier device for electric machines, 4,052,631, Cl. 310-68.00D.
- Kuts, Mathew, to B. F. Goodrich Company, The. Centering device, 4,052,245, Cl. 156-405.00R.
- Kutsukake, Yukinori: See—
 Nagano, Kentaro; Nomaki, Koji; Kutsukake, Yukinori; and Nanao, Junji, 4,052,691, Cl. 338-35.000.
- Kwiatkowski, Gerald M.: See—
 Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 4,051,965, Cl. 214-16.40A.
- Labatt Breweries of Canada Limited: See—
 Richardson, Bruce E.; Wilson, Gerald E.; Leselelle, Louis A.; and Oetliker, Rudy, 4,051,958, Cl. 214-8.50C.
- Laboratoires de Physicochimie Appliquée I S S E C: See—
 Samat, André; Guglielmetti, Robert; and Metzger, Jacques, 4,052,218, Cl. 96-114.100.
- Lagabholm AB: See—
 Staff, Finn; and Svensson, Christer, 4,051,959, Cl. 214-38.0BA.
- Lagunilla-Leca, Carlos. Double-walled cover for cooking food, 4,051,836, Cl. 126-275.00R.
- Laitram Corporation, The: See—
 Lapeyre, James M., 4,051,949, Cl. 198-853.000.
- Lake Geneva A & C Corporation: See—
 Frankel, Donald P.; Kendall, Willard E.; and Cooper, John F., 4,051,561, Cl. 4-131.000.
- Lamy, Jacques Edouard Jean, to C. G. Doris. Platforms resting upon the bed of a body of water, 4,051,686, Cl. 61-86.000.
- Landreth, Thomas C.: See—
 Sanders, Harold D.; and Landreth, Thomas C., 4,052,116, Cl. 339-8.00R.
- Landsberg, Dieter. Actuator for fluid pressure-operated power devices, 4,051,767, Cl. 91-420.000.
- Lang, William H.: See—
 Chang, Clarence D.; Lang, William H.; and Silvestri, Anthony J., 4,052,479, Cl. 260-682.000.
- Lange, Gerhard, to Wafios, Maschinenfabrik, Wagner, Ficker & Schmid (GmbH & Co. KG). Chain welding machine, 4,051,667, Cl. 59-31.000.
- Lange, Julius, to Ford Motor Company. Adaptive equalizer, 4,052,671, Cl. 325-42.000.
- Langen Company: See—
 Strauß, Gunter, 4,051,766, Cl. 91-417.00R.
- Strauß, Gunter, 4,052,233, Cl. 148-12.100.
- Lapeyre, James M., to Laitram Corporation, The. Conveyor system, 4,051,949, Cl. 198-853.000.
- Lapin, Evgeny Mikhailovich: See—
 Sidyak, Vitaly Alexandrovich; Sabantsev, Alexandr Nikolaevich; Lapin, Evgeny Mikhailovich; and Machnev, Evgeny Alex-
 cevich, 4,052,585, Cl. 219-100.000.
- Large, Bryan John: See—
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- Larkin, Kenneth A., to E. & J. Gallo Winery. Analog-to-digital encoder unit employing a pre-encoded film with improved film tensioning means, 4,052,612, Cl. 250-237.00R.
- Larock, Richard Craig, to Iowa State University Research Foundation, Inc. Synthesis of α,β -unsaturated carboxylic acids and esters, 4,052,423, Cl. 260-410.90R.
- Lars Collin Consult AB: See—
 Collin, Lars Thorbjörn, 4,051,679, Cl. 60-656.000.
- Larson, Floyd Gotthard, Jr.; and deBarbillo, John Joseph, II, to International Nickel Company, Inc. The. Crushable low reactivity nickel-base magnesium additive, 4,052,203, Cl. 75-130.00B.
- Larson, Raymond George. Versatile light diffuser, 4,052,607, Cl. 362-18.000.
- Larson, Wayne K., to Minnesota Mining and Manufacturing Company. Water-dispellable hot melt polyester adhesives, 4,052,368, Cl. 260-75.00S.
- Lash, Ronald J.: See—
 Harbulak, Edward P.; and Lash, Ronald J., 4,052,254, Cl. 156-664.000.
- Lasman, Henry R.: See—
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- Lassig, Wolfgang: See—
 Credner, Hans Heinrich; Lassig, Wolfgang; Meier, Ernst; Ranz, Erwin; Schleger, Siegfried; and Schranz, Karl-Wilhelm, 4,052,213, Cl. 96-66.300.
- Laubert, Gunter; and Ribka, Joachim, to Hoechst Aktiengesellschaft. N-(aminobenzoyl)-aminoarylsulfonic acids, 4,052,444, Cl. 260-507.00R.
- Lavell, Maurice; and Wilson, Donald P. Battery charging system, 4,052,656, Cl. 320-23.000.
- Lawrence Peska Assoc., Inc.: See—
 Balkcom, Robby P., 4,052,060, Cl. 273-73.00R.
- Steinfeld, Carolyn VeAlletto, 4,051,977, Cl. 221-96.000.
- Lear Motors Corporation: See—
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- Lear Siegler, Inc.: See—
 Dudheker, Jay; and Isaacson, Charles E., 4,052,141, Cl. 431-167.000.
- Learn, Richard D., to Duchess Mfg. Corporation. Link chain, 4,051,668, Cl. 59-80.000.
- Lebenson, Robert J.: See—
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- Lecolier, Serge L.: See—
 Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, 4,052,487, Cl. 260-945.000.
- Ledeen Flow Control Systems: See—
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- Ledeen Flow Control Systems, Inc.: See—
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- Lee, Emerson H., to Monsanto Company. Catalyst treatment, 4,052,333, Cl. 252-416.000.
- Lee-Mason Tools Ltd.: See—
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- Leeds & Northrup Company: See—
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- Lefevre, Marcel Robert, to Research-Cottrell, Inc. Modular gas and liquid contact means, 4,052,491, Cl. 261-112.000.
- Lehman, Maurice E. Wheelbarrow transport means, 4,052,079, Cl. 280-47.200.
- Lehmann, Joachim Walter: See—
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- Leistner, William E.; Spiegelman, Gerald H.; and Hover, Louis J., to Witco Chemical Corporation. Process for the preparation of dialkyltin dihalides, 4,052,427, Cl. 260-429.700.
- Lekberg, Robert D. Preparation of calcium pantothenate, 4,052,451, Cl. 260-534.00A.
- Leland Stanford Junior University, Board of Trustees of: See—
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- Leonard, Edward C., to Kraft, Inc. Fatty acid feed stock blend of red oil and soap stock for the preparation of dimer fatty acids, 4,052,425, Cl. 260-413.000.
- Leonhardt, Herbert. Guide bar assembly for a warp knitting machine, 4,051,698, Cl. 66-205.000.
- Leprohon, Louis C., Jr.; and Overdurf, John C., Jr., to Bethlehem Steel Corporation. Wire strand and rope, 4,051,661, Cl. 57-148.000.
- Lerner, Robert Wendell; Towers, Russell S.; and Flasch, John Robert,

- to Stauffer Chemical Company. Stable aluminum alkoxide solutions. 4,052,428, Cl. 260-448.0AD.
- Leselelleur, Louis A.: See—
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- Leuschner, Horst, to Texas Instruments Incorporated. Low cost remote control receiver. 4,052,701, Cl. 340-171.00R.
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- Leutner, Bernd: See—
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- Leveque, Marcel; and Battigelli, Jean A., to Saint-Gobain Industries. Method and apparatus for suppression of pollution in toration of glass fibers. 4,052,183, Cl. 65-3.00C.
- Levine, Norman S. Synthetic skin wound dressing. 4,051,848, Cl. 128-156.000.
- Levine, Seymour D.: See—
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- Levis, William W., Jr.: See—
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- Levy, Stephen David: See—
Schriber, Michael Stanley; and Levy, Stephen David, 4,052,381, Cl. 260-206.000.
- Lew, Hyok Sang. Variable tension ring exerciser. 4,052,070, Cl. 272-120.000.
- Lewis, Blair F.: See—
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- Lichtin, Norman N.; and Wildes, Peter D., to Boston University. The Treatment of Electrolytes which are useful in solar energy conversion. 4,052,538, Cl. 429-105.000.
- Licke, George C., to Ethyl Corporation. Process for producing diurethane from dinitro compounds, hydroxyl compounds and carbon monoxide. 4,052,420, Cl. 260-351.000.
- Licke, George C., to Ethyl Corporation. Process for producing urethane from nitro compounds, hydroxyl compounds and carbon monoxide using rhodium oxide catalysts. 4,052,437, Cl. 560-25.000.
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- Lie, Gina: See—
Dorff, Thor, 4,051,617, Cl. 43-18.00R.
- Liedek, Egon: See—
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- Lin, Yeow S.; and Stanland, Jackson E., to International Business Machines Corporation. Bubble lattice file using movable fixed lattice. 4,052,711, Cl. 340-174.0TF.
- Lindemann, Maschinenfabrik GmbH: See—
Kaffka, Dietmar, 4,051,955, Cl. 214-1.0BB.
- Lindsay, Ernest Harold, Jr.; and Daubert, Richard Francis, Jr., to Illinois Tool Works Inc. One-piece molded filter. 4,052,315, Cl. 210-232.000.
- Lindsey, Alfred L., to Honeywell Inc. Timing system for measuring angle of advance of fuel injection. 4,052,663, Cl. 324-16.00R.
- Linjogods A/S: See—
Staff, Finn; and Svensson, Christer, 4,051,959, Cl. 214-38.0BA.
- Linn, Randy W.: See—
Trumley, Richard L.; and Linn, Randy W., 4,051,626, Cl. 47-17.000.
- Liquid Carbonic Canada Ltd.: See—
Ross, Edward Alan, 4,051,886, Cl. 164-16.000.
- Livick, Lester R. Bread slicer useable by a blind person. 4,051,758, Cl. 83-437.000.
- Loberg, Hans O., to General Electric Company. Isolated semiconductor gate control circuit. 4,052,623, Cl. 307-251.000.
- Lobos, Zbigniew Jack: See—
Wei, Yung-Kang; and Lobos, Zbigniew Jack, 4,052,542, Cl. 526-46.000.
- Loch, Ernst, to Zellweger Uster AG. Method and apparatus for the moisture measurement of flat structures, especially textile webs. 4,051,719, Cl. 73-73.000.
- Lockwood, Harry Francis; and Ettenberg, Michael, to RCA Corporation. Liquid phase epitaxial growth with interfacial temperature difference. 4,052,252, Cl. 156-622.000.
- Lockwood, James L., Jr. Method for installing ceiling panels in a tunnel. 4,051,682, Cl. 61-45.00R.
- Lombardi, Francis T.: See—
Lombardi, Jack P.; Lombardi, Francis T.; and Lombardi, Tarky J., Jr., 4,051,639, Cl. 52-64.000.
- Lombardi, Jack P.; Lombardi, Francis T.; and Lombardi, Tarky J., Jr., to Syracuse Tank & Manufacturing Co., Inc. Removable deck for a building structure interstitial space. 4,051,639, Cl. 52-64.000.
- Lombardi, Tarky J., Jr.: See—
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- Lonza, Ltd.: See—
Feneberger, Kurt; and Gely, Rolf, 4,052,323, Cl. 252-23.000.
- Loomans, Maurice E.: See—
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- Lorentzen, Alan P.: See—
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- Lorenz, Hans Peter: See—
Dahl, Helmut; and Lorenz, Hans Peter, 4,052,447, Cl. 260-514.00G.
- Lorenz, Helmut; and Bunge, Heino, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Friction false twister. 4,051,655, Cl. 57-77.400.
- Lorenz, Michael. Child's lamp and audio device. 4,052,622, Cl. 307-112.000.
- Lott, George T.; and Kiewert, Harold J., to Lott Tool Corporation. Automatic snag grinder. 4,052,175, Cl. 51-96.000.
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- Louderback, George D., Sr. Lift mechanism for truck sideboards. 4,052,106, Cl. 298-23.0MD.
- Louis G. Freeman Company: See—
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- Love, Robert J.; and Graff, James C., to General Electric Company. Flare-wedge lamp. 4,052,638, Cl. 313-318.000.
- Lovisa, Peter R.; Tausanovitch, Dusan; and Lovisa, Tullio E. Exterior form spreader system for threaded end concrete ties. 4,052,032, Cl. 249-40.000.
- Lovisa, Tullio E.: See—
Lovisa, Peter R.; Tausanovitch, Dusan; and Lovisa, Tullio E., 4,052,032, Cl. 249-40.000.
- Low, Ian Alexander: See—
Gregory, Richard Langton; and Low, Ian Alexander, 4,052,571, Cl. 179-107.00R.
- Lowery, Dennis J.; Merchant, Robert E.; and Walls, Milton A., to Dixon, Inc. Oncoming air spoilers for vehicles, mounted near the hood to deflect air carried bugs, rain, road spray, snow, and lightweight debris up and away from the windshield. 4,052,099, Cl. 296-91.000.
- Lowrigkeit, Paul E. Paving stone. 4,052,131, Cl. 404-34.000.
- Lowry, Eric G.: See—
Arena, Ronald D.; and Lowry, Eric G., 4,052,327, Cl. 252-141.000.
- Lucas Electrical Company Limited: See—
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- Luhman, Robert A.; and Ward, John R., to Minnesota Mining and Manufacturing Company. Taping device and method of taping. 4,052,240, Cl. 156-212.000.
- Lukhmanov, Viktor Mikhailovich: See—
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- Lutz, David Edward. Load bracing device. 4,052,083, Cl. 280-179.00R.
- Luyckx, Leon, to Reactive Metals & Alloys Corporation. Zirconium alloy additive and method for making zirconium additions to steels. 4,052,202, Cl. 75-129.000.
- Lynch, Thomas J.: See—
Kehl, William L.; and Lynch, Thomas J., 4,052,544, Cl. 526-102.000.
- Lyons, Bernard J., to Raychem Corporation. Hydroxy aromatic compound containing sulfur and an organic phosphonate as polymer antioxidant. 4,052,279, Cl. 204-159.150.
- Lytle, William F.; and Cathcart, Thomas E., Jr., to Waterbury Scroll Pen Corporation. Universal snap mounting for disposable chart pens. 4,052,713, Cl. 346-140.00A.
- M & T Chemicals Inc.: See—
Beiter, Charles B.; and Hafner, Lee A., 4,052,354, Cl. 260-29.60M.
- Harbulak, Edward P.; and Lash, Ronald J., 4,052,254, Cl. 156-664.000.
- MacArthur, Samuel E.; and Smith, Stanley N., to Federal-Mogul Corporation. Shaft seal with clinch-butt metal case and method of making same. 4,052,077, Cl. 277-183.000.
- MacDonald, Ronald A. Air separating apparatus. 4,051,689, Cl. 62-5.000.
- Machnev, Evgeny Alexeevich: See—
Sidyakin, Vitaly Alexandrovich; Sabantsev, Alexandr Nikolaevich; Lapin, Evgeny Mikhailovich; and Machnev, Evgeny Alexeevich, 4,052,585, Cl. 219-100.000.
- MacKay, William Allan, to D.D.I. Communications, Inc. Multiplexer transmitter terminator. 4,052,566, Cl. 179-15.00A.
- MacKay, William Allan, to D.D.I. Communications, Inc. Multiplexer receiver terminator. 4,052,567, Cl. 179-15.0AL.
- MacNitt, Donald G., Jr.: See—
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- Maeshima, Tsugio: See—
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- Mageli, Orville L.: See—
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- Mahay & Cie: See—
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- Mahn, Gustav: See—
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- Rheinlander, Paul; Mahn, Gustav; Schulz, Klaus, deceased; Ruhland, Ingrid, legal representative; and Berner, Klaus, 4,052,043, Cl. 266-207.000.
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- Mair, Barrie; and Schumann, Bernard Roy, to Mars Limited. Drinking

- cup structured to enhance beverage blending. 4,052,037, Cl. 366-341.000.
- Maitland, David Steven; and Thayer, Billy E., to Hewlett-Packard Company. Binary adder. 4,052,604, Cl. 364-786.000.
- Malfroid, Pierre, to Solvay & Cie. Process for the manufacture of alkylacetophenones. 4,052,459, Cl. 260-592.000.
- Mallory, Henry Rogers, to P. R. Mallory & Co. Inc. Electrical device. 4,052,537, Cl. 429-174.000.
- Mammino, Joseph; and Jossel, Franklin, to Xerox Corporation. Electrostatographic imaging process. 4,052,207, Cl. 96-1.200.
- Mandlak, Louis John. Powder gun. 4,051,981, Cl. 222-189.000.
- Mangalick, Mahesh C., to Carborundum Company, The. Gas injection method. 4,052,199, Cl. 75-68.00R.
- Manschot, James G.; Mather, Byron L.; and Balistreri, Thomas W., to Plastronics, Inc. Combination hanger and clamp member for bedside drainage bag. 4,051,578, Cl. 251-4.000.
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- Mansmann, Manfred; and Brandel, Karl, to Bayer Aktiengesellschaft. Production of low-sulfur chromium (III) oxide pigment. 4,052,225, Cl. 106-302.000.
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- Marantette, William E.; and Marantette, Ruth B. Analog data recording and playback system for path control. 4,052,653, Cl. 318-568.000.
- Marceno, Josephine. Baking device. 4,052,034, Cl. 249-110.000.
- Marcus, Konrad H., to Prince Corporation. Rearview mirror assembly with plurality of simultaneously movable mirrors. 4,052,124, Cl. 350-304.000.
- Marczewski, George A. Drive belt with connector. 4,051,741, Cl. 74-231.00J.
- Marek, Cecil J., to United States of America, National Aeronautics and Space Administration. Fuel combustor. 4,052,144, Cl. 431-352.000.
- Margaris, Panajotis: See—
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- Marhold, Werner: See—
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- Marigold Enterprises Ltd.: See—
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- Marinik, James A., to Dow Corning Corporation. High modulus silicone rubber. 4,052,357, Cl. 260-37.0SB.
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- Marquis, Edward T.; and Watts, Lewis W., Jr., to Texaco Development Corporation. Method of preparing polyaminopolyphenylmethanes. 4,052,456, Cl. 260-570.00D.
- Marris, Oren L.; Reusser, Robert E.; and Tieszen, Dale O., to Phillips Petroleum Company. Pipe coating composition. 4,052,219, Cl. 106-14.000.
- Mars Limited: See—
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- Marshall, Hamilton W., Jr.: See—
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- Marshall, Stuart Malcolm: See—
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- Martin, Barrie James; and Bridger, Victor Ernest, to Plessey Handel und Investments A.G. Vibratory atomizer. 4,052,004, Cl. 239-102.000.
- Martin Engineering Company: See—
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- Martin, Frederick Raymond Patrick, to Lucas Electrical Company Limited. Motor vehicle with headlamp tilting mechanism. 4,052,609, Cl. 362-71.000.
- Martin Marietta Corporation: See—
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- Martin, William F., to Herring, James A., a part interest. Apparatus for separating solids from liquids. 4,052,311, Cl. 210-223.000.
- Martinelli, Michael A. Image recording medium employing photoconductive granules and a heat disintegrable layer. 4,052,208, Cl. 96-1.50R.
- Martini, Thomas, to Hoechst Aktiengesellschaft. Process for preparing perfluorinated ethers. 4,052,277, Cl. 204-158.00R.
- Maruyama, Koichi: See—
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- Masaki, Kenji; and Okamura, Kenji, to Nissan Motor Company, Limited. Multi-cylinder internal combustion engine. 4,051,672, Cl. 60-277.000.
- Masaki, Kenji, to Nissan Motor Company, Limited. Automotive internal combustion engine. 4,051,673, Cl. 60-282.000.
- Masaki, Kenji, to Nissan Motor Company, Limited. Method of and apparatus for controlling air-fuel mixtures into a multi-cylinder internal combustion engine. 4,051,816, Cl. 123-32.0EA.
- Maschinenfabrik Turner GmbH: See—
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- Masclat, Jean, to Messier-Hispano. Disc brake with graphite friction linings. 4,051,930, Cl. 188-251.00A.
- Mason, Leonard; and Anderson, Clifford, to Lee-Mason Tools Ltd. Spline mechanism for drill tools. 4,051,696, Cl. 64-23.000.
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Dowd, Allyn C.; and Rahman, Habibur, 4,051,860, Cl. 137-271.000.
- Massey, Navarre Andre. Load handling method and apparatus. 4,051,968, Cl. 214-506.000.
- Massey, William A.; and Evans, Donald J., to Molins Machine Company, Inc. Speed control system for a corrugator. 4,052,646, Cl. 318-39.000.
- Masurekar, Prakash S.; and Goodhue, Charles T., to Eastman Kodak Company. Production of cholesterol esterase using *Nocardia cholesterolicum*. 4,052,263, Cl. 195-66.00R.
- Materials Technology Corporation: See—
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- Mathauser, William R. Rod with strike signalling apparatus. 4,051,616, Cl. 43-17.000.
- Mather, Byron L.: See—
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- Mathis, Ronald D.: See—
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- Matier, William L.; and Comer, William T., to Mead Johnson & Company. Styrylamidines. 4,052,455, Cl. 260-562.00R.
- Matsui, Shigeru, to Nippon Gakki Seizo Kabushiki Kaisha. Switch with movable and fixed contacts. 4,052,581, Cl. 200-283.000.
- Matsumoto, Masaki: See—
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- Matsushita Electric Industrial Co., Ltd.: See—
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- Fukuda, Yoji; Fukushima, Fumio; Tsujimoto, Yoshinobu; Fukai, Masakazu; and Sugai, Shinji, 4,052,329, Cl. 252-301.40F.
- Hayakawa, Daishiro; and Tani, Kenroku, 4,052,627, Cl. 310-322.000.
- Hosomi, Fumio; Wasa, Kiyotaka; Eayakawa, Shigeru; and Nagai, Takeshi, 4,052,738, Cl. 358-128.000.
- Miyamoto, Kunito, 4,052,674, Cl. 325-374.000.
- Mori, Kazuhiro; and Misawa, Yoshihiko, 4,051,593, Cl. 29-564.600.
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- Sakamoto, Yoichi; Kato, Nobuyuki; and Ohtani, Tadao, 4,051,706, Cl. 72-253.00R.
- Wada, Masanobu; Koike, Yujiro; and Okuma, Yoshihisa, 4,052,739, Cl. 358-299.000.
- Mattern, Gunter, to Ciba-Geigy Corporation. Process for the production of 3-hydroxy-2-imino-(2H)-pyridinesulphonic acid monohydrate. 4,052,406, Cl. 260-294.80R.
- Matuokadecare, Kazuyuki: See—
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- Maul, Rudolf: See—
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- Mauz, Otto: See—
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- Maxman AG: See—
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- May & Baker Limited: See—
Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 4,052,390, Cl. 544-118.000.
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- McAlpine Prestcold Limited: See—
Needham, Frederick Johnston, 4,051,693, Cl. 62-262.000.
- McClellan, Bingham A., to McClellan Industries, Inc. Artificial fishing lure. 4,051,619, Cl. 43-42.240.
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- McClure, James D., to Shell Oil Company. Toluene disproportionation process using an unsupported perfluorinated polymer catalyst. 4,052,474, Cl. 260-672.00T.
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- McDonald Douglas Corporation: See—
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- McFee, Richard. Water distiller. 4,052,267, Cl. 202-185.00B.
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- McGregor, Howard Norman; and Chanaud, Robert Charles. Dynamic sound controller and method therefor. 4,052,720, Cl. 340-420.000.
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- Meadows, John W., to Quantor Corporation. Apparatus for developing and fixing heat sensitive film. 4,052,732, Cl. 354-297.000.
- Mears, Whitney H.; and Orfeo, Sabatino R., to Allied Chemical Corporation. Gaseous dielectric compositions. 4,052,555, Cl. 174-17.0GF.
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- Meditz, William F.; and Congin, James V. Vehicle safe. 4,051,790, Cl. 109-5.000.
- Meeks, John K.: See—
Holt, James W.; and Meeks, John K., 4,051,869, Cl. 137-636.100.
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- Meier, Ernst: See—
Credner, Hans Heinrich; Lassig, Wolfgang; Meier, Ernst; Ranz, Erwin; Schlegler, Siegfried; and Schranz, Karl-Wilhelm, 4,052,213, Cl. 96-66.300.
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- Meijer, Thomas Hanke Daniel: See—
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- Meinan Machinery Works, Inc.: See—
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- Melchior, August S. Directional heat transfer unit. 4,051,890, Cl. 165-38.000.
- Mele, Anthony P. Solvent sink and dispenser. 4,051,858, Cl. 134-56.00R.
- Melfi, Samuel T. Adjustable concrete form apparatus. 4,052,031, Cl. 249-19.000.
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- Meroer, James L.; and Togashi, Hachiro J., to CRYO-MAID Inc. Method and apparatus for extracting oil from hydrocarbonaceous solid material. 4,052,293, Cl. 208-11.00R.
- Merchant, Robert E.: See—
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- Merck & Co., Inc.: See—
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- Merkel, George C. Method of forming a compound containing aluminum and glycerol. 4,052,429, Cl. 260-448.0AD.
- Mersereau, Robert E.; and Silverman, Harold, to Pitney-Bowes, Inc. Sheet feeder. 4,052,051, Cl. 271-94.000.
- Merz, Walter: See—
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- Mesares, Stephen A.: See—
Tengler, John N.; Mesares, Stephen A.; and Venaieck, John T., 4,052,117, Cl. 339-17.0CF.
- Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschränkter Haftung: See—
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- Messier-Hispano: See—
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- Messing, Theodor; and Wamser, Karl H., to Standard-Messo Duisburg Gesellschaft fuer Chemietechnik mit Beschränkter Haftung & Co. Process and apparatus for the fermentation of carbohydrate-containing nutrient substrate. 4,052,261, Cl. 195-36.00R.
- Metaco AG: See—
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- Metropolitan Wire Corporation: See—
Becker, Frederick R., III, 4,052,081, Cl. 280-79.300.
- Metz, Lloyd E. Adjustable end gate assembly for pick-up truck or other vehicle. 4,052,098, Cl. 296-50.000.
- Metz, Walter. Instrument for monitoring physical parameters of temperature and pressure. 4,051,728, Cl. 73-343.00R.
- Metzger, Jacques: See—
Samat, Andre; Guglielmetti, Robert; and Metzger, Jacques, 4,052,218, Cl. 96-114.100.
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- Michalczyk, Georg; and Gluzek, Karl-Heinz, to Deutsche Texaco Aktiengesellschaft. Catalyst for the production of gamma-butyrolactone and a method for preparing the catalyst. 4,052,335, Cl. 252-446.000.
- Michel, Jacques; and Iost, Michel, to U.S. Philips Corporation. Method of manufacturing a semiconductor device and semiconductor device manufactured by using said method. 4,052,269, Cl. 204-15.000.
- Micka, William Frank; and Robinson, Thomas Scott, to International Business Machines Corporation. High speed real time image transformation. 4,052,699, Cl. 340-146.3MA.
- Mikatais, Uldis Yanovich: See—
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- Mikulas, Martin M., Jr.: See—
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- Milgo Electronic Corporation: See—
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- Mill & Mix Company, Inc.: See—
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- Millard, Keith, to Decatur Electronics, Inc. Traffic radar and apparatus therefor. 4,052,722, Cl. 343-8.000.
- Miller, Charles G.: See—
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- Miller, Coleman J., to Westinghouse Electric Corporation. Randomly agglomerated subarrays for phased array radars. 4,052,723, Cl. 343-100.0LE.
- Miller, Franklin E. Blackjack play director. 4,052,073, Cl. 273-148.00R.
- Miller, J. B., to Phillips Petroleum Company. Testing shaft seals without pressuring system to operating pressure. 4,051,717, Cl. 73-46.000.
- Miller, Roland E.: See—
Valek, John; Miller, Roland E.; and Scaletta, Joseph A., 4,051,707, Cl. 72-348.000.
- Mills, King L.; and Denton, Roy V., to Phillips Petroleum Company. Catalytic reduction of aldehydes to alcohols. 4,052,467, Cl. 260-638.00B.
- Mindler, Fredric Alton: See—
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- Mine Support Systems (Proprietary) Limited: See—
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- Minnesota Mining and Manufacturing Company: See—
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- Larson, Wayne K., 4,052,368, Cl. 260-75.00S.
- Luhman, Robert A.; and Ward, John R., 4,052,240, Cl. 156-212.000.
- Pastor, Sheldon Lee; Erickson, Milton E.; and Kahn, Donald D., 4,052,742, Cl. 360-96.000.
- Schwartz, Michael G.; Lorentzen, Alan P.; and Bucheck, David J., 4,052,306, Cl. 210-242.00S.
- Mir, Leon, to Avco Corporation. Materials handling apparatus for a ferrofluid sink/float separator. 4,052,297, Cl. 209-1.000.
- Misawa, Yoshihiko: See—
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- Mita, Yasuhiro; Yamazaki, Takayuki; and Izumi, Takahisa, to Nissan Motor Company, Limited. Converter with catalyst pellets. 4,052,166, Cl. 23-288.00F.
- Mitchell, Jack H. Precooked peanut-containing materials and process for making the same. 4,052,516, Cl. 426-271.000.
- Mitsubishi Chemical Industries Ltd.: See—
Nishitani, Kiyoshi; Ebina, Ryuzo; Sukekawa, Ikuo; and Shintani, Shuji, 4,051,787, Cl. 108-55.300.
- Mitsubishi Denki Kabushiki Kaisha: See—
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- Takeichi, Yoshihiro; Hashimoto, Tsutomu; Takeda, Fumio; and Katagi, Takashi, 4,052,724, Cl. 343-786.000.
- Yoshino, Masataka; and Oguri, Atsushi, 4,051,898, Cl. 165-166.000.
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Sagara, Hideo; Nishio, Yasuhiro; Wada, Hirokazu; and Hiromoto, Yoshinori, 4,052,632, Cl. 219-137.00R.
- Shirakawa, Seichi; Iwahashi, Koji; Nishi, Akio; Honda, Keisuke; and Taoda, Kiyomichi, 4,052,172, Cl. 48-197.00R.
- Mitsubishi Petrochemical Co., Ltd.: See—
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- Mitsubishi Rayon Co., Ltd.: See—
Ide, Fumio; Kishida, Kazuo; and Hasegawa, Akira, 4,052,482, Cl. 260-876.00R.
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- Mitsui Engineering & Shipbuilding Co., Ltd.: See—
Itani, Mituo; Kawashima, Hiroyuki; Inoue, Takasuke; and Maruyama, Mikio, 4,051,796, Cl. 114-44.000.
- Mitteregger, Anton, to Dr. Ernst Fehrer Gesellschaft m.b.H. & Co., K.G. Textilmaschinenfabrik u. Stahlbau. Apparatus for spinning textile fibers. 4,051,653, Cl. 57-58.890.
- Mixan, Craig E.; and Pews, R. Garth, to Dow Chemical Company, The. 2-(Dicyanomethylene)-1,3-dithiolo-(4,5-b)pyrazine-5,6-dicarbonitrile. 4,052,394, Cl. 260-250.0BC.
- Miyake, Takao; Koashi, Katsue; and Sawada, Masato, to Kurashiki Boseki Kabushiki Kaisha. Method and apparatus for counting yarn-splicing frequencies of spindles in automatic winding machine. 4,052,018, Cl. 242-36.000.
- Miyamoto, Kunito, to Matsushita Electric Industrial Co., Ltd. VHF tuner device. 4,052,674, Cl. 325-374.000.
- Miyamoto, Nobutaka: See—
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- Miyashita, Osamu: See—
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- Miyata, Junjiro; and Kikuchi, Yasushi, to Asahi Breweries, Ltd. Apparatus for obtaining lupulin-rich products from hops. 4,051,771, Cl. 99-276.000.
- Miyoshi, Haruki: See—
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- Miyoshi, Hiroshi: See—
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- Mizuno, Junji: See—
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- Mobil Oil Corporation: See—
Braid, Milton, 4,052,324, Cl. 252-32.500.
- Chang, Clarence D.; Lang, William H.; and Silvestri, Anthony J., 4,052,479, Cl. 260-682.000.
- Cushman, Donald R.; Pagen, Charles A.; Schick, John W.; and Yan, Tsoung-Yuan, 4,052,290, Cl. 208-6.000.
- Donk, Daniel Lawrence; and Olson, Robert Hutchins, 4,051,994, Cl. 229-65.000.
- Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, 4,052,291, Cl. 208-8.000.
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- Givens, Edwin Neil; Plank, Charles Joseph; and Rosinski, Edward Joseph, 4,052,472, Cl. 260-668.00B.
- Ireland, Henry R.; Peters, Alan W.; and Stein, Thomas R., 4,052,477, Cl. 260-676.00R.
- Morrison, Roger A., 4,052,476, Cl. 260-672.00T.
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- Mockett, Keith Henry George, to BP Chemicals Limited. Catalyst support. 4,052,334, Cl. 252-429.00R.
- Moe, Walter. Truck hoist. 4,052,105, Cl. 298-22.00J.
- Mogi, Minoru; and Matsumoto, Shoichi, to Fuji Jukogyo Kabushiki Kaisha. Internal combustion engine. 4,051,823, Cl. 123-117.00A.
- Mojden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., to Fleetwood Systems, Inc. Filled bag handling and storage apparatus. 4,051,965, Cl. 214-16.40A.
- Molay, Ira, to Audiophonics Corporation. Lectern with detent-hinged shelf for portable sound system. 4,052,561, Cl. 179-1.0AT.
- Molins Machine Company, Inc.: See—
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- Moll, Franz; and Rosenhahn, Lothar, to AGFA-Gevaert, A.G. Color photographic multilayered material with improved color density. 4,052,215, Cl. 96-84.00R.
- Monkovic, Ivo; Bachand, Carol; and Wong, Henry, to Bristol-Myers Company. Derivatives of 9,10-dihydroxy-1-(p-alkoxybenzyl)-perhydroisoquinoline oxazine-3-one. 4,052,389, Cl. 344-89.000.
- Monnet, Bernard Leon, to Billon S.A. Method of injection-moulding by injection of an article composed of at least three different materials. 4,052,497, Cl. 264-255.000.
- Monsanto Company: See—
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- Harris, Alva F.; and Shapras, Peter, 4,052,348, Cl. 260-5.000.
- Higginbottom, Harold P., 4,052,359, Cl. 260-17.500.
- Lee, Emerson H., 4,052,333, Cl. 252-416.000.
- Sternberg, Ernest M., 4,052,146, Cl. 425-463.000.
- Tinker, Harold Burnham; and Morris, Donald E., 4,052,461, Cl. 260-599.000.
- Montagna, Angelo Anthony, to Gulf Research & Development Company. Hydrogenation process employing a zinc promoted catalyst. 4,052,296, Cl. 208-216.000.
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- Mooney, Joseph R. Leak detector. 4,051,716, Cl. 73-40.50R.
- Moore, Geoffrey James: See—
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- Morganite Modmor Limited: See—
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- Mori, Kazuhiro; and Misawa, Yoshihiko, to Matsushita Electric Industrial Co., Ltd. Component mounting apparatus. 4,051,593, Cl. 29-564.600.
- Mori, Shigeru: See—
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- Moroe, Michio: See—
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- Morris, Donald E.: See—
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- Morris, Dorsey J.: See—
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- Morrison, Roger A., to Mobil Oil Corporation. Toluene disproportionation over zeolite catalyst. 4,052,476, Cl. 260-672.00T.
- Mortensen, Tage A. Fire and intruder detection and alarm apparatus. 4,052,716, Cl. 340-233.000.
- Mortoly, John L., to James L. Taylor Mfg. Co. Jaw adapter for a clamp. 4,052,046, Cl. 269-208.000.
- Morton-Norwich Products, Inc.: See—
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- Mory, Rudolf: See—
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- Moser, Louis: See—
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- Mosso, Franco Achille, to Italta, S.p.A. Process and device for the filtration of liquids polluted by suspended solid bodies. 4,052,300, Cl. 210-20.000.
- Motorola, Inc.: See—
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- Enderby, Ralph Thomas; Steel, Francis Robert; and Victor, Alan Michael, 4,052,672, Cl. 325-147.000.
- Kingzett, Thomas J., 4,052,253, Cl. 156-657.000.
- Ramsland, David Gordon, 4,052,678, Cl. 330-281.000.
- MRC Manufacturing Co.: See—
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- Mueller, Dale R.: See—
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- Muhlbock, Franz: See—
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- Mullen, John H.; and Taylor, Glenn R., to Westinghouse Electric Corporation. Rotary selector switch. 4,052,582, Cl. 200-330.000.
- Muller, Hans, to Grapha-Holding AG. Apparatus for feeding and transporting signatures in bookbinding machines. 4,052,052, Cl. 271-157.000.
- Murata, Hikaru. Hydraulic actuating system. 4,051,764, Cl. 91-29.000.
- Murata Manufacturing Co., Ltd.: See—
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- Muraviev, Alexandr Petrovich: See—
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- Murphy, Francis T.; Sagan, Peter; Rosenthal, Martin B.; and Ostrowski, Alfred R., to Seeburg Corporation. The Coin or token operated amusement device. 4,051,939, Cl. 194-10.000.
- Murphy, James A.: See—
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- Murphy, Robert P.; and Spurlock, James W., to Standard Oil Company (Indiana). Log-inject-log in sand consolidation. 4,052,613, Cl. 250-259.000.
- Musher, Evelyn: See—
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- Musher, Jeremy; and Su, Kai, to Musher, Evelyn. Group V pentavalent atom-containing compositions. 4,052,369, Cl. 260-77.5CH.
- Myers, Philip E., to Warner Electric Brake & Clutch Company. Break-away protection for electrically controlled trailer brakes. 4,052,695, Cl. 340-52.00D.
- N L Industries, Inc.: See—
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- Nabors, Jim B.: See—
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- Nagamori, Tomitada: See—
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- Nagano, Satoshi: See—
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- Nagao, Kameji: See—
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- Nagase, Kazuhiko; and Takakubo, Michihiko, to Japanese National Railways. Air brake system employing combined automatic and direct braking. 4,052,109, Cl. 303-25.000.
- Naipawer, Richard E.; and Easter, William M., to Givaudan Corporation. 3-Methyl-5-(2,2,3-trimethylcyclopent-3-en-1-yl)pentan-2-ol compound and perfume compositions. 4,052,341, Cl. 252-522.000.
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- Nakai, Toshio: See—
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- Nakamichi, Niro, to Nakamichi Research Inc. Magnetic head adjustment means for a magnetic tape machine. 4,052,745, Cl. 360-109.000.
- Nakamichi Research Inc.: See—
Nakamichi, Niro, 4,052,745, Cl. 360-109.000.
- Nakamoto, Soichi: See—
Ito, Tadashi; Ito, Fumio; Nakamoto, Soichi; and Isobe, Yasuo, 4,052,727, Cl. 354-29.000.
- Nakamura, Tatsuji; Fukuda, Kenji; Tsuji, Toshihiko; Maruyama, Takeo; Sakai, Ryouji; Sawada, Shohei; and Miyoshi, Haruki, to Nippon Kinzoku Co., Ltd. Electric heater panel. 4,052,588, Cl. 219-345.000.
- Nakaoka, Kazuhide; Araki, Kenji; Takada, Yoshikazu; Osaka, Shinobu; and Hirogami, Katsuhiko, to Nippon Kokan Kabushiki Kaisha. Method of preventing oxidation during water quenching of steel strip. 4,052,235, Cl. 148-156.000.
- Nakase, Takamichi: See—
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- Nakayama, Eiji: See—
Work tool. 4,051,935, Cl. 192-44.000.
- Nakayama, Takao: See—
Inoue, Eiichi; Kokado, Hiroshi; Yamaguchi, Takashi; Tokunaga, Yukio; Nakayama, Takao; and Yamase, Toshihiro, 4,052,211, Cl. 36-35.000.
- Namy, Gerald; Becker, August; and Trappe, Klaus. Method and apparatus of moistening charge material for an ore-dressing plant. 4,052,196, Cl. 75-25.000.
- Nanao, Junji: See—
Nagano, Kentaro; Nomaki, Koji; Kutsukake, Yukinori; and Nanao, Junji, 4,052,691, Cl. 338-35.000.
- Narand, Rajendra K. Segmental V belt. 4,051,740, Cl. 74-231.00C.
- Narita, Koji, to Inoue Gomu Kogyo Kabushiki Kaisha. Bicycle mudguard. 4,052,522, Cl. 428-31.000.
- Nash, Richard B.: See—
Appleby, Paul E.; Houck, Stanley J.; and Nash, Richard B., 4,052,237, Cl. 156-117.000.
- National Gypsum Company: See—
Stilling, Rodney A., 4,052,149, Cl. 432-58.000.
- National Presto Industries, Inc.: See—
Alder, Richard F.; and Tienor, Lawrence J., 4,052,590, Cl. 219-438.000.
- National Research Development Corporation: See—
Dobson, John Vincent, 4,052,285, Cl. 204-195.00G.
- Nelson, Richard Langton; and Low, Ian Alexander, 4,052,571, Cl. 179-107.00R.
- National Semiconductor Corporation: See—
Thal, Ted William; and Haines, Ralph Warren, 4,051,605, Cl. 35-30.000.
- Wilcox, Milton E., 4,052,682, Cl. 332-16.00R.
- Zias, Arthur R.; and Tandeske, Duane R., 4,051,712, Cl. 73-4.00R.
- National Starch and Chemical Corporation: See—
Pistor, Stephen D.; and Skoultschi, Martin M., 4,052,527, Cl. 428-463.000.
- Skoultschi, Martin M., 4,052,244, Cl. 156-310.000.
- Nea-Lindberg A/S: See—
Kide, Leif, 4,052,177, Cl. 55-139.000.
- Needham, Frederick Johnston, to McAlpine Prestcold Limited. Self-contained air-conditioning units. 4,051,693, Cl. 62-262.000.
- Nemec, James: See—
Wade, Mark W.; and Goodrum, Donald A. (said Donald A. Goodrum assigns to), 4,051,798, Cl. 114-199.000.
- Nepein, Valery Nikolaevich: See—
Baburin, Sergei Vyshelevich; Akimov, Vasily Ivanovich; Gorbushin, Vladimir Alexandrovich; Muraviev, Alexander Petrovich; Nepein, Valery Nikolaevich; Frolov, Mikhail Vladimirovich; Aizenberg, Sergei Arnoldovich; Golovko, Evgeny Mikhailovich; Kamenev, Alexander Fedorovich; and Sergeev, Igor Alexandrovich, 4,051,576, Cl. 19-156.000.
- Neptune Dynamics Ltd.: See—
Hauptmann, Edward G.; and Green, John Richard, 4,051,952, Cl. 209-73.000.
- Neubert, Terry C.: See—
Foley, Howard K.; Hutchings, David A.; and Neubert, Terry C., 4,052,547, Cl. 526-212.000.
- Neukam, Theo; Bentz, Francis; and Nischk, Gunther, to Bayer Aktiengesellschaft. Acrylonitrile polymer solutions. 4,052,355, Cl. 260-30.200.
- Neumaier, Hubert: See—
Huber, Bernd; Kleiner, Hans-Jerg; and Neumaier, Hubert, 4,052,551, Cl. 526-278.000.
- Neumann, Harry: See—
Peddinghaus, Gunther; Neumann, Harry; and Wittenstein, Horst, 4,051,747, Cl. 76-107.00R.
- New Concepts, Inc.: See—
Still, Robert C., 4,051,863, Cl. 137-454.200.
- Newman, Gerald H.: See—
Shropshire, Joseph A.; and Newman, Gerald H., 4,052,539, Cl. 429-194.000.
- Nicholls, Lawrence George, to Girling Limited. Vehicle suspension units. 4,052,088, Cl. 280-708.000.
- Nicholson, John S.: See—
Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 4,052,514, Cl. 424-316.000.
- Nickerson, Malcolm H.; and Rinker, William R., to B. F. Goodrich Company. The Solar powered method and apparatus for venting gaseous material from an enclosed space to atmosphere. 4,051,769, Cl. 98-43.00R.
- Niebylski, Leonard M., to Ethyl Corporation. Fuel compositions and additive mixtures containing methanetricarboxylates for reducing exhaust gas catalyst plugging. 4,052,171, Cl. 44-68.000.
- Niedner, Peter: See—
Hultsch, Gunther; Zeppenfeld, Kurt; Niedner, Peter; and Ostermeyer, Peter, 4,052,303, Cl. 210-78.000.
- Nielsen, Raymond J.: See—
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- Niemann, Helmut: See—
Schumacher, Peter; and Niemann, Helmut, 4,051,947, Cl. 198-478.000.
- Nihon Beru-Haueru Kabushiki Kaisha: See—
Ishibashi, Takao, 4,052,125, Cl. 352-29.000.
- Nihon Radiator Co., Ltd.: See—
Ohgida, Hidetoshi; Sakai, Yoshiharu; and Kawai, Hiroyuki, 4,051,975, Cl. 220-203.000.
- Nijhuis, Jan: See—
Terwee, Thomas Henricus Marie; and Nijhuis, Jan, 4,051,658, Cl. 57-140.0BY.
- Nikitits, Edwin; and Demers, Jean Guy, to Markus, Franklyn M. Combined folding table and seat assembly. 4,052,100, Cl. 297-159.000.
- Niksa, Gregory J.: See—
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., 4,052,155, Cl. 8-14.000.
- Nintendo Co., Ltd.: See—
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- Nippon Gakki Seizo Kabushiki Kaisha: See—
Matsui, Shigeru, 4,052,581, Cl. 200-283.000.
- Nippon Kinzoku Co., Ltd.: See—
Nakamura, Tatsuji; Fukuda, Kenji; Tsuji, Toshihiko; Maruyama, Takeo; Sakai, Ryouji; Sawada, Shohei; and Miyoshi, Haruki, 4,052,588, Cl. 219-345.000.
- Nippon Kokan Kabushiki Kaisha: See—
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- Yamagishi, Hidehisa; Tanaka, Mizuo; and Shiono, Riichi, 4,052,234, Cl. 148-156.000.
- Nippon Soken, Inc.: See—
Hattori, Tadashi; Nakase, Takamichi; and Nishida, Minoru, 4,051,817, Cl. 123-32.0EA.
- Nippon Steel Corporation: See—
Yoshida, Minoru; Yamaguchi, Susumu; and Hirano, Yoshihiko, 4,052,276, Cl. 204-130.000.
- Nippon Telegraph and Telephone Public Corporation: See—
Fujimoto, Isao; Kasubuchi, Takeshi; Aiba, Masahiko; and Shimazawa, Yoichi, 4,051,945, Cl. 197-176.000.
- Noda, Ken-ichi; and Saito, Shuzo, 4,052,563, Cl. 179-1.0SA.
- Nippondenso Co., Ltd.: See—
Yoshida, Hiroshi, 4,051,822, Cl. 123-117.00D.
- Nischk, Gunther: See—
Neukam, Theo; Bentz, Francis; and Nischk, Gunther, 4,052,355, Cl. 260-30.200.
- Nishi, Akio: See—
Shirakawa, Seiichi; Iwahashi, Koji; Nishi, Akio; Honda, Keisuke; and Taoda, Kiyomichi, 4,052,172, Cl. 48-197.00R.
- Nishida, Minoru: See—
Hattori, Tadashi; Nakase, Takamichi; and Nishida, Minoru, 4,051,817, Cl. 123-32.0EA.
- Nishikawa, Eiichiro; Itoh, Takuji; Maeshima, Tsugio; and Kamiyama, Setsuo, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst for reduction of nitrogen oxides and process for preparing same. 4,052,337, Cl. 252-455.00Z.
- Nishikawa, Tatsuo, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Ink roller cartridge. 4,051,781, Cl. 101-348.000.
- Nishio, Yasuhiro: See—
Sagara, Hideo; Nishio, Yasuhiro; Wada, Hirokazu; and Hiromoto, Yoshinori, 4,052,632, Cl. 219-137.00R.
- Nishitani, Kiyoshi; Ebina, Ryuzo; Sukekawa, Ikuo; and Shintani, Shuji, to Mitsubishi Chemical Industries Ltd. Plastic pallet. 4,051,787, Cl. 108-55.300.
- Nissan Motor Company, Limited: See—
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- Masaki, Kenji, 4,051,673, Cl. 60-282.000.

- Masaki, Kenji, 4,051,816, Cl. 123-32.0EA.
- Mita, Yasuhiro; Yamazaki, Takayuki; and Izumi, Takahisa, 4,052,166, Cl. 23-288.00F.
- Oda, Takaaki, 4,051,916, Cl. 180-90.000.
- Nisshin Sangyo Co., Ltd.: See—
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- Nitro Nobel AB: See—
Egerstrom, Bengt Gunnar Wilhelm; and Sternhoff, Bror Lennart Teodor, 4,051,988, Cl. 226-162.000.
- Nittel, Fritz: See—
Sobel, Johannes; Klein, Alfons; Nittel, Fritz; and Wedemeyer, Karlfried, 4,052,216, Cl. 96-84.0UV.
- Nivas, Yogesh: See—
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- Noakes, Thomas E.: See—
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- Nobel Hoechst Chemie: See—
Christidis, Yanni; Mauz, Otto; and Prinz, Eberhard, 4,052,364, Cl. 260-45.85B.
- Noda, Ken-ichi; and Saito, Shuzo, to Nippon Telegraph and Telephone Public Corporation. Multiplex speech transmission system with speech analysis-synthesis. 4,052,563, Cl. 179-1.0SA.
- Noguchi, Takanobu: See—
Yagi, Yoshiharu; Yasui, Seimei; Sato, Hiroshi; Noguchi, Takanobu; and Yamamoto, Michio, 4,052,473, Cl. 260-669.00P.
- Nola, Frank J., to United States of America, National Aeronautics and Space Administration. Power factor control system for AC induction motors. 4,052,648, Cl. 318-200.000.
- Nolan, John J., to Sala Magnetics, Inc. Seal assembly. 4,052,310, Cl. 210-222.000.
- Nomaki, Koji: See—
Nagano, Kentaro; Nomaki, Koji; Kutsukake, Yukinori; and Nanao, Junji, 4,052,691, Cl. 338-35.000.
- Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, to Matsushita Electric Industrial Co., Ltd. Thin film magnetic head. 4,052,749, Cl. 360-123.000.
- Nordentoft, Lars, to Friedrich Grohe Armaturenfabrik. Single handle mixer valve. 4,051,870, Cl. 137-636.200.
- Nordgren, Hans-Elov. Loading pallet. 4,051,786, Cl. 108-51.100.
- Norman, Ambrose. Attachable camp oven. 4,051,837, Cl. 126-275.00R.
- North American Philips Corporation: See—
Haas, David J., 4,052,621, Cl. 250-458.000.
- Northrop Corporation: See—
Garrigan, Peter P.; Gordon, Alfred A.; and Watson, Walter W., 4,052,494, Cl. 264-78.000.
- Noss, William H. Seating unit. 4,052,104, Cl. 297-456.000.
- Nouchi, Norimoto: See—
Nomura, Noboru; Kanai, Kenji; Kaminaka, Nobuyuki; and Nouchi, Norimoto, 4,052,749, Cl. 360-123.000.
- NTN Toyo Bearing Co. Ltd.: See—
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- Numabe, Hitomi: See—
Chihara, Hiroyuki; and Numabe, Hitomi, 4,051,663, Cl. 58-26.00R.
- Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., to Allied Chemical Corporation. Process for the production of chlorofluorinated acyclic hydrocarbons. 4,052,470, Cl. 260-653.700.
- Nychka, Henry R.: See—
Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,052,468, Cl. 260-648.00F.
- Nyegaard, Jens. Burner head in an oil burner. 4,052,147, Cl. 431-354.000.
- Nylen, Artur. Method for adjusting the tone characteristic of tone generating elements and a device therefor. 4,051,761, Cl. 84-1.150.
- Oates, William L. Method and apparatus for drilling fine holes in frangible workpieces. 4,052,132, Cl. 408-1.00R.
- Oberbacher, Rudolf: See—
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- Oce-van der Grinten N.V.: See—
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- O'Connor, Arthur H.; and McCullough, Robert E., to Time Computer, Inc. Solid state watch with inertial switch. 4,051,662, Cl. 58-4.00A.
- Oda, Takaaki, to Nissan Motor Company, Limited. Apparatus for mounting instrument to instrument panel in motor vehicle. 4,051,916, Cl. 180-90.000.
- Odstrchel, Gerald: See—
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- Oetliker, Rudy: See—
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- Ogawa, Akira: See—
Watanabe, Tatsuo; Saito, Hideki; Ogawa, Akira; and Yamaguchi, Masahisa, deceased, 4,052,670, Cl. 325-4.000.
- Ogawa, Iwakichi, to Takara Co., Ltd. Mobile reconfigurable robot toy. 4,051,623, Cl. 46-103.000.
- Ogawa, Iwakichi, to Takara Co., Ltd. Control tower and track toy assembly. 4,051,624, Cl. 46-202.000.
- Ogden, Ralph. Cutting torch and guide assembly. 4,052,040, Cl. 266-68.000.
- Ogura, Iwao: See—
Yamazaki, Eiichi; Ogura, Iwao; Ueda, Toshio; Maruyama, Koichi; and Shimizu, Kenji, 4,052,122, Cl. 350-189.000.
- Oguri, Atsushi: See—
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- Oh-e, Shunji: See—
Yoshikawa, Toshio; Sakamoto, Nagayoshi; Kurita, Masayuki; Oh-e, Shunji; and Nagamori, Tomitada, 4,052,362, Cl. 260-45.9NC.
- Ohama, Masanori; and Nakada, Yutaka, to Pacific Kogyo Kabushiki Kaisha. Apparatus for photographing road ruts. 4,052,712, Cl. 346-107.00R.
- Ohchi, Torao: See—
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- Ohgida, Hidetoshi; Sakai, Yoshiharu; and Kawai, Hiroyuki, to Nihon Radiator Co., Ltd. Cap for fuel tank. 4,051,975, Cl. 220-203.000.
- Ohmeis, Peter M.; Gehring, Robert L.; and Hahn, Roger A., to Avon Products, Inc. Rotary filler apparatus. 4,051,878, Cl. 141-82.000.
- Ohmura, Ryuichi. Line guide assembly for fishing rods. 4,051,618, Cl. 42-24.000.
- Ohnuma, Kiyoshi: See—
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- Ohrn, Gosta Arvid Valdemar, to AB Casco. Apparatus for finishing shaped articles. 4,051,635, Cl. 51-108.00R.
- Ohta, Takao, to Nintendo Co., Ltd. Light-emission gun amusement machine for home use. 4,052,066, Cl. 273-101.100.
- Ohtani, Tadao: See—
Sakamoto, Yoichi; Kato, Nobuyuki; and Ohtani, Tadao, 4,051,706, Cl. 72-253.00R.
- Oishi, Yasushi; and Yoshida, Yoshinobu, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic light-sensitive material for forming both positive transfer dye images and negative dye images. 4,052,214, Cl. 96-74.000.
- Okami, Yoshiro: See—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,052,449, Cl. 260-519.000.
- Okamura, Kenji: See—
Masaki, Kenji; and Okamura, Kenji, 4,051,672, Cl. 60-277.000.
- Okuma, Yoshihisa: See—
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- O'Leary, Kevin P.: See—
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- Oloff, Gerald. Miter box for a portable electric saw. 4,051,759, Cl. 83-471.300.
- Olin Corporation: See—
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- Olschewski, Armin: See—
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- Olson, Robert Hutchins: See—
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- Omori, Mamoru: See—
Yajima, Seishi; Hayashi, Josaburo; and Omori, Mamoru, 4,052,430, Cl. 260-448.20D.
- Ondetti, Miguel Angel: See—
Cushman, David W.; and Ondetti, Miguel Angel, 4,052,511, Cl. 424-274.000.
- Oneida Electronic Mfg. Co. Inc.: See—
Smith, Dalton T. Sr., 4,052,689, Cl. 337-215.000.
- Ono Pharmaceutical Co., Ltd.: See—
Hayashi, Masaki; Kori, Seiji; and Wakatsuka, Hirohisa, 4,052,512, Cl. 424-305.000.
- Op de Beeck, Herbert Kamel Maria, to U.S. Philips Corporation. Halogen incandescent lamp. 4,052,637, Cl. 313-222.000.
- Oppelt, John Christian: See—
Susi, Peter Vincent; and Oppelt, John Christian, 4,052,361, Cl. 260-45.80N.
- Opton W. Erich Heilmann GmbH: See—
Heimberger, Helmut, 4,051,579, Cl. 24-205.16R.
- Orange Products, Inc.: See—
Gentile, Charles J., 4,051,974, Cl. 215-329.000.
- Orfeo, Sabatino R.: See—
Mears, Whitney H.; and Orfeo, Sabatino R., 4,052,555, Cl. 174-17.0GF.
- Ort, Wolfgang: See—
Hopfner, Clemens; and Ort, Wolfgang, 4,052,726, Cl. 354-29.000.
- Osaka, Shinobu: See—
Nakaoka, Kazuhide; Araki, Kenji; Takada, Yoshikazu; Osaka, Shinobu; and Hirogami, Katsuhiko, 4,052,235, Cl. 148-156.000.
- Oshima, Kenji, to Kabushiki Kaisha Seikosha. Gear mechanism for preventing reverse rotation. 4,051,744, Cl. 74-437.000.
- Ostermeyer, Peter: See—
Hultsch, Gunther; Zeppenfeld, Kurt; Niedner, Peter; and Ostermeyer, Peter, 4,052,303, Cl. 210-78.000.
- Ostrowski, Alfred R.: See—
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- Otis Engineering Corporation: See—
Amancarla, Amareswar; and Young, Carter R., 4,051,896, Cl. 166-123.000.
- Fredd, John V., 4,051,899, Cl. 166-217.000.
- Otsuka, Steven R.: See—
Bencke, Jene A.; Otsuka, Tsuruo; Otsuka, Steven R.; and Sarkisian, Samuel G., 4,051,933, Cl. 192-18.00A.
- Otsuka, Tsuruo: See—
Bencke, Jene A.; Otsuka, Tsuruo; Otsuka, Steven R.; and Sarkisian, Samuel G., 4,051,933, Cl. 192-18.00A.

- Otten, Klaus-Detlef: See—
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- Overdurf, John C., Jr.: See—
Lemmon, Louis C., Jr.; and Overdurf, John C., Jr., 4,051,661, Cl. 57-148.000.
- Owens-Corning Fiberglass Corporation: See—
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Cunningham, Cecil R.; and Symborski, Alex P., 4,052,016, Cl. 242-18.000.
Desonancourt, Maurice J., 4,051,873, Cl. 139-440.000.
Hadd, Ronnie D.; Chappelle, Robert N.; and Mueller, Dale R., 4,052,015, Cl. 242-18.000.
Hill, Homer G.; and Austin, Kenneth L., 4,052,257, Cl. 162-156.000.
Renaud, Laurent C.; and Charon, Clarence W., 4,052,256, Cl. 162-145.000.
Stalego, Joseph P.; and Rigby, William H., Jr., 4,052,182, Cl. 65-300C.
- Owens-Illinois, Inc.: See—
Grey, Don N.; and Guilbault, George G., 4,052,286, Cl. 204-095.000.
- Ozolin, Alexandre: See—
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- P.E.I. Incorporated: See—
Barn, Werner, 4,051,909, Cl. 175-93.000.
- P. R. Mallory & Co. Inc.: See—
Mallory, Henry Rogers, 4,052,537, Cl. 429-174.000.
- Pacific Kogyo Kabushiki Kaisha: See—
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- Packard, Douglas Randall: See—
Jensen, Neil John; Nivas, Yogesh; and Packard, Douglas Randall, 4,052,330, Cl. 252-301.100.
- Pagen, Charles A.: See—
Cushman, Donald R.; Pagen, Charles A.; Schick, John W.; and Yan, Tsoung-Yuan, 4,052,290, Cl. 208-6.000.
- Paillass, Pierre; and Raymond, Joel. Method and apparatus for improving the energy yield of a reaction. 4,052,139, Cl. 431-2.000.
- Pain, David Lord: See—
Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 4,052,390, Cl. 544-118.000.
- Palnik, Karl; to Carolinch Company, The. Filtering equipment. 4,052,317, Cl. 210-323.00T.
- Pandel Bradford, Inc.: See—
Kapoor, Vikram C.; Lashman, Henry R.; Lebeson, Robert J.; and Wisotzky, Reuben, 4,052,236, Cl. 156-85.000.
- Pantel, Howard W., Jr.: See—
Majden, Wallace W.; Davila, Jose E.; Hooper, George W.; Kwiatkowski, Gerald M.; and Pantel, Howard W., Jr., 4,051,965, Cl. 114-16.40A.
- Papa, Sisto Sergio; and Condo, Antonino, to Aziende Colori Nazionali Affini ACNA S.p.A. Water-soluble trisazo-sulfonated dyestuff derived from 2-aminophenol-4-sulfonic acid, resorcinol, 4,4'-diaminobenzonitrile and m-aminophenol. 4,052,375, Cl. 260-145.00C.
- Papenhu, Theodor, to Hoechst Aktiengesellschaft. Process for preparing aromatic hydroxy-carboxylic acid alkyl esters. 4,052,438, Cl. 560-61.000.
- Papenmeier, Horst. Inspection glass light. 4,052,608, Cl. 362-368.000.
- Paper Converting Machine Company: See—
Shirasaka, Fumitake, 4,052,048, Cl. 270-40.000.
- Parfitt, Norman Leslie Cyril, to Coal Industry (Patents) Limited. Non return device. 4,051,929, Cl. 188-196.00C.
- Parker, Ian David: See—
Els, John William; and Parker, Ian David, 4,051,688, Cl. 61-110.000.
- Parker Manufacturing Company: See—
Goodchild, Harry M., 4,051,991, Cl. 227-155.000.
- Parker, Stephen D.: See—
Bao, Frank W.; Hummendorf, James L.; and Parker, Stephen D., 4,051,713, Cl. 73-9.000.
- Parkins, Derek Ray: See—
Garrett, Roy Peter; Parkins, Derek Ray; Brandenstein, Manfred; and Olachewski, Armin, 4,051,937, Cl. 192-88.00A.
- Partners Limited, The: See—
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- Parup, Erika, to Pitney-Bowes, Inc. Container loading system. 4,051,957, Cl. 214-6.00H.
- Peahley, Richard D., to Intel Corporation. Process for preparing a substrate for MOS devices of different thresholds. 4,052,229, Cl. 148-1.500.
- Passavant-Werke Michelbacher Hütte: See—
Basse, Oswald; and Klesper, Hugo, 4,052,314, Cl. 210-230.000.
- Pastor, Sheldon Lee; Erickson, Milton E.; and Kahn, Donald D., to Minnesota Mining and Manufacturing Company. Magnetic tape recorder drive mechanism having a latching member with a pause mode and a stop mode. 4,052,742, Cl. 360-96.000.
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- Patterson, Colin Davey. Data transmission system. 4,052,558, Cl. 178-68.000.
- Patton, Michael C.: See—
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- Pedlik, Miroslav: See—
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- Peerless Industries Inc.: See—
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- Peters, Alan W.: See—
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- Peters, Charles Allan, to IMC Chemical Group, Inc. Cis-zealanone, cis-zealanol, and cis-zealanene. 4,052,414, Cl. 260-343.410.
- Peterson, Dean M., to Honeywell Inc. Electrographic recording head having an integral recording electrode cleaning means. 4,052,714, Cl. 346-155.000.
- Peterson, Harold Severin, to Applied Power Inc. Curing rim. 4,051,881, Cl. 144-288.00A.
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- Petry, Stanton H., to Cory Food Services, Inc. Lime breakup means. 4,051,839, Cl. 126-344.000.
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- Pierce, Robert M., to United Technologies Corporation. Suction vent at recirculation zone of combustor. 4,051,670, Cl. 60-39.72R.
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- Pinckney, Cheryl. Oven rack. 4,051,838, Cl. 126-340.000.
- Pirnie, Robert M., III, to Communication Equipment & Contracting Co., Inc. Emergency call answering system. 4,052,569, Cl. 179-27.00H.
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- Pixley Richards West, Inc.: See—
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- Plastronics, Inc.: See—
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- Plough, Inc.: See—
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- Pohl, Leonard Buster. Circuit monitor to determine power on and circuit working. 4,052,664, Cl. 324-51.000.
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- Polk, Donald E.; Ray, Ranjan; and Davis, Lance A., to Allied Chemical Corporation. Amorphous alloys with improved resistance to embrittlement upon heat treatment. 4,052,201, Cl. 75-124.000.
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- Polychrome Corporation: See—
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- Polymer Processing Research Institute Ltd.: See—
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- Potts, Robert G. Cone labeling, separating and restacking apparatus. 4,052,250, Cl. 156-556.000.
- Powell, James E., to Shell Oil Company. 3-Acetyltetrahydro-2-(nitromethylene)-2H-1,3-thiazine. 4,052,388, Cl. 544-54.000.
- Powell, Leslie Vernon: See—
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- Powers, Robert H., to Itek Corporation. Cassette-like device for advancing and withdrawing a predetermined length of film to and from a camera. 4,052,731, Cl. 354-275.000.
- PPG Industries, Inc.: See—
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- Preuss, Robert K.: See—
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- Priddy, Duane B., to Dow Chemical Company, The. Process for the manufacture of di-*t*-butylperoxy ketals. 4,052,464, Cl. 260-610.00C.
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- Production Specialties, Inc.: See—
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- Progressive Equipment, Inc.: See—
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- Prunk, Karel M. A., to Shell Oil Company. Process for the desulfurization of hydrocarbon oils with water vapor addition to the reaction zone. 4,052,295, Cl. 208-211.000.
- Propst, Robert L., to Herman Miller, Inc. Material handling apparatus. 4,052,084, Cl. 280-408.000.
- Propst, Robert L.; and Wodka, Michael A.; to Herman Miller, Inc. Masking sound generator. 4,052,564, Cl. 179-1.50M.
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- Saunders Valve Company Limited: See—
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- Sawada, Masato: See—
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- Sawada, Shohsei: See—
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- Scardigno, Salvatore; Rivolta, Luigi; Caprara, Giuseppe; and Cassar, Luigi, to Montedison S.p.A. Process for preparing glycolic acid and its polymers. 4,052,452, Cl. 260-535.00R.
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- Schauer, Curtiss R., to Electro-Physical Research, Inc. Hearing aid. 4,052,572, Cl. 179-107.00R.
- Schar, Hugo, to Rietz Machine Works, Ltd. Method and apparatus for automatically changing textile bobbins on a cantilevered bobbin check of a textile winding machine. 4,052,017, Cl. 242-35.50A.
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- Schemgold, William Samuel; and Youngfleish, Frank Christian, to AMP Incorporated. Contact carrying spring member. 4,052,118, Cl. 334-17.0CF.
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- Schumann, Bernard Roy: See—
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- Schwan, Thomas J., to Morton-Norwich Products, Inc. Hypertensive 1-substituted 2(1H)-pyrimidones. 4,052,400, Cl. 260-256.40C.
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- Scope Incorporated: See—
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- Sergeev, Igor Alexandrovich: See—
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- Setler, Paulette E.: See—
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- Seymour, Samuel L., to PPG Industries, Inc. Press bending fixture with improved adjusting means. 4,052,188, Cl. 65-273.000.
- Shaddix, Billy Joe. Alignment of flanges. 4,052,045, Cl. 269-43.000.
- Shaefer, Archie B.: See—
Arnold, John B.; Bowyer, John M.; Hegbar, Howard R.; and Shaefer, Archie B., 4,052,717, Cl. 340-249.000.
- Shapras, Peter: See—
Harris, Alva F.; and Shapras, Peter, 4,052,348, Cl. 260-5.000.
- Sharp Kabushiki Kaisha: See—
Fujimoto, Isao; Kasubuchi, Takeshi; Aiba, Masahiko; and Shimazawa, Yoichi, 4,051,945, Cl. 197-176.000.
- Sharp, Peter A. Free flying aerodynamic toy with high stability. 4,051,622, Cl. 46-74.00R.
- Sheldon, Jerome F., to Rexnord Inc. Grease plug. 4,051,921, Cl. 184-1.00D.
- Shell Oil Company: See—
Fernley, George W.; and Stone, Cecil M., 4,052,342, Cl. 252-541.000.
- McClure, James D., 4,052,474, Cl. 260-672.00T.
- McClure, James D.; and Brandenberger, Stanley G., 4,052,475, Cl. 260-672.00T.
- Powell, James E., 4,052,388, Cl. 544-54.000.
- Pronk, Karel M. A., 4,052,295, Cl. 208-211.000.
- Riesser, Gregor H., 4,052,338, Cl. 252-470.000.
- Roman, Steven A., 4,052,411, Cl. 548-342.000.
- Shepard, Marshall Howard, to Gillette Company, The. Ground fault interrupter circuit. 4,052,751, Cl. 361-50.000.
- Sherman, Charles F., to Unican Security Systems, Ltd. Key cutting machine for producing obliquely oriented bitting. 4,051,748, Cl. 76-110.000.
- Sherman, James Bryon: See—
Chiu, Ran-Fun; Sherman, James Bryon; and Gilbert, Judson Truman, 4,052,557, Cl. 178-67.000.
- Shields, James J.: See—
Yannone, Robert A.; and Shields, James J., 4,051,669, Cl. 60-39.030.
- Shigeji, Yoshihiro. Sandal. 4,051,610, Cl. 36-11.500.
- Shimazawa, Yoichi: See—
Fujimoto, Isao; Kasubuchi, Takeshi; Aiba, Masahiko; and Shimazawa, Yoichi, 4,051,945, Cl. 197-176.000.
- Shimizu, Kenji: See—
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- Shintani, Shuji: See—
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- Shiohara, Tomoo; Kohara, Minoru; and Miyoshi, Hiroshi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Chlorine-containing resin composition. 4,052,350, Cl. 260-2.0XA.
- Shiono, Riichi: See—
Yamagishi, Hidehisa; Tanaka, Mizuo; and Shiono, Riichi, 4,052,234, Cl. 148-156.000.
- Shirakawa, Seichi; Iwahashi, Koji; Nishi, Akio; Honda, Keisuke; and Taoda, Kiyomichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for gasifying coal or other carbon containing material. 4,052,172, Cl. 48-197.00R.
- Shirasaka, Fumitake, to Paper Converting Machine Company. Longitudinally interlocking device and method. 4,052,048, Cl. 270-40.000.
- Shoaf, Walter D. Pivotal support. 4,051,953, Cl. 211-119.100.
- Shoop, John C.; Post, Roger L.; and Herschler, Michael G., to Gardner-Denver Company. Control system for helical screw compressor. 4,052,135, Cl. 417-295.000.
- Showa Seitai Kogyo Kaisha Limited: See—
Saito, Akio, 4,051,643, Cl. 53-30.00S.
- Shropshire, Joseph A.; and Newman, Gerald H., to Exxon Research and Engineering Company. Electrochemical cell with a graphite intercalation compound cathode. 4,052,539, Cl. 429-194.000.
- Shuey, Kenneth C., to Westinghouse Electric Corporation. DC series voltage regulator with gating means for output to remain off until regulation level is reached. 4,052,660, Cl. 323-19.000.
- Shute, Raymond J.: See—
Baker, Thomas G.; and Shute, Raymond J., 4,052,431, Cl. 260-513.00T.
- Sick, Erwin; and Hartman, Klaus, to Erwin Sick Optik-Elektronik. Optical apparatus for producing a light curtain. 4,052,120, Cl. 350-6.000.
- Sidyakin, Vitaly Alexandrovich; Sabantsev, Alexandr Nikolaevich; Lapin, Evgeny Mikhailovich; and Machnev, Evgeny Alexeevich. Butt welding process and apparatus for effecting same. 4,052,585, Cl. 219-100.000.
- Siegfried, Jack. Travel game. 4,052,071, Cl. 273-134.0AC.
- Sielaff GmbH & Co. Automatenbau Herrieden: See—
Kiefer, Josef, 4,051,978, Cl. 221-197.000.
- Siemens Aktiengesellschaft: See—
Eschler, Hans; and Oberbacher, Rudolf, 4,051,582, Cl. 29-25.350.
- Frantetzki, Manfred; Korn, Volker; and Prestele, Karl, 4,051,843, Cl. 128-2.080.
- Haass, Adolf, 4,052,556, Cl. 178-60.000.
- Heine, Karlheinz, 4,051,636, Cl. 51-145.00R.
- Kuelzer, Peter, 4,051,940, Cl. 197-1.00R.
- Schmitt, Reinhold; Freygang, Hans-Joachim; and Margaris, Panajotis, 4,052,668, Cl. 324-126.000.
- Speth, Winfried; Dreiselt, Walter; Bohm, Klaus; Schleicher, Lothar; and Polster, Herbert, 4,052,642, Cl. 318-561.000.
- Signinolfi, Orazio: See—
de Ruggieri, Pietro; and Signinolfi, Orazio, 4,052,352, Cl. 260-239.55R.
- Silverman, Harold: See—
Mersereau, Robert E.; and Silverman, Harold, 4,052,051, Cl. 271-94.000.
- Silvestri, Anthony J.: See—
Chang, Clarence D.; Lang, William H.; and Silvestri, Anthony J., 4,052,479, Cl. 260-682.000.
- Simm, Wolfgang: See—
Steine, Hans T.; Simm, Wolfgang; and Quaa, Joseph F., 4,052,531, Cl. 428-673.000.
- Simmons Company: See—
Hutchinson, Ronald G., 4,051,567, Cl. 5-260.000.
- Simnovec, Andre; Wiebe, Martin; and Berndt, Willi, to Schwing Hydraulik Elektronik KG. Apparatus for tightening and releasing a pressure vessel clamping nut. 4,052,652, Cl. 318-476.000.
- Simpson, William R.; and Strohschein, Robert J., to Sandoz, Inc. 4-Alkyl-2,6-di(secondary or tertiary alkylamino) pyridines, compositions thereof and methods for treating diabetes and obesity. 4,052,510, Cl. 424-263.000.
- Sims, Anson: See—
Jones, Lawrence T.; and Sims, Anson, 4,052,082, Cl. 280-87.02R.
- Sinai Hospital of Detroit: See—
Kantrowitz, Adrian; and Freed, Paul S., 4,051,840, Cl. 128-1.00D.
- Singer Company, The: See—
Hestley, Charles E., 4,051,880, Cl. 144-252.00R.
- Singh, Jasbir: See—
Forster, Siegfried; Dibelius, Gunter; Hewing, Gunter; and Singh, Jasbir, 4,052,260, Cl. 176-60.000.
- Sinkovec, Andrej, to Friedrich Frech. Beam compass. 4,051,599, Cl. 33-27.00C.
- SKF Industrial Trading and Development Company B.V.: See—
Garrett, Roy Peter; Parkins, Derek Ray; Brandenstein, Manfred; and Olschewski, Armin, 4,051,937, Cl. 192-88.00A.
- SKF Kugellagerfabriken GmbH: See—
Bartling, Gerhard, 4,051,654, Cl. 57-58.890.
- Skinner Precision Industries, Inc.: See—
Ellison, John E.; and Flink, Herbert M., 4,051,861, Cl. 137-315.000.
- Skinner, Reginald R. G-Meter. 4,051,734, Cl. 73-514.000.
- Skoutchi, Martin M., to National Starch and Chemical Corporation. Rapid curing two part adhesive. 4,052,244, Cl. 156-310.000.
- Skoutchi, Martin M.: See—
Pastor, Stephen D.; and Skoutchi, Martin M., 4,052,527, Cl. 428-463.000.
- Sleight, Arthur William: See—
D'Amore, Michael Brian; and Sleight, Arthur William, 4,052,332, Cl. 252-413.000.
- Slinkard, William Earl; and Baylis, Anthony Basil, to Celanese Corporation. Vapor phase oxidation of butane producing maleic anhydride and acetic acid. 4,052,417, Cl. 260-346.750.
- Slonczewski, John C.: See—
Calhoun, Bertram A.; Slonczewski, John C.; and Voegeli, Otto, 4,052,710, Cl. 340-174.0TF.

Slovacek, Raymond J.: See—
Horn, Robert; and Slovacek, Raymond J., 4,052,602, Cl. 364-424.000.

Smalek, Josef: See—
Reichert, Vaclav; Smalek, Josef; Pedlik, Miroslav; and Alexa, Miloslav, 4,052,151, Cl. 432-115.000.

Smatko, Joseph S., to McDonnell Douglas Corporation. Substantially non-gassing alkali resistant battery separator and method of producing same. 4,052,540, Cl. 429-229.000.

Smith, Arthur C. Starting apparatus for rodeo events. 4,051,811, Cl. 119-15.50A.

Smith, Dalton T., Sr., to Oneida Electronic Mfg. Co. Inc. Wire spring rise holder with pigtail leads. 4,052,689, Cl. 337-215.000.

Smith, Ernest L., to Phillips Petroleum Company. Package having means for providing coaxial alignment in a stack thereof. 4,051,951, Cl. 206-508.000.

Smith, James M., to United States of America, Army. Pneumatic servo system utilizing heat squib and explosive valve. 4,051,979, Cl. 222-3.000.

Smith, James M., to United States of America, Army. Pneumatic gear motor application. 4,052,024, Cl. 244-3.210.

Smith, Kay D.; Bachass, Arjun S.; and Black, Francis B., to Kenway Incorporated. Circuit for interfacing microcomputer to peripheral devices. 4,052,702, Cl. 364-200.000.

Smith, Lawrence William: See—
Fulkerson, David Wilham; and Smith, Lawrence William, 4,051,684, Cl. 61-53.500.

Smith, Robert Kirkland, to I-T-E Imperial Corporation. Contact structure for SF₆ arc spinner. 4,052,576, Cl. 200-147.00R.

Smith, Stanley N.: See—
MacArthur, Samuel E.; and Smith, Stanley N., 4,052,077, Cl. 277-183.000.

SmithKline Corporation: See—
Kaiser, Carl; Pendleton, Robert G.; and Setler, Paulette E., 4,052,506, Cl. 424-244.000.

Snap-On Tools Corporation: See—
Gruenwald, Clifford F., 4,052,665, Cl. 324-54.000.

Sner, Meer. Dental implants. 4,051,598, Cl. 32-10.00A.

Sobel, Johannes; Klein, Alfons; Nittel, Fritz; and Wedemeyer, Karlfried, to AGFA-Gevaert, A.G. Color photographic material containing a hydroxyindane. 4,052,216, Cl. 96-84.0UV.

Societe d'Assistance Technique pour Produits Nestle S.A.: See—
Finot, Paul-Andre; Hirsbrunner, Pierre; and Bertholet, Raymond, 4,052,372, Cl. 260-112.50R.

Societe Nationale des Poudres et Explosifs: See—
Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, 4,052,487, Cl. 260-945.000.

Solomon, Daniel M.: See—
Gold, Elijah H.; and Solomon, Daniel M., 4,052,383, Cl. 260-239.00A.

Solovet, Alexei Ivanovich: See—
Borisov, Vasily Nikolaevich; Akulov, Evgeny Alexandrovich; and Solovet, Alexei Ivanovich, 4,052,518, Cl. 426-482.000.

Solway & Cie: See—
Malfroid, Pierre, 4,052,459, Cl. 260-592.000.

Sotbil, Lembit; and Leuschner, Horst, to Texas Instruments Incorporated. Remote control receiver. 4,052,700, Cl. 340-171.0PF.

Sordie, Donald Thomas: See—
Brandt, Henry William, Jr.; and Sordie, Donald Thomas, 4,051,792, Cl. 111-85.000.

South Cove Corporation, Inc.: See—
Schellens, Eugene Peter, 4,051,831, Cl. 126-76.000.

Spacek, Karel: See—
Johansson, Jan-Olof; and Spacek, Karel, 4,051,742, Cl. 74-241.000.

Speth, Claus; Wilhelm, Gunter; and Hammel, Ingeborg, to Villero & Koch Keramische Werke KG. Apparatus for producing glass parison by the press-and-blow process. 4,052,187, Cl. 65-160.000.

Spaw, Robert Lynn: See—
Collins, Jerry Alan, Sr.; and Spaw, Robert Lynn, 4,052,703, Cl. 364-200.000.

Speth, Winfried; Dreiseitl, Walter; Bohm, Klaus; Schleicher, Lothar; and Polster, Herbert, to Siemens Aktiengesellschaft. Apparatus for controlling controlled systems with dead time. 4,052,642, Cl. 118-561.000.

Spiegelman, Gerald H.: See—
Leistner, William E.; Spiegelman, Gerald H.; and Hover, Louis J., 4,052,427, Cl. 260-429.700.

Spies, Alfons, to Dr. Johannes Heidenhain, GmbH. Spinning-ring bearing and support. 4,051,657, Cl. 57-124.000.

Spitz, Erich; d'Auria, Luigi; and Huignard, Jean-Pierre, to Thomson-CSF. System for reading an optical recording of binary numerical data. 4,052,706, Cl. 340-173.0LM.

Spittstoesser, Clair D.: See—
Uhlinger, Charles E.; and Spittstoesser, Clair D., 4,051,648, Cl. 56-255.000.

Spratt, Robert B.: See—
Sarem, Amir M.; Darr, Russell C.; Elchlepp, Dale L.; and Spratt, Robert B., 4,051,901, Cl. 166-270.000.

Spurlock, James W.: See—
Murphy, Robert P.; and Spurlock, James W., 4,052,613, Cl. 250-259.000.

Stachier, David Lloyd: See—
Williams, Brown F.; Burke, William Joseph; Phillips, William; and Stachier, David Lloyd, 4,052,119, Cl. 350-3.500.

Staff, Finn; and Svensson, Christer, to Linjogods A/S; and Lagaholm

AB. System for handling goods on carriers for combined railway and overland transportation. 4,051,959, Cl. 214-38.0BA.

Stafford, Donald Claude, to Chicago Bridge & Iron Company. Multi-port swivel joint. 4,052,090, Cl. 285-61.000.

Stahlin, Walter: See—
Borer, Werner J.; Kugler, Tibor; Schmidt, Walter; and Stahlin, Walter, 4,052,153, Cl. 432-156.000.

Stahlwerke Peine-Salzgitter AG: See—
Brotzmann, Karl; Knuppel, Helmut; Rheinlander, Paul; and Mahn, Gustav, 4,052,197, Cl. 75-60.000.

Rheinlander, Paul; Mahn, Gustav; Schulz, Klaus, deceased; Ruhland, Ingrid, legal representative; and Berner, Klaus, 4,052,043, Cl. 266-207.000.

Stalego, Joseph P.; and Rigby, William H., Jr., to Owens-Corning Fiberglass Corporation. Process for producing air blown glass fiber strand mat. 4,052,182, Cl. 65-3.00C.

Stamcarbon B.V.: See—
Klein, Joseph F. M.; Stijfs, Petrus A. M. J.; and Thoma, Jozef A., 4,052,458, Cl. 260-586.00C.

van Montfoort, Abraham; and Scholten, Joseph J. F., 4,052,336, Cl. 252-447.000.

Stanaback, Robert J., to Tenneco Chemicals, Inc. Process for the production of vinyl halide polymers. 4,052,546, Cl. 526-206.000.

Stanaback, Robert J., to Tenneco Chemicals, Inc. Process for the polymerization of vinyl halides in the presence of an alkylene bis-(mercaptoalkanoate). 4,052,548, Cl. 526-214.000.

Standard-Messo Duisburg Gesellschaft Fuer Chemietechnik mit Beschränkter Haftung & Co.: See—
Messing, Theodor; and Wamser, Karl H., 4,052,261, Cl. 195-36.00R.

Standard Oil Company, The: See—
Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., 4,052,418, Cl. 260-346.740.

Standard Oil Company (Indiana): See—
Murphy, Robert P.; and Spurlock, James W., 4,052,613, Cl. 250-259.000.

Stanish, Ronald J., to AMF Incorporated. Momentary contact pushbutton type switch having flexible, mounted housing. 4,052,580, Cl. 200-159.00R.

Stankevich, Paul Alexandrovich: See—
Giller, Solomon Aronovich; Venter, Karl Karlovich; Trushule, Margarita Aleksovna; Berggrin, Guntis Erikovich; Brinkmanis, Robert Augustovich; Mikstais, Uldis Yanovich; and Stankevich, Paul Alexandrovich, 4,052,419, Cl. 260-347.400.

Stanland, Jackson E.: See—
Lin, Yeong S.; and Stanland, Jackson E., 4,052,711, Cl. 340-174.0TF.

Starr, David G., to Tally Corporation. Capstan driven, endless printer ribbon cartridge. 4,051,944, Cl. 197-168.000.

Staton, Lynn D. Milling roll. 4,051,773, Cl. 99-622.000.

Stauffer Chemical Company: See—
Baker, Don R.; and Walker, Francis H., 4,052,432, Cl. 260-465.00D.

Lerner, Robert Wendell; Towers, Russell S.; and Flasch, John Robert, 4,052,428, Cl. 260-448.0AD.

Uhing, Eugene H.; and Toy, Arthur D. F., 4,052,463, Cl. 260-606.50P.

Weil, Edward D., 4,052,158, Cl. 8-116.00P.

Steel, Francis Robert: See—
Enderby, Ralph Thomas; Steel, Francis Robert; and Victor, Alan Michael, 4,052,672, Cl. 325-147.000.

Steffen, Ronald W., to Dickey-john Corporation. Liquid spreader control system. 4,052,003, Cl. 239-71.000.

Stein, Thomas R.: See—
Ireland, Henry R.; Peters, Alan W.; and Stein, Thomas R., 4,052,477, Cl. 260-676.00R.

Steine, Hans T.; Simm, Wolfgang; and Quaas, Joseph F., to Eutectic Corporation. Indium-containing silver-copper-zinc brazing alloy. 4,052,531, Cl. 428-673.000.

Steinfeld, Carolyn VeAlletto, to Lawrence Peska Assoc., Inc., a part interest. Pill and water dispenser. 4,051,977, Cl. 221-96.000.

Steinthal, Pierre T., to Compagnie Nationale Air France. Central arm rest for a complex of at least two seats. 4,052,103, Cl. 297-417.000.

Steitzer, William. Solar heating panel. 4,051,832, Cl. 126-270.000.

Stenhall, Turo. Apparatus for manufacturing slide fastener filament. 4,052,145, Cl. 425-392.000.

Stapan Chemical Company: See—
Baker, Thomas G.; and Shute, Raymond J., 4,052,431, Cl. 260-513.00T.

Sterigard Corporation: See—
Bruce, Roger K.; and Marhold, Werner, 4,052,249, Cl. 156-513.000.

Sterling Drug Inc.: See—
Diana, Guy D., 4,052,382, Cl. 260-239.0BE.

Sternberg, Ernest M., to Monsanto Company. Extrusion pack for sheath-core filaments. 4,052,146, Cl. 425-463.000.

Sternhoff, Bror Lennart Teodor: See—
Egerstrom, Bengt Gunnar Wilhelm; and Sternhoff, Bror Lennart Teodor, 4,051,988, Cl. 226-162.000.

Sternlicht, Mark, to Wonder Corporation of America. Flashlight case assembly and flashlight. 4,052,610, Cl. 362-200.000.

Stetson, Harold M., to Martin Engineering Company. Fast release aerator for materials handling. 4,051,982, Cl. 222-195.000.

Stewart, Samuel F. Racket weighting means. 4,052,061, Cl. 273-73.00R.

Stijfs, Petrus A. M. J.: See—
Klein, Joseph F. M.; Stijfs, Petrus A. M. J.; and Thoma, Jozef A., 4,052,458, Cl. 260-586.00C.

Stiling, Rodney A., to National Gypsum Company. Continuous calciner. 4,052,149, Cl. 432-58.000.

Still, Robert C., to New Concepts, Inc. Gate valve with replaceable liner. 4,051,863, Cl. 137-454.200.

Still, Eric T.; Levine, Seymour D.; Principe, Pacifico A.; and Diassi, Patrick A., to E. R. Squibb & Sons, Inc. Fluorene-2-acetic acids and derivatives, process and method of using. 4,052,436, Cl. 560-52.000.

Stoddard, Xerxes T.; and Terry, Ruel C. Heating Frasch sulphur mine water using waste heat. 4,051,889, Cl. 165-1.000.

Stolka, Milan; and Yanus, John F., to Xerox Corporation. Photoconductive imaging member with substituted anthracene plasticizer. 4,052,205, Cl. 96-1.0PC.

Stoltzfus, Henry: See—
Weaver, Richard L.; Stoltzfus, John; and Stoltzfus, Henry, 4,052,108, Cl. 302-60.000.

Stoltzfus, John: See—
Weaver, Richard L.; Stoltzfus, John; and Stoltzfus, Henry, 4,052,108, Cl. 302-60.000.

Stone, Cecil M.: See—
Fernley, George W.; and Stone, Cecil M., 4,052,342, Cl. 252-541.000.

Stouffer, Ronald D.; and Bray, Harry C., Jr., to Bowles Fluidics Corporation. Controlled fluid dispersal techniques. 4,052,002, Cl. 239-4.000.

Stradmann, Adolf: See—
Groth, Volker; Stradmann, Adolf; and Pelzel, Erich, 4,051,887, Cl. 164-76.000.

Stratton, Boyd Lehman, to Arvin Industries, Inc. Transducer carriage transport having cylindrical bearings and a grooved guide member. 4,052,743, Cl. 360-99.000.

Strauff, Gunter, to Langen Company. Arrangement for steering-power limitation in hydraulic servo-steering systems. 4,051,766, Cl. 91-417.00R.

Strauff, Gunther, to Langen & Co. Method for gas-and fluid-tight sealing of boreholes which are threadless and under pressure, and are mounted in a hardenable raw material. 4,052,233, Cl. 148-12.100.

Streifer, William, to Xerox Corporation. Digital half-tone grey scale expansion system. 4,052,715, Cl. 346-160.000.

Strohschein, Robert J.: See—
Simpson, William R.; and Strohschein, Robert J., 4,052,510, Cl. 424-263.000.

Strok, Jack M., to General Electric Company. High pressure sodium vapor lamp stabilized for pulse operation. 4,052,636, Cl. 313-217.000.

Strolenber, Willem Josef George. Life saving garment. 4,051,568, Cl. 9-340.000.

Strong, James P., III: See—
Schaefer, David H.; and Strong, James P., III, 4,052,705, Cl. 340-173.0LM.

Struthers Scientific and International Corporation: See—
Kern, Hobart Malcolm, Jr., 4,051,603, Cl. 34-57.00A.

Studiengesellschaft Kohle m.b.H.: See—
Wilke, Gunther; and Heimbach, Paul, 4,052,435, Cl. 560-128.000.

Sturtz, Georges L.; Lecolier, Serge L.; Clement, Jean-Claude; and Biehler, Jean Marie, to Societe Nationale des Poudres et Explosifs. Diol-phosphonates. 4,052,487, Cl. 260-945.000.

Stuttgart, Friedel: See—
Ippen, Jakob; and Stuttgart, Friedel, 4,051,883, Cl. 152-324.000.

Su, Kai: See—
Musher, Jeremy; and Su, Kai, 4,052,369, Cl. 260-77.5CH.

Sugai, Shinji: See—
Fukuda, Yoji; Fukushima, Fumio; Tsujimoto, Yoshinobu; Fukai, Masakazu; and Sugai, Shinji, 4,052,329, Cl. 252-301.40F.

Sugiura, Katsuhiko, to Fuji Jukogyo Kabushiki Kaisha. Internal combustion engine for motor vehicles. 4,051,824, Cl. 123-119.00A.

Sukekawa, Ikuo: See—
Nishitani, Kiyoshi; Ebina, Ryuzo; Sukekawa, Ikuo; and Shintani, Shuji, 4,051,787, Cl. 108-55.300.

Sukle, Vincent F. Lubricating system for bearings. 4,051,922, Cl. 184-7.00R.

Sukornick, Bernard: See—
Peterson, James Oliver; Sukornick, Bernard; Sweeney, Richard Francis; Nychka, Henry R.; Eibeck, Richard E.; and Berenbaum, Morris B., 4,052,468, Cl. 260-648.00F.

Sullivan, Roger J. Celestial display device. 4,051,607, Cl. 35-43.000.

Sulzer Brothers Limited: See—
Brunner, Alfred, 4,052,586, Cl. 219-284.000.

Sumitomo Chemical Company, Limited: See—
Kanagawa, Shuichi; Tanimura, Shozo; and Sagawa, Seiji, 4,052,363, Cl. 260-45.9KA.

Yagi, Yoshiharu; Yasui, Seimei; Sato, Hiroshi; Noguchi, Takanobu; and Yamamoto, Michio, 4,052,473, Cl. 260-669.00P.

Sun Chemical Corporation: See—
Angus, James W., 4,052,597, Cl. 235-92.00C.

Whelan, Edward J.; and Douma, William L., 4,052,152, Cl. 432-122.000.

Sun, Kwok K., to Upjohn Company, The. Process for the preparation of bisphenol-A. 4,052,466, Cl. 260-619.00A.

Sunder, Shyam: See—
Peet, Norton P.; and Sunder, Shyam, 4,052,385, Cl. 260-239.0BF.

Sundstrand Corporation: See—
Hucker, David J., 4,052,658, Cl. 363-43.000.

Suprunov, Vladimir; Kryczun, Alfred; and Manshausen, Theodor, to Klockner-Humboldt-Deutz Aktiengesellschaft. Kiln for the thermal treatment of slurry type materials such as magnesite. 4,051,602, Cl. 34-10.000.

Suresh, Dev D.; Bremer, Noel J.; and Grasselli, Robert K., to Standard

Oil Company, The. Preparation of maleic anhydride from four-carbon hydrocarbons. 4,052,418, Cl. 260-346.740.

Susi, Peter Vincent; and Oppelt, John Christian, to American Cyanamid Company. N-(2,2-dimethyl-6,6-di(lower alkyl)-4-piperidyl)-amides of hindered 3,5-dialkyl-4-hydroxybenzoic acids and use as light stabilizers in polyolefins. 4,052,361, Cl. 260-45.80N.

Sutton, Paul J. Telephone system. 4,052,570, Cl. 179-90.00B.

Suzuki, Motoo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Multi-cylinder internal combustion engine. 4,051,674, Cl. 60-282.000.

Suzuki, Takeo; Inoue, Ikutaro; Tamai, Hideo; and Aoki, Masatsugu, to Alps Electric Co., Ltd. Printing apparatus. 4,051,942, Cl. 197-49.000.

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Everman, Wayne F.; and Bernard, Vincent E., 4,051,753, Cl. 83-29.000.

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Yarwood, John C.; Dore, James E.; and Preuss, Robert K., 4,052,198, Cl. 75-68.00R.

Symborski, Alex P.: See—
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T K Valve & Manufacturing, Inc.: See—
Bowden, Billy W., 4,052,091, Cl. 285-305.000.

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Takahi, Yukiyoshi: See—
Jojima, Teruomi; and Takahi, Yukiyoshi, 4,052,395, Cl. 424-250.000.

Takakubo, Michihiko: See—
Nagase, Kazuhiko; and Takakubo, Michihiko, 4,052,109, Cl. 303-25.000.

Takara Co., Ltd.: See—
Ogawa, Iwakichi, 4,051,623, Cl. 46-103.000.

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Nagakura, Akira; Moroe, Michio; Koyama, Yasuto; and Kurihara, Haruki, 4,052,457, Cl. 260-586.00G.

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Hayakawa, Daihiro; and Tani, Kenroku, 4,052,627, Cl. 310-322.000.
- Tanimura, Shozo: See—
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- Tanzenberger, Helmut; and van den Berghe, Paul, to Compagnie Française de Raffinage. Electrolyte-electrode assembly for a combustible battery. 4,052,532, Cl. 429-33.000.
- Taoda, Kiyomichi: See—
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Lovisa, Peter R.; Tausanovitch, Dusan; and Lovisa, Tullio E., 4,052,032, Cl. 249-40.000.
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Felter, John V.; Taylor, Bill P., Jr.; and Rudine, Kenneth M., 4,051,770, Cl. 98-43.00B.
- Taylor, Edward R. Method and means for securing railroad cars to a barge deck. 4,052,027, Cl. 248-119.00R.
- Taylor, Glenn R.: See—
Mullen, John H.; and Taylor, Glenn R., 4,052,582, Cl. 200-330.000.
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- Teagler, John N.; Mesaros, Stephen A.; and Venaleck, John T., to A P Products Incorporated. Integrated circuit socket. 4,052,117, Cl. 359-17.00CF.
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- Stanaback, Robert J., 4,052,546, Cl. 526-206.000.
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Burton, John S.; and Whitney, Ronald L., 4,052,128, Cl. 355-77.000.
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- Terry, Ruel C.: See—
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Child, Edward T.; Schlenger, Warren G.; and Richter, George N., 4,052,176, Cl. 55-32.000.
- Cole, Edward L.; Hess, Howard V.; and Franz, William F., 4,052,169, Cl. 44-1.00R.
- Crookshank, Fred T., 4,052,322, Cl. 252-18.000.
- Texas Instruments Incorporated: See—
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- Thayer, Billy E.: See—
Maitland, David Steven; and Thayer, Billy E., 4,052,604, Cl. 364-786.000.
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- Thompson, Thomas L. Method of assembling flotation units. 4,051,591, Cl. 29-433.000.
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Cherrington, Martin D., 4,051,911, Cl. 175-107.000.
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Anderl, Richard F.; and Tienor, Lawrence J., 4,052,590, Cl. 219-438.000.
- Tierney, Paul A.: See—
Harakas, Nicholas K.; Fulton, Kent H.; Tierney, Paul A.; and Bender, Malcolm F., 4,052,524, Cl. 428-383.000.
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O'Connor, Arthur H.; and McCullough, Robert E., 4,051,662, Cl. 58-4.00A.
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- Tinker, Harold Burnham; and Morris, Donald E., to Monsanto Company. Hydroformylation process. 4,052,461, Cl. 260-599.000.
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- Tischlinger, Edward A. Diaphragm assembly for a medicament dispensing unit. 4,051,851, Cl. 128-218.0NV.
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- Toal, Ted William; and Haines, Ralph Warren, to National Semiconductor Corporation. Competitive educational calculator. 4,051,605, Cl. 35-30.000.
- Tobias, Torao. Apparatus for electrostatically purifying non-conductive liquid. 4,052,289, Cl. 204-302.000.
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Zabel, William P., 4,051,998, Cl. 364-465.000.
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Hayashida, Yoshihiro, 4,051,928, Cl. 188-79.50P.
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- Zehren, James N., 4,051,989, Cl. 226-190.000.
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Volk, Anthony J. Poultry leg retainer. 4,051,573, Cl. 17-11.000.

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Votta, Gerald A., to I-T-E Imperial Corporation. Magnetically driven ring arc runner for circuit interrupter. 4,052,577, Cl. 200-147.00R.

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- Wix Corporation: See—
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- Johnson, James L.; and Brunner, Russell K., 4,051,735, Cl. 74-25.000.
- Mammino, Joseph; and Jossel, Franklin, 4,052,207, Cl. 96-1.200.
- Stolka, Milan; and Yanus, John F., 4,052,205, Cl. 96-1.0PC.
- Streifer, William, 4,052,715, Cl. 346-160.000.
- Wang, Shing Chung; Hamerding, Randolph W.; and Hug, William F., 4,052,680, Cl. 331-94.50G.
- Weller, Ivor, 4,052,746, Cl. 360-109.000.
- Yagi, Yoshiharu; Yasui, Seimei; Sato, Hiroshi; Noguchi, Takanobu; and Yamamoto, Michio, to Sumitomo Chemical Company, Limited. Process for producing liquid polymer. 4,052,473, Cl. 260-669.00P.
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- Yamaguchi, Masahisa, deceased: See—
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- Yamaguchi, Susumu, to Adachi, Kizo. Linear scale electric meter with cylindrical internal magnet and two arc-shaped auxiliary yokes. 4,052,669, Cl. 324-151.00A.
- Yamaguchi, Susumu: See—
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- Yamaguchi, Takashi: See—
Inoue, Eiichi; Kokado, Hiroshi; Yamaguchi, Takashi; Tokunaga, Yukio; Nakayama, Takao; and Yamase, Toshihiro, 4,052,211, Cl. 96-35.000.
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Yagi, Yoshiharu; Yasui, Seimei; Sato, Hiroshi; Noguchi, Takanobu; and Yamamoto, Michio, 4,052,473, Cl. 260-669.00P.
- Yamamoto, Nobuo: See—
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- Yamamoto, Shiro: See—
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- Yamase, Toshihiro: See—
Inoue, Eiichi; Kokado, Hiroshi; Yamaguchi, Takashi; Tokunaga, Yukio; Nakayama, Takao; and Yamase, Toshihiro, 4,052,211, Cl. 96-35.000.
- Yamazaki, Eiichi; Ogura, Iwao; Ueda, Toshio; Maruyama, Koichi; and Shimizu, Kenji, to Hitachi, Ltd. Correcting lenses utilized in the manufacture of fluorescent screen of color picture tubes. 4,052,122, Cl. 350-189.000.
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- Yamazaki, Takayuki: See—
Mita, Yasuhiro; Yamazaki, Takayuki; and Izumi, Takahisa, 4,052,166, Cl. 23-288.00F.
- Yan, Tsoung-Yuan, to Mobil Oil Corporation. Magnetic desulfurization of airborne pulverized coal. 4,052,170, Cl. 44-1.00R.
- Yan, Tsoung-Yuan: See—
Cushman, Donald R.; Pagen, Charles A.; Schick, John W.; and Yan, Tsoung-Yuan, 4,052,290, Cl. 208-6.000.
- Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, 4,052,291, Cl. 208-8.000.
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- Yanagiuchi, Noboru: See—
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- Yarwood, John C.; Dore, James E.; and Preuss, Robert K., to Swiss Aluminium Limited. Method for in-line degassing and filtration of molten metal. 4,052,198, Cl. 75-68.00R.
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- Yasue, Kenji: See—
Asahara, Nakaba; Asai, Yasuhiko; and Yasue, Kenji, 4,052,481, Cl. 260-857.0PE.
- Yasui, Seimei: See—
Yagi, Yoshiharu; Yasui, Seimei; Sato, Hiroshi; Noguchi, Takanobu; and Yamamoto, Michio, 4,052,473, Cl. 260-669.00P.
- Yasui, Teruo: See—
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- York, Herbert. High pile fabric. 4,051,697, Cl. 66-9.00B.
- Yoshida, Hiroshi, to Nippondenso Co., Ltd. Ignition control system for internal combustion engines. 4,051,822, Cl. 123-117.00D.
- Yoshida Kogyo K.K.: See—
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- Yoshida, Minoru; Yamaguchi, Susumu; and Hirano, Yoshihiko, to Nippon Steel Corporation. Treatment process for electrolytic purifying of used solution for electrolytic tin plating. 4,052,276, Cl. 204-130.000.
- Yoshida, Mitsuru: See—
Hirano, Satoru; Kubota, Atsushi; Yoshida, Mitsuru; Mizuno, Junji; and Miyamoto, Nobutaka, 4,051,652, Cl. 57-52.000.
- Yoshida, Yoshinobu: See—
Oishi, Yasushi; and Yoshida, Yoshinobu, 4,052,214, Cl. 96-74.000.
- Yoshigai Kikai Kinzoku Kabushiki Kaisha: See—
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- Seikosha. Electronic timepiece hand-adjustment mechanism. 4,051,666, Cl. 58-85.500.
- Yoshino, Masataka; and Oguri, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Static heat-and-moisture exchanger. 4,051,898, Cl. 165-166.000.
- Young, Carter R.: See—
Amancharla, Amarswar; and Young, Carter R., 4,051,896, Cl. 166-123.000.
- Young, Maurice G.: See—
Rosenthal, Isadore; Exner, Lawrence J.; Niska, Gregory J.; Weiss, Warren I.; and Young, Maurice G., 4,052,155, Cl. 8-14.000.
- Youngfleish, Frank Christian: See—
Scheingold, William Samuel; and Youngfleish, Frank Christian, 4,052,118, Cl. 339-17.0CF.
- Youngquist, Rudolph William, to Proctor & Gamble Company, The. Shaped textured protein food product. 4,052,517, Cl. 426-302.000.
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Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; Hamada, Masa; and Okami, Yoshiro, 4,052,449, Cl. 260-519.000.
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- Zambito, James B. Dental floss holder. 4,051,857, Cl. 132-91.000.
- Zehren, James N., to TRW Inc. Cable pulling apparatus. 4,051,989, Cl. 226-190.000.
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Bognar, Istvan; and Brassel, Peter, 4,051,756, Cl. 83-389.000.
- Feller, Peter, 4,051,722, Cl. 73-160.000.
- Zellweger Uster AG: See—
Loch, Ernst, 4,051,719, Cl. 73-73.000.
- Zenith Radio Corporation: See—
Prazak, Charles J., III, 4,052,519, Cl. 427-68.000.
- Zeppenfeld, Kurt: See—
Hultsch, Gunther; Zeppenfeld, Kurt; Niedner, Peter; and Ostermeyer, Peter, 4,052,303, Cl. 210-78.000.
- Zias, Arthur R.; and Tandeske, Duane R., to National Semiconductor Corporation. Pressure transducer auto reference. 4,051,712, Cl. 73-4.00R.
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B 24,017	3,914,140	Oct. 21, 1975	B 287,275	3,925,141	Dec. 9, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 287,373	3,918,568	Nov. 11, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 288,018	3,925,239	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 288,627	3,916,179	Oct. 28, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 288,638	3,925,132	Dec. 9, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 289,523	3,921,166	Nov. 18, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 290,328	3,924,838	Dec. 9, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 291,104	3,925,007	Dec. 9, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 306,655	3,924,642	Dec. 9, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,599	3,925,323	Dec. 9, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 310,740	3,985,686	Oct. 12, 1976
B 265,727	3,914,479	Oct. 21, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 311,977	3,925,233	Dec. 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 313,900	3,915,932	Oct. 28, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 282,390	3,924,576	Dec. 9, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 282,819	3,982,932	Sep. 28, 1976	B 316,422	4,016,206	Apr. 19, 1977
B 283,124	3,923,512	Dec. 2, 1975	B 316,917	3,925,494	Dec. 9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 317,624	3,925,167	Dec. 9, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,122	4,026,905	May 31, 1977
B 285,796	3,914,303	Oct. 21, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 319,339	3,916,056	Oct. 28, 1975

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B 319,402	3,919,568	Nov. 11, 1975	B 345,060	3,916,018	Oct. 28, 1975
B 319,414	3,928,666	Dec. 23, 1975	B 345,384	3,916,146	Oct. 28, 1975
B 320,261	3,924,033	Dec. 2, 1975	B 345,390	3,940,343	Feb. 24, 1976
B 320,482	3,925,083	Dec. 9, 1975	B 345,422	3,914,392	Oct. 21, 1975
B 320,603	3,915,571	Oct. 28, 1975	B 345,527	3,927,365	Dec. 16, 1975
B 321,018	3,921,623	Nov. 25, 1975	B 345,567	3,913,985	Oct. 21, 1975
B 321,101	3,917,163	Nov. 4, 1975	B 346,044	3,988,405	Oct. 26, 1976
B 321,988	3,923,889	Dec. 2, 1975	B 346,145	3,913,293	Oct. 21, 1975
B 322,182	3,925,390	Dec. 9, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 322,289	3,920,973	Nov. 18, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,621	3,920,863	Nov. 18, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 348,383	3,923,452	Dec. 21, 1975
B 323,588	3,920,536	Nov. 18, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 324,405	3,928,664	Dec. 23, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,799	3,924,990	Dec. 9, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 325,261	3,921,304	Nov. 25, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 326,314	3,925,080	Dec. 9, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 327,412	3,925,620	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 328,300	3,916,031	Oct. 28, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 328,305	3,914,106	Oct. 21, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,310	3,914,275	Oct. 21, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,391	4,039,888	Aug. 2, 1977	B 351,421	3,914,733	Oct. 21, 1975
B 328,470	3,916,486	Nov. 4, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,412	3,925,128	Dec. 9, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 330,336	3,925,452	Dec. 9, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 330,428	3,913,589	Oct. 21, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 331,457	3,916,577	Nov. 4, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,495	3,916,403	Oct. 28, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 332,127	3,924,017	Dec. 2, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 332,111	3,924,359	Dec. 9, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 333,176	3,921,208	Nov. 18, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 334,668	3,919,469	Nov. 11, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 335,070	3,928,686	Dec. 23, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 339,059	3,924,822	Dec. 9, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,402	3,914,180	Oct. 21, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 342,763	4,051,920	Oct. 4, 1977	B 359,174	3,924,117	Oct. 21, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,506	3,916,021	Oct. 28, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 359,947	3,914,653	Oct. 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 360,208	3,923,750	Dec. 2, 1975	B 382,021	3,913,212	Oct. 21, 1975
B 360,296	3,916,720	Nov. 4, 1975	B 382,261	3,914,991	Oct. 28, 1975
B 360,719	3,915,715	Oct. 28, 1975	B 382,290	3,924,717	Dec. 9, 1975
B 360,910	3,925,696	Dec. 9, 1975	B 382,783	3,919,527	Nov. 11, 1975
B 361,265	3,923,569	Dec. 2, 1975	B 382,798	3,924,435	Dec. 9, 1975
B 361,347	3,914,642	Oct. 21, 1975	B 382,840	3,922,007	Nov. 25, 1975
B 361,443	3,927,405	Dec. 16, 1975	B 383,465	3,927,412	Dec. 16, 1975
B 361,569	3,914,554	Oct. 21, 1975	B 383,581	3,925,318	Dec. 9, 1975
B 361,604	3,922,702	Nov. 25, 1975	B 383,852	3,914,246	Oct. 21, 1975
B 361,734	3,915,764	Oct. 28, 1975	B 384,499	3,925,135	Dec. 9, 1975
B 361,743	4,035,255	July 12, 1977	B 384,658	3,913,452	Oct. 21, 1975
B 361,744	4,035,254	July 12, 1977	B 384,773	3,915,416	Oct. 28, 1975
B 362,589	3,914,012	Oct. 21, 1975	B 385,210	3,913,406	Oct. 21, 1975
B 363,205	3,923,744	Dec. 2, 1975	B 386,403	3,924,895	Dec. 9, 1975
B 363,337	3,928,639	Dec. 23, 1975	B 386,592	3,925,305	Dec. 9, 1975
B 363,457	3,922,595	Nov. 25, 1975	B 387,039	3,924,510	Dec. 9, 1975
B 363,674	3,929,716	Dec. 30, 1975	B 387,331	3,913,701	Oct. 21, 1975
B 363,892	3,913,395	Oct. 21, 1975	B 387,363	3,927,378	Dec. 16, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,687	3,918,151	Nov. 11, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 387,761	3,914,245	Oct. 21, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 387,790	3,925,380	Dec. 9, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 387,818	3,918,935	Nov. 11, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,295	3,914,631	Oct. 21, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 365,371	3,988,181	Oct. 26, 1976	B 389,639	3,914,626	Oct. 21, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,726	3,921,010	Nov. 18, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 390,738	4,035,343	July 12, 1977
B 367,021	3,914,752	Oct. 21, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 393,347	3,985,800	Oct. 12, 1976
B 370,453	3,964,101	Jun. 15, 1976	B 393,970	3,914,638	Oct. 21, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 373,051	3,914,162	Oct. 21, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 399,349	3,923,694	Dec. 9, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,248	3,926,294	Dec. 16, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 405,005	3,922,111	Nov. 25, 1975	B 422,467	3,924,804	Dec. 9, 1975
B 405,060	3,913,403	Oct. 21, 1975	B 422,949	3,921,873	Nov. 25, 1975
B 405,095	3,924,577	Dec. 9, 1975	B 424,415	3,919,458	Nov. 11, 1975
B 405,098	3,920,109	Nov. 18, 1975	B 424,462	3,920,522	Nov. 18, 1975
B 406,065	3,914,199	Oct. 21, 1975	B 424,572	3,924,979	Dec. 9, 1975
B 406,057	3,924,529	Dec. 9, 1975	B 424,748	3,924,395	Dec. 9, 1975
B 406,000	3,952,708	Apr. 27, 1976	B 425,035	3,914,025	Oct. 21, 1975
B 407,057	3,924,614	Dec. 9, 1975	B 425,345	3,922,015	Nov. 25, 1975
B 407,028	3,925,240	Dec. 9, 1975	B 425,470	3,923,796	Dec. 2, 1975
B 407,036	3,924,463	Dec. 9, 1975	B 425,539	3,916,742	Nov. 4, 1975
B 408,080	3,984,172	Oct. 5, 1976	B 425,541	3,914,051	Oct. 21, 1975
B 408,087	3,924,046	Dec. 2, 1975	B 425,572	3,923,822	Dec. 2, 1975
B 408,049	3,914,116	Oct. 21, 1975	B 425,770	3,989,817	Nov. 2, 1976
B 409,026	3,925,497	Dec. 9, 1975	B 427,631	3,921,433	Nov. 25, 1975
B 409,020	3,915,648	Oct. 28, 1975	B 428,177	3,914,624	Oct. 21, 1975
B 409,051	3,922,620	Nov. 25, 1975	B 428,795	3,921,056	Nov. 18, 1975
B 409,057	3,927,362	Dec. 16, 1975	B 429,442	3,923,485	Dec. 2, 1975
B 409,016	3,921,317	Nov. 25, 1975	B 430,106	3,918,941	Nov. 11, 1975
B 410,062	3,923,855	Dec. 2, 1975	B 430,140	3,922,084	Nov. 25, 1975
B 410,168	3,914,717	Oct. 21, 1975	B 430,149	4,037,175	July 19, 1977
B 411,145	3,914,168	Oct. 21, 1975	B 430,385	4,001,104	Jan. 4, 1977
B 411,056	3,919,649	Nov. 11, 1975	B 430,798	3,918,204	Nov. 11, 1975
B 411,083	3,925,196	Dec. 9, 1975	B 430,944	3,922,096	Nov. 25, 1975
B 411,033	3,914,741	Oct. 21, 1975	B 432,373	3,919,670	Nov. 11, 1975
B 412,016	3,927,417	Dec. 16, 1975	B 433,587	3,914,567	Oct. 21, 1975
B 412,019	3,925,292	Dec. 9, 1975	B 435,343	3,919,244	Nov. 11, 1975
B 412,067	3,924,587	Dec. 9, 1975	B 435,844	3,925,170	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975	B 437,172	3,913,251	Oct. 21, 1975
B 413,046	3,924,314	Dec. 9, 1975	B 437,173	3,924,627	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 414,288	3,925,537	Dec. 9, 1975	B 437,450	3,922,479	Nov. 25, 1975
B 415,113	3,915,717	Oct. 28, 1975	B 438,053	3,916,013	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975	B 438,706	3,925,050	Dec. 9, 1975
B 415,045	3,925,076	Dec. 9, 1975	B 439,168	3,919,676	Nov. 11, 1975
B 415,047	3,914,208	Oct. 21, 1975	B 439,669	3,921,499	Nov. 25, 1975
B 415,057	3,925,635	Dec. 9, 1975	B 440,898	3,921,789	Oct. 21, 1975
B 415,077	3,927,359	Dec. 16, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 416,098	3,923,473	Dec. 2, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 416,710	3,923,746	Dec. 2, 1975	B 442,280	3,914,054	Nov. 11, 1975
B 416,832	3,924,975	Dec. 9, 1975	B 442,859	3,918,570	Dec. 9, 1975
B 416,933	3,924,968	Dec. 9, 1975	B 442,919	3,925,483	Dec. 23, 1975
B 417,299	3,918,235	Nov. 11, 1975	B 444,614	3,927,996	Oct. 21, 1975
B 418,121	3,925,023	Dec. 9, 1975	B 445,471	3,914,711	Dec. 2, 1975
B 418,153	3,925,251	Dec. 9, 1975	B 445,740	3,923,612	May 24, 1977
B 418,302	3,913,252	Oct. 21, 1975	B 447,417	4,024,727	Dec. 9, 1975
B 419,327	3,921,197	Nov. 18, 1975	B 448,571	3,924,760	Nov. 4, 1975
B 419,481	3,924,970	Dec. 9, 1975	B 449,647	3,916,797	Nov. 18, 1975
B 420,016	3,914,572	Oct. 21, 1975	B 450,499	3,920,526	Dec. 9, 1975
B 420,148	3,927,414	Dec. 16, 1975	B 450,546	3,924,417	Oct. 21, 1975
B 420,514	3,923,929	Dec. 2, 1975	B 450,927	3,913,844	Nov. 25, 1975
B 420,568	3,925,069	Dec. 9, 1975	B 455,520	3,922,543	Oct. 21, 1975
B 421,026	3,914,785	Oct. 21, 1975	B 455,775	3,914,356	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975	B 456,346	3,928,773	Nov. 11, 1975
B 421,383	3,925,047	Dec. 9, 1975	B 459,425	3,919,586	Oct. 28, 1975
B 421,797	3,914,023	Oct. 21, 1975	B 461,872	3,915,119	Dec. 9, 1975
B 422,399	3,928,656	Dec. 23, 1975	B 467,684	3,925,340	
			B 468,198		

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 4TH DAY OF
OCTOBER, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

- Albarino, Robert Vincent; and Hart, Arthur Clifford, Jr., to Bell Telephone Laboratories, Incorporated. Coating of fiber waveguides. T963,002, 10-4-77, Cl. 65-3.00R.
- Bell Telephone Laboratories, Incorporated: See—
Albarino, Robert Vincent; and Hart, Arthur Clifford, Jr., T963,002, Cl. 65-3.00R.
- Everhart, Joseph Robert; Genaro, Donald Michael; Stokes, Rembert Ryan; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, T963,001, Cl. 14-63.000.
- Everhart, Joseph Robert; Genaro, Donald Michael; Stokes, Rembert Ryan; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, to Bell Telephone Laboratories, Incorporated. Telephone handset. T963,001, 10-4-77, Cl. 14-63.000.
- Ford Motor Company: See—
Van Wicklin, Warren A., Jr., T963,004, Cl. 152-158.000.
- Genaro, Donald Michael: See—
Everhart, Joseph Robert; Genaro, Donald Michael; Stokes, Rembert Ryan; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, T963,001, Cl. 14-63.000.
- Hart, Arthur Clifford, Jr.: See—
Albarino, Robert Vincent; and Hart, Arthur Clifford, Jr., T963,002, Cl. 65-3.00R.
- Mangus, James D.: See—
Schrock, Steven L.; and Mangus, James D., T963,003, Cl. 73-40.700.
- Schrock, Steven L.; and Mangus, James D., to Westinghouse Electric Corporation. Method and apparatus for locating a defective tube of a liquid metal-to-water tube type heat exchanger. T963,003, 10-4-77, Cl. 73-40.700.
- Stokes, Rembert Ryan: See—
Everhart, Joseph Robert; Genaro, Donald Michael; Stokes, Rembert Ryan; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, T963,001, Cl. 14-63.000.
- Sylvester, Gordon Elliot: See—
Everhart, Joseph Robert; Genaro, Donald Michael; Stokes, Rembert Ryan; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, T963,001, Cl. 14-63.000.
- Tilley, Alvin Richard: See—
Everhart, Joseph Robert; Genaro, Donald Michael; Stokes, Rembert Ryan; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, T963,001, Cl. 14-63.000.
- Van Wicklin, Warren A., Jr., to Ford Motor Company. Run-flat system for a vehicle wheel. T963,004, 10-4-77, Cl. 152-158.000.
- Westinghouse Electric Corporation: See—
Schrock, Steven L.; and Mangus, James D., T963,003, Cl. 73-40.700.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF OCTOBER, 1977

NOTE—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- Bethlehem Steel Corporation: See—
Homberg, Otto A.; Sheldrake, Charles W.; and Singleton, Alan H., Re. 29,428, Cl. 423-228.000.
- Bognacs, Ragnar; and Solberg, Olav, to Kvaerner Brug AS. Tank construction for liquified and/or compressed gas. Re. 29,424, Cl. 62-55.000.
- Cunningham, Walter F., to Superior Tabbies, Incorporated. Index tabs. Re. 29,422, Cl. 40-2.00R.
- Desai, Ashok K., to Pertec Computer Corporation. Phase-locked loop for an electronic sectoring scheme for rotating magnetic memory. Re. 29,431, Cl. 360-51.000.
- Emerson Electric Co.: See—
Plasko, Emil Robert, Re. 29,430, Cl. 337-163.000.
- Engelbreiten, Einar O., to Hobart Corporation. Trash compactor and bag system. Re. 29,425, Cl. 100-215.000.
- Fujita, Kinji, to Kabushiki Kaisha Suwa Seikoshu. Time correction device for digital watches. Re. 29,423, Cl. 58-50.00R.
- Hobart Corporation: See—
Engelbreiten, Einar O., Re. 29,425, Cl. 100-215.000.
- Homberg, Otto A.; Sheldrake, Charles W.; and Singleton, Alan H., to Bethlehem Steel Corporation. Regeneration of alkanolamine absorbing solution in gas sweetening processes. Re. 29,428, Cl. 423-228.000.
- Kabushiki Kaisha Suwa Seikoshu: See—
Fujita, Kinji, Re. 29,423, Cl. 58-50.00R.
- Kawai, Masanori; Takada, Haruo; and Kobayashi, Shinkichi, Re. 29,429, Cl. 310-348.000.
- Kawai, Masanori; Takada, Haruo; and Kobayashi, Shinkichi, to Kabushiki Kaisha Suwa Seikoshu. Oscillator for a timepiece. Re. 29,429, Cl. 310-348.000.
- Kobayashi, Shinkichi: See—
Kawai, Masanori; Takada, Haruo; and Kobayashi, Shinkichi, Re. 29,429, Cl. 310-348.000.
- Kvaerner Brug AS: See—
Bognacs, Ragnar; and Solberg, Olav, Re. 29,424, Cl. 62-55.000.
- Lariviere widow Giroux, Alice Louise Rosalie. Safety stopping device for marine engines. Re. 29,426, Cl. 123-148.00S.
- Matsushita Electric Industrial Co., Ltd.: See—
Sekine, Yoichi, Re. 29,427, Cl. 204-2.000.
- Pertec Computer Corporation: See—
Desai, Ashok K., Re. 29,431, Cl. 360-51.000.
- Plasko, Emil Robert, to Emerson Electric Co. Thermal limiter for one or more electrical circuits and method of making the same. Re. 29,430, Cl. 337-163.000.
- Sekine, Yoichi, to Matsushita Electric Industrial Co., Ltd. Electrotone recording paper. Re. 29,427, Cl. 204-2.000.
- Sheldrake, Charles W.: See—
Homberg, Otto A.; Sheldrake, Charles W.; and Singleton, Alan H., Re. 29,428, Cl. 423-228.000.
- Singleton, Alan H.: See—
Homberg, Otto A.; Sheldrake, Charles W.; and Singleton, Alan H., Re. 29,428, Cl. 423-228.000.
- Solberg, Olav: See—
Bognacs, Ragnar; and Solberg, Olav, Re. 29,424, Cl. 62-55.000.
- Superior Tabbies, Incorporated: See—
Cunningham, Walter F., Re. 29,422, Cl. 40-2.00R.
- Takada, Haruo: See—
Kawai, Masanori; Takada, Haruo; and Kobayashi, Shinkichi, Re. 29,429, Cl. 310-348.000.

LIST OF PLANT PATENTEES

Flemer, William, III, to Tresearch. Vine — *Campsis radicans*. 4,119, 10-4-77, Cl. 54.000.
Ikuta, Hideo: See—
Ito, Tokuyasu; and Ikuta, Hideo. 4,117, Cl. 88.000.
Ito, Tokuyasu; and Ikuta, Hideo. Rubber plant (*Ficus elastica*). 4,117, 10-4-77, Cl. 88.000.
Pan-American Plant Company: See—
Shoesmith, Leonard H., 4,120, Cl. 74.000.
Ruehle, Elmer C. Pistachio tree. 4,118, 10-4-77, Cl. 30.000.
Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum plant named pink concord. 4,120, 10-4-77, Cl. 74.000.
Stark Brothers Nurseries & Orchards Company: See—
Ten Hove, Hendrik Willem, 4,121, Cl. 34.000.
Ten Hove, Hendrik Willem, to Stark Brothers Nurseries & Orchards Company. Apple tree—Royal Gala variety. 4,121, 10-4-77, Cl. 34.000.
Tresearch: See—
Flemer, William, III, 4,119, Cl. 54.000.

LIST OF DESIGN PATENTEES

A.V./American Ventures, Inc.: See—
Vasilatos, Anastasios J.; and Nagele, Albert L., 245,973, Cl. D12-69.000.
Vasilatos, Anastasios J.; and Nagele, Albert L., 245,974, Cl. D12-69.000.
AAI Corporation: See—
Barr, Irwin R., 245,997, Cl. D25-21.000.
Akazawa, Toshimasa, to Matsushita Electric Industrial Co., Ltd. Combined tape recorder, tuner and amplifier. 245,978, 10-4-77, Cl. D14-5.000.
American Home Products Corporation: See—
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Amey, Aubrey, deceased; and by Beckner, Greta A., administratrix. Chair. 245,955, 10-4-77, Cl. D6-78.000.
Anderson, Robert K.; and Stuver, Richard L. Combined burner blower and support stand for simulated logs. 245,993, 10-4-77, Cl. D23-93.000.
Anjar, Inc.: See—
Hahne, Dieter; Stohr, Jurgen; and Ulrich, Hans-R., 246,002, Cl. D34-5.0BB.
Arbrook, Inc.: See—
Schmidt, George H., 245,976, Cl. D13-6.000.
Astro-Die, Ltd.: See—
Goff, Lois, 246,004, Cl. D34-5.0DT.
Barr, Irwin R., to AAI Corporation. Solar building. 245,997, 10-4-77, Cl. D25-21.000.
Beckner, Greta A., administratrix: See—
Amey, Aubrey, deceased; and Beckner, Greta A., administratrix. 245,949, Cl. D6-36.000.
Amey, Aubrey, deceased; and Beckner, Greta A., administratrix. 245,955, Cl. D6-78.000.
Brandt, Michael W. Pour spout perforating tool. 245,962, 10-4-77, Cl. D6-41.000.
Burr, Alvin L.; and Burr, Virginia H. Ball rolling game stick. 246,006, 10-4-77, Cl. D34-5.0HP.
Burr, Virginia H.: See—
Burr, Alvin L.; and Burr, Virginia H., 246,006, Cl. D34-5.0HP.
Calcedon, Robert L., to Recreation Systems Co. Child recreation structure. 246,005, 10-4-77, Cl. D34-5.00H.
Carroll, John Warren. Serial printer or similar article. 246,007, 10-4-77, Cl. D64-11.00R.
Chartier, Guy Norman, to Guy-Chart Tools Limited. Trammel gauge. 245,967, 10-4-77, Cl. D10-61.000.
Cordell, Carl R., Jr. Fishing lure. 245,990, 10-4-77, Cl. D22-28.000.
Dango, Geronimo. Sheet material holder. 245,989, 10-4-77, Cl. D19-91.000.
De Sede AG: See—
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Drapar, Earle Sumner, Jr. Convertible modular mobile home. 245,995, 10-4-77, Cl. D25-17.000.
Dunchock, Richard S., to Optarac Corporation. Eyeglass display unit. 245,956, 10-4-77, Cl. D6-85.000.
Eastman Kodak Company: See—
Olson, Richard Joseph, 245,987, Cl. D16-32.000.
Ethyl Development Corporation: See—
Lewman, John W., 245,963, Cl. D9-143.000.
Finkel, Henry, to International Business Relations Bureau Inc. Thermometer. 245,966, 10-4-77, Cl. D10-58.000.
Finley, Betty. Tennis ball pouch with belt clip. 245,947, 10-4-77, Cl. D24-00.000.
Fuji Photo Film Co., Ltd.: See—
Fukuda, Hiroshi, 245,986, Cl. D16-06.000.
Fukuda, Hiroshi, to Fuji Photo Film Co., Ltd. Camera. 245,986, 10-4-77, Cl. D16-06.000.
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Fukuoka, Tatsuo. Shoe. 245,946, 10-4-77, Cl. D2-308.000.
General Electric Company: See—
Ludwick, Ellen V. B., 245,981, Cl. D14-73.000.
Goff, Lois, to Astro-Die, Ltd. Dodecahedron astrological die. 246,004, 10-4-77, Cl. D34-5.0DT.
Gravel, Jean Guy. Collar for gas tank filling pipes of service stations. 245,991, 10-4-77, Cl. D23-41.000.
Gruber, Morton A. Incense holder. 245,992, 10-4-77, Cl. D23-78.000.
Guy-Chart Tools Limited: See—
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Hahne, Dieter; Stohr, Jurgen; and Ulrich, Hans-R., to Anjar, Inc. Apparatus for playing a game. 246,002, 10-4-77, Cl. D34-5.0BB.
Hanson Limited: See—
Mox, Dana W., 245,968, Cl. D10-91.000.
Mox, Dana W., 245,969, Cl. D10-91.000.
Havstad, Harold R., to Hudson Oxygen Therapy Sales Company. Oxygen analyzer housing. 245,965, 10-4-77, Cl. D10-46.000.
Hudson Oxygen Therapy Sales Company: See—
Havstad, Harold R., 245,965, Cl. D10-46.000.
Igo, Toshio; and Koda, Hironosuke, to Matsushita Electric Industrial Co., Ltd. Portable radio receiver. 245,980, 10-4-77, Cl. D14-68.000.
Interlemon Holding S.A.: See—
Mouttet, Leon, 245,977, Cl. D13-24.000.
International Business Relations Bureau Inc.: See—
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Kameyama Candle Co., Ltd.: See—
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Kifer, Gary Wayne. Lifting tongs. 245,972, 10-4-77, Cl. D12-54.000.
Koda, Hironosuke: See—
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Lewman, John W., to Ethyl Development Corporation. Bottle or similar article. 245,963, 10-4-77, Cl. D9-143.000.
Ludwick, Ellen V. B., to General Electric Company. Digital clock radio. 245,981, 10-4-77, Cl. D14-73.000.
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Luthy, Ernst, to De Sede AG. Chair. 245,952, 10-4-77, Cl. D6-56.000.
Martens, Melvin R. Collapsible cart. 245,971, 10-4-77, Cl. D12-24.000.
Massey-Ferguson Inc.: See—
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Montgomery, Roy W. Cribbage board. 246,001, 10-4-77, Cl. D34-5.0TT.
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Mox, Dana W., to Hanson Limited. Household scale. 245,968, 10-4-77, Cl. D10-91.000.
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Nagele, Albert L.: See—
Vasilatos, Anastasios J.; and Nagele, Albert L., 245,973, Cl. D12-69.000.
Vasilatos, Anastasios J.; and Nagele, Albert L., 245,974, Cl. D12-69.000.

LIST OF DESIGN PATENTEES

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Norton Company: See—
Strigle, Ralph F., Jr.; and Moore, Frank D., 245,999, Cl. D25-91.000.
Olson, Donald L., to Tennant Company. Blower. 245,994, 10-4-77, Cl. D23-162.000.
Olson, Richard Joseph, to Eastman Kodak Company. Copy tray. 245,987, 10-4-77, Cl. D16-32.000.
Optarac Corporation: See—
Dunchock, Richard S., 245,956, Cl. D6-85.000.
Pelly, Charles W., to Steiger Tractor Inc. Combined tractor cab and hood. 245,982, 10-4-77, Cl. D15-23.000.
Priefert Mfg. Co., Inc.: See—
Priefert, William D., 245,984, Cl. D15-32.000.
Priefert, William D., to Priefert Mfg. Co., Inc. Bale carrier attachment for tractors or the like. 245,984, 10-4-77, Cl. D15-32.000.
Recreation Systems Co.: See—
Calcedon, Robert L., 246,005, Cl. D34-5.00H.
Regie Nationale des Usines Renault: See—
Tixier, Michel, 245,975, Cl. D12-196.000.
Roderick, Ronald R., to National Equipment Corporation. Food display oven. 245,958, 10-4-77, Cl. D6-172.000.
Schmidt, George H., to Arbrook, Inc. Charging unit for portable electronic thermometer. 245,976, 10-4-77, Cl. D13-6.000.
Sexton, Edward W., Jr.: See—
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Sexton, Edward William, Sr.; and Sexton, Edward W., Jr. Can or similar article. 245,964, 10-4-77, Cl. D9-218.000.
Shimada, Asao. Golf club. 246,003, 10-4-77, Cl. D34-5.0GS.
Simerl, R. A. Anemometer transducer. 245,970, 10-4-77, Cl. D10-103.000.
Sperry Rand Corporation: See—
Wolff, Martin J., 245,948, Cl. D4-14.000.
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Stein, Peter. Utensil holder or similar article. 245,957, 10-4-77, Cl. D6-114.000.
Stohr, Jurgen: See—
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Tanikawa, Masashi, to Kameyama Candle Co., Ltd. Candle. 246,009, 10-4-77, Cl. D73-1.00R.
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Tosaw, Richard T. Combined stool and periscope. 245,954, 10-4-77, Cl. D6-74.000.
Ulrich, Hans-R.: See—
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Vasilatos, Anastasios J.; and Nagele, Albert L., to A.V./American Ventures, Inc. Personal water craft. 245,973, 10-4-77, Cl. D12-69.000.
Vasilatos, Anastasios J.; and Nagele, Albert L., to A.V./American Ventures, Inc. Personal water craft. 245,974, 10-4-77, Cl. D12-69.000.
Volkamer, Richard L. Florist partition structure for the inside of a shopping center complex. 245,998, 10-4-77, Cl. D25-59.000.
Wolff, Martin J., to Sperry Rand Corporation. Facial cleaning apparatus. 245,948, 10-4-77, Cl. D4-14.000.
Yacos, George J. Manicuring implement. 246,000, 10-4-77, Cl. D28-57.000.
Zephries, Z. George, to American Home Products Corporation. Spoon or similar article. 245,959, 10-4-77, Cl. D7-137.000.
Zephries, Z. George, to American Home Products Corporation. Spoon or similar article. 245,960, 10-4-77, Cl. D7-137.000.
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CLASSIFICATION OF PATENTS

ISSUED OCTOBER 4, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

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26	CLASS 10 4,051,570	26 74 R 103 202	4,051,621 4,051,622 4,051,623 4,051,624	45 B 45 R 53.5	4,051,681 4,051,682 4,051,683 4,051,684 4,051,685 4,051,686 4,051,687 4,051,688	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 102 151	4,051,783	CLASS 125 29	4,052,226
167 R 227	CLASS 11 4,051,571 4,051,572	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 103 131 280	4,051,784 4,051,785	CLASS 126 1 D 2.05 R 2.06 E 2.08 20 132 D 142 R 145.6 156 214.4 218 NV	4,051,840 4,051,841 4,051,842 4,051,843 4,051,844 4,051,845 4,051,846 4,051,847 4,051,848 4,051,849 4,051,850 4,051,851 4,051,852 4,051,853 4,051,855
291	CLASS 12 4,051,573 4,051,574	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 104 151	4,051,783	CLASS 127 29	4,052,226
2.7 A	CLASS 13 4,052,160	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 105 131 280	4,051,784 4,051,785	CLASS 128 1 D 2.05 R 2.06 E 2.08 20 132 D 142 R 145.6 156 214.4 218 NV	4,051,840 4,051,841 4,051,842 4,051,843 4,051,844 4,051,845 4,051,846 4,051,847 4,051,848 4,051,849 4,051,850 4,051,851 4,051,852 4,051,853 4,051,855
230 R 253 R 259	CLASS 14 4,052,161 4,052,162 4,052,163 4,052,164 4,052,165 4,052,166	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 106 14 90 270 300	4,052,219 4,052,220 4,052,221 4,052,222 4,052,223 4,052,224 4,052,225	CLASS 129 1 D 2.05 R 2.06 E 2.08 20 132 D 142 R 145.6 156 214.4 218 NV	4,051,840 4,051,841 4,051,842 4,051,843 4,051,844 4,051,845 4,051,846 4,051,847 4,051,848 4,051,849 4,051,850 4,051,851 4,051,852 4,051,853 4,051,855
288 F	CLASS 15 4,052,166	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 107 131 280	4,051,784 4,051,785	CLASS 130 27 HF	4,051,856
205.16 R	CLASS 16 4,051,579	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 108 51.1 55.3 125 152	4,051,786 4,051,787 4,051,788 4,051,789	CLASS 131 91	4,051,857
255 272	CLASS 17 4,051,580 4,051,581	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 109 58	4,051,790	CLASS 132 56 R	4,051,858 4,052,227
25.35 40 156.8 R 157.3 AH 240 252 405 420.5 433 509 564.6 596	CLASS 18 4,051,582 4,051,583 4,051,585 4,051,586 4,051,587 4,051,588 4,051,589 4,051,590 4,051,591 4,051,592 4,051,593 4,051,594 4,051,595	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 110 28 R	4,051,791	CLASS 133 89 PC	4,052,228
133 373	CLASS 19 4,051,582 4,051,583 4,051,585 4,051,586 4,051,587 4,051,588 4,051,589 4,051,590 4,051,591 4,051,592 4,051,593 4,051,594 4,051,595	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 111 85	4,051,792	CLASS 134 154 271 315 454.2	4,051,858 4,051,859 4,051,860 4,051,861 4,051,862 4,051,863 4,051,864 4,051,865
10 A	CLASS 20 4,051,596 4,051,597	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 112 83 121.12 153	4,051,793 4,051,794 4,051,795	CLASS 135 154 271 315 454.2	4,051,858 4,051,859 4,051,860 4,051,861 4,051,862 4,051,863 4,051,864 4,051,865
27 C	CLASS 21 4,051,599	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,051,743 4,051,744 4,051,745 4,051,746	CLASS 113 12 R 17	4,051,801 4,051,802	CLASS 136 504 556	4,051,864 4,051,865
	CLASS 22 4,051,599	14 17 39 48.5 58	4,051,625 4,051,626 4,051,627 4,051,628 4,051,629 4,051,630 4,051,631	5 55 64 188 236 244 262 490	4,051,689 Re.29,424 4,051,690 4,051,691 4,051,692 4,051,693 4,051,694	230 R 306 343 R 407 R 416 422 R 425.4 R 484 514	4,051,735 4,051,736 4,051,737 4,051,738 4,051,739 4,051,740 4,051,741 4,051,742 4,				

CLASSIFICATION OF PATENTS

556.3	4,051,866	107	4,051,911	CLASS 204	506	4,052,591	445 T	4,052,620	429.7	4,052,426
595	4,051,867	410	4,051,912	1 T	521	4,052,592	458	4,052,621	448 AD	4,052,427
596.13	4,051,868	CLASS 176		2	CLASS 220	4,052,593	CLASS 251		448.2 D	4,052,428
636.1	4,051,869	60	4,052,260	Re.29,427	203	4,051,975	4	4,051,578	465 D	4,052,429
636.2	4,051,870	CLASS 177		15	269	4,051,976	14	4,052,035	465 E	4,052,430
370.2	4,051,871	25	4,051,913	37 R	CLASS 221		144	4,052,036	502 R	4,052,431
436	4,051,872	CLASS 178		129.43	96	4,051,977	8.6	4,052,321	507 R	4,052,432
440	4,051,873	60	4,052,556	129.95	197	4,051,978	18	4,052,322	513 T	4,052,433
88	4,051,874	67	4,052,557	130	CLASS 222		23	4,052,323	514 G	4,052,434
124	4,051,875	68	4,052,558	158 R	3	4,051,979	32.5	4,052,324	515 H	4,052,435
CLASS 140		159.14	4,052,270	159.15	189	4,051,981	62.1 L	4,052,325	519	4,052,436
CLASS 141		159.2	4,052,271	159.22	321	4,051,982	62.56	4,052,326	533 N	4,052,437
1.1	4,051,876	159.23	4,052,272	159.23	471	4,051,983	171	4,052,327	534 A	4,052,438
4	4,051,877	159.24	4,052,273	159.24	610	4,051,984	301.1 R	4,052,328	535 R	4,052,439
82	4,051,878	159.25	4,052,274	159.25	CLASS 224		312	4,052,329	543 F	4,052,440
329	4,051,879	159.26	4,052,275	159.26	32 A	4,051,985	413	4,052,330	562 R	4,052,441
CLASS 144		159.27	4,052,276	159.27	CLASS 226		416	4,052,331	570 D	4,052,442
252 R	4,051,880	159.28	4,052,277	159.28	114	4,051,986	429 R	4,052,332	586 C	4,052,443
288 A	4,051,881	159.29	4,052,278	159.29	115	4,051,987	446	4,052,333	586 G	4,052,444
309 D	4,051,882	159.30	4,052,279	159.30	162	4,051,988	447	4,052,334	592	4,052,445
CLASS 148		159.31	4,052,280	159.31	190	4,051,989	455 Z	4,052,335	593 H	4,052,446
1.5	4,052,229	159.32	4,052,281	159.32	CLASS 227		470	4,052,336	599	4,052,447
2	4,052,230	159.33	4,052,282	159.33	10	4,051,990	512	4,052,337	604 R	4,052,448
6.15 Z	4,052,231	159.34	4,052,283	159.34	155	4,051,991	518	4,052,338	606.5 P	4,052,449
6.2	4,052,232	159.35	4,052,284	159.35	CLASS 229		522	4,052,339	610 C	4,052,450
12.1	4,052,233	159.36	4,052,285	159.36	21	4,051,992	541	4,052,340	619 A	4,052,451
156	4,052,234	159.37	4,052,286	159.37	22	4,051,993	638 B	4,052,341	648 F	4,052,452
CLASS 152		159.38	4,052,287	159.38	23	4,051,994	648 F	4,052,342	653.6	4,052,453
324	4,051,883	159.39	4,052,288	159.39	25	4,051,995	653.7	4,052,343	660	4,052,454
330 L	4,051,884	159.40	4,052,289	159.40	26	4,051,996	660 B	4,052,344	666 B	4,052,455
CLASS 156		159.41	4,052,290	159.41	27	4,051,997	669 P	4,052,345	672 T	4,052,456
85	4,052,236	159.42	4,052,291	159.42	35	4,051,998	672 T	4,052,346	676 R	4,052,457
117	4,052,237	159.43	4,052,292	159.43	61.11 E	4,052,594	17.2	4,052,347	681	4,052,458
148	4,052,238	159.44	4,052,293	159.44	92 C	4,052,595	17.5	4,052,348	682	4,052,459
177	4,052,239	159.45	4,052,294	159.45	92 PC	4,052,596	23 H	4,052,349	856	4,052,460
212	4,052,240	159.46	4,052,295	159.46	92 TC	4,052,597	23 XA	4,052,350	876 R	4,052,461
245	4,052,241	159.47	4,052,296	159.47	CLASS 230		29.6 PM	4,052,351	880 R	4,052,462
265	4,052,242	159.48	4,052,297	159.48	20	4,052,300	30.2	4,052,352	927 R	4,052,463
310	4,052,243	159.49	4,052,298	159.49	51	4,052,301	37 SB	4,052,353	945	4,052,464
405 R	4,052,244	159.50	4,052,299	159.50	63 R	4,052,302	40 R	4,052,354	970 T	4,052,465
412	4,052,245	159.51	4,052,300	159.51	78	4,052,303	45.8 N	4,052,355	18 A	4,052,466
506	4,052,246	159.52	4,052,301	159.52	79	4,052,304	45.8 B	4,052,356	34 A	4,052,467
513	4,052,247	159.53	4,052,302	159.53	130	4,052,305	45.9 KA	4,052,357	112	4,052,468
513	4,052,248	159.54	4,052,303	159.54	168	4,052,306	45.9 NC	4,052,358	6	4,052,469
556	4,052,250	159.55	4,052,304	159.55	222	4,052,307	49	4,052,359	49	4,052,470
612	4,052,251	159.56	4,052,305	159.56	223	4,052,308	63 R	4,052,360	49	4,052,471
622	4,052,252	159.57	4,052,306	159.57	224	4,052,309	63 UY	4,052,361	49	4,052,472
657	4,052,253	159.58	4,052,307	159.58	225	4,052,310	75 S	4,052,362	49	4,052,473
664	4,052,254	159.59	4,052,308	159.59	226	4,052,311	75 CH	4,052,363	49	4,052,474
CLASS 159		159.60	4,052,309	159.60	227	4,052,312	77.5 CR	4,052,364	49	4,052,475
4 B	4,052,255	159.61	4,052,310	159.61	228	4,052,313	112.5 R	4,052,365	49	4,052,476
CLASS 162		159.62	4,052,311	159.62	229	4,052,314	117	4,052,366	49	4,052,477
145	4,052,256	159.63	4,052,312	159.63	230	4,052,315	145 A	4,052,367	49	4,052,478
156	4,052,257	159.64	4,052,313	159.64	231	4,052,316	145 B	4,052,368	49	4,052,479
161	4,052,258	159.65	4,052,314	159.65	232	4,052,317	145 C	4,052,369	49	4,052,480
164 EP	4,052,259	159.66	4,052,315	159.66	233	4,052,318	154	4,052,370	49	4,052,481
CLASS 164		159.67	4,052,316	159.67	234	4,052,319	155	4,052,371	49	4,052,482
16	4,051,886	159.68	4,052,317	159.68	235	4,052,320	156	4,052,372	49	4,052,483
76	4,051,887	159.69	4,052,318	159.69	236	4,052,321	157	4,052,373	49	4,052,484
CLASS 168		159.70	4,052,319	159.70	237	4,052,322	158	4,052,374	49	4,052,485
1	4,051,888	159.71	4,052,320	159.71	238	4,052,323	159	4,052,375	49	4,052,486
32	4,051,889	159.72	4,052,321	159.72	239	4,052,324	160	4,052,376	49	4,052,487
54	4,051,890	159.73	4,052,322	159.73	240	4,052,325	161	4,052,377	49	4,052,488
107	4,051,891	159.74	4,052,323	159.74	241	4,052,326	162	4,052,378	49	4,052,489
125	4,051,892	159.75	4,052,324	159.75	242	4,052,327	163	4,052,379	49	4,052,490
166	4,051,893	159.76	4,052,325	159.76	243	4,052,328	164	4,052,380	49	4,052,491
CLASS 166		159.77	4,052,326	159.77	244	4,052,329	165	4,052,381	49	4,052,492
73	4,051,894	159.78	4,052,327	159.78	245	4,052,330	166	4,052,382	49	4,052,493
117.5	4,051,895	159.79	4,052,328	159.79	246	4,052,331	167	4,052,383	49	4,052,494
123	4,051,896	159.80	4,052,329	159.80	247	4,052,332	168	4,052,384	49	4,052,495
125	4,051,897	159.81	4,052,330	159.81	248	4,052,333	169	4,052,385	49	4,052,496
217	4,051,898	159.82	4,052,331	159.82	249	4,052,334	170	4,052,386	49	4,052,497
250	4,051,899	159.83	4,052,332	159.83	250	4,052,335	171	4,052,387	49	4,052,498
270	4,051,900	159.84	4,052,333	159.84	251	4,052,336	172	4,052,388	49	4,052,499
CLASS 172		159.85	4,052,334	159.85	252	4,052,337	173	4,052,389	49	4,052,500
32	4,051,902	159.86	4,052,335	159.86	253	4,052,338	174	4,052,390	49	4,052,501
47	4,051,903	159.87	4,052,336	159.87	254	4,052,339	175	4,052,391	49	4,052,502
49	4,051,904	159.88	4,052,337	159.88	255	4,052,340	176	4,052,392	49	4,052,503
CLASS 173		159.89	4,052,338	159.89	256	4,052,341	177	4,052,393	49	4,052,504
104	4,051,905	159.90	4,052,339	159.90	257	4,052,342	178	4,052,394	49	4,052,505
131	4,051,906	159.91	4,052,340	159.91	258	4,052,343	179	4,052,395	49	4,052,506
CLASS 174		159.92	4,052,341	159.92	259	4,052,344	180	4,052,396	49	4,052,507
17 GF	4,052,555	159.93	4,052,342	159.93	260	4,052,345	181	4,052,397	49	4,052,508
CLASS 175		159.94	4,052,343	159.94	261	4,052,346	182	4,052,398	49	4,052,509
4.55	4,051,907	159.95	4,052,344	159.95	262	4,052,347	183	4,052,399	49	4,052,510
78	4,051,908	159.96	4,052,345	159.96	263	4,052,348	184	4,052,400	49	4,052,511
93	4,051,909	159.97	4,052,346	159.97	264	4,052,349	185	4,052,401	49	4,052,512
103	4,051,910	159.98	4,052,347	159.98	265	4,052,350	186	4,052,402	49	4,052,513

CLASSIFICATION OF PATENTS

74	4,052,061	CLASS 305	42	4,052,671	140 A	4,052,713	424	4,052,602	537	4,052,529	
84 R	4,052,062	14	4,052,111	147	4,052,672	155	4,052,714	465	4,051,998	552	4,052,530
85 R	4,052,063	CLASS 307		153	4,052,673	160	4,052,715	469	4,052,599	673	4,052,531
95 F	4,052,064	112	4,052,622	374	4,052,674	CLASS 330		554	4,052,600	CLASS 429	
101.1	4,052,066	251	4,052,623	465	4,052,675	3.5	4,052,119	724	4,052,605	33	4,052,532
109	4,052,067	252 B	4,052,624	CLASS 328		6	4,052,120	786	4,052,604	54	4,052,533
122 R	4,052,068	252 K	4,052,625	134	4,052,676	149	4,052,121	825	4,052,606	54	4,052,534
131 AB	4,052,069	271	4,052,626	143	4,052,677	189	4,052,122	900	4,052,704	104	4,052,535
134 AC	4,052,071	CLASS 308		CLASS 330		304	4,052,123	CLASS 366		105	4,052,536
148 R	4,052,072	3.5	4,052,112	261	4,052,679	CLASS 352		90	4,052,038	174	4,052,537
157 R	4,052,073	CLASS 310		281	4,052,678	29	4,052,125	341	4,052,037	193	4,052,538
171	4,052,075	68 D	4,052,629	CLASS 331		84	4,052,126	2	4,052,130	194	4,052,539
CLASS 277			4,052,631	94.5 D	4,052,681	CLASS 354		CLASS 404		229	4,052,540
24	4,052,076	162	4,052,630	94.5 G	4,052,680	1	4,052,725	34	4,052,131	233	4,052,541
183	4,052,077	322	4,052,627	CLASS 332		29	4,052,726	CLASS 407		2	4,052,139
CLASS 279		333	4,052,628	16 R	4,052,682	86	4,052,727	107	4,051,584	4	4,052,138
93	4,052,078	348	Re.29,429	CLASS 333		21 R	4,052,683	CLASS 408		77	4,052,136
CLASS 280		11	4,052,113	82 R	4,052,684	135	4,052,684	1 R	4,052,132	167	4,052,141
47.2	4,052,079	245	4,052,114	CLASS 336		275	4,052,730	CLASS 415		202	4,052,142
47.26	4,052,080	CLASS 313		60	4,052,685	297	4,052,731	200	4,052,133	215	4,052,143
79.3	4,052,081	146	4,052,633	65	4,052,686	CLASS 335		CLASS 416		352	4,052,144
87.02 R	4,052,082	184	4,052,634	CLASS 337		3 DD	4,052,127	119	4,052,134	354	4,052,147
179 R	4,052,083	217	4,052,635	25	4,052,687	77	4,052,128	CLASS 417		1	4,052,148
408	4,052,084	222	4,052,636	163	Re.29,430	CLASS 356		295	4,052,135	58	4,052,149
446 B	4,052,085	318	4,052,638	213	4,052,688	106 R	4,052,129	CLASS 423		60	4,052,150
618	4,052,086	325	4,052,639	215	4,052,689	CLASS 358		228	Re.29,428	115	4,052,151
650	4,052,087	330	4,052,640	405	4,052,690	10	4,052,733	470	4,052,503	122	4,052,152
708	4,052,088	450	4,052,641	CLASS 338		12	4,052,734	CLASS 424		156	4,052,153
CLASS 285		CLASS 315		35	4,052,691	18	4,052,735	CLASS 426		222	4,052,154
47	4,052,089	16	4,052,643	CLASS 339		37	4,052,736	1	4,052,504	46	4,052,542
61	4,052,090	151	4,052,644	8 R	4,052,116	86	4,052,737	14	4,052,505	48	4,052,543
305	4,052,091	388	4,052,645	17 CF	4,052,117	128	4,052,738	244	4,052,506	102	4,052,544
CLASS 292		31	4,052,115	CLASS 340		299	4,052,739	250	4,052,507	140	4,052,545
172	4,052,092	CLASS 316		3 R	4,052,692	CLASS 360		251	4,052,508	212	4,052,546
218	4,052,093	39	4,052,646	17 R	4,052,693	30	4,052,740	258	4,052,509	214	4,052,547
336.3	4,052,094	139	4,052,647	52 D	4,052,694	51	Re.29,431	263	4,052,510	237	4,052,548
74	4,052,095	200	4,052,648	58	4,052,695	77	4,052,741	274	4,052,511	255	4,052,549
88	4,052,096	212 H	4,052,649	58	4,052,696	96	4,052,742	305	4,052,512	278	4,052,551
CLASS 296		230	4,052,651	87	4,052,697	99	4,052,743	310	4,052,513	413	4,052,552
20	4,052,097	476	4,052,652	146.1 AL	4,052,698	109	4,052,746	316	4,052,514	469	4,052,553
50	4,052,098	561	4,052,642	146.3 MA	4,052,699	110	4,052,747	343	4,052,515	CLASS 542	
91	4,052,099	649	4,052,653	171 PF	4,052,700	123	4,052,748	CLASS 425		22	4,052,387
CLASS 297		CLASS 320		171 R	4,052,701	135	4,052,750	392	4,052,145	26	4,052,388
159	4,052,100	2	4,052,655	173 LM	4,052,702	CLASS 361		463	4,052,146	54	4,052,389
243	4,052,101	23	4,052,656	174 TF	4,052,703	50	4,052,751	577	4,052,137	89	4,052,390
334	4,052,102	CLASS 323		233	4,052,704	103	4,052,744	CLASS 426		117	4,052,391
417	4,052,103	19	4,052,660	249	4,052,705	18	4,052,607	271	4,052,516	211	4,052,392
456	4,052,104	CLASS 324		274 R	4,052,706	71	4,052,609	302	4,052,517	CLASS 548	
22 J	4,052,105	6	4,052,662	324 AD	4,052,707	200	4,052,610	482	4,052,518	305	4,052,410
23 MD	4,052,106	5 R	4,052,661	420	4,052,720	368	4,052,608	CLASS 427		341	4,052,411
62	4,052,107	51	4,052,664	CLASS 343		43	4,052,657	68	4,052,519	CLASS 560	
CLASS 302		54	4,052,665	6.5 LC	4,052,721	57	4,052,658	164	4,052,520	25	4,052,437
60	4,052,108	58.5 B	4,052,666	100 LE	4,052,722	104	4,052,659	173	4,052,521	52	4,052,438
CLASS 303		65 P	4,052,667	786	4,052,724	113	4,052,601	31	4,052,522	61	4,052,439
25	4,052,109	126	4,052,668	CLASS 344		120	4,052,603	116	4,052,523	121	4,052,440
25	4,052,110	151 A	4,052,669	107 R	4,052,712	200	4,052,702	383	4,052,524	128	4,052,441
CLASS 305		4	4,052,670	CLASS 346		43	4,052,703	412	4,052,525	129	4,052,442
25	4,052,111	CLASS 325		107 R	4,052,712	57	4,052,703	447	4,052,526	154	4,052,443
25	4,052,112	4	4,052,671	CLASS 347		104	4,052,704	483	4,052,527	179	4,052,444
25	4,052,113	CLASS 326		104	4,052,713	113	4,052,705	483	4,052,528	243	4,052,445
25	4,052,114	CLASS 327		104	4,052,714	120	4,052,706	483	4,052,529	243	4,052,446
25	4,052,115	CLASS 328		104	4,052,715	200	4,052,707	483	4,052,530	243	4,052,447
25	4,052,116	CLASS 329		104	4,052,716	200	4,052,708	483	4,052,531	243	4,052,448
25	4,052,117	CLASS 330		104	4,052,717	200	4,052,709	483	4,052,532	243	4,052,449
25	4,052,118	CLASS 331		104	4,052,718	200	4,052,710	483	4,052,533	243	4,052,450
25	4,052,119	CLASS 332		104	4,052,719	200	4,052,711	483	4,052,534	243	4,052,451
25	4,052,120	CLASS 333		104	4,052,720	200	4,052,712	483	4,052,535	243	4,052,452
25	4,052,121	CLASS 334		104	4,052,721	200	4,052,713	483	4,052,536	243	4,052,453
25	4,052,122	CLASS 335		104	4,052,722	200	4,052,714	483	4,052,537	243	4,052,454
25	4,052,123	CLASS 336		104	4,052,723	200	4,052,715	483	4,052,538	243	4,052,455
25	4,052,124	CLASS 337		104	4,052,724	200	4,052,716	483	4,052,539	243	4,052,456
25	4,052,125	CLASS 338		104	4,052,725	200	4,052,717	483	4,052,540	243	4,052,457
25	4,052,126	CLASS 339		104	4,052,726	200	4,052,718	483	4,052,541	243	4,052,458
25	4,052,127	CLASS 340		104	4,052,727	200	4,052,719	483	4,052,542	243	4,052,459
25	4,052,128	CLASS 341		104	4,052,728	200	4,052,720	483	4,052,543	243	4,052,460
25	4,052,129	CLASS 342		104	4,052,729	200	4,052,721	483	4,052,544	243	4,052,461
25	4,052,130	CLASS 343		104	4,052,730	200	4,052,722	483	4,052,545	243	4,052,462
25	4,052,131	CLASS 344		104	4,052,731	200	4,052,723	483	4,052,546	243	4,052,463
25	4,052,132	CLASS 345		104	4,052,732	200	4,052,724	483	4,052,547	243	4,052,464
25	4,052,133	CLASS 346		104	4,052,733	200	4,052,725	483	4,052,548	243	4,052,465
25	4,052,134	CLASS 347		104	4,052,734	200	4,052,726	483	4,052,549	243	4,052,466
25	4,052,135	CLASS 348		104	4,052,735	200	4,052,727	483	4,052,550	243	4,052,467
25	4,052,136	CLASS 349		104	4,052,736	200	4,052,728	483	4,052,551	243	4,052,468
25	4,052,137	CLASS 350		104	4,052,737	200	4,052,729	483	4,052,552	243	4,052,469
25	4,052,138	CLASS 351		104	4,052,738	200	4,052,730	483	4,052,553	243	4,052,470
25	4,052,139	CLASS 352		104	4,052,739	200	4,052,731	483	4,052,554	243	4,052,471
25	4,052,140	CLASS 353		104	4,052,740	200	4,052,732	483	4,052,555	243	4,052,472
25	4,052,141	CLASS 354		104	4,052,741	200	4,052,733	483	4,052,556	243	4,052,473
25	4,052,142	CLASS 355		104	4,052,742	200	4,052,734	483	4,052,557	243	4,052,474
25	4,052,143	CLASS 356		104	4,052,743	200	4,052,735	483	4,052,558	243	4,052,475
25	4,052,144	CLASS 357		104	4,052,744	200	4,052,736	483	4,052,559	243	4,052,476
25	4,052,145	CLASS 358		104	4,052,745	200	4,052,737	483	4,052,560	243	4,052,477
25	4,052,146	CLASS 359		104	4,052,746	200	4,052,738	483	4,052,561	243	4,052,478
25	4,052,147	CLASS 360		104	4,052,747	200	4,052,739	483	4,052,562	243	4,052,479
25	4,052,148	CLASS 361		104	4,052,748	200	4,052,740	483	4,052,563	243	4,052,480
25	4,052,149	CLASS 362		104	4,052,749	200	4,052,741	483	4,052,564	243	4,052,481
25	4,052,150	CLASS 363		104	4,052,750	200	4,052,742	483	4,052,565	243	4,052,482
25	4,052,151	CLASS 364		104	4,052,751	200	4,052,743				

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1	4,051,846	4,051,909	4,052,680	4,052,662	4,051,972	4,051,825
	4,052,569	4,051,911	4,052,682	4,052,713	4,051,973	4,052,011
	4,052,648	4,051,941	4,052,694	10 : 4,052,332	4,051,982	4,052,414
2	4,051,837	4,051,983	4,052,697	4,052,440	4,051,985	4,052,305
	4,052,136	4,052,000	4,052,698	12 : 4,051,377	4,051,995	4,052,716
	4,052,664	4,052,006	4,052,710	4,051,585	4,052,003	4,051,586
4	4,051,811	4,052,019	4,052,715	4,051,670	4,052,060	21 : 4,051,963
	4,051,815	4,052,020	4,052,721	4,051,678	4,052,090	22 : 4,051,716
	4,051,858	4,052,025	4,052,732	4,051,708	4,052,098	4,051,895
	4,051,863	4,052,028	4,052,740	4,051,713	4,052,135	4,051,945
	4,051,877	4,052,069	4,052,743	4,051,798	4,052,179	4,052,045
	4,052,033	4,052,074	4,052,746	4,051,803	4,052,190	4,052,099
	4,052,085	4,052,076	4,052,750	4,051,849	4,052,191	23 : 4,051,785
	4,052,253	4,052,082	4,051,565	4,051,857	4,052,192	4,052,077
5	4,051,642	4,052,092	4,051,611	4,051,957	4,052,193	24 : 4,051,611
	4,051,773	4,052,121	4,051,695	4,051,979	4,052,226	4,051,645
	4,051,869	4,052,128	4,051,842	4,051,997	4,052,305	4,051,908
6	Re 29,431	4,052,129	4,051,889	4,052,024	4,052,315	4,051,944
	4,051,558	4,052,130	4,052,054	4,052,031	4,052,431	4,052,000
	4,051,564	4,052,181	4,052,058	4,052,075	4,052,439	4,052,025
	4,051,570	4,052,228	4,052,070	4,052,167	4,052,451	4,052,085
	4,051,573	4,052,229	4,052,099	4,052,194	4,052,480	4,052,255
	4,051,587	4,052,239	4,052,106	4,052,436	4,052,519	4,052,565
	4,051,591	4,052,248	4,052,304	4,052,549	4,052,591	4,052,575
	4,051,592	4,052,249	4,052,534	4,052,557	4,052,622	4,052,665
	4,051,605	4,052,265	4,052,604	4,052,565	4,052,639	4,052,665
	4,051,617	4,052,279	4,052,714	4,052,579	4,052,658	4,052,685
	4,051,622	4,052,293	4,052,720	4,052,580	4,052,676	4,052,695
	4,051,625	4,052,302	4,052,741	4,052,672	4,052,678	4,052,705
	4,051,645	4,052,330	9 : 4,051,702	13 : 4,051,812	18 : 4,052,722	25 : 4,052,722
	4,051,676	4,052,340	4,051,774	4,052,220	4,051,671	4,051,565
	4,051,677	4,052,388	4,051,831	4,052,063	4,051,910	4,051,575
	4,051,680	4,052,411	4,051,850	15 : 4,051,616	4,051,946	4,051,625
	4,051,712	4,052,432	4,051,851	16 : 4,052,168	4,051,960	4,051,705
	4,051,715	4,052,434	4,051,861	17 : Re 29,422	4,051,998	4,051,722
	4,051,725	4,052,494	4,051,976	4,051,567	4,052,040	4,051,745
	4,051,735	4,052,540	4,051,987	4,051,609	4,052,080	4,051,785
	4,051,743	4,052,559	4,052,018	4,051,703	4,052,387	4,051,785
	4,051,758	4,052,594	4,052,051	4,051,707	4,052,416	4,051,795
	4,051,797	4,052,598	4,052,062	4,051,724	4,052,455	4,051,795
	4,051,810	4,052,607	4,052,161	4,051,738	4,052,611	4,051,845
	4,051,813	4,052,612	4,052,198	4,051,759	4,052,675	4,051,865
	4,051,814	4,052,614	4,052,327	4,051,785	19 : 4,051,621	4

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

PI 53

4,052,359		4,052,112		4,051,838		4,051,890		41 :	4,051,597		4,051,575
4,052,536		4,052,520		4,051,859		4,052,146			4,051,806		4,052,039
4,052,561		4,052,597		4,051,878		4,052,307			4,052,013		4,052,250
4,052,687	34 :	4,051,608		4,051,891		4,052,396			4,052,180		4,052,321
4,052,728		4,051,668		4,051,938		4,052,397			4,052,247		4,052,425
4,052,729		4,051,681		4,051,977		4,052,524			4,052,266		4,052,513
4,051,594		4,051,775		4,051,994	38 :	4,051,881			4,052,492		4,052,589
4,051,595		4,051,855		4,051,996		4,052,012		42 :	Re-29,428		4,051,553
4,051,619		4,051,974		4,052,010	39 :	Re-29,425			4,051,603		4,051,717
4,051,626		4,052,009		4,052,032		Re-29,430			4,051,633		4,051,749
4,051,638		4,052,068		4,052,034		4,051,569			4,051,661		4,051,770
4,051,684		4,052,093		4,052,035		4,051,588			4,051,662		4,051,894
4,051,730		4,052,119		4,052,046		4,051,590			4,051,669		4,051,896
4,051,777		4,052,132		4,052,049		4,051,634			4,051,897		4,051,897
4,051,779		4,052,152		4,052,065		4,051,731			4,051,723		4,051,899
4,051,784		4,052,174		4,052,071		4,051,740			4,051,907		4,051,907
4,051,821		4,052,203		4,052,095		4,051,755			4,051,809		4,051,918
4,051,832		4,052,204		4,052,110		4,051,769			4,051,820		4,051,933
4,051,840		4,052,244		4,052,134		4,051,778			4,051,848		4,051,961
4,051,860		4,052,251		4,052,149		4,051,790			4,051,866		4,051,980
4,051,875		4,052,290		4,052,150		4,051,830			4,051,953		4,051,981
4,051,934		4,052,291		4,052,158		4,051,919			4,052,005		4,052,030
4,051,936		4,052,292		4,052,169		4,051,922			4,052,061		4,052,073
4,051,969		4,052,294		4,052,173		4,051,954			4,052,064		4,052,101
4,051,970		4,052,324		4,052,176		4,051,992			4,052,079		4,052,116
4,052,077		4,052,328		4,052,184		4,052,067			4,052,081		4,052,322
4,052,084		4,052,341		4,052,189		4,052,089			4,052,083		4,052,338
4,052,111		4,052,346		4,052,205		4,052,097			4,052,104		4,052,417
4,052,124		4,052,353		4,052,207		4,052,117			4,052,108		4,052,443
4,052,141		4,052,354		4,052,252		4,052,133			4,052,118		4,052,456
4,052,171		4,052,360		4,052,263		4,052,144			4,052,154		4,052,471
4,052,227		4,052,361		4,052,267		4,052,175			4,052,155		4,052,474
4,052,241		4,052,381		4,052,268		4,052,182			4,052,170		4,052,475
4,052,254		4,052,383		4,052,272		4,052,185			4,052,188		4,052,530
4,052,258		4,052,401		4,052,273		4,052,199			4,052,202		4,052,596
4,052,312		4,052,413		4,052,275		4,052,231			4,052,221		4,052,602
4,052,316		4,052,422		4,052,281		4,052,237			4,052,230		4,052,701
4,052,345		4,052,424		4,052,283		4,052,245			4,052,296		4,052,703
4,052,357		4,052,429		4,052,320		4,052,257			4,052,317	49 :	4,052,308
4,052,385		4,052,446		4,052,325		4,052,280			4,052,319		4,052,318
4,052,394		4,052,472		4,052,367		4,052,284			4,052,343		4,052,702
4,052,394		4,052,476		4,052,369		4,052,286			4,052,348		4,052,737
4,052,420		4,052,477		4,052,382		4,052,339			4,052,454	50 :	4,052,454
4,052,437		4,052,479		4,052,399		4,052,344			4,052,508	51 :	4,051,762
4,052,464		4,052,491		4,052,400		4,052,370			4,052,544		4,051,607
4,052,490		4,052,506		4,052,427		4,052,418			4,052,575		4,051,612
4,052,495		4,052,509		4,052,463		4,052,483			4,052,576		4,051,682
4,052,502		4,052,510		4,052,468		4,052,515			4,052,577		4,051,721
4,052,529		4,052,511		4,052,470		4,052,517			4,052,582		4,051,768
4,052,538		4,052,527		4,052,504		4,052,526			4,052,584		4,052,178
4,052,552		4,052,539		4,052,553		4,052,533			4,052,599		4,052,522
4,052,564		4,052,546		4,052,555		4,052,545			4,052,600	53 :	4,051,611
4,051,600		4,052,548		4,052,560		4,052,547			4,052,623		4,051,725
4,051,644		4,052,646		4,052,570		4,052,615			4,052,627		4,051,944
4,052,105		4,052,673		4,052,592		4,052,620			4,052,647	54 :	4,052,047
4,052,209		4,052,688		4,052,593		4,052,636			4,052,655	55 :	4,051,361
4,052,306		4,052,733		4,052,603		4,052,638			4,052,677		4,051,578
4,052,368		4,051,566	35 :	4,052,606		4,052,660			4,052,684		4,051,732
4,052,595		4,051,835		4,052,641		4,052,661			4,052,689		4,051,801
4,052,742		4,051,552	36 :	4,052,699		4,052,696			4,052,690		4,051,802
4,052,113		4,051,554		4,052,704		4,052,717			4,052,725		4,051,911
4,051,614		4,051,562		4,052,709	40 :	4,051,691		43 :	4,051,741		4,051,921
4,051,915		4,051,571		4,052,711		4,051,956		44 :	4,051,873		4,052,044
4,052,007		4,051,572		4,052,718		4,051,989			4,052,238		4,052,137
4,052,008		4,051,627		4,052,730		4,052,142		45 :	4,051,880		4,052,244
4,052,138		4,051,628		4,052,731		4,052,219			4,051,999		4,052,270
4,052,333		4,051,631		4,052,735		4,052,311			4,052,015		4,052,291
4,052,343		4,051,639		4,051,660	37 :	4,052,467			4,052,016		4,052,571
4,052,102		4,051,647		4,051,699		4,052,469			4,052,351		4,052,591
4,051,714		4,051,692		4,051,761		4,052,478			4,052,516		4,052,644
4,052,649		4,051,733		4,051,799		4,052,503		46 :	4,052,026		4,052,661
4,052,047		4,051,804		4,051,808		4,052,613		47 :	4,051,556		4,052,691

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5 :	245,990		246,006		245,969		246,007		245,949	41 :	245,96
6 :	245,954	8 :	245,951		245,973	26 :	245,956		245,955	42 :	245,99
	245,981		245,958		245,974		245,983		245,976	48 :	245,96
	245,982	9 :	245,948	19 :	245,998	27 :	245,994		245,987		245,98
	245,985	17 :	245,959	20 :	245,971		246,005		245,992	49 :	243,97
	245,989		245,960	24 :	245,970	29 :	245,963		245,995		245,99
	246,000		245,961		245,997	34 :	245,957	37 :	245,995		245,99
	246,004		245,968	25 :	245,964	36 :	245,947	39 :	245,999	53 :	246,00

PLANT PATENTS

6 :	4,118	34 :	4,119				
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DEFENSIVE PUBLICATIONS APPLICATIONS
[Notice of Dec. 16, 1969, 869 O.G. 6877]

26	T963,004	34	T963,001	T963,002	42	T963,003		
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October 11, 1977

Volume 963

Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Documentation Presentation

A presentation on the "Technical Activities of the U.S. Patent and Trademark Office" will be given in cooperation with the Information Retrieval Committee of the American Patent Law Association. The presentation is to be held on October 19, 1977 from 9:30 A.M. until 4:00 P.M. at the Marriott Hotel at Dulles International Airport and is open to all members of the public. It is requested that anyone wishing to attend please contact Mr. P. James Terragno, Director, Office of Search Systems, U.S. Patent and Trademark Office, Washington, D.C. 20231, telephone (703)557-3049. Any inquiries concerning the presentation may be addressed to Mr. Terragno.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

Sept. 12, 1977.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,630,728, Re. S.N. 817,442, Filed July 20, 1977, Cl. 75/123, FREE CUTTING STEELS, Chiaki Asada, Owner of Record: *Daido Seiko Kabushiki Kaisha, Nagoya, Aichi Prefecture, Japan*, Attorney or Agent: Richard K. Stevens, et al., Ex. Gp.: 111

3,653,234, Re. S.N. 824,013, Filed Aug. 12, 1977, Cl. 68/12 R, CONTROL INJECTION SYSTEM FOR DRYCLEANING APPARATUS IN SYSTEMS, Robert A. Gillespie, Owner of Record: *Stauffer Chemical Company, New York, N.Y.*, Attorney or Agent: Ellen P. Trevors, et al., Ex. Gp.: 242

3,711,432, Re. S.N. 823,158, Filed Aug. 9, 1977, Cl. 260/16, LOW SHRINK POLYESTER RESIN SYSTEMS FORMED OF A MIXTURE OF UNSATURATED POLYESTER RESIN, MONOMERIC COPOLYMERIZABLE COMPONENT AND CELLULOSE ORGANIC ESTER, Navin Shah, Owner of Record: *W. R. Grace & Company, New York, N.Y.*, Attorney or Agent: William W. McDowell, Jr., et al., Ex. Gp.: 143

3,787,140, Re. S.N. 821,426, Filed Aug. 3, 1977, Cl. 415/80, POWER PLANT, Alvin L. Gregory, Owner of Record: *Inventor*, Attorney or Agent: Felix J. D'Ambrosio, et al., Ex. Gp.: 343

3,898,674, Re. S.N. 821,152, Filed Aug. 2, 1977, Cl. 354/25, DISTANCE DETECTING DEVICE, Kazuya Hosoe, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: David Toren, et al., Ex. Gp.: 211

3,898,790, Re. S.N. 821,207, Filed Aug. 2, 1977, Cl. 58/23 BA, BATTERY-DRIVEN WATCH WITH BATTERY CONSUMPTION DISPLAY ALARM, Hirotoiki Takamune, et al., Owner of Record: *Citizen Watch Company, Limited, Tokyo, Japan*, Attorney or Agent: John Clarke Holman, et al., Ex. Gp.: 217

3,900,712, Re. S.N. 825,540, Filed Aug. 15, 1977, Cl. 200/307, KEYBOARD SWITCH ARRANGEMENT, Satoshi Fukao, Owner of Record: *Brother Kogyo Kabushiki Kaisha, Mizuho-ku, Nagoya-shi, Japan*, Attorney or Agent: Alvin Browdy, et al., Ex. Gp.: 241

3,919,181, Re. S.N. 825,051, Filed Aug. 16, 1977, Cl. 260/80.78, PREPARATION OF HYDROCARBON RESINS USING ZIRCONIUM TETRACHLORIDE, Kenneth C. Petersen, et al., Owner of Record: *Schenectady Chemicals, Inc., Schenectady, N.Y.*, Attorney or Agent: John W. Malley, et al., Ex. Gp.: 144

3,960,770, Re. S.N. 825,321, Filed Aug. 17, 1977, Cl. 252/444, PROCESS FOR PREPARING MACROPOROUS OPEN-CELL CARBON FOAM FROM NORMALLY CRYSTALLINE VINYLIDENE CHLORIDE POLYMER, Charles F. Raley, Jr., et al., Owner of Record: *The Dow Chemical Company, Midland, Mich.*, Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 115

3,963,140, Re. S.N. 825,190, Filed Aug. 16, 1977, Cl. 215/254, BOTTLE CAPS, Sune Harding, Owner of Record: *AB Wicanders Korkfabriker, Alvangen, Sweden*, Attorney or Agent: Granville M. Brumbaugh, et al., Ex. Gp.: 241

3,976,508, Re. S.N. 823,119, Filed Aug. 9, 1977, Cl. 136/89, TUBULAR SOLAR CELL DEVICES, Abraham I. Mlavsky, Owner of Record: *Mobil Tyco Solar Energy Corporation, Waltham, Mass.*, Attorney or Agent: Robert J. Schiller, et al., Ex. Gp.: 114

3,977,555, Re. S.N. 822,378, Filed Aug. 5, 1977, Cl. 215/247, PROTECTIVE SAFETY CAP FOR MEDICAMENT VIAL, Roger R. Larson, Owner of Record: *Pharmaco, Inc., Champaign, Ill.*, Attorney or Agent: Harvey B. Jacobson, et al., Ex. Gp.: 241

3,989,517, Re. S.N. 823,802, Filed Aug. 11, 1977, Cl. 75/175.5, TITANIUM-BERYLLIUM BASE AMORPHOUS ALLOYS, Lee E. Tanner, et al., Owner of Record: *Allied Chemical Corporation, New York, N.Y.*, Attorney or Agent: David W. Collins, et al., Ex. Gp.: 111

4,005,637, Re. S.N. 822,112, Filed Aug. 5, 1977, Cl. 91/276, HYDROACOUSTIC APPARATUS AND VALVING MECHANISMS FOR USE THEREIN, John V. Bouyoucos, et al., Owner of Record: *Hydroacoustics, Inc., Rochester, N.Y.*, Attorney or Agent: Martin Lu Kacher, Ex. Gp.: 341

4,008,717, Re. S.N. 825,391, Filed Aug. 17, 1977, Cl. 128/214 R, SYSTEM FOR CONTINUOUS WITHDRAWAL AND ANALYSIS OF BLOOD, Allen A. Kowarski, Owner of Record: *Johns Hopkins University, Baltimore, Md.*, Attorney or Agent: Edwin T. Yates, Ex. Gp.: 335

4,032,576, Re. S.N. 823,316, Filed Aug. 10, 1977, Cl. 260/586, 2-DECARBOXY-2-HYDROXY-METHYL-PGE, ANALOGS, Norman A. Nelson, Owner of Record: *The Upjohn Company, Kalamazoo, Mich.*, Attorney or Agent: Robert A. Armitage, et al., Ex. Gp.: 126

PATENT NOTICES

Certificates of Correction for the Week of Oct. 11, 1977

3,754,455	4,018,930	4,027,647	4,032,497
3,784,634	4,018,975	4,027,659	4,032,588
3,868,400	4,019,889	4,027,722	4,032,862
3,917,457	4,021,198	4,027,733	4,032,868
3,944,004	4,021,553	4,027,812	4,032,877
3,950,003	4,021,564	4,027,917	4,032,976
3,954,976	4,021,601	4,028,024	4,033,013
3,958,025	4,021,630	4,028,118	4,033,038
3,965,385	4,021,871	4,028,187	4,033,137
3,966,534	4,021,939	4,028,247	4,033,230
3,969,373	4,022,012	4,028,316	4,033,255
3,969,552	4,022,372	4,028,450	4,033,353
3,971,825	4,022,390	4,028,581	4,033,361
3,983,152	4,022,576	4,028,668	4,033,393
3,983,196	4,022,644	4,028,669	4,033,428
3,983,238	4,022,775	4,028,672	4,033,530
3,986,106	4,022,836	4,028,756	4,033,535
3,987,723	4,022,869	4,028,800	4,033,576
3,988,937	4,022,899	4,028,844	4,033,615
3,992,394	4,022,973	4,028,933	4,033,660
3,994,628	4,023,190	4,029,367	4,033,710
3,998,140	4,023,255	4,029,394	4,033,779
4,000,085	4,023,664	4,029,536	4,033,838
4,001,540	4,023,790	4,029,578	4,033,973
4,003,233	4,023,950	4,029,582	4,034,012
4,005,645	4,024,225	4,029,745	4,034,113
4,006,195	4,024,285	4,030,075	4,034,189
4,006,266	4,024,604	4,030,080	4,034,360
4,006,466	4,024,698	4,030,102	4,034,508
4,007,628	4,024,893	4,030,150	4,034,535
4,008,184	4,024,972	4,030,188	4,034,592
4,008,328	4,025,008	4,030,198	4,034,761
4,009,092	4,025,171	4,030,386	4,034,944
4,009,594	4,025,177	4,030,501	4,035,081
4,009,727	4,025,330	4,030,510	4,035,167
4,010,460	4,025,395	4,030,521	4,035,201
4,010,751	4,026,082	4,030,532	4,035,312
4,010,832	4,026,130	4,030,583	4,035,466
4,011,311	4,026,438	4,030,592	4,035,593
4,011,871	4,026,480	4,030,651	4,035,767
4,012,533	4,026,554	4,030,672	4,036,260
4,012,872	4,026,682	4,030,684	4,036,263
4,012,877	4,026,692	4,030,707	4,036,300
4,012,994	4,026,742	4,030,723	4,036,347
4,013,192	4,026,770	4,030,910	4,036,442
4,013,837	4,026,798	4,030,973	4,036,682
4,014,615	4,026,952	4,031,152	4,036,758
4,015,317	4,027,018	4,031,211	4,036,972
4,015,996	4,027,079	4,031,219	4,037,110
4,016,473	4,027,146	4,031,267	4,037,437
4,016,692	4,027,176	4,031,398	4,037,454
4,016,907	4,027,194	4,031,595	4,037,848
4,017,146	4,027,243	4,031,742	4,037,849
4,018,165	4,027,305	4,031,899	4,038,085
4,018,316	4,027,399	4,031,997	4,038,531
4,018,629	4,027,400	4,032,033	
4,018,801	4,027,589	4,032,391	

Disclaimers

3,902,965.—*Toshiro Furukawa and Hiroo Kaneyuki, Yamaguchi, Japan*. METHOD FOR PRODUCTION OF CITRIC ACID. Patent dated Sept. 2, 1975. Disclaimer filed Sept. 1, 1977, by the assignee, *Mitsui Petrochemical Industries*. Hereby enters this disclaimer to claims 1, 2, 3, 4 and 11 of said patent.

3,932,713. *Albert C. Fleuchaus, Wheeling, and Paul Shylo, Norridge, Ill.* INDUCTION CANCELLATION CIRCUIT. Patent dated Jan. 13, 1976. Disclaimer filed Aug. 15, 1977, by the inventors and the assignee, *Cook Electric Company*. Hereby enter this disclaimer to claim 7 of said patent.

3,949,213.—*Harold Patchell, Clifton, N.J.* UNDERWATER LIGHT. Patent dated Apr. 6, 1976. Disclaimer filed Aug. 15, 1977, by the assignee, *Hayward Manufacturing Co., Inc.*

Hereby enters this disclaimer to claims 1 to 3, inclusive, and claims 8 to 10, inclusive, of said patent.

Patents Available for Licensing or Sale

D-243,952. *CHILDS' COMPASS*. William J. Bryant, 2251 Washington Ave., #A, San Leandro Calif. 94577.

3,964,120. *COMB CLEANER*. Nevin R. Woodford, 1011 Arlington Blvd., Arlington, Va. 22209.

3,953,983. *REFRIGERATION METHOD AND REFRIGERATION APPARATUS FOR CARRYING OUT THE METHOD*. Ernst Sander. Correspondence to: Craig & Antonelli, 909 Watergate Office Bldg., 2600 Virginia Ave. NW., Washington, D.C. 20037.

3,946,144. *SEALED CABLE JUNCTION*. Wilhelm Quante Spezialmaschinen-Fabrik fur Apparate der Fernmeldetechnik. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

3,906,559. *BLANKET AND SHEET*. Agnes K. Bahr, 707 Whispering Pine Drive, Auburndale, Fla. 33823.

3,899,157. *TACK FASTENER AND STRIPPER*. Robert Thomas, 30 W. Chicago Ave., Chicago, Ill. 60610.

3,835,836. *COMPRESSION OPHTHALMODYNAMOMETER*. Yale C. Kanter and Bruce A. Nemer. Correspondence to: Wicks & Nemer, Suite 1407 Soo Line Building, Minneapolis, Minn. 55402.

3,808,921. *CUTTING MACHINE FOR CUTTING FLAT MATERIALS*. Wilfried Baumann, Germany. Correspondence to: Striker, Striker & Stenby, 360 Lexington Ave., New York, N.Y. 10017.

3,601,327. *APPARATUS FOR STORING AND FOR TRANSPORTING WEBS TO A CUTTING DEVICE*. Wilfried Baumann, Germany. Correspondence to: Striker, Striker & Stenby, 360 Lexington Ave., New York, N.Y. 10017.

3,596,297. *MODULAR FURNITURE*. Herbert James Route 2, Box 168A, York, Ala. 36925.

3,330,237. *MULTI-PRONG HAIRPIN*. Eleanor J. Muhs, 1064 Winona Blvd., Rochester, N.Y. 14617.

3,325,958. *PREASSEMBLED STRUCTURAL FRAMEWORK*. Albert B. Moore, Albert B. Moore Associates, Inc., Wells Hill Road, Lakeville, Conn. 06039.

3,250,652. *EXOTHERMIC COMPOSITION CONTAINING ZINC AND AMMONIUM CHLORIDE*. John E. Claiborne, 814 Boag St., Opelousas, La. 70570.

4,001,911. *MANUALLY OPERATED ROTARY SEWER CLEANOUT DEVICE*. Clyde W. Watson, 1916 SE., 6th Ave. Mineral Wells, Tex. 76067.

4,003,275. *WRENCH*. Mr. Rodney W. Smith, 83353 Spruce Lane, Florence, Oreg. 97439.

4,006,843. *APPARATUS AND METHOD OF WATERING OBJECTS*. Antonio Martinez Martinez, Avda. del Manzanares No. 148, Madrid, Spain, and Jose M. Saenz, 45 Tudor City Pl. (Apt. 1311), New York, N.Y. 10017.

4,010,949. *TWO BILLIARD PRODUCTS*. A. George Lee, 4103 Elmhurst, Royal Oak, Mich. 48073.

4,018,593. *PROCESS FOR RECOVERING USEFUL SUBSTANCES FROM CULTURE MEDIA*. Hans Muller, Switzerland. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,019,661. *LIQUID DISPENSER FOR SELECTIVE UPSIDE DOWN OR RIGHT SIDE UP USE*. Janos Szabo, 214 East 82nd St., New York, N.Y. 10028.

4,020,826. *SOLAR ENERGY SYSTEM*. Robert Alan Mole, 230 S. 39th St., Boulder, Colo. 80303.

4,021,965. *FERTILIZER AND PESTICIDE DISPENSING TOMATO STAKE*. F. W. Norris, Horse Cove Road, Box 133E, Highlands, N.C. 28741.

4,032,099. *RECLINER PLATFORM*. James W. Maude, 52 Village St., Marblehead, Mass. 01945.

4,032,238. *IMPROVED FOUNTAIN PAINT ROLLER*. Ragnvald G. Leland, P.O. Box 4174, Palm Springs, Calif. 92262.

4,033,098. *GRASS TRIMMING APPARATUS*. Garry J. Green, Box 162, Corydon, Iowa 50600.

4,034,310. *PHASE-LOCKED LOOP OSCILLATOR*. Thomas F. Coe, 3173-39 Bancroft Drive, Spring Valley, Calif. 92077.

- 4,036,507. WHEELS AND ASSEMBLY FOR A BOAT. Eldon V. Henderson, Route #1, Box 204-H, West Sacramento, Calif. 95691.
- 4,037,581. SCREEN DEVICE FOR STOVE OVENS. Thomas Trifletti, Albany, N.Y. Correspondence to: Frederick L. Bergert, Crystal Square No. 5, 1755 Jefferson Davis Highway, Arlington, Va. 22202.
- 4,049,009. APPARATUS FOR TRIMMING THE NAILS. Florian Marchand. Correspondence to: Georges Marchand S. A. CH 2738 Court, BE Switzerland.

The following two patents are offered by John O. Richards, 980 Mill Circle Apt. #98, Alliance, Ohio 44601.

3,835,507. ROPE HOLDING DEVICE.

3,578,840. REVOLVING REFLECTOR.

The following two patents are offered by Mr. How Wachspress, Technical Director, Auditac, Ltd., 1940 Washington St., San Francisco, Calif. 94109.

- 3,875,932. AUDIOTACTILE STIMULATION AND COMMUNICATIONS SYSTEM.
- 3,954,101. AUDIOTACTILE COMMUNICATION SYSTEM.

General Electric Company is prepared to grant non-exclusive licenses under the following 6 patents upon reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to: General Electric Company, 100 Woodlawn Ave., Pittsfield, Mass. 01201.

- 3,612,750. CABLE-CONNECTING ADAPTOR FOR HIGH VOLTAGE BUSHING OF A PAD-MOUNTED TRANSFORMER.
- 3,782,324. METER DIAL WITH MIRROR IMAGE PORTION.
- 3,792,404. CIRCUIT BREAKER HAVING MECHANICAL LOCK TO PREVENT AUTOMATIC OPERATION.
- 3,829,810. BUSHING, FUSE AND FUSEHOLDER.
- 4,009,417. ELECTRICAL APPARATUS WITH HEAT PIPE COOLING.
- 4,009,418. ATTACHMENT OF HEAT PIPES TO ELECTRICAL APPARATUS.

Applications for licenses may be addressed to the Patent Counsel, Mobile Radio Prods. Dept., General Electric Company, Lynchburg, Va. 24502.

- 4,020,421. MUTING CIRCUIT.

Application for license may be addressed to Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

- 4,024,486. OUTER LOCKING TURN FOR PRECUT CORE.

Application for license may be addressed to: General Electric Company, 2001 Jefferson Davis Highway, Arlington, Va. 22202.

- 3,996,081. METHOD FOR MAKING A HIGH VOLTAGE CABLE.

Application for license under the following patent should be addressed to: Patent Counsel, Drive Systems Department, General Electric Company, 1501 Roanoke Blvd., Salem, Va. 24153.

- 4,019,094. STATIC CONTROL SHORTING CLIP FOR SEMICONDUCTOR PACKAGE.

Applications for licenses should be addressed to: Division Patent Counsel, Space Division, General Electric Company, P.O. Box 8455, Philadelphia, Pa. 19101.

- 4,008,573. MOTIVE FLUIDS FOR EXTERNAL COMBUSTION ENGINES.

- 4,016,493. SIMPLIFIED LAND LINE AND SATELLITE COMMUNICATION SWITCHING SYSTEM.

- 4,016,494. SATELLITE COMMUNICATION SYSTEM WITH IMPROVED CONFERENCE FACILITY.

- 4,017,985. MULTISENSOR DIGITAL IMAGE GENERATOR.

- 4,025,248. RADIALLY EXTENDED VAPOR INLET FOR A ROTARY MULTIVANED EXPANDER.

Applications for licenses may be addressed to Patent Counsel, Turbine Operations, Turbine Patent Operation, General Electric Company, 1 River Road, Building 18A, 5th Floor, Schenectady, N.Y. 12345.

- 3,427,880. OVERHEATING DETECTOR FOR GAS COOLED ELECTRIC MACHINE.

- 3,536,591. MULTIPLE EFFECT DISTILLATION APPARATUS.

- 3,573,460. ION CHAMBER DETECTOR FOR SUBMICRON PARTICLES.
- 3,653,019. SIGNAL MONITORING SYSTEM.
- 3,665,234. GENERATOR END WINDING SUPPORT.
- 4,032,874. REACTOR CORE.
- 4,001,654. TESTABLE PROTECTIVE SYSTEM.
- 4,008,433. CAPACITANCE DISPLACEMENT TYPE MEASURING PROBE.
- 4,013,378. AXIAL FLOW TURBINE EXHAUST HOOD.
- 4,020,869. COMBINED STOP AND INTERCEPT VALVE FOR STEAM TURBINES.
- 4,022,424. SHAFT BEARING AND SEAL FOR BUTTERFLY VALVES.

Applications for licenses may be addressed to the General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

- 3,489,936. TOOTHBRUSH WITH MOTION SELECTOR BUTTON.

- 3,742,174. INDUCTION COOKING APPLIANCE INCLUDING COOKING VESSEL HAVING MEANS FOR TRANSMISSION OF TEMPERATURE DATA BY LIGHT PULSES.

- 3,742,178. INDUCTION COOKING APPLIANCE INCLUDING COOKING VESSEL HAVING MEANS FOR WIRELESS TRANSMISSION OF TEMPERATURE DATA.

- 3,745,290. INDUCTIVELY HEATABLE UTENSILS OR VESSELS FOR HEATING, SERVING AND STORING FOOD.

- 3,990,460. DRYING HAIR CURLER.

- 4,000,834. APPARATUS FOR HEATING AND DISPENSING FLOWABLE MATERIAL.

- 4,006,338. MICROWAVE HEATING APPARATUS WITH IMPROVED MULTIPLE COUPLERS AND SOLID STATE POWER SOURCES.

- 4,006,339. MICROWAVE HEATING APPARATUS WITH MULTIPLE COUPLING ELEMENTS AND MICROWAVE POWER SOURCES.

- 4,027,786. APPARATUS FOR HEATING DISPENSABLE FLOWABLE MATERIAL.

Applications for licenses may be addressed to: Patent Counsel, Motors & Drives Business Division, General Electric Co., 1285 Boston Ave., Building, 21EE, Bridgeport, Conn. 06602.

- 3,942,741. REEL CONSTRUCTION.

- 3,942,937. METHOD OF PROVIDING DURABLE, SLICK SLIDING SURFACES ON EXTRUSION FORMING APPARATUS, AND THE PRODUCT THEREOF.

- 3,957,719. METHOD OF HEAT TREATING AN ETHYLENE CONTAINING POLYMER ELECTRICAL INSULATING COMPOSITION AND PRODUCT FORMED THEREBY.

- 3,959,558. PRESSURELESS CURING SYSTEM FOR CHEMICALLY CROSSLINKING ETHYLENE-CONTAINING POLYMERS AND PRODUCT FORMED THEREBY.

- 3,960,739. METHOD OF STABILIZING THE DIELECTRIC STRENGTH OF POLYOLEFIN POLYMERS, AND THE STABILIZED COMPOSITIONS AND PRODUCTS THEREOF.

- 3,962,531. ELECTRICAL CONDUCTOR INSULATED WITH FILLED POLYMERIC COMPOUNDS.

- 3,978,815. CONTINUOUS CASTING APPARATUS WITH AN ARTICULATIVE SEALING CONNECTION.

- 3,979,356. POLYMERIC COMPOSITION AND INSULATED PRODUCTS.

- 3,979,488. PROCESS OF CONTINUOUSLY BLENDING, MOLDING AND CURING HEAT CURABLE POLYMERIC COMPOUNDS.

- 3,981,653. APPARATUS FOR THE MANUFACTURE OF AN ELECTRICAL CONDUCTOR COVERED WITH A CROSSLINK CURED POLYMERIC INSULATION.

- 3,995,587. CONTINUOUS CASTING APPARATUS INCLUDING Mo-Ti-Zr ALLOY BUSHING.

- 3,997,494. COMPOUNDED THERMOPLASTIC POLYMERIC MATERIALS AND FILLERS.

Application for license may be addressed to the Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky. 40225.

- 3,229,379. CONTROL SYSTEM FOR FABRIC DRYER.

- 3,238,636. AUTOMATIC DRYER CONTROL SYSTEM.

- 3,290,587. DRYNESS SENSOR FOR AUTOMATIC FABRIC DRYING MACHINE.

- 3,362,082. AUTOMATIC DRYER CONTROL SYSTEM.

- 3,721,948. TERMINAL ASSEMBLY.

- 3,870,440. HERMETICALLY SEALED COMPRESSOR SUCTION TUBE ASSEMBLY.

- 3,885,580. DISHWASHER CONTROL SYSTEM.

- 3,896,641. COMBINATION LINT FILTER AND ADDITIVE DISPENSER FOR AUTOMATIC WASHER.

- 4,008,454. DIFFERENTIAL EXPANSION ROD AND TUBE THERMOSTAT.

- 4,009,795. COMBINED REFLECTOR PAN AND TRIM RING.

- 4,017,702. MICROWAVE OVEN INCLUDING APPARATUS FOR VARYING POWER LEVEL.

- 4,020,323. ENERGY SAVING BROILING OVEN.

- 4,021,642. OVEN EXHAUST SYSTEM FOR RANGE WITH SOLID COOKTOP.

- 4,025,427. REUSABLE WATER SOFTENER SYSTEM FOR CLOTHES WASHER.

- 4,028,012. SEALING MEANS FOR A DISHWASHER TUB AND MOTOR ASSEMBLY.

- 4,035,787. FOOD TEMPERATURE RESPONSIVE CONTROL APPARATUS.

IU Technology Corporation is prepared to grant non-exclusive licenses on reasonable terms and conditions under the following patents.

- 3,720,609. PROCESS FOR TREATING AQUEOUS CHEMICAL WASTE SLUDGES AND COMPOSITIONS PRODUCED THEREBY.

- 3,785,840. LIME-FLY ASH-SULFITE MIXTURES.

Inquiries respecting licenses under these and/or related patents may be addressed to B. Lawrence Seabrook, Jr., President, IU Technology Corporation, 3624 Market St., Philadelphia, Pa. 19104.

The following 7 patents are offered by: Mr. Richard P. Mergehenn, J. H. Filbert, Inc., 3701 Southwestern Blvd., Baltimore, Md. 21229.

- 3,534,792. ONION RING SEPARATOR. Gerald J. Orłowski.

- 3,537,494. SLICING MACHINE. Gerald J. Orłowski.

- 3,606,917. PEELING MACHINE. Gerald J. Orłowski.

- 3,678,976. ONION PEELING APPARATUS. Gerald J. Orłowski.

- 3,682,214. ONION RING SEPARATOR. Gerald J. Orłowski.

- 3,885,519. APPARATUS FOR BREADING FOOD OBJECTS. Gerald J. Orłowski.

- 3,941,538. APPARATUS FOR FORMING EDIBLE RINGS. Gerald J. Orłowski.

The Du Pont Company announces that non-exclusive licenses are available on reasonable terms under the following thirty-seven patents. Inquiries respecting licenses may be directed to:

Director, Patent Liaison & Research Services, Textile Fibers Department, E. I. du Pont de Nemours & Company, Wilmington, Del. 19898.

- 3,670,048. GRAFT COPOLYMERS OF UNSATURATED POLYETHERS ON POLYAMIDE AND POLYESTER SUBSTRATES.

- 3,565,780. PROCESS FOR THE PREPARATION OF GRAFT COPOLYMERS USING REPETITIVE IRRADIATION AND CONTACTING STEPS.

- 3,514,385. PROCESS FOR RADIATION GRAFTING ONTO A PARTIALLY SWOLLEN CELLULOSIC SUBSTRATE.

- 3,488,268. IRRADIATION PROCESS FOR PREPARING GRAFT COPOLYMERS.

- 3,424,820. GRAFT COPOLYMERS OF AMINE COMPOUNDS ON POLYAMIDE AND POLYESTER SUBSTRATES.

- 3,423,163. CELLULOSIC TEXTILE FIBERS BEARING GRAFTED N-METHYLOL AMIDE.

- 3,413,378. GRAFT COPOLYMERS OF NITRILE GROUPS ON POLYAMIDE SUBSTRATES.

- 3,412,176. GRAFT COPOLYMERS OF UNSATURATED ALCOHOL SIDE CHAINS ON POLYAMIDE OR POLYESTER SUBSTRATES.

- 3,412,175. GRAFT COPOLYMERS OF FLUOROCARBON GROUPS ON POLYAMIDE OR POLYESTER SUBSTRATES.

- 3,394,985. GRAFT POLYMERIZATION REACTION OF POLYAMIDE FILAMENTS AND ACRYLIC ACID PROMOTED BY HYDROGEN PEROXIDE - FORMALDEHYDE SULFOXYLATE SALT CATALYST COMBINATION.

- 3,338,985. GRAFT COPOLYMERS OF EPOXYETHYLENE GROUPS OF POLYAMIDE OR POLYESTER SUBSTRATES.

- 3,313,591. PROCESS OF GRAFT POLYMERIZING ETHYLENICALLY UNSATURATED MONOMERS TO SOLID, SHAPED POLYCARBONAMIDES EMPLOYING HEAT AS THE SOLE GRAFT INITIATOR.

- 3,297,471. ACRYLIC OR METHACRYLIC ACID GRAFTING COPOLYMERIZED ON NYLON AND FORMING SALT OF SAID GRAFT.

- 3,290,415. GRAFT COPOLYMER OF POLYMERIC HYDROCARBON AND ORGANIC ACID BEARING RADICAL.

- 3,290,207. FIBRILLATED FIBER.

- 3,286,025. RECORDING PROCESS USING AN ELECTRON BEAM TO POLYMERIZE A RECORD.

- 3,284,156. SYNTHETIC POLYAMIDE TEXTILE MATERIAL HAVING A POLYORGANOSILOXANE GRAFTED THERETO.

- 3,215,671. CROSSLINKED POLYOXYMETHYLENES AND THEIR PREPARATION.

- 3,188,229. PROCESS OF ADHERING AN ORGANIC COATING TO A SUBSTRATE.

- 3,188,228. METHOD OF GRAFT POLYMERIZING AN ORGANIC COMPOUND TO A SOLID SHAPED CONDENSATION POLYMER STRUCTURE.

- 3,188,165. PROCESS FOR GRAFTING AN ORGANIC COMPOUND TO A SHAPED ARTICLE OF AN ADDITION POLYMER.

- 3,170,892. GRAFT POLYMERS WITH POLYSULFONE GRAFTS AND THEIR PREPARATION.

- 3,128,528. PREPARATION OF HYDROSET TEXTILE MATERIAL.

- 3,111,424. PROCESS OF COATING IRRADIATED POLYMER SUBSTRATES.

- 3,101,276. PROCESS FOR GRAFTING POLYMERS TO CELLULOSE SUBSTRATES.

- 3,101,275. PROCESS OF COATING A SHAPED SWOLLEN POLYMER SUBSTRATE AND TREATING WITH IONIZING RADIATION.

- 3,099,631. NITROGENOUS CONDENSATION POLYMER CONTAINING GRAFTED ACID.

- 3,092,512. GRAFT COPOLYMER OF POLYMERIZABLE AMIDE AND NITROGENOUS CONDENSATION POLYMER, AND PROCESS FOR PREPARING SAME.

- 3,090,664. GRAFT POLYMERIZING AN UNSATURATED ORGANIC ACID OR SALT THEREOF ONTO A NITROGEN CONTAINING POLYMER SUBSTRATE.

- 3,088,791. GRAFT POLYMERIZATION OF A VINYL MONOMER TO A POLYMERIC SUBSTRATE BY LOW TEMPERATURE IRRADIATION.

- 3,079,312. SHAPED POLYMERIC ARTICLES.

- 3,076,843. FLUORINATED DERIVATIVES OF CARBOXYLIC ACID HYDRAZIDES.

- 3,068,122. SELECTED GRAFT POLYMERS AND THEIR PREPARATION.

- 3,065,157. PROCESS FOR MODIFYING POLYMERS AND PRODUCTS THUS OBTAINED.

- 2,999,772. COATED ARTICLE COMPRISING A SUBSTRATE OF POLYETHYLENE OR POLYAMIDE AND A GRAFTED COATING OF POLYTETRAFLUOROETHYLENE OR POLYMETHYL METHACRYLATE.

- 2,999,056. IRRADIATION BONDING OF ACIDIC COMPOUNDS TO SHAPED POLYMERIC STRUCTURES.

- 2,988,493. IRRADIATION SYNTHESIS OF SULFONYL VINYLAMINES.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

- 4,036,651. ELECTROLESS COPPER PLATING BATH.

- 4,037,005. METHOD OF MAKING OPTICAL WAVEGUIDES AND PRODUCT BY THE PROCESS.

- 4,037,014. SEMICONDUCTOR ABSORBER FOR PHOTO-THERMAL CONVERTER.

4,037,114.	TRI-STATE LOGIC CIRCUIT.	4,034,239.	CAPACITANCE MEMORIES OPERATED WITH INTERMITTENTLY - ENERGIZED INTEGRATED CIRCUITS.
4,037,137.	CENTERING CIRCUIT FOR A TELEVISION DEFLECTION SYSTEM.	4,034,255.	VANE STRUCTURE FOR A FLAT IMAGE DISPLAY DEVICE.
4,037,140.	PROTECTION CIRCUIT FOR INSULATED-GATE FIELD-EFFECT TRANSISTORS (IGFETS).	4,034,262.	GATE DRIVE CIRCUIT FOR SCR DEFLECTION SYSTEM.
4,037,155.	CURRENT-RESPONSIVE THRESHOLD DETECTION CIRCUITRY.	4,034,263.	GATE DRIVE CIRCUIT FOR THYRISTOR DEFLECTION SYSTEM.
4,037,195.	VEHICULAR SIGNAL LIGHT CONTROL SYSTEM.	4,034,307.	CURRENT AMPLIFIER.
4,037,267.	PACKAGE FOR SEMICONDUCTOR COMPONENTS.	4,034,320.	HIGH POWER COAXIAL CAVITY RESONATOR TUNABLE OVER A BROAD BAND OF FREQUENCIES.
4,037,936.	CORRECTING LENS HAVING TWO EFFECTIVE SURFACES.	4,024,373.	AIRBORNE MOVING-TARGET INDICATING RADAR SYSTEM.
4,037,942.	OPTICAL ADJUSTMENT DEVICE.	4,034,382.	APPARATUS FOR FORMING A COLOR TELEVISION PICTURE TUBE SCREEN.
4,038,106.	FOUR-LAYER TRAPATT DIODE AND METHOD FOR MAKING SAME.	4,034,399.	INTERCONNECTION MEANS FOR AN ARRAY OF MAJORITY CARRIER MICROWAVE DEVICES.
4,038,203.	CERTAIN ALKALI METAL-RARE EARTH METAPHOSPHATE PHOTOLUMINESCENT GLASSES.	4,035,055.	COHERENT WAVE IMAGING AND/OR RECORDING TECHNIQUE FOR REDUCING THE GENERATION OF SPURIOUS COHERENT-WAVE IMAGE PATTERNS.
4,038,581.	CIRCUIT FOR ELIMINATION OF SURFACE CHARGE INTEGRATION.	4,035,226.	METHOD OF PREPARING PORTIONS OF A SEMICONDUCTOR WAFER SURFACE FOR FURTHER PROCESSING.
4,038,607.	COMPLEMENTARY FIELD EFFECT TRANSISTOR AMPLIFIER.	4,035,590.	APPARATUS FOR ELECTROMECHANICAL RECORDING OF SHORT WAVELENGTH MODULATION IN A METAL MASTER.
4,038,616.	VACUUM TUBE GAS TEST APPARATUS.	4,035,757.	SEMICONDUCTOR DEVICE RESISTORS HAVING SELECTED TEMPERATURE COEFFICIENTS.
4,038,655.	RADAR CONTOUR EDGE RESTORE CIRCUIT.	4,035,822.	PRESSURE SENSITIVE FIELD EFFECT DEVICE.
4,038,681.	CHROMA-BURST SEPARATOR AND AMPLIFIER.	4,035,826.	REDUCTION OF PARASITIC BIPOLAR EFFECTS IN INTEGRATED CIRCUITS EMPLOYING INSULATED GATE FIELD EFFECT TRANSISTORS VIA THE USE OF LOW RESISTANCE SUBSTRATE CONTACTS EXTENDING THROUGH SOURCE REGION.
4,038,682.	VIDEO DISC PLAYER APPARATUS FOR ESTABLISHING ELECTRICAL CONNECTION BETWEEN A STYLUS ELECTRODE AND A SIGNAL PROCESSING CIRCUIT.	4,035,827.	THERMALLY BALLASTED SEMICONDUCTOR DEVICE.
4,038,683.	TELEVISION SYNCHRONIZING GENERATOR.	4,035,828.	SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE.
4,038,685.	APPARATUS FOR AUTOMATIC GAMMA CONTROL OF TELEVISION COLOR SIGNALS.	4,035,829.	SEMICONDUCTOR DEVICE AND METHOD OF ELECTRICALLY ISOLATING CIRCUIT COMPONENTS THEREON.
4,038,686.	DEFECT DETECTION AND COMPENSATION.		
4,038,687.	VIDEO BLANKING CIRCUIT.		
4,033,665.	SYSTEM FOR RECORDING REDUNDANT FOURIER-TRANSFORM HOLOGRAM.		
4,033,905.	METHOD FOR INCREASING THE CONDUCTIVITY OF ELECTRICALLY RESISTIVE ORGANIC MATERIALS.		
4,034,127.	METHOD OF FORMING AND TREATING CADMIUM SELENIDE PHOTOCONDUCTIVE BODIES.		

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 24, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-4-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director..... Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-10-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director..... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director..... Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	11-29-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-6-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director..... Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	7-26-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director..... Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-3-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director..... Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-17-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director..... Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-24-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	7-9-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director..... Industrial Arts; Household, Personal and Fine Arts.	1-23-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	8-30-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director..... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-24-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	9-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-22-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director..... Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-27-77

Expiration of patents: The patents within the range of numbers indicated below expire during September 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,951,249 to 2,954,559, inclusive
Plant Patents..... Numbers 1,970 to 1,973, inclusive

REISSUES

OCTOBER 11, 1977

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,432

APPARATUS FOR MEASURING AND POSITIONING OF FISH AT HEAD CUTTING

Lelf Leander, and Curt Eriksson, both of Vastra Frolunda, Sweden, assignors to Arenco-KM AB, Vastra Frolunda, Sweden

Original No. 3,925,847, dated Dec. 16, 1975, Ser. No. 384,899, Aug. 2, 1973. Application for reissue Apr. 14, 1976, Ser. No. 677,032

Claims priority, application Sweden, Aug. 11, 1972, 10463/72 Int. Cl.² A22C 25/14

U.S. Cl. 17—63

Re. 29,433

AIR-POLLUTION PREVENTIVE ARRANGEMENT

Yasuo Nakajima, Yokosuka; Takeji Oguri, Yokohama, and Hiroshi Kuroda, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

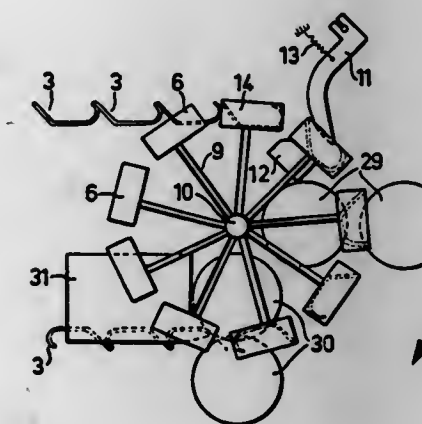
Original No. 3,826,089, dated July 30, 1974, Ser. No. 160,278, July 7, 1971. Application for reissue Dec. 11, 1975, Ser. No. 639,701

Claims priority, application Japan, July 8, 1970, 45-59704; Oct. 19, 1970, 45-91519

Int. Cl.² F02B 75/10; F01N 3/15

U.S. Cl. 60—290

5 Claims



1. Apparatus for measuring fish and positioning them in an optimum position for deheading, said apparatus comprising a first conveyor having a path of movement and having a plurality of fish boxes carried thereby, each of said fish boxes being adapted to advance a fish carried thereby sideways with the fish head located on a particular side thereof,

a second conveyor having a path of movement extending adjacent and substantially parallel to part of the path of movement of said first conveyor and having a plurality of head boxes carried thereby,

sensing means for determining the thickness of a fish carried by a fish box in the region of the fish located immediately behind the eyes of the fish,

means for locating said sensing means in an interspace between the respective paths of movement of said fish boxes and said head boxes,

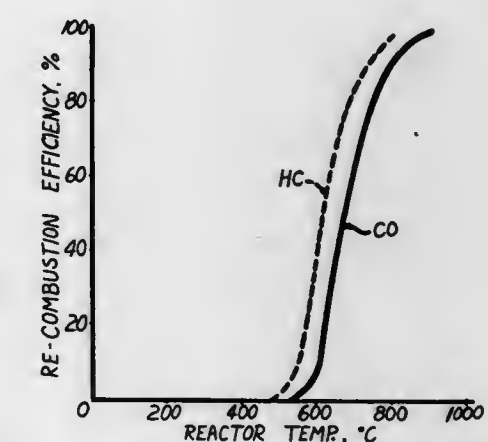
means for moving each of said plurality of head boxes of said second conveyor in synchronism with and in the same direction as and directly opposite to an individual fish box of said first conveyor along a portion of the path of movement of said second conveyor,

means for displacing each of said head boxes toward and away from an individual fish box in the longitudinal direction of a fish resting in said fish box,

a first control means fixedly mounted with respect to the paths of movement of said conveyors for actuating second control means in response to said sensing means,

a plurality of second control means for controlling said head box displacing means to optimum locations, a second control means connected to each of said head boxes and movable therewith in the path of movement of said second conveyor and for controlling said head box displacing means to move its connected head box longitudinally to an optimum location dependent upon the measured thickness of the fish in its connected head box, and

means for locking each head box at said optimum position.



1. An air pollution preventive arrangement for use with an engine for a motor vehicle having an exhaust system through which exhaust gases emitted from the engine are discharged, comprising:

a thermal reactor mounted on said exhaust system and located posterior to exhaust ports of said exhaust system for primarily recombusting unconsumed hydrocarbons and carbon monoxides contained in said exhaust gases;

at least one catalytic converter mounted on said [exhaust] exhaust system and located posterior to said thermal reactor for secondarily recombusting the exhaust gases passed from said thermal reactor.

means for supplying additional air to said [exhaust] exhaust system anterior to said thermal reactor and to said exhaust system anterior to said catalytic converter, comprising:

a pneumatic pump;

a first passage leading from said pneumatic pump to said exhaust system anterior to said thermal reactor; and

a second passage leading from said pneumatic pump to said exhaust system anterior to said catalytic converter; and

means for controlling the amounts of said additional air to be supplied to said thermal reactor and said catalytic converter, respectively, comprising:

a one-way check valve mounted on said first passage for preventing a reverse flow of the exhaust gases from said exhaust system upstream of said thermal reactor,

a device including a valve means mounted on and normally closing said second passage, said valve means being caused to open said second passage when actuated; and

a combination of detector and switch means which is responsive to deceleration conditions of the motor vehicle for closing said valve means when said conditions are detected thereby.

Re. 29,434

ASSEMBLY FOR TESTING SHOCK ABSORBERS INCORPORATED IN A VEHICLE

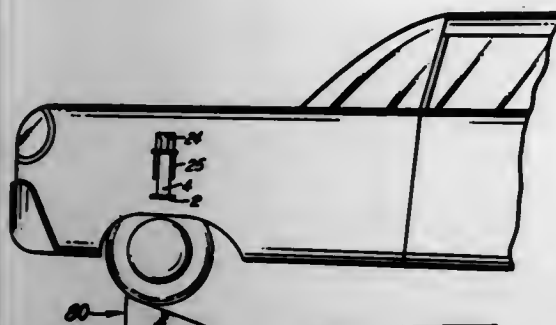
Alfred R. Bolliger, Im Siedfeld, 8803 Ruschlikon, Switzerland
Original No. 3,939,692, dated Feb. 24, 1976, Ser. No. 475,920,
June 3, 1974. Application for reissue Mar. 29, 1976, Ser. No.
671,489

Claims priority, application Switzerland, Nov. 5, 1973,
15556/73

Int. Cl.² G01M 17/04

U.S. Cl. 73—11

6 Claims



1. An assembly for testing a shock absorber associated with a wheel pair of a spring suspended vehicle having a vehicle body, said assembly comprising

a. a step to produce a drop motion of said wheel pair so that said vehicle body will rise in oscillation under the influence of springs but damped by a shock absorber after dropping motion thereof,

b. means for indicating the condition of a shock absorber of said wheel pair by evaluating the acceleration inherent in the rise of said vehicle body during the first oscillation and first oscillation only of said vehicle body after dropping motion thereof,

said means comprising

i. means for sensing the acceleration of said vehicle body during the rise thereof, said means including an inertia body member which is freely mounted for vertical movement in a vertical path,

ii. means for mounting said sensing means to a body component of said vehicle body in the vicinity of a shock absorber to be tested,

iii. means extending into the vertical path of movement of said inertia body member for generating a signal upon movement of said body member in said vertical path more than a predetermined amount, and

iv. an indicating device responsive to the signal generated by said signal generating means for indicating movement more than said predetermined amount by said body member.

Re. 29,435

METHOD OF SUPERVISING THE FILLING LEVEL IN HOPPERS, SHAFTS, SILOS AND THE LIKE FOR MISCELLANEOUS MATERIALS AND MEANS FOR PERFORMING THE METHOD

Sven Gunnar Bergdahl, Uppl. Vasby, and Erik Torsten Wangdahl,
Åmneberg, both of Sweden, assignors to Asca Aktiebolag,
Vasteras, Sweden

Original No. 3,927,569, dated Dec. 23, 1975, Ser. No. 453,389,
Mar. 21, 1974. Application for reissue Mar. 25, 1976, Ser. No.
670,419

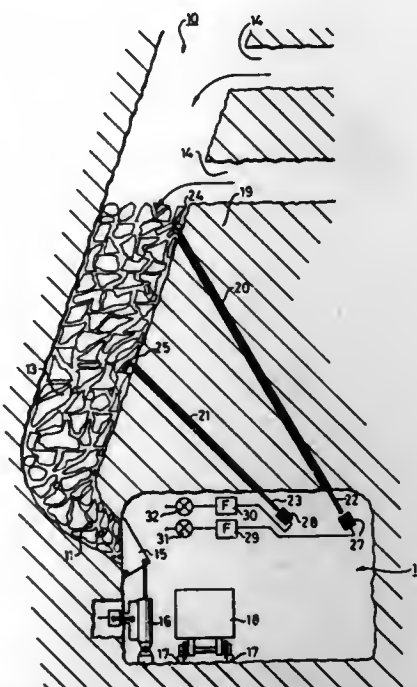
Claims priority, application Sweden, Mar. 21, 1973, 7303961
Int. Cl.² G01F 23/00

U.S. Cl. 73—290 V

12 Claims

7. Means for supervising the filling level and downward movement of granular material in a vertically elongated space, said space having a filling opening above the bottom thereof, comprising at least one sensing member arranged in the wall of said space above the bottom and located in the downward path of material fed into said space through said filling opening, said sensing member comprising a rod device placed substantially spaced from the walls in the hole and being axially fastened near

its end in the hole whereby such material will come into contact with the member when falling down into the space as long as the level of the material in the space is below said member, said member being provided with vibration transmitting means responsive to the fall of material against said member when



passing into said space, and an indicating mechanism connected to said vibration transmitting means to indicate the movement of material and filling level in the space. [.] other vibrations being substantially not sensed in the member because of the spaced positioning of the rod means in the hole.

Re. 29,436

ENCODER FOR ALTIMETERS AND THE LIKE INSTRUMENTS

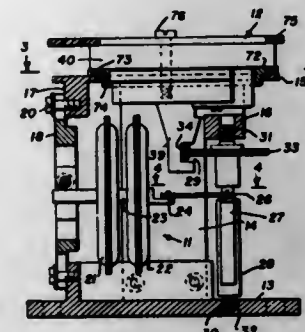
Robert M. Hulle, Calabasas; John Ferrero, Chatsworth, and Gerald Pannullo, Canoga Park, all of Calif., assignors to Trans-Cal Industries, Inc., Van Nuys, Calif.

Original No. 3,918,307, dated Nov. 11, 1975, Ser. No. 494,778,
Aug. 5, 1974. Application for reissue Mar. 31, 1976, Ser. No.
672,114

Int. Cl.² G01L 7/14

U.S. Cl. 73—387

13 Claims



1. Encoding means for altimeters or the like comprising a frame, a fluid pressure actuated device including a drive gear rotatably supported by said frame; an encoding device including an encoder disc and a pinion connected to said encoder disc; said pinion being engageable with said gear, a support for said encoding device, means on said frame forming a bearing, an adjusting member supported by said bearing for rotational adjustment about the axis of said bearing, said adjusting member supporting said support with the axis of said pinion eccentric to the axis of said bearing whereby said adjustment of said adjusting member will adjust said pinion relative to said gear, and

means for sensing the position of said encoder disc relative to said support.

Re. 29,437

DEVICE FOR THE VERTICAL AND LATERAL DISPLACEMENT OF RAILWAY TRACK

Hans Hurni, Pres Lausanne, Switzerland, assignor to Canron, Inc., Phillipsburg, N.J.

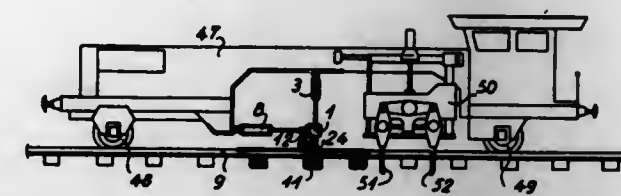
Original No. 3,832,952, dated Sept. 3, 1974, Ser. No. 308,945,
Nov. 24, 1972. Application for reissue Sept. 1, 1976, Ser. No.
719,507

Claims priority, application Switzerland, Dec. 3, 1971,
17606/71

Int. Cl.² E01B 33/02

U.S. Cl. 104—7 B

11 Claims



1. Apparatus for the vertical and lateral movement of a section of railway track wherein gripping members operated so as to be able to grip the two lines of rails are mounted on at least one support frame connected by articulated connecting members to a chassis movable on the track, which support frame is movable both vertically and laterally relative to said chassis under the action of lifting members or lining members, in order to move said track section and to bring it into a predetermined reference position, characterized in that said gripping members are provided for each side of the track and are transversely displaceable, substantially in a straight line, transversely in relation to the support frame, along said support frame; and in that rail engaging means, for each side of the track, are mounted on the support frame and are operable to engage the track so as to face the gripping members for the same side of the track.

Re. 29,438

APPARATUS FOR CREATING AND MAINTAINING AN ICE SLAB

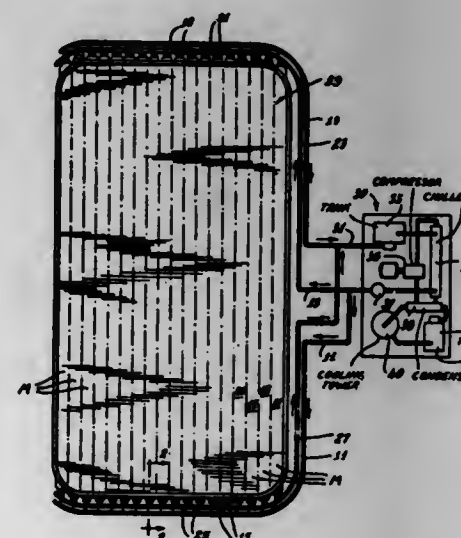
Calvin D. MacCracken, Englewood, N.J., and Helmut J. Schmidt, Greenlawn, N.Y., assignors to Calmac Manufacturing Corporation, Englewood, N.J.

Original No. 3,893,507, dated July 8, 1975, Ser. No. 387,148,
Aug. 9, 1973. Division of Ser. No. 204,112, Dec. 2, 1971, Pat.
No. 3,751,935. Application for reissue Mar. 25, 1976, Ser. No.
670,550

Int. Cl.² F28F 7/00; A63C 19/10

U.S. Cl. 165—46

7 Claims



1. A flexible portable plastic tubing mat adapted to be laid side-by-side with other similar mats for creating and maintain-

ing an ice slab for skating and for preventing snow from melting on a ski slope and adapted to be laid end-to-end with other similar mats for creating an ice chute or trough for a toboggan slide or similar sliding purposes,

a. said portable mat having a length many times greater than its width with a plurality of small diameter flexible plastic tubing members extending lengthwise of said mat adapted to have cooled anti-freeze liquid pumped therethrough,
b. said flexible plastic tubing members having an inside diameter in the range from one-eighth to three-eighths of an inch,
c. securing means connected to said tubing members for securing them in a grid pattern in said mat,
d. said mat including supply and return sub-headers extending across one end of said mat with the ends of a plurality of said tubing members being connected respectively to said supply and return sub-headers with the direction of flow of the anti-freeze liquid being opposite in neighboring tubing members in the mat,
e. said flexible portable mat being rollable into a roll for ease of transportation, and
f. said sub-headers being adapted to be connected to main headers in an installation for interconnecting the plurality of said tubing members through the sub-headers to the main headers.

Re. 29,439

CERTAIN 1,2,4-OXA- AND -THIADIAZOL-5-YLTHIOALKANOIC ACID DERIVATIVES

John Henry Parsons, Saffron Walden, England, assignor to Fisons Limited, England

Original No. 3,770,754, dated Nov. 6, 1973, Ser. No. 80,165, Oct.
12, 1970. Application for reissue Nov. 4, 1975, Ser. No.
628,732

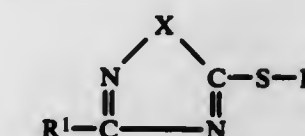
Claims priority, application United Kingdom, Oct. 18, 1969,
51248/69

Int. Cl.² C07D 271/06, 285/08

U.S. Cl. 260—302 SD

38 Claims

1. A compound of the formula:



wherein

R¹ represents [alkyl; alkyl substituted by halogen, alkoxy, carboxy, hydroxy or nitro;] phenyl; or phenyl substituted by halogen, alkyl, alkoxy or nitro,

R₂ is —CH₂COOH or —CH₂CH₂—COOH

X is oxygen or sulphur

wherein the alkyl and alkoxy radicals have from 1 to 6 carbon atoms, or a herbicidal or plant growth regulant salt; [lower] herbicidal or plant growth regulant alkyl ester or unsubstituted amide of such compound.

Re. 29,440

CALCULATOR KEYBOARD SWITCH WITH DISC SPRING CONTACT AND PRINTED CIRCUIT BOARD

Gilbert H. Durkee, Fort Wayne, Ind.; Per G. Wareberg, Ottawa, Canada, and Alan C. Yoder, Fort Wayne, Ind., assignors to Bowmar Instrument Corporation, Fort Wayne, Ind.

Original No. 3,796,843, dated Mar. 12, 1974, Ser. No. 320,147,
Jan. 2, 1973. Application for reissue Mar. 9, 1976, Ser. No.
665,325

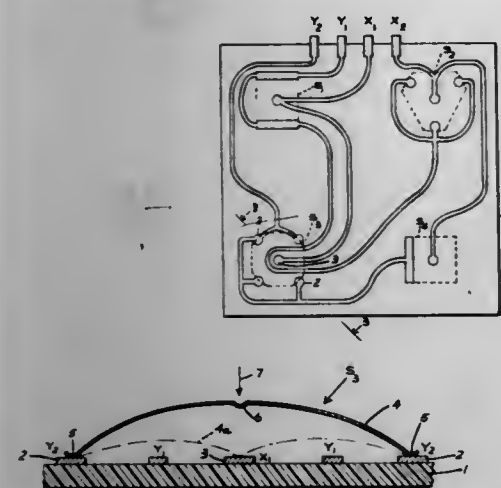
Int. Cl.² H01H 13/70

U.S. Cl. 200—5 A

24 Claims

23. In a keyboard switch assembly including a resilient, conductive switch device manually actuatable from a normal to a deflected position, said switch device resiliently returning to its normal

position upon removal of force therefrom, the improvement comprising an insulative member having opposite surfaces, one of said surfaces having first and second elongated conductors thereon, said first conductor including a first switch terminal portion and said second conductor including a second switch terminal portion, said conductors and terminal portions being generally coplanar, said switch device being positioned in facing relationship with said one surface and said conductors, said switch device having first and second spaced contact areas thereon, said contact areas being respectively in registry with said terminal portions and engaging the same when said device is in said deflected position thereby electrically connecting said terminal portions, at least one of said



contact areas being spaced from the respective terminal portion in said normal position of said device, said one surface of said member having at least a third conductor thereon intermediate and spaced from said first and second conductors and generally coplanar therewith, said third conductor extending between said contact areas and under said device from a location on said one surface remote therefrom, means for maintaining said device in spaced relationship with said third conductor in both positions of said device whereby there is no electrical connection between said third conductor and said device in either position thereof, and means for holding said switch device and insulative member in operative relationship.

Re. 29,441

DIRECT CURRENT POWER SUPPLY FOR MANUAL ARC WELDING

Rolf Ericson, Laxa, Sweden, assignor to Elektriska Svetsningssaktiebolaget, Goteborg, Sweden

Original No. 3,961,154, dated June 1, 1976, Ser. No. 515,415, Oct. 16, 1974. Continuation of Ser. No. 352,446, April 18, 1973, abandoned. Application for reissue Aug. 23, 1976, Ser. No. 716,889

Claims priority, application Sweden, Apr. 18, 1972, 4963/72 Int. Cl.² B23K 9/10

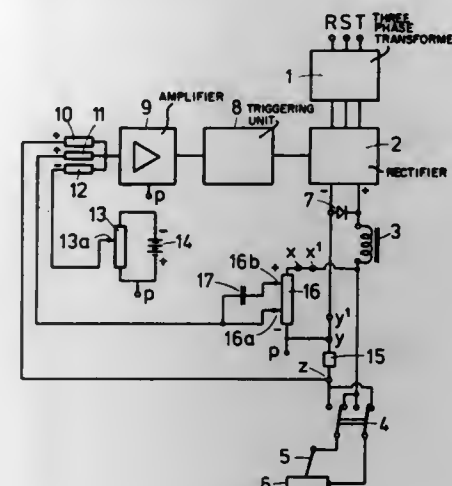
U.S. Cl. 219—135

3 Claims

1. A direct current power supply for manual arc welding

having a steeply drooping, adjustable volt-ampere characteristic comprising

- a polyphase transformer having a plurality of secondary output leads carrying mutually phase displaced voltages, a polyphase rectifier system connecting said secondary output leads to a pair of D. C. welding current conductors, said rectifier system comprising a set of triggered rectifier valves connected one in series with each of said secondary output leads, said triggered rectifier valves having each a trigger terminal for initiating current flow through the valve,
- means for periodically supplying igniting pulses to each of said trigger terminals, including means for causing the angular position of said pulses to vary in response to a direct current control signal, and,
- means for producing said direct current control signal comprising the following means, to wit,
 - a. means for producing an adjustable direct current reference signal,



- b. means including a welding current sensing means for producing a welding current feed-back direct current signal bearing a substantially fixed proportion to the welding current carried by the pair of welding current conductors,
- c. means including a welding voltage sensing means for producing a welding voltage feed-back direct current signal proportional to the welding voltage between said welding current conductors,
- d. summing means for combining said reference signal, said welding current feed-back signal and said welding voltage feed-back signal into a compound signal constituting the control signal aforementioned, both of said feed-back signals being supplied to said summing means in opposing relationship to said reference signal, said means for producing a welding voltage feed-back signal including means for adjustment of the slope of the volt-ampere characteristic of the power supply through adjustment of the ratio of said welding voltage feed-back signal to the welding voltage independently of the ratio of the welding current feed-back signal to the welding current.

PLANT PATENTS

GRANTED OCTOBER 11, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,122

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 6, 1976, Ser. No. 712,191

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—79

1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat. plant to be known by the cultivar name Marmalade and particularly characterized as to uniqueness by the combined characteristics of incurved inflorescence form, standard inflorescence type, red-bronze to orange-bronze inflorescence color, very tall plant height, uniform 10 week flowering response to photoperiodic short day control, and diameter across face of inflorescence up to 18 cm. at maturity.

4,123

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 6, 1976, Ser. No. 712,192

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—77

1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat. plant known by the cultivar name Jade and particularly characterized as to uniqueness by the combined characteristics of flat inflorescence form, reflexing slightly at full maturity; spider inflorescence type; ivory white inflorescence color; diameter across face of inflorescence ranging from 140 to 165 mm at maturity; uniform 9 week photoperiodic flowering response to short days; medium plant height; and semi-spreading branching pattern.

4,124

BEGONIA PLANT

Hans-Joachim Rohde, Nurlingen, Germany, assignor to Mikelsens Inc., Ashtabula, Ohio

Filed Aug. 17, 1976, Ser. No. 715,101

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of begonia plant characterized particularly as to uniqueness by the combined characteristics of bright yellow double flowers having a size up to 6 cm. in diameter when mature, with the flowers having an odd number of tepals; very fast growing habit which requires growth regulation for height control in high light and high temperature conditions, and long lasting nature of the individual flowers.

4,125

BEGONIA PLANT

Hans Joachim Rohde, Nurlingen, Germany, assignor to Mikelsens Inc., Ashtabula, Ohio

Filed Aug. 17, 1976, Ser. No. 715,102

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of begonia plant characterized particularly by the combined characteristics of bright, apple-blossom pink colored, double flowers; short full compact and upright growth habit in all seasons; a high degree of self-branching; round, heavily textured dark green foliage with nearly complete edges; rapid propagation from leaf cuttings, with the cuttings consistently producing four to six adventitious shoots at all times of the year; excellent keeping quality and long flowering period, and by the uniform leaf area on each plant.

4,126

CHRYSANTHEMUM NAMED LEXINGTON

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Oct. 15, 1976, Ser. No. 733,471

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct cultivar of chrysanthemum substantially as shown and described, characterized by its single flower form with clear yellow ray florets which do not bronze when finished cool and which do not reflex upon opening, by its upright pot habit, and by its abundant production of dark green foliage.

PATENTS

GRANTED OCTOBER 11, 1977

ERRATA

For CLASS	See PATENT NO.
093-058.3	4,052,886
072-214	4,052,898
134-167 R	4,052,953
242-001.1 R	4,053,111
366-339	4,053,141
366-165	4,053,142
366-089	4,053,143
366-097	4,053,144
358-051	4,053,203
355-104	4,053,230
350-310	4,053,241
544-021	4,053,286
204-049	4,053,400
204-059 R	4,053,402
204-159.19	4,053,415
261-044 R	4,053,449
542-454	4,053,466
542-426	4,053,467
544-030	4,053,468
544-021	4,053,469
544-025	4,053,470
544-133	4,053,471
544-139	4,053,472
548-336	4,053,482
560-060	4,053,500
560-103	4,053,501
560-053	4,053,502
560-202	4,053,503
560-004	4,053,504
364-703	4,053,739
364-705	4,053,740
364-478	4,053,741
364-506	4,053,742
364-500	4,053,743
364-501	4,053,744
364-494	4,053,745
364-494	4,053,746
364-494	4,053,747
364-525	4,053,748
364-424	4,053,749
364-724	4,053,750
235-302.3	4,053,751
235-302.1	4,053,752
364-709	4,053,753
364-723	4,053,754
364-561	4,053,755

ERRATA—continued

362-007	4,053,756
362-004	4,053,757
362-158	4,053,758
362-218	4,053,759
362-186	4,053,760
362-413	4,053,761
362-223	4,053,762
362-301	4,053,766
361-042	4,053,815
361-062	4,053,816
363-044	4,053,820
363-060	4,053,821
363-172	4,053,822
325-479	4,053,843
364-200	4,053,944

PATENTS

GRANTED OCTOBER 11, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

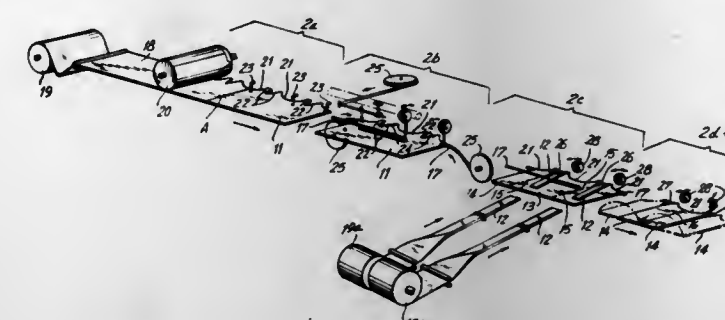
4,052,752
METHOD OF MAKING A DISPOSABLE GARMENT
 Charles B. Green, Lewisburg, Pa., assignor to International Paper Company, New York, N.Y.

Filed Dec. 15, 1976, Ser. No. 750,839

Int. Cl.² A41D 13/00

U.S. Cl. 2—243 R

16 Claims



1. A method of making a disposable garment comprising the steps of
 cutting the body of the garment from a continuous web of material, the longitudinal axis of the body being in the cross direction of the web and the body having a central portion and having first and second lateral portions separated by and adjacent to the central portion;
 applying a pair of first adhesive stripes to the body, one of the first adhesive stripes being applied to a selected one of the central and first lateral portions and the other of the first adhesive stripes being applied to a selected one of the central and second lateral portions;
 applying a sleeve on each first adhesive stripe to partially adhere the sleeves to the body;
 applying a first one of a pair of second adhesive stripes to a selected one of one of the sleeves and the portion of the body adjacent the portion to which the one of the first adhesive stripes is applied and a second one of the pair of second adhesive stripes being applied to a selected one of the other of the sleeves and the portion of the body adjacent the portion to which the other of the first adhesive stripes is applied; and
 folding the lateral portions against the central portion of the body, whereby the sleeves are completely adhered to and enclosed within the body.

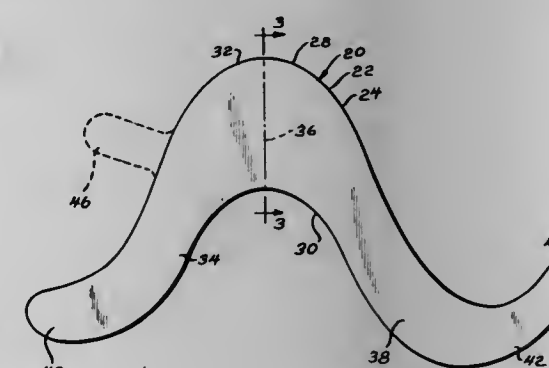
4,052,753
KNEE SPACER AND METHOD OF REFORMING SLIDING BODY SURFACES
 Richard G. Dedo, 8629 La Losa Drive, West, Jacksonville, Fla. 32217

Filed Aug. 2, 1976, Ser. No. 710,402

Int. Cl.² A61F 1/00, 1/24

U.S. Cl. 3—1

21 Claims



1. A knee spacer comprising, an elongated member of a flexible and relatively biologically inert material having a front

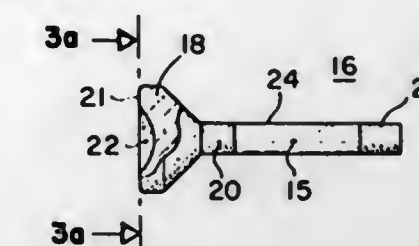
surface, a back surface, and side edges defining a shape similar to the normal contour of the suprapatellar pouch of a human knee superior the femoral articular cartilage.

4,052,754
IMPLANTABLE STRUCTURE
 Charles A. Homsy, 11526 Raintree Circle, Houston, Tex. 77024
 Continuation-in-part of Ser. No. 604,624, Aug. 14, 1975, abandoned. This application July 14, 1976, Ser. No. 705,334

Int. Cl.² A61F 1/24, 1/18; A61B 19/00; A61N 1/04

U.S. Cl. 3—1.9

16 Claims



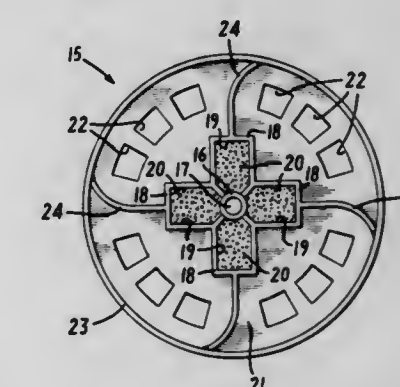
1. A structure for in vivo implantation, comprising an elongate biocompatible, porous element, said porous element having at least a portion of its length compressed so that the surface pores along said portion are closed, one projecting end of said element being enlarged and having open pores throughout to allow tissue ingrowth therein, said porous element having the characteristics of promoting ingrowth of living tissue therein when implanted.

4,052,755
WAVE-QUELLING FLOAT
 William H. Baker, 30 Honeysuckle Woods, Clover, S.C. 29710
 Filed May 18, 1976, Ser. No. 687,578

Int. Cl.² E04H 3/16, 3/18

U.S. Cl. 4—172

45 Claims



1. A wave-quelling float for marker lines extending across the surface of a body of water comprising a supporting body of lightweight plastic material; the float body comprising a hub and a web portion extending radially of and circumferentially about the hub; a central passage through the hub for reception of a float-tethering marking line; a plurality of buoyant members attached to the body and disposed at regular intervals about the hub in a manner to float the body such that at least one-half the body is above the water with the float balanced for free rotation in the water about a float-tethering line extending through the passage of the hub; and a plurality of wave-quelling vanes extending laterally from the web on at least one side thereof; the vanes being spaced and generally flat, and defining a plane at their inner portions, and being curved away from that plane at their outer ends so as to receive

surface surges and waves on the body of water, absorb the impact thereof as rotation of the float, and thereby quell them.

16. A wave-quelling float for marker lines extending across the surface of a body of water comprising a supporting body of lightweight plastic material; the float body comprising a hub and a web portion extending radially of and circumferentially about the hub; a central passage through the hub for reception of a float-tethering marking line; a plurality of float supports in the body, arranged radially about the hub a plurality of buoyant members carried by the float supports, and the float supports and buoyant members being disposed at regular intervals about the hub in a manner to float the body such that at least one-half the body is above the water with the float balanced for free rotation in the water about a float-tethering line; and a plurality of wave-quelling vanes extending laterally from the web in radial alignment with the float supports on at least one side thereof; the vanes being spaced and shaped to receive surges and waves on the body of water, absorb the impact thereof as rotation of the float, and thereby quell them.

33. A wave-quelling float for marker lines extending across the surface of a body of water comprising a supporting body of lightweight plastic material; the float body comprising a hub and a web portion extending radially of and circumferentially about the hub; a central passage through the hub for reception of a float-tethering marking line; a plurality of air chambers in the body disposed at regular intervals about the hub in a manner to float the body such that at least one-half the body is above the water with the float balanced for free rotation in the water about a float-tethering line extending through the passage in the hub; the air chambers extending through the body and having open ends and end caps closing off the open ends; and a plurality of wave-quelling vanes extending laterally from the web on at least one side thereof; the vanes being spaced and shaped to receive surface surges and waves on the body of water, absorb the impact thereof as rotation of the float, and thereby quell them.

4,052,756

WET TYPE MARINE JET TOILET

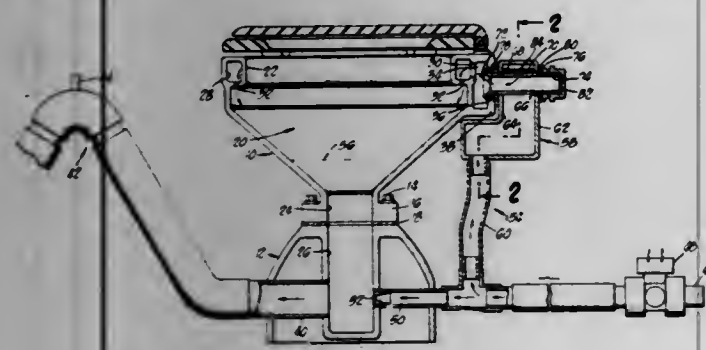
Marvin E. Whiteman, Sr., deceased, late of Coronado Cays, Calif.; Wilene Whiteman, co-executor, No. 5 The Point, Coronado Cays, Calif. 92118; Marvin E. Whiteman, Jr., co-executor, 1010 Antelope Mountain Road, Big Bear City, Calif. 92314, and Gary DeLong Whiteman, co-executor, 18643 Vintage St., Northridge, Calif. 91324

Filed May 10, 1976, Ser. No. 684,922

Int. Cl.² E03D 11/02, 11/18

U.S. Cl. 4-73

10 Claims



1. In a marine toilet in which a toilet bowl structure has a top flushing rim and a bottom discharge outlet, said flushing rim and bottom outlet having flow connections with a controlled source of pressurized flushing fluid, the improvement comprising:

- a. a reservoir tank positioned above the toilet bowl outlet, said tank having an outlet in connection with the flushing rim and an inlet in connection with said pressurized fluid source and said bottom outlet, whereby to receive and impound a quantity of the pressurized fluid during a flushing operation to discharge impounded fluid from the tank

to the bottom discharge outlet into the bowl so as to form a normal fluid level therein.

4,052,757

HYDROTHERAPY INSTALLATION

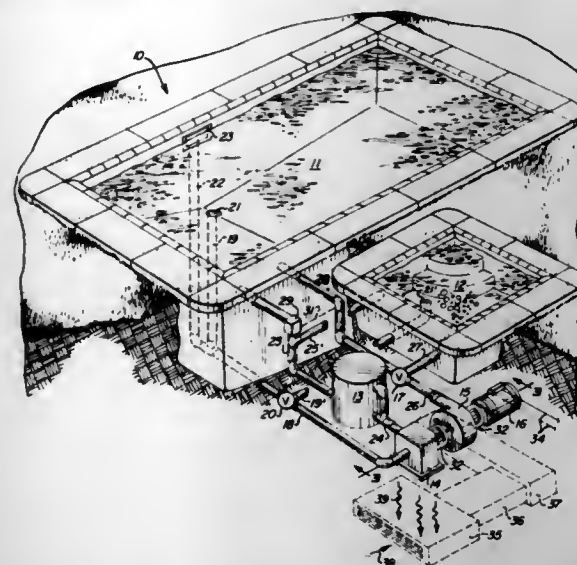
Troy R. Dotson, 3702 E. Winchcomb, Phoenix, Ariz. 85032

Filed Jan. 29, 1976, Ser. No. 653,460

Int. Cl.² E04H 3/16, 3/18; F16L 22/02

U.S. Cl. 4-172.17

5 Claims



1. A hydrotherapy installation for pools comprising in combination:

- a rotary driven shaft,
- a pump assembly connected to said shaft for actuation thereof for pumping water to and from a pool,
- a blower assembly connected to said shaft for actuation thereof,
- means for transmitting air under pressure from said blower assembly to a pool,
- an electric motor for rotating said shaft,
- a cowling mounted around at least a part of said blower assembly for directing air into said blower assembly, and
- means for preheating the air received by said cowling.

4,052,758

HUMAN WASTE DISPOSAL SYSTEM

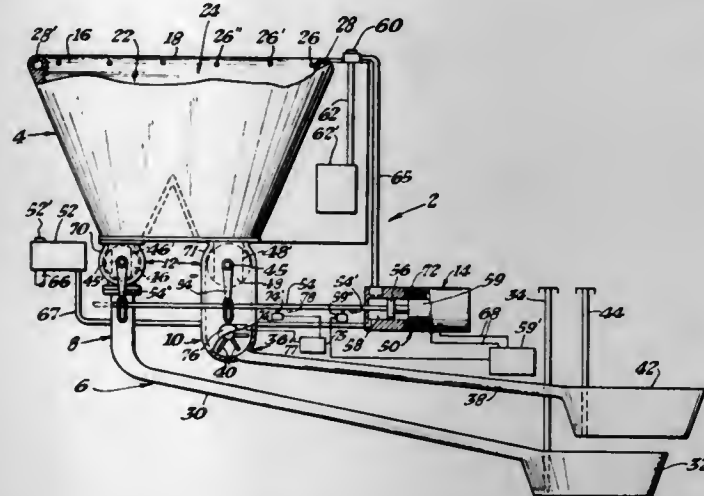
Frank Arena, 624 Southwind Circle, N. Palm Beach, Fla. 33408

Filed Sept. 12, 1975, Ser. No. 612,661

Int. Cl.² E03D 3/00, 11/00

U.S. Cl. 4-79

5 Claims



1. A human waste disposal system comprising:

- a toilet means including a solid waste toilet bowl means and a liquid waste toilet bowl means,
- a low volume flushing means connected to said toilet means,
- said low volume flushing means including fluid flushing nozzle distribution means connected to the upper portion of said toilet means,

a grinding and transfer mechanism connected to an outlet at the bottom of said solid waste toilet bowl means to provide movement of gravity feed waste into a first transfer conduit means,

said first transfer conduit means connected to said grinding and transfer mechanism,

a first storage means connected to said first transfer means, a water inlet and an additive means inlet connected to said low volume flushing means,

a metering means including inlets and an outlet, said metering means connected to both said water inlet and said additive means inlet to distribute water and additive out through said metering means outlet, and

a fluid flushing conduit connected to an outlet of said metering means, said fluid flushing conduit having an outlet and connected to said fluid flushing nozzle distribution means.

springs remaining in the rows adjacent the outermost lengthwise rows being of the other set with the number of lengthwise

FULL SIZE (9x9)

X = 9/16 GA. COIL
O = 10/16 GA. COIL

55-9/16 GA. COILS
28-10/16 GA. COILS

rows of coil springs of the one set comprising at least half of the lengthwise rows of coil springs in the spring assembly.

4,052,759

FLOOR-MOUNTED ANCHOR UNIT FOR TOILETS

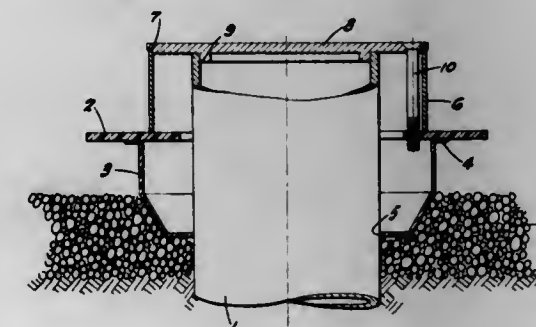
Lloyd W. Hill, 2471 E. Gerard Ave., Merced, Calif. 95340

Filed Oct. 23, 1975, Ser. No. 625,070

Int. Cl.² E03D 11/00; F16L 51/02, 55/00, 11/12

U.S. Cl. 4-252 R

2 Claims



1. In a floor-mounted anchor unit, for a toilet, which includes, in association with a floor, an annular, floor-supported, toilet attachment flange, there being a vertical sewer pipe riser disposed coaxially of the toilet attachment flange and extending upwardly therebelow, an annular, floor-engaging sub-flange concentrically surrounding the riser in spaced relation below the toilet attachment flange, and a plurality of vertical, circumferentially spaced screws connected in holding relation between the toilet attachment flange and sub-flange radially outwardly of the riser; the improvement characterized by the sub-flange including a cup-like shroud fixed on and depending from said sub-flange, and the shroud having a circular bottom opening through which the riser extends in matching frictional relation whereby the shroud positionally supports the sub-flange from the riser upon initial placement of such sub-flange on said riser, and the shroud being of a diameter such that said shroud encompasses, in protecting relation, lower end portions of the screws which project below the sub-flange.

4,052,760

COIL SPRING ASSEMBLY

Gerald A. Golembeck, Lake Elmo, and Ralph J. Marx, St. Paul, both of Minn., assignors to The United States Bedding Company, St. Paul, Minn.

Filed Feb. 23, 1976, Ser. No. 660,763

Int. Cl.² A47C 23/04

U.S. Cl. 5-248

1 Claim

1. A coil spring assembly for mattresses and box springs characterized by improved comfort and support in which the coil spring assembly is formed of coil springs arranged in a plurality of lengthwise and crosswise extending rows and in which the coil springs consist of two sets of coil springs in which the coil springs of both sets are of the same size but in which the coil springs of one set are of lower gauge and greater stiffness than the coil springs of the other set with the outermost coil springs in each of the lengthwise and crosswise extending rows and in the middle rows extending lengthwise of the spring assembly being of the one set while the coil

4,052,761

CARTOP TRUNK BOAT

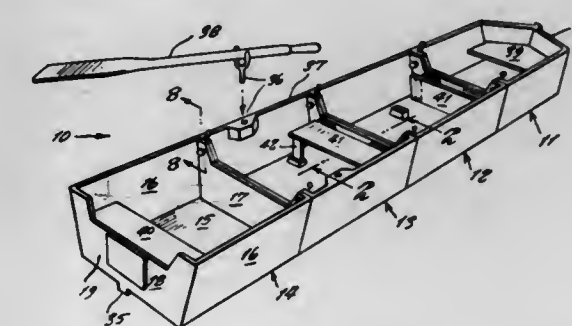
Charles A. Rilling, 191 Carman Hill Road No. 2, New Milford, Conn. 06776

Filed July 6, 1976, Ser. No. 702,945

Int. Cl.² B63B 7/04

U.S. Cl. 9-2 S

2 Claims



1. A cartop trunk boat, comprising in combination, a plurality of boat sections including a bow section, a forward central section, an aft central section and a stern section, said sections being detachably attachable together to form said boat, said sections when detached, nesting into each other for compact transportation on a car roof rack, wherein each said section comprises an open box made of molded plastic and including a bottom, opposite side walls and an aft and forward wall, wherein said sections are attachable together by means of a hook along a lower portion of said forward walls being receivable in an upward groove formed on an aft wall of an adjacent said section; and upper corners of said aft and forward walls being locked together by a forwardly projecting stud at each said corner of said aft wall removably received through an opening of said forward wall, a projecting end of said stud having an annular groove receiving a vertically slidable yoke in a frame mounted on said forward wall.

4,052,762

BABY LIFE PRESERVER

Phyllis D. Zawislak, Huntington, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 14, 1976, Ser. No. 695,731

Int. Cl.² B63C 9/10

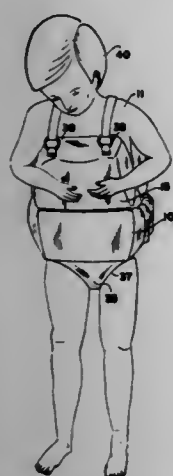
U.S. Cl. 9-337

1 Claim

1. A child's life preserver formed of buoyant foam plastic sections joined together to form a vest and shaped so in the worn position the upper sections of the vest are of greater volume than the lower sections of the vest to provide a greater degree of buoyancy to the upper section of the body of the wearer and to cause the wearer to float in a vertical upright position in the water, comprising:

- a front section and a rear section, each formed of an upper section of a shaped semi-rigid block of foam plastic material joined to a lower section of a shaped block of similar material, with

a section of shaped webbing joined at opposed ends to the bottom edges of the two said lower sections, said webbing formed with shaped openings so as to fit about the legs of a wearer, with each said upper section of greater thickness and volume than each said lower section, with a flexible articulated section of foam plastic shaped as a belt fitted at a first end to each of two opposed sides of the front lower section, with each of said articulated sections fitted at a second end with clip means for detachably fastening to an individual clasp fastened on the exterior of the back lower section,



a pair of spaced straps each fastened at a first end by an individual clasp to the exterior of the front upper section, and each said strap extending in slidable relation to an individual fastener fixed on the exterior of the rear upper section and with the second end of each said strap fixed to a clasp fastened to the exterior of the back lower section, such that in the worn position each strap fits about a shoulder of the wearer and each articulated belt section fits about a side of the wearer to hold the back section and the front section in their respective positions about the wearer.

4,052,763

RIVET MAKING METHOD

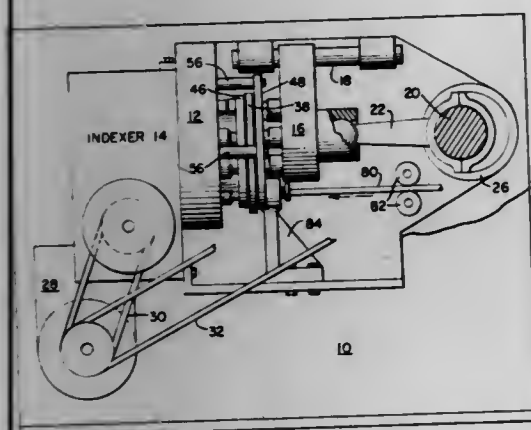
Albert Dunkin, 12 Split Rock Road, South Norwalk, Conn. 06854

Division of Ser. No. 651,149, Jan. 21, 1976, Pat. No. 4,019,432. This application Nov. 11, 1976, Ser. No. 740,923

Int. Cl.² B21K 1/44, 1/58

U.S. Cl. 10—27 R

2 Claims



1. The method of making rivets and other headed articles comprising the steps of: successively loading a blank in a direction from one end toward the other end of a plurality of blank holding dies supported for concurrent lateral indexing movement in relation to laterally spaced working stations and for independent axial movement at each of said stations; simultaneously shaping said blanks in a plurality of said dies after concurrent lateral indexing movement thereof to said

working stations to form a head against the other end of each die, each blank thereby being shaped progressively upon indexing movement to successive ones of said working stations; axially positioning each blank and each die at each of said stations independently of others of said blanks and said dies at others of said stations as necessary for the performance of each of said shaping steps concurrently; and returning all of said dies to a common axial position after each of said shaping steps and prior to indexing movement of said dies.

4,052,764

BAG ACCESSORY

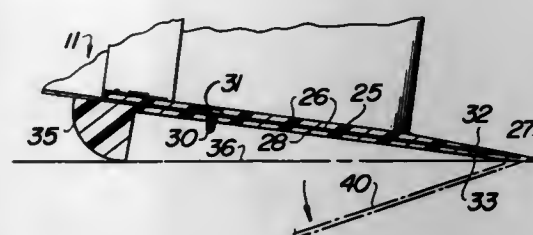
Harold M. Groff, Santa Ana, Calif., assignor to Donald M. Groff, Medford, N.J., a part interest

Filed Feb. 19, 1976, Ser. No. 659,260

Int. Cl.² A47L 13/52; B65B 67/12

U.S. Cl. 15—257.9

7 Claims



1. A bag accessory comprising a ramp member for location in the bag mouth and extending therebeyond to and terminating in a distal edge, bag gripping means carried by said ramp member for releasably securing a bag to the ramp member in the bag mouth, bag distention means associated with said ramp member for holding a gripped bag open, said ramp distal edge being engageable with a work surface for guiding material from the surface into an open bag, suspension means associated with said ramp member for selectively suspending said bag in open position to receive gravitationally falling material, said bag gripping means comprising a gripping member hingedly connected to said ramp member adjacent to said distal ramp edge for swinging movement toward and away from said ramp member and combining therewith to releasably grip an interposed bag edge portion, and support means on said gripping member remote from said distal ramp edge and engageable with said work surface to maintain said ramp in inclined relation.

4,052,765

VACUUM CLEANER

Wieland Gühne, Remscheid, and Klaus Hoffmann, Haan, both of Germany, assignors to Vorwerk & Co. Elektrowerke GmbH & Co. KG, Wuppertal, Germany

Filed Dec. 10, 1975, Ser. No. 639,231

Claims priority, application Germany, Dec. 21, 1974, 2460863

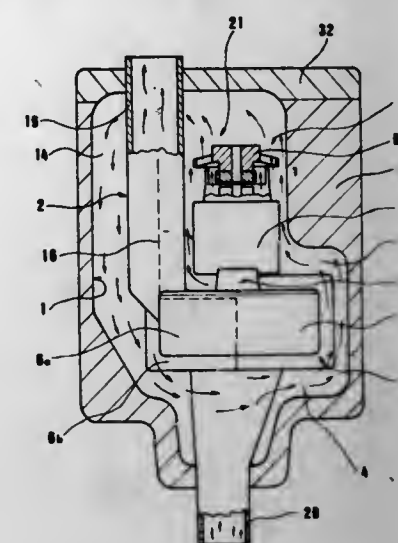
Int. Cl.² A47L 5/24, 9/22

U.S. Cl. 15—344

18 Claims

18. In a vacuum cleaner, particularly a hand-held vacuum cleaner, in combination, housing means defining a first space and a separate second space which is surrounded by but does not communicate with the first space; impeller means in the second space for sucking dust-laden air into one end of the second space and discharging it out the other; drive means for driving the impeller means, the drive means being located in the first space so as not to be contacted by the dust-laden air

passing through the second space but so as to be nevertheless cooled by such dust-laden air; and heat-exchanging means for gripping manner as required for moving the dirt pickup means along said surface, the improvement comprising control means carried by said handle at said gripping portion for selectively controlling the operation of the driven brush independently of the operation of the motor driven suction unit, said control means including an actuator means for bridging said gripping portion to preclude



effecting an exchange of heat between the air in the first space and the impelled air in the second space.

4,052,766

HAND SCRUBBER

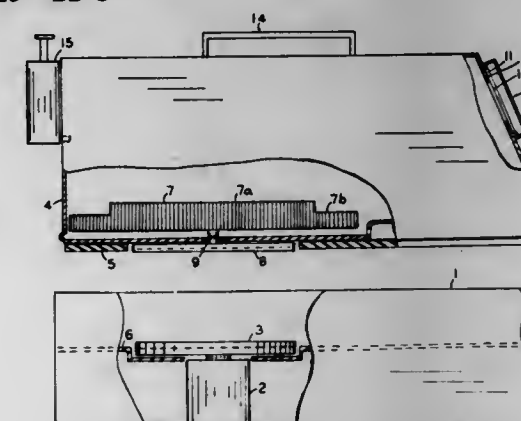
Gordon MacRitchie Morrison, 45 Ballpark Lane, Hicksville, N.Y. 11801

Filed May 6, 1976, Ser. No. 683,766

Int. Cl.² A46B 13/04

U.S. Cl. 15—21 C

5 Claims



1. Hand scrubbing means comprising a hollow base member, a motor mounted in said base member, a shaft driven by said motor, a drive dog connected to the shaft of said motor, a hollow container removably mounted in said base, said container having a driven dog meshing with said drive dog, a shaft driven by said driven dog, a brush mounted in said container and connected to the shaft of said driven dog for rotation, said container having a front surface having an aperture so that a hand may be inserted into contact with said brush, said container having no permanent connection with the base so that it is easily removable.

4,052,767

POWER DRIVEN BRUSH DRIVE CONTROL

Ival G. Dutcher, White Bear Lake, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

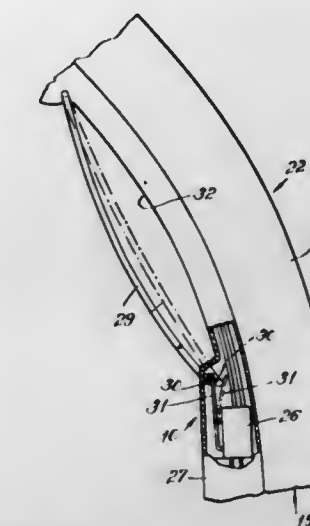
Filed Nov. 7, 1975, Ser. No. 629,845

Int. Cl.² A47L 9/28

U.S. Cl. 15—377

9 Claims

1. In a vacuum cleaner having a selectively operable motor driven suction unit, a dirt pickup means including a motor driven rotary brush for brushing the surface to be cleaned for facilitated dirt pickup therefrom by a pickup means, and a handle having a gripping portion to be gripped by a user in a



movement of the user's hand from either end of said actuator means to between said actuator means and said gripping portion, said actuator means being biased to prevent operation of the driven brush, the actuator means being arranged to be engaged by the hand of the user to cause operation of the driven brush whenever the user grips the handle gripping portion as required for moving the dirt pickup means along said surface.

4,052,768

HANDLE OF A WINDOW REGULATOR FOR VEHICLES

Takeo Yamazaki, Anjo, and Kuniyoshi Harada, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

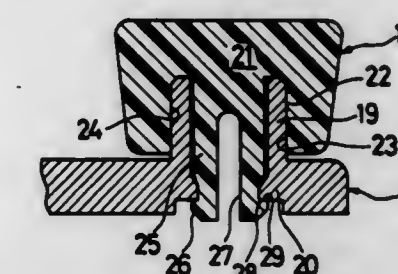
Filed Mar. 30, 1976, Ser. No. 671,997

Claims priority, application Japan, Apr. 11, 1975, 50-44431

Int. Cl.² B25G 3/00

U.S. Cl. 16—121

7 Claims



1. A handle of a window regulator for vehicles, comprising a main body of a handle including a cylindrical projecting portion vertically extended from one end thereof and an opened shoulder portion formed on an inner end of said cylindrical projecting portion; and a knob member operatively attached to said one end of said main body of said handle comprises a knob member main body, an annular groove formed in said main body of said knob member for inserting said cylindrical projecting portion of said main body of said handle thereto, an extending portion vertically extended from said main body of said knob member for supporting said cylindrical projecting portion of said main body of said handle, a bearing portion formed on an inner surface of said annular groove for bearing an outer surface of said projecting portion of said main body of said handle, a flange portion formed on an end of said extending portion for joining with said shoulder portion of said main body of said handle.

dle, the outer diameter of said flange portion being the same as or less than the outer diameter of said extending portion, and an axial slot formed in said extending portion and being capable of inwardly and elastically bending into a minimizing direction of the outer diameter of said flange portion.

4,052,769

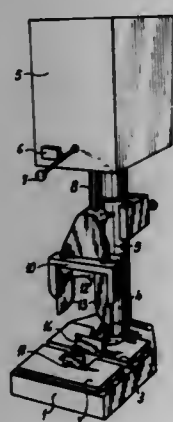
MACHINE FOR OPENING A SEVERED BOVINE OR OVINE HEAD

Antoine Thillet, 5 Chemain du Signal, Sainte Foy, (Lyon), and Tomaso Morillo, 5 rue Albert Camus, Decines, both of France
Filed Feb. 14, 1975, Ser. No. 550,018

Claims priority, application France, Feb. 15, 1974, 74.05858
Int. Cl.² A22B 5/20

U.S. Cl. 17-23

5 Claims



1. An apparatus for opening a severed livestock head, said apparatus comprising:

- a base;
- a pair of upwardly directed and parallel base blades on said base spaced to support said head at the back thereof;
- a vertically displaceable blade of wedge-shaped cross section directed downwardly toward said base blades and positioned to open the back of said transversely thereto, said vertically displaceable blade having a downwardly concave central portion and a pair of symmetrical side portions flanking said central portion and each having a generally vertical upper region terminating at said central portion and a lower region extending downwardly from said upper region laterally away from the other side portion, said side portions and said central portion forming a downwardly open outwardly flaring U adapted to embrace and split the skull of said head; and

means for vertically displacing said displaceable blade toward and away from said base blades while maintaining said displaceable blade parallel to said base blades, said displaceable blade being engageable between said base blades, each of said blades having a first face substantially parallel to the displacement direction of said displaceable blade and a second face inclined to said direction and forming with the respective first face a cutting edge, at least one of said base blades being upwardly concave at its cutting edge, said means for displacing including a holder for said displaceable blade having a pressing element with a pressing surface lying transverse to the displacement direction of said displaceable blade, said displaceable blade having a cutting edge spaced in said direction from said surface by a predetermined distance corresponding to the penetration distance of said displaceable blade into said head, said head having an upper face lying at a predetermined angle when said head is resting on said base blades, said pressing surface being inclined to the vertical at substantially the same angle as said face.

4,052,770 METHOD AND APPARATUS FOR SEVERING THIN-WALLED TUBING ON A MANDREL

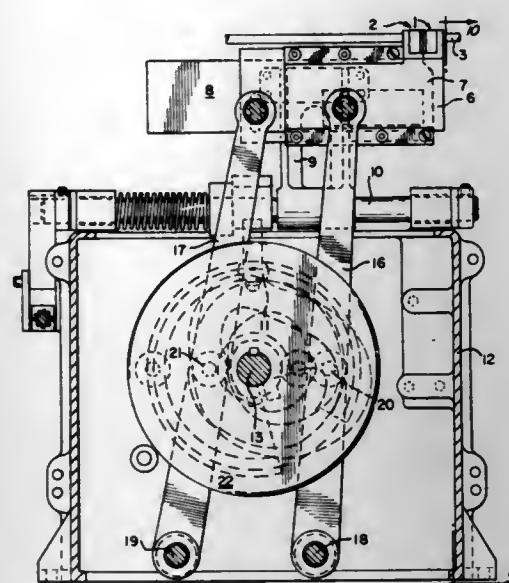
Dixon Redfern Asquith, Danville, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Aug. 2, 1976, Ser. No. 711,040

Int. Cl.² A22C 11/02, 13/02

U.S. Cl. 17-42

9 Claims



1. In a machine for continuously shirring a thin-walled sausage casing or the like on a mandrel, an improved device for severing a strand of the shirred casing from the following shirred casing while the casing moves along the mandrel, said device including means for separating adjacent folds of the shirred casing to provide an extended portion along the mandrel and for tensioning the extended portion to effect separation thereof, said means comprising paired double-jawed resilient clamping members adapted for gripping the shirred casing at two points along the axis thereof for deshirring the casing therebetween and for grasping the deshirred casing at two points along the axis thereof for effecting a separation therein.

4,052,771

CUFF LINKING DEVICE

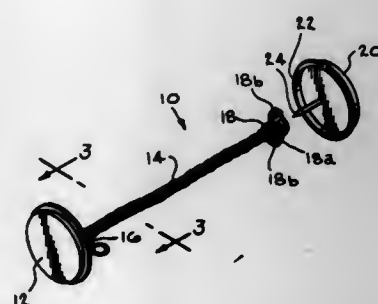
Cody Jack Cole, 6200 W. Bellfort, Apt. 257, Houston, Tex. 77035

Filed June 7, 1976, Ser. No. 693,722

Int. Cl.² A44B 1/18, 1/34

U.S. Cl. 24-102 SL

1 Claim



1. A cuff linking device composed of a disc shaped member to which is attached one end of a length of jewelry chain by means of an eyelet, said eyelet having outwardly extending flexible retaining members, said members having a loop formed at the ends thereof, and the other end of said jewelry chain securely attached to a clasping member having a hole therein to receive a stud member, said clasping device having loops formed thereon for frictionally gripping said stud member, and a second disc shaped member having an outer side identical in appearance to the first disc shaped member and the inner side being sufficiently recessed to enclose and cover an existing button, said recess having a stud member securely attached

therein and extending outwardly to a length sufficient to penetrate a hole in an existing button, the underlying fabric material, and the hole and looped ends of said clasping member.

4,052,772

PILLAR LOOP FOR BELTS, SUCH AS SEAT BELTS IN CARS OR THE LIKE

Ulf Tølfen, Gralum, Norway, assignor to Loyo's Industri A/S, Fredrikstad, Norway

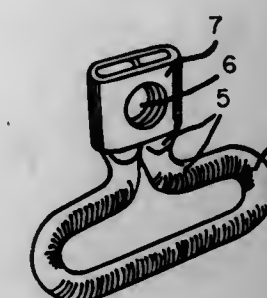
Filed Dec. 9, 1975, Ser. No. 639,171

Claims priority, application Norway, May 20, 1975, 1778/75

Int. Cl.² A44B 11/00

U.S. Cl. 24-163 FC

4 Claims



1. In a pillar loop for belts, such as for seat belts in cars and the like, said pillar loop being securable to a vehicle for guiding a belt extending through a portion of said pillar loop, the improvement wherein said pillar loop is formed of a length of round steel bent into a loop through which a belt is adapted to be passed, said length of round steel having end portions bent towards one another in an angle of 90° so that said end portions extend in a parallel and adjacent relationship, and further comprising means for securing said end portions in the parallel and adjacent relationship including an at least partially flattened tube having a hole formed therein, said hole serving for the attachment of said pillar loop, the pillar loop portion for guiding said belt being slightly bent and twisted relative to the remaining portion of said pillar loop, for said pillar loop to be securable in a somewhat inclined position relative to a surface of the vehicle

4,052,773
BUCKLE

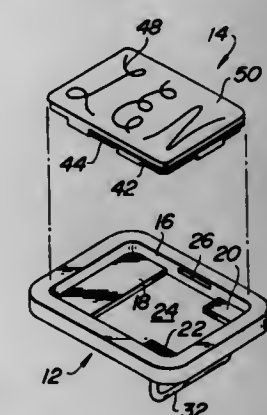
Leroy E. Nesbitt, 6213 Gardenia St., Philadelphia, Pa. 19144

Filed Nov. 7, 1975, Ser. No. 629,820

Int. Cl.² A44B 11/00; A44C 17/02

U.S. Cl. 24-163 K

8 Claims



1. A buckle comprising a body having front and rear major faces with a recess on one major face thereof, said body having an opening therethrough and communicating with said recess, said body having means defining a support means in said recess adjacent the periphery of said opening, an ornamental member having front and rear major faces disposed in said recess and removably coupled to said body and supported by said support means, said body having at least one groove communicating with said recess and said member having at least one cavity opposite said groove, a spring having at least one portion partially disposed in said cavity and said groove, means defin-

ing an access hole in a major face of and said ornamental member, said access hole being accessible from the exterior of said body when said ornamental member is supported by said support means, said access hole communicating with one of said cavity and said groove to facilitate movement of the spring from said groove to said cavity to thereby facilitate uncoupling of said member from said body and attachment means for facilitating attaching the buckle to a support structure.

4,052,774

PLASTIC BUCKLE

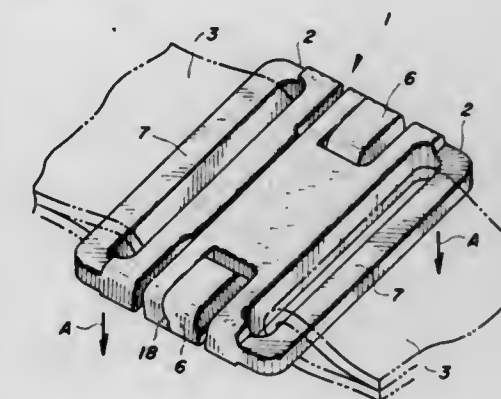
Taizo Noda, Nishinomiya, Japan, assignor to Kohshoh Limited, Kyoto, Japan

Filed Nov. 26, 1976, Ser. No. 745,002

Int. Cl.² A44B 13/00, 21/00

U.S. Cl. 24-201 A

9 Claims



1. A plastic buckle comprising a pair of plastic engaging elements each of which includes a plate portion having a means for attaching a belt or the like thereto, a base plate portion extended from the longitudinal edge of the plate portion, one surface of the base plate portion being substantially in the same plane with one surface of the plate portion and the other surface thereof at such a level as having the thickness half the thickness of the plate portion, and two engaging portions extended from the edge of the base plate portion so as to be in parallel with the longitudinal edge of the plate portion and so as to have substantially the same planes with those of the plate portion, the plate portion, the base plate portion and the engaging portions being integrally formed, the width of the upper surface of each engaging portion defined by the upper edge of the inner side thereof and the corresponding upper edge of the outer side thereof being somewhat larger than that of the space defined by the upper edge of the inner side of the engaging portion and the corresponding inner edge of the plate portion, each engaging portion being provided at the inside surface thereof with a fitting means.

4,052,775

SAFETY SEAT BELT BUCKLE

James A. Gavan, Center Line, and Carl Mogens Petersen, III, Pontiac, both of Mich., assignors to Irvin Industries, Inc., Stamford, Conn.

Continuation of Ser. No. 439,732, Feb. 5, 1974, abandoned. This application Sept. 15, 1975, Ser. No. 613,240

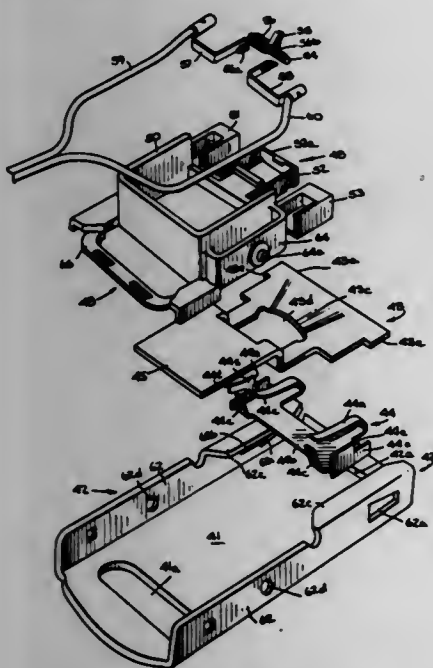
Int. Cl.² A44B 11/26, 11/00

U.S. Cl. 24-230 A

6 Claims

1. In a safety seat belt buckle, the improvement comprising: a housing, a clip-holding latching lever and a spring constituting a three element operative unit apart from the rest of the buckle, said housing having an open top, a base and first and second opposed side walls integral with said base, said side walls of said housing each having an opening, said opening having a forward edge and an upper edge, said clip-holding latching lever having a push button releas-

ing portion and a transversely extending forward edge, said lever mounted for limited pivotal movement within said housing, said spring being mounted between said lever and said base of said housing, said lever when depressed compressing said spring, said spring engaging said lever and said housing, said spring and said housing providing the sole support for said lever, said lever having a pair of outwardly extending ears integral therewith, said ears extending into said side wall openings of said housing, said ears having a forward edge and an upper surface, said forward edge of said ears bearing against said forward edge of said side wall openings to provide resistance against forward movement of said lever in said housing when a clip is engaged by said lever,

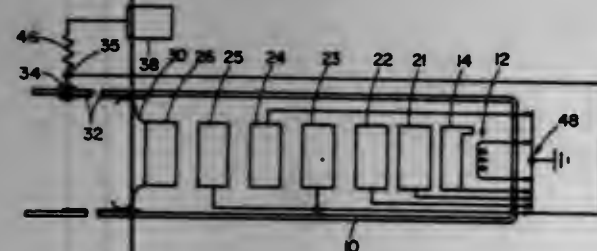


the upward position of said forward edge of said lever being limited by said upper edge of said side wall openings of said housing, the forward portion of said housing having members extending inwardly from said side walls, said members, said side walls and said lever serving to receive and guide the mating clip, said housing having a front portion extending up from said base and integral therewith, said forward edge of said lever being closely spaced from said front portion of said housing, said spacing between said lever and said front portion of said housing having a relationship to the elasticity of said lever and housing such that under pre-determined load conditions, said forward edge of said lever engages said front portion of said housing.

4,052,776
METHOD OF SPOT-KNOCKING AN ELECTRON GUN ASSEMBLY IN A COLOR TELEVISION PICTURE TUBE
Roy Maskell, Oak Park, and Armando V. Marino, Chicago, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.
Filed Sept. 30, 1976, Ser. No. 728,108
Int. Cl.² H01J 9/02

U.S. Cl. 29-25.11

5 Claims



1. For use in the manufacture of an electron gun having a heater and cathode, a control grid (G1), a screen grid (G2), and

four main focus lens electrodes (G3, G4, G5 and G6) wherein a first relatively large gap exists between G2 and G3, between G3 and G4, between G4 and G5, and between G5 and G6, and a second relatively small gap exists between G1 and G2, and a third relatively very small gap exists between G1 and said cathode, a method for spot-knocking said electron gun comprising

establishing said heater and cathode, said G1 and G2 grids and said G3, G4 and G5 electrodes at substantially ground potential; applying a first fluctuating DC voltage to electrode G6 of a magnitude and for a time effective to cause arcs to occur between portions of electrodes G5 and G6, so as to remove any particles of metal or contaminants on said electrodes;

whereby said grounding of said heater and cathode of said G1 and G2 grids, and said G3, G4 and G5 electrodes protects said heater and cathode, and said G1 and G2 grids from arcs caused by said first fluctuating DC voltage;

in a separate and independent step, establishing said heater and cathode, said G1 and G2 grids and said G4 electrode at substantially ground potential and removing said ground potential from said G3 and G5 electrodes;

applying a second fluctuating DC voltage with an amplitude less than said first fluctuating DC voltage to electrodes G3, G5 and G6 of a magnitude and for a time effective to cause arcs to occur between portions of said electrodes G4 and G5, between portions of said electrodes G4 and G3 and between portions of said electrodes G2 and G3 so as to remove any sharp particles of metal or contaminants on said G2, G3, G4 and G5 electrodes;

whereby said grounding of said heater and cathode and said grounding of said G1 and G2 grids protects said heater and cathode from arcs caused by said second fluctuating DC voltage.

4,052,777
ROLLERS FOR USE IN PRINTING AND METHOD OF MAKING SAME

Alain Meudec, rue de la Tour Coulon, 89000 Laborde par Auxerre, France

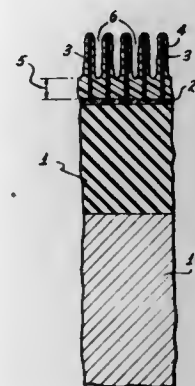
Filed Sept. 30, 1974, Ser. No. 510,721

Claims priority, application France, Oct. 4, 1973, 73.35466

Int. Cl.² B21B 31/08

U.S. Cl. 29-120

12 Claims



1. Printing roller comprising a support, a first thin adhesive layer on said support flocked with textile fibers having one end adhesively secured to and embedded in said first layer and projecting radially therefrom, a second layer of elastic binder applied on said first layer and connecting said fibers to each other, the thickness of said second layer being greater than that of said first layer, and said fibers projecting outwardly beyond said second layer.

4,052,778
APPARATUS FOR THE SIMULTANEOUS TERMINATION IN TERMINAL SLEEVES OF A PLURALITY OF WIRES WITH A MULTI-PIN CONNECTOR

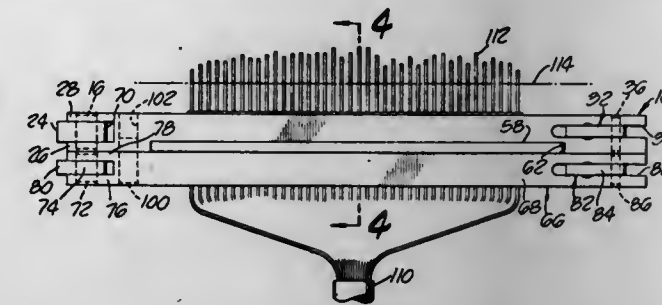
Dennis Carl Siden, Portola Valley, and Corey John McMills, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 442,580, Feb. 14, 1974, Pat. No. 3,945,114.
This application Jan. 30, 1976, Ser. No. 653,754

Int. Cl.² H01R 43/00

U.S. Cl. 29-749

13 Claims

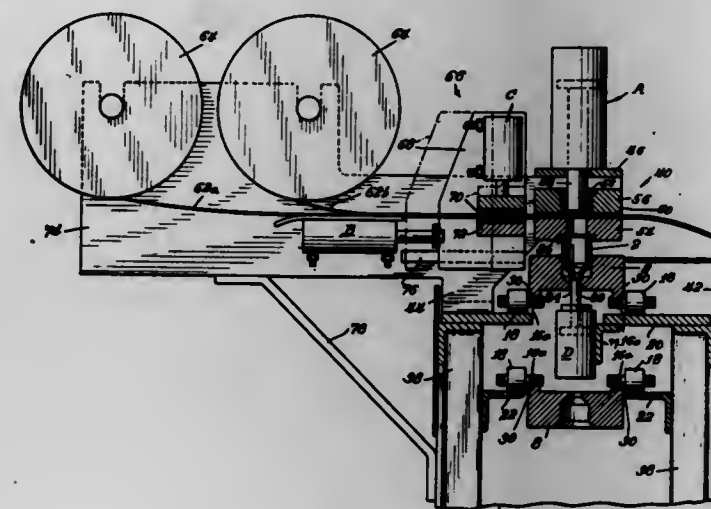


1. An assembly to aid in the termination of a plurality of wires with a multi-pin connector, comprising an identification block including two elongated members pivotally hinged together at one end, a latching assembly to hold said elongated members together, recesses provided in the mating surfaces of said elongated members forming a cavity for receiving and holding terminal sleeves in specific orientation, said elongated members providing for the passage of wires between said elongated members when held together and through the terminal sleeves; and a wire clamp, said wire clamp including two jaws pivotally coupled at one end, and a latching assembly for selectively holding said jaws together; said identification block and said wire clamp being capable of holding and positioning a plurality of wires such that the wires may be drawn through the identification block longitudinally in a first direction and are prevented from moving longitudinally in a second direction through said identification block.

4,052,779
METHOD FOR ASSEMBLING MICRO-FILTER UNITS
H. Eric Hunter, Westwood, Calif., assignor to Charter-Wallace, Inc., New York, N.Y.
Division of Ser. No. 563,663, March 31, 1975, Pat. No. 3,973,313. This application Apr. 22, 1976, Ser. No. 679,360
Int. Cl.² B23P 19/00

U.S. Cl. 29-429

11 Claims



1. A process for assembling micro-filter units having a barrel, a plug adapted for insertion into said barrel, and a filter disc clamped between the barrel and the plug, which comprises seating said barrel holder, punching out the filter disc from a

sheet of filter stock with a unitary punch, and seating it in the barrel in said barrel holder with a single stroke of the punch.

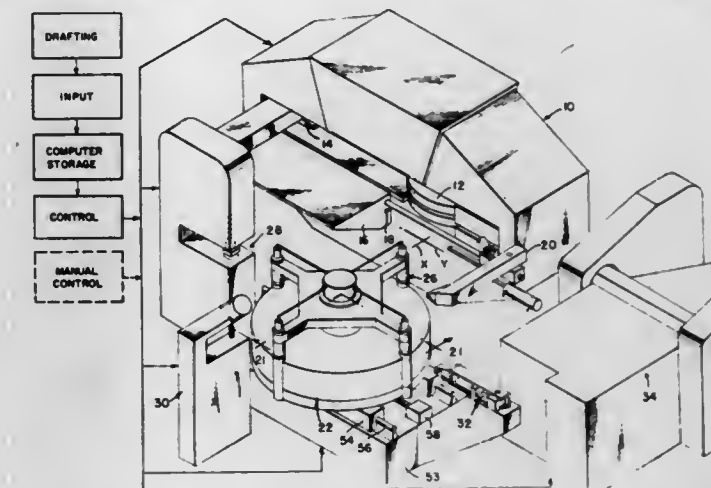
4,052,780
PUNCHING, CONTOURING, HANDLING APPARATUS AND METHOD

Dennis Daniels, Bellevue, Wash., assignor to U.S. Amada, Ltd. Division of Ser. No. 386,064, Aug. 6, 1973, Pat. No. 3,949,635, which is a continuation-in-part of Ser. No. 359,983, May 14, 1973. This application Feb. 18, 1975, Ser. No. 550,861

Int. Cl.² B23Q 7/02; B23C 3/04

U.S. Cl. 29-558

6 Claims



1. The method of punching and separating sheet parts from a larger worksheet comprising the steps of automatically punching a part integral with the worksheet on a program controlled rotary turret punch press at a punching station, said part having a reference point located thereon for subsequent positioning, automatically separating the part from the worksheet, automatically engaging the part at a discharge station at a variable location and transferring the part to an adjacent location, and at said adjacent location automatically receiving the part in a position and orientation relative to said reference point whereby the part is automatically punched and separated from the worksheet and accurately positioned at the adjacent location removed from the punch press, said step of automatically clamping and separating the part including rotating the turret 90° and carrying the part on said turret separate from the worksheet.

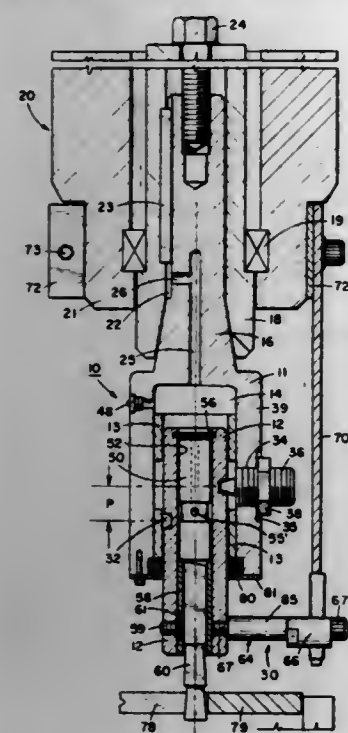
4,052,781
ROTATION-TO-RECIPROCATING MOTION CONVERTING TOOL
B. Paul Sanford, Houston, Tex., assignor to Cougar Instruments Corporation, Houston, Tex.
Filed July 8, 1976, Ser. No. 703,491
Int. Cl.² B23P 23/00

U.S. Cl. 29-560

6 Claims

1. A tool attachment for a machine having a rotatable member, said tool converting rotating into reciprocating motion, comprising: a hollow traveling body having a radial bore and an axial bore therein; a bearing housing mounted in said radial bore, a ram movably mounted in said axial bore and having on its periphery a single groove, the groove having a pitch depending on the desired reciprocating stroke of the ram; a roller rotatably mounted in said bearing housing and having a portion thereof rollably disposed in said groove, and restraining means coupled between said ram and said machine, whereby, in use said ram remains restrained against

rotation and unrestrained against longitudinal motion, upon rotation of said traveling body in either direction,



and said roller imparts a reciprocating motion to said ram about its longitudinal axis.

4,052,782

TUBULAR SOLAR CELL AND METHOD OF MAKING SAME

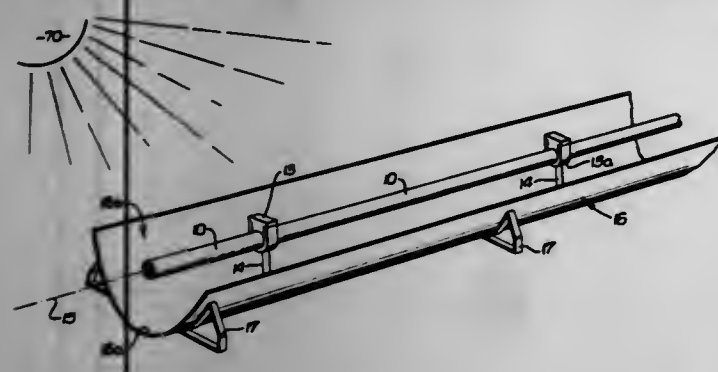
Harold Weinstein, Sherman Oaks, and Ray H. Lee, Calabasas, both of Calif., assignors to Sensor Technology, Inc., Chatsworth, Calif.

Division of Ser. No. 502,272, Sept. 3, 1974, Pat. No. 3,990,914. This application Feb. 26, 1976, Ser. No. 661,778

Int. Cl.² B01J 17/00

U.S. Cl. 29-572

15 Claims



1. A process for promoting oriented crystalline growth on a glass surface, consisting of;
coating said glass surface with a film of a metal having a eutectic temperature with silicon of less than the melting temperature of said glass;
depositing silicon atop said metal film,
heating said metal film and said deposited silicon to approximately said eutectic temperature, then lowering the temperature to below said eutectic temperature to cause separation of the silicon from said metal, thereby forming islands of crystalline silicon in said metal film,
growing additional silicon atop said layer of metal, said silicon crystalline islands serving as growth centers promoting oriented crystalline growth of said additional silicon.

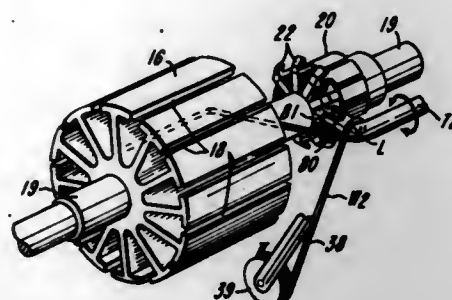
4,052,783 APPARATUS AND METHOD FOR WINDING ARMATURES

Lawrence A. Shively, 6014 Frederick Road, Dayton, Ohio 45414
Filed May 17, 1976, Ser. No. 687,018

Int. Cl.² H02K 15/09

U.S. Cl. 29-597

24 Claims



1. A method for winding an armature including a shaft supporting a core and a commutator having peripherally spaced tangs, comprising the steps of winding a wire on said core to form a wire coil, extending the wire from the wire coil about a member supported for movement, moving said member for twisting the wire to form a twisted wire loop on said member, transferring the twisted wire loop from said member to one of said tangs, and successively repeating the above steps to form a plurality of wire coils continuously interconnected by lead wires each having a twisted wire loop connection with a corresponding tang.

4,052,784

METHOD FOR THE MANUFACTURE OF A TUBULAR CONDUCTOR SUITABLE FOR SUPERCONDUCTING CABLES

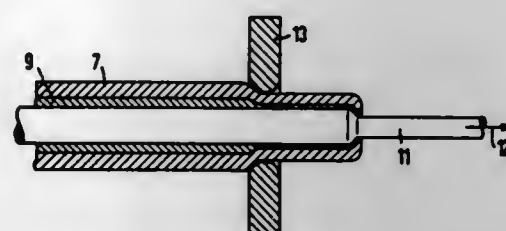
Heinrich Diepers, Erlangen-Bruck; Otto Schmidt, and Horst Musebeck, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Feb. 26, 1974, Ser. No. 446,096

Claims priority, application Germany, Mar. 9, 1973, 2311835

Int. Cl.² H01L 39/14; B21C 23/24

U.S. Cl. 29-599

20 Claims



1. A method for manufacturing a tubular conductor consisting of a niobium layer and a copper layer, which conductor is particularly suited for a superconducting cable, comprising the steps of:
a. plating one cylindrical surface of a seamless tube of electrolytic copper with a layer of niobium by fusion electrolysis;
b. applying a lubricating coating to the niobium layer and copper surface;
c. drawing the tube so formed in several cold drawing passes to reduce the outside diameter and the wall thickness of the tube and the niobium layer in order to form a longer tube.

4,052,785

METHOD OF MAKING A TRANSFORMER ASSEMBLY

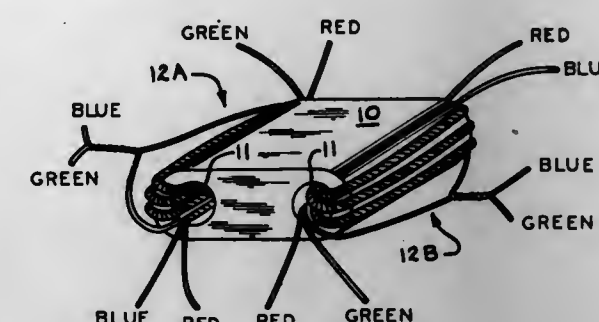
John D. Duncan, Bozeman, Mont., assignor to Dana Corporation, Toledo, Ohio

Filed Nov. 28, 1975, Ser. No. 635,820

Int. Cl.² H01F 41/08

U.S. Cl. 29-605

3 Claims



1. A method of forming a transformer assembly comprising: providing a single core of magnetic material, said core defining two apertures therethrough, said apertures being symmetrically located with respect to each other and with respect to said core; winding a coded three wire cable through each of said apertures providing two ends of said cable corresponding to each aperture; and interconnecting one wire from one end of each cable with a different wire from the other end of the same cable such that diagonally corresponding ones of the wires are interconnecting whereby the transformer is symmetrical.

4,052,786

METHOD OF MAKING A VARIABLE RESISTANCE CONTROL

James N. Hufford, Elkhart, Ind., and John Zdany, Edwardsburg, Mich., assignors to CTS Corporation, Elkhart, Ind.

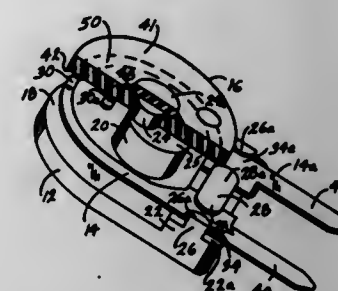
Division of Ser. No. 484,599, July 1, 1974, Pat. No. 3,950,722.

This application Apr. 5, 1976, Ser. No. 673,672

Int. Cl.² H01C 17/02, 17/28

U.S. Cl. 29-610 R

11 Claims



1. A method of making a variable resistance control comprising the steps of:
a. providing an electrically nonconductive frame of plastic material and carrying a shaft,
b. aligning a pair of conductive members on the frame, one of the frame and the conductive members being provided with a pair of posts,
c. securing the conductive members to the frame by deforming the posts, and
d. rotatably securing a base having an aperture, a collector path, and a resistive path to the shaft by deforming the end of the shaft, the resistive path wipably engaging one of the conductive member, the collector path wipably engaging the other of the conductive members, and the shaft being received in the aperture of the base.

4,052,787

METHOD OF FABRICATING A BEAM LEAD FLEXIBLE CIRCUIT

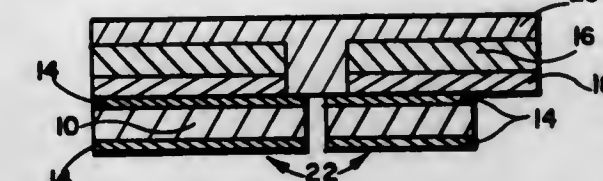
Joseph M. Shaheen, La Habra, and John Simone, Stanton, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 18, 1975, Ser. No. 641,806

Int. Cl.² H05K 3/30

U.S. Cl. 29-626

10 Claims



1. A method for fabricating beam lead interconnect circuits comprising the steps of:
processing a metal layer to form a pattern of beam lead interconnections thereon;
coating a layer of insulation material on a first surface with an adhesive;
forming at least one cavity through said insulation layer for supporting a device;
coating said insulation layer on a second surface with a plastic material;
laminating at a suitable temperature and pressure said metal layer to the adhesive coated first surface of said layer of insulation material and substantially, concurrently forcing said plastic material into each cavity in said insulation layer to form a backing to prevent deformation of said metal layer;
etching the surfaces of said metal layer except the pattern portion thereof to form beam lead interconnections; and removing said plastic material and leaving a cavity having said beam lead interconnections cantilevered over said cavity ready for connection to said device.
9. The method recited in claim 1 including the steps of placing a circuit device within said cavity in the laminated composite, placing a substrate under said laminated composite, and bonding said cantilevered beam leads to said circuit device.

4,052,788

TOOL FOR REMOVING A SNAP-IN BUSHING FROM A MOUNTING PANEL HOLE

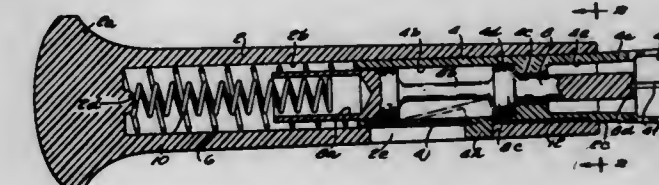
Jerome K. Hastings, Sussex, and Earl T. Fifer, Oconomowoc, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed July 6, 1976, Ser. No. 702,760

Int. Cl.² B25B 27/14

U.S. Cl. 29-764

8 Claims



1. A removal tool for releasing a snap-in bushing switch having a snap-in collar from its hole in a mounting panel comprising:
an elongated compressor member having a tubular section open at its forward end and having a spring abutment at its rear end;
an elongated chuck member extending rearwardly into the open forward end of said tubular section of said compressor member and having a divided and flared, self-expanding tubular section at its forward end forming a chuck

normally projecting from said open end of said compressor member to an initial condition far enough to allow self-expansion thereof so that it is adapted to be placed about the snap-in bushing collar of the switch against the mounting panel;

a return spring within the rear portion of said compressor member forwardly of said abutment and engaging said chuck member;

and snap-in coupling means operable when said chuck member is inserted rearwardly into the open forward end of said tubular section of said compressor member against said return spring for coupling the two members together to provide a stop so that said chuck member cannot be moved forwardly from its said initial condition but said compressor member can be depressed forwardly along said chuck member against the force of said return spring to cause its tubular forward section to squeeze said chuck and the snap-in bushing collar therewithin small enough to slip back through the hole in the mounting panel for removal of the switch.

4,052,789

ROTARY CUTTING ASSEMBLY

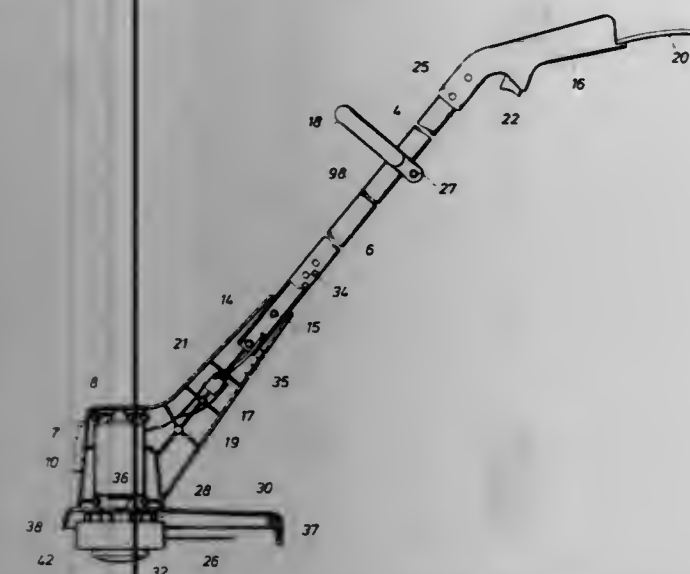
George Charles Ballas, Sr., Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 746,685, Dec. 2, 1976. This application Dec. 3, 1976, Ser. No. 747,319

Int. Cl.² B26B 27/00; A01D 55/18

U.S. Cl. 30—276

25 Claims



1. Apparatus for cutting vegetation and the like, comprising: head means rotatable about an axis in a cutting plane, electrically actuated driving means for rotating said head means in said plane,

a flexible non-metallic line member having a portion coiled within said head means and having an uncoiled portion extending outwardly of the periphery of said head means in said cutting plane,

a housing supporting and enclosing said driving means, handle means attached at one end to said housing and including a switch,

an electrical harness assembly including a full-wave rectifier connected between said driving means and said switch for actuating said driving means, and

a cutting blade associated with said housing and spaced from said axis in said cutting plane for trimming said line to a predetermined length upon actuation of said driving means.

4,052,790

PEA AND BEAN CUTTER

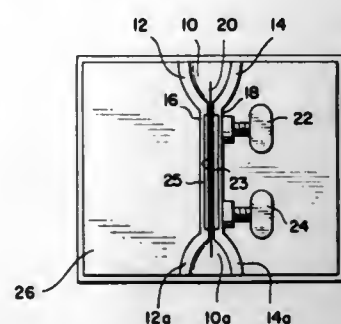
Albert S. Carle, R.R. 2, Box 129 E 2, Lake City, Fla. 32055

Filed Aug. 3, 1976, Ser. No. 711,309

Int. Cl.² B26B 29/00

U.S. Cl. 30—287

5 Claims



1. A vegetable preparing utensil having side plates comprising:

- a pair of troughs in said side plates defined by outward bowing regions disposed at an angle to a horizontal plane at opposite ends of said side plates adapted to the lengthwise fitting therein of a vegetable;
- a cutting blade having a cutting edge at each end protruding part way into each of said troughs;
- means for adjusting the amount of protrusion of said cutting edges into each of said troughs; and
- means for holding said cutting edges in an adjusted position.

4,052,791

LAWN EDGE TRIMMER

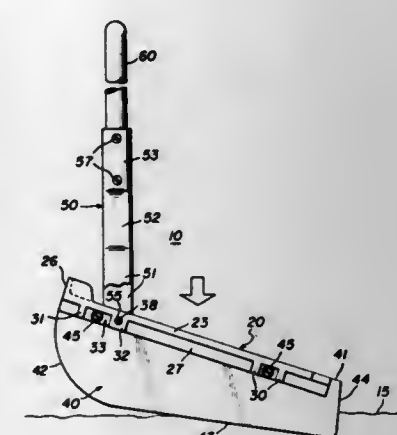
Mario Anesi, Inverness, Ill., assignor to Ansan Tool and Manufacturing Co., Inc., Harwood Heights, Ill.

Filed Sept. 23, 1976, Ser. No. 722,873

Int. Cl.² B26B 3/00

U.S. Cl. 30—315

1 Claim



1. A lawn edge trimmer comprising a pair of platform sections; each of said platform sections being integrally formed of a single piece of metal and including a substantially flat base having a foot-receiving surface thereon and an attachment flange depending from said base along one side edge thereof, said foot-receiving surface having laterally-extending grooves formed therein, two pairs of longitudinally spaced-apart and laterally-extending ribs integral with said attachment flange and extending laterally therefrom to the other edge of said base, said attachment flange including thickened portions respectively disposed between said pairs of ribs and projecting laterally toward said other edge of said base and each being provided with a laterally-extending aperture therethrough, the ribs of each pair or ribs cooperating to define therebetween a recess extending from the corresponding thickened portion of said attachment flange to said other edge of said base, one of said ribs being enlarged and provided with a bore extending axially therethrough laterally of said base; a knife blade disposed in use between said attachment flanges and extending

therebeyond in a direction away from said foot-receiving surfaces and being provided with openings therethrough respectively alignable with said bores and apertures, said blade being coterminous with said platform sections at the front ends thereof and extending rearwardly beyond the rear ends of said platform sections; fastening members respectively extending through aligned ones of said apertures and openings for securely clamping said blade between said attachment flanges with said foot-receiving surfaces being substantially coplanar for forming a platform and with said toe-retaining wall sections cooperating to form a toe-retaining wall for engagement with the toe end of a user's foot; and handle means including a clevis-shaped lower end having holes therethrough respectively alignable with the outer ends of said bores through said enlarged ribs of said platform sections; and pivot means extending through said holes and said bores for pivotally connecting said handle means to said platform section bases, said handle means having an upper end accessible to the hands of a user with said clevis-shaped lower end being adapted in use to receive thereunder the foot of the user, whereby said knife blade may be guided by said handle means and may be driven downwardly into the lawn by the weight of a user standing on said platform.

4,052,792

ORTHODONTIC DEVICE

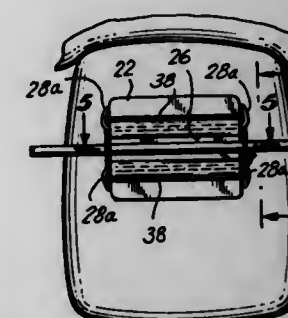
William Blederman, 325 Hempstead Ave., Rockville Centre, N.Y. 11570

Filed June 3, 1976, Ser. No. 692,314

Int. Cl.² A61C 7/00

U.S. Cl. 32—14 A

6 Claims



1. An orthodontic appliance having a molded plastic base and defining an elongated arch wire slot for use in connection with orthodontic arch wire comprising a reinforcement opening, reinforcing wire disposed within said opening and having ligatable extensions disposed beyond said base in the direction of the arch wire slot, said reinforcing wire being of a shape to prevent rotation and being held in place by insertion concurrently with molding of said base.

4,052,793

METHOD OF OBTAINING PROPER PROBE ALIGNMENT IN A MULTIPLE CONTACT ENVIRONMENT

Charles Paul Coughlin, Chelsea, and Louis Henry Faure, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,537

Int. Cl.² G01B 7/00; B27G 23/00

U.S. Cl. 33—180 R

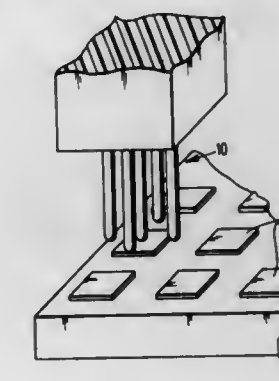
6 Claims

1. A method of aligning a plurality of probes to a plurality of contacts arranged in a pattern on a substrate, said method comprising the steps of:

- powering one of a selected pattern of probes or a like pattern of selected contacts such that upon the selected patterns being in coincidence, the plurality of probes will be in contact with predetermined contacts on the substrate;
- providing a circuit path through one of all of the other probes or contacts not so powered,
- bringing said plurality of probes into contact at random with said contacts of said substrate, and moving one of said

substrate and probes until said selected patterns coincide as indicated by a completed circuit path between said selected patterns.

6. A method of aligning a plurality of probes to a plurality of electrically conductive contacts on a substrate, said contacts on the substrate including pad like contacts adjacent to the contacts on the substrate, said method comprising the steps of: positioning said plurality of probes approximately in the area of said contacts on said substrate; providing at least a pair of probe clusters each being associated with a contact on said substrate and having a plurality of spaced apart probes, each of said probes of a cluster being spaced from at least its adjacent probe a distance less



than the width of the associated pad like contact which is to be contacted but greater than one half the width of said pad like contact, providing a source of electrical power to a selected probe of each of said pair of probe clusters, contacting said associated pad like contacts with the associated selected probes, sensing whether a shorted condition exists between said selected probe and any other probe of a cluster, and moving one of said plurality of probes and substrate until a non-shorting condition exists between the selected probe of each cluster and the associated contact thereby indicating that said plurality of probes is aligned with said substrate.

4,052,794

FLUIDIZED BED PROCESS

Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Scientific and International Corporation, New York, N.Y.

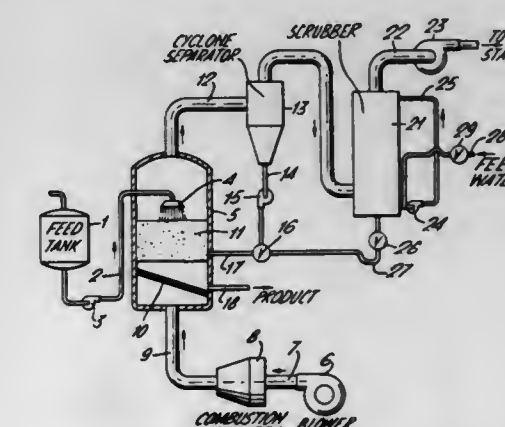
Continuation-in-part of Ser. No. 260,150, June 6, 1972, abandoned. This application Feb. 24, 1976, Ser. No. 660,945

Claims priority, application United Kingdom, June 18, 1971, 28754/71

Int. Cl.² F26B 3/08

U.S. Cl. 34—10

2 Claims



1. The process of providing product granules of a desired size in a fluidized bed dryer from an aqueous feed solution comprising the steps of:

- passing heated air upward in a fluidized bed dryer;
- spraying an aqueous solution of feed into the dryer forming a fluidized bed therein in which drying particles aggregate and grow into granules to fall from the fluidized bed;

- c. withdrawing aggregated particles from the fluidized bed as a product;
- d. recovering fines blown upward from the fluidized bed;
- e. passing the fines through a water scrubber with a predominantly recycled water supply to provide dust in a water solution; and
- f. withdrawing dust laden water from the scrubber and adding it to the fluidized bed.

4,052,795

MALTING AT LOW MOISTURE

James Richard Allan Pollock, Reading, and Alan Aldred Pool, Camberley, both of England, assignors to Pollock and Pool Limited, Reading, England

Filed Mar. 9, 1976, Ser. No. 665,267

Claims priority, application United Kingdom, Mar. 14, 1975, 10777/75

Int. Cl.² F26B 7/00

U.S. Cl. 34—12

11 Claims

1. In a method of malting a cereal grain which comprises: steeping cereal grain in water; allowing the steeped grain to germinate during which time the grain develops roots and undergoes a series of chemical and physical changes with the production of enzymes which render the grain capable of yielding a high percentage of extractable material when ground and extracted with hot water; treating the grain with gibberellic acid; exposing the grain to air; and drying the germinated grain;

the improvement which comprises:

- rupturing the surface of the cereal grain without damaging the germinative ability of the grain; and
- providing water during germination in an amount insufficient to allow a root growth having a dry weight equal to more than 0.59% of the dry weight of the grain if the grain were allowed to germinate for five days in the presence of air at 16° C.

4,052,796

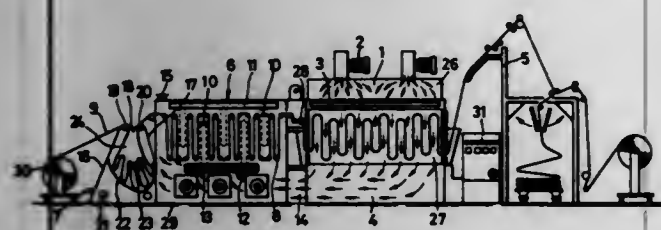
PROCESS AND APPARATUS FOR THE CONTINUOUS FINISHING OF WEBS OF TEXTILES, ARTIFICIAL LEATHER AND THE LIKE

Hans F. Arendt, Bleichinsel, 712 Bietigheim, Germany
Continuation-in-part of Ser. No. 400,911, Sept. 26, 1973, Pat. No. 3,938,356. This application Sept. 23, 1975, Ser. No. 616,090
Claims priority, application Germany, Sept. 27, 1972, 2247320; Sept. 26, 1974, 2445915

Int. Cl.² F26B 13/12

U.S. Cl. 34—60

3 Claims



1. An apparatus for treating a web of material of indefinite length comprising a combination of,
 - a web supply means for supplying a web of material of indefinite length,
 - a relaxed-state web treatment chamber comprising a base, a front wall, a rear wall and a pair of side walls fixed to the base and to each other enclosing a chamber open at a gap in the top existing between the front and rear walls, a screen arranged within the chamber to asymmetrically sag in a shape of approximately elliptical cross-section, means for introducing the web of material from the web supply means into the chamber through the gap, means for introducing a web treatment medium into the chamber and

means for withdrawing the web of material from the chamber through the gap,
a flow-through reversible drum treatment chamber comprising a casing, a drum mounted for rotation within the casing, means for introducing the web received from the relaxed-state web treatment chamber into the drum, the web travelling continuously through the interior of the drum, conditioning means for controllably conditioning air and introducing the air into the drum and casing and means for withdrawing the web from the drum and casing, and
web demand means for receiving the web from the flow-through reversible drum treatment chamber and depositing the web in a easily handled form.

4,052,797

ROTARY DRUM PLENUM SEAL

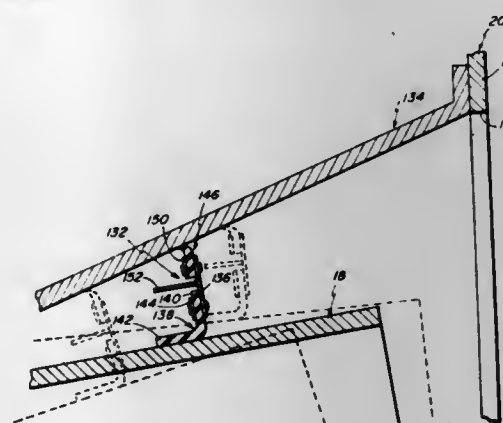
Charles W. Christensen, Cedar Rapids, Iowa, assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 2, 1976, Ser. No. 673,035

Int. Cl.² F26B 25/00

U.S. Cl. 34—242

4 Claims



1. Apparatus comprising an elongated hollow member rotatable about its longitudinal axis, a stationary enclosure having an opening therein, one end of said member being located adjacent said opening with the interior of the member being in communication with the interior of the enclosure, the member further being angularly adjustable about an axis adjacent said one end thereof, means for providing a flow of air through said member and enclosure, a hood mounted on said enclosure around the opening therein, said one end of the rotatable member projecting freely into said hood, and seal means disposed within the hood between the hood and said end of the rotatable member for preventing passage of substantial amounts of air therebetween while permitting rotation and angular movement of the member, said hood surrounding the adjacent end portion of said rotatable member, and said seal means comprising a flexible inner annulus encircling and frictionally engaging said rotatable member, and a flexible outer annulus in slidable engagement with the surrounding inner surface of the hood.

4,052,798

AUDIO-VISUAL TEACHING SYSTEM

Shinji Tomita, Zushi, and Tsunehiro Kashima, Yamato, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 2, 1976, Ser. No. 672,970

Claims priority, application Japan, Apr. 8, 1975, 50-42528

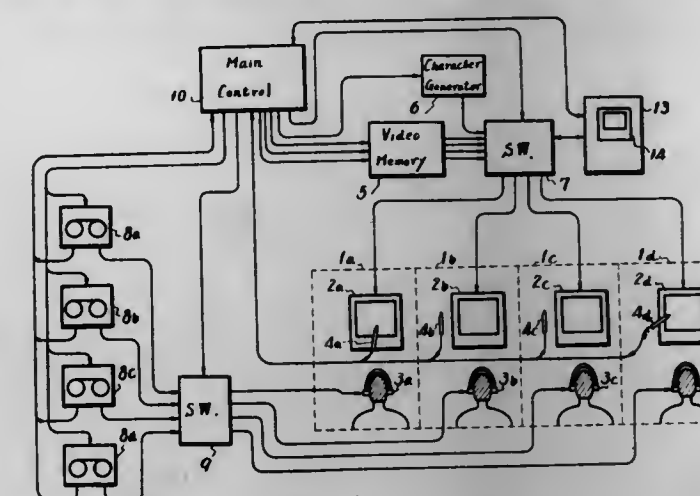
Int. Cl.² G09B 7/04

U.S. Cl. 35—9 A

19 Claims

1. A system for selectively supplying information requiring independent response to plural stations whereat operators provide said independent responses, said system returning further information to said stations as a function of each response, comprising:
 - a television monitor at each station for displaying video picture information;

manually operable responding means at each said station for producing said response when operated by said operator;
main storage means for storing a plurality of addressable frames of video picture signal information, each frame representing predetermined still video information;
buffer storage means having a plurality of storage channels corresponding to the number of said stations, each storage channel having a storage capacity to store a frame of video picture signal information;
first switch means intercoupled between said main storage means and said buffer storage means and selectively operable for transferring an addressed frame of video picture signal information to a selected channel in said buffer storage means;
second switch means intercoupled between said buffer storage means and said plurality of stations and selectively operable for transmitting selected frames of video picture



signal information from said storage channels in said buffer storage means to corresponding ones of said stations so as to display on the television monitors at said stations still video picture information represented by the respective transmitted frames; and
control means coupled to said main storage means and to said buffer storage means for controlling said main storage means in accordance with a produced response to address a selected frame of video picture signal information and to transmit the addressed frame to a particular storage channel in said buffer storage means as determined by the selective operation of said first switch means, and for controlling said buffer storage means to transmit the frames of video picture signal information stored in said respective storage channels to selected ones of said stations as determined by the selective operation of said second switch means.

4,052,799

MANUALLY INDEXED VISUAL TEST RECORDING APPARATUS

Vida M. Journot, 73 Stonegate Drive, Bedford, Tex. 76021

Filed Mar. 25, 1975, Ser. No. 561,917

Int. Cl.² G09B 7/00; H03K 21/18

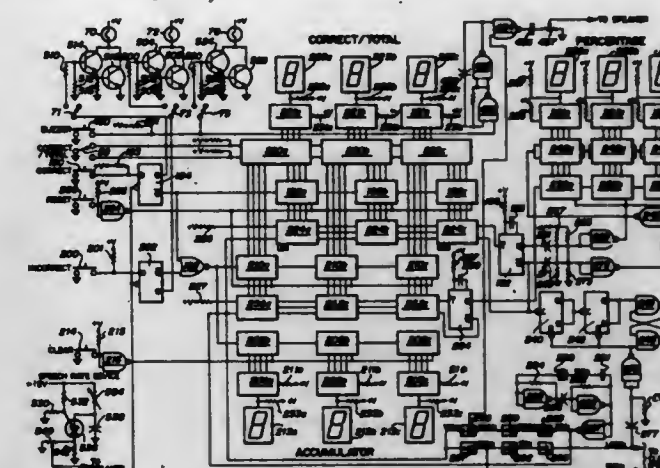
U.S. Cl. 35—48 R

21 Claims

1. Apparatus for recording the performance of an individual student responding to a test environment, comprising in combination:

operator control means including first and second selector means, with said first selector means being for generating a "correct" signal in response to an operator's manual input that the student has given an acceptable reply, and said second selector means being for generating an "incorrect" signal in response to an operator's manual input that the student has given an unacceptable reply,
first counter means connected to said first selector means to record the quantity of "correct" signals generated by said first selector means,
second counter means responsive to said first and second selector means to record the quantity of both "correct" and "incorrect" signals which are generated by said first and second selector means, so as to count the total number of input signals,
first circuit means responsive to said first and second selector means to also record the quantity of "correct" and "incorrect" signals which are generated by said first and second selector means,

display means for continuously indicating the percentage of "correct" signals generated for the recorded quantity of both "correct" and "incorrect" signals, and
second circuit means responsive to said first counter and connected to said first circuit means and said display means for transferring to the display means a signal representing the percentage of "correct" signals.



4,052,800

SYSTEM FOR GATHERING SOLIDS FROM THE OCEAN FLOOR AND BRINGING THEM TO THE SURFACE

Alfred Fuhrbater, and Manfred Mittelstadt, both of Braunschweig, Germany, assignors to Salzgitter AG, Germany

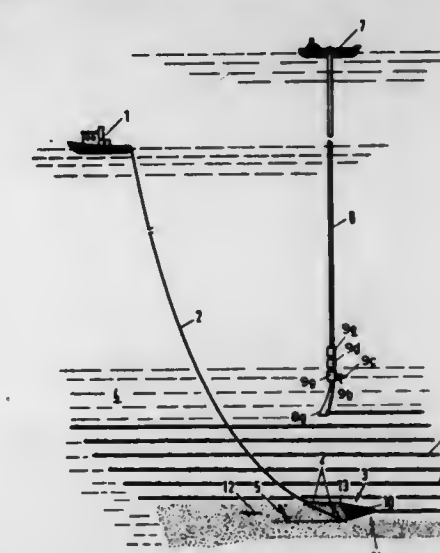
Filed July 31, 1975, Ser. No. 600,853

Claims priority, application Germany, Aug. 1, 1974, 2437071

Int. Cl.² E02F 3/88

U.S. Cl. 37—58

9 Claims



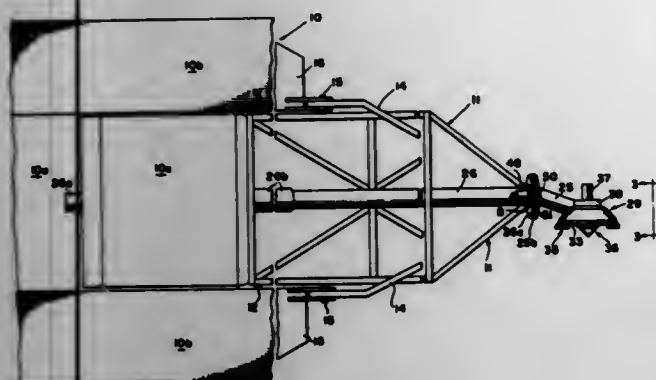
7. A method for gathering nodulous mineral deposits disposed on the ocean floor, comprising the steps of dragging a collecting means across a strip of the ocean floor in a randomly selected direction, the collecting means being adapted to receive solids, including nodulous mineral deposits, strewn over the strip of the ocean floor; collecting and concentrating substantially all the solids, including the nodulous mineral deposits, received by the collecting means into an extended pile on the strip of the ocean floor, the width of the extended pile being less than the width of the strip; and thereafter drawing the nodulous mineral deposits from the extended pile and driving them up to the surface of the water.

4,052,801

DREDGING SYSTEM AND METHODS OF DREDGING
Leward N. Smith, Millbrook Road, Rte. 1, Remus, Mich. 49340
Filed Apr. 28, 1976, Ser. No. 681,275
Int. Cl.² E02F 3/92

U.S. Cl. 37-64

14 Claims



1. In a dredging system for excavating material from the bed or bank of a body of water and removing it as a slurry: a floatable vessel having sides and front and rear ends; a cutterhead supporting, longitudinally forwardly extending boom mounted thereon; a suction creating means carried by said vessel; a housing mounted for pivotal movement on said boom about the generally longitudinal axis of said boom and defining a material collecting compartment; a suction conduit, connected with the suction creating means, leading from said compartment to deliver slurry therefrom to a location remote from the cutterhead housing; the housing being imperforate except for an opening leading to said suction conduit and a side opening, a sidewise disposed rotary disc supported for rotation about an axis generally transverse to said longitudinal axis and having an inner face closing said side opening and defining one wall of said compartment, and an outer knife mounting face extending generally parallel with the boom, the disc having generally radially extending openings removed from its said axis and leading from its outer face to its inner face; and knives mounted at said openings having edges extending generally linearly generally parallel with the outer face of the disc along the openings to cut material and propel it through the openings to the inner face of the disc and the material collecting compartment of said housing; motor means for rotating the disc about its axis; means for rotating the housing, including the disc, through a downward and thence upward path of travel including partial arcs of revolution in the same direction of rotation totaling substantially 180° about said generally longitudinal axis; and means for moving said boom and cutterhead in a sidewise excavating path of travel in which the disc is disposed in a generally vertical plane.

4,052,802

GROUND-ENGAGING TOOL WITH WEAR-RESISTANT INSERT

Lowell J. Moen; Eugene L. Helton, both of Peoria, and Chris R. Straesser, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 23, 1976, Ser. No. 660,752

Int. Cl.² A01B 35/22

U.S. Cl. 37-141 R

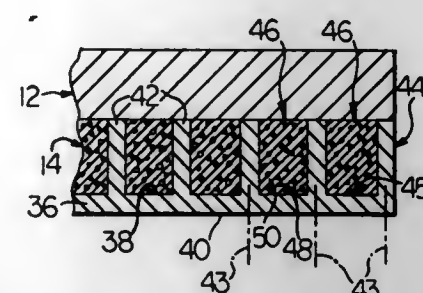
8 Claims

1. A ground-engaging tool comprising: a blade including a load carrying front face, a ground-engaging bottom surface, and a rear face; and wear-resistant means for extending the wear life of the tool including a back-up plate disposed in rearwardly spaced relation from said rear face and adjacent said bottom surface, a wear-resistant material bondably sandwiched between said plate and said rear face, and a plurality of substantially parallel ribs which extend through said wear-resistant material and are rigidly secured to said plate and said rear face of said blade, said ribs being oriented in vertical planes parallel to a normal direction of linear

travel of the tool, to minimize in use spalling of said wear-resistant material.

6. A wear-resistant insert for a ground-engaging tool comprising:

a back-up plate of low carbon steel with a plurality of projecting members of low carbon steel extending generally normally therefrom; and
a composite material including a plurality of abrasive-resist-



ant particles of low carbon ferrous-based alloy material in a carrying matrix of low carbon ferrous-based alloy material different than said material of the particles and being bonded to said back-up plate and to said projecting members and covering said back-up plate between said projecting members to a depth of the projecting members, wherein said back-up plate, said projecting members, said abrasive resistant particles and said matrix are each of a material having less than 0.2% carbon by weight.

4,052,803

LOADER BUCKET CUTTING EDGE WITH RECESSED BOLT STUDS AND METHOD

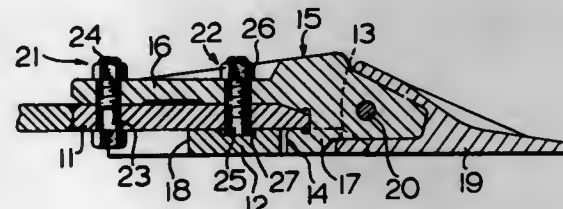
William E. Lanz, Joliet, and Visvaldis A. Stepe, Willow Springs, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 18, 1976, Ser. No. 733,689

Int. Cl.² E02F 9/28

U.S. Cl. 37-141 T

16 Claims



1. A work implement comprising
an elongated and flat general purpose edge disposed forwardly thereon,
a flat cutting edge mounted beneath said general purpose edge to be substantially coextensive therewith and having a forward edge,
a plurality of fastening means, releasably securing said cutting edge to said general purpose edge, comprising a plurality of fastening studs each having a lower end thereof secured on an upper side of said cutting edge and extending upwardly through a hole formed through said general purpose edge and a nut threadably mounted on an upper end of each stud and
means defining a recess in at least one of said general purpose edge and said cutting edge, said recess having a lower end of each fastening stud disposed therein.

4,052,804

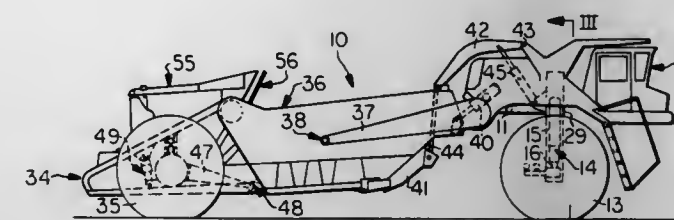
NON-ARTICULATED SCRAPER ARRANGEMENT
Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 17, 1976, Ser. No. 667,768

Int. Cl.² E02F 3/62

U.S. Cl. 37-129

12 Claims



1. A non-articulated scraper disposed on a longitudinal axis thereof comprising
a front frame,
an operator's station mounted forwardly on said front frame, a pair of front roadwheels,
a pair of generally vertically disposed and laterally spaced suspension cylinder means each connected at its upper end to said front frame and at its lower end to a respective one of said roadwheels, said cylinder means acting as a king pin means for permitting said front roadwheels to pivot in a horizontal plane for steering purposes,
steering linkage means pivotally interconnected between said front frame and said front roadwheels for selectively pivoting said front roadwheels,
a rear frame mounted on a pair of rear roadwheels,
a scraper bowl mounted on said rear frame,
a pair of draft arms disposed on either side of said scraper bowl and pivotally interconnected directly to said scraper bowl and to said front frame, and
actuating means interconnected to said scraper bowl and to said front frame for selectively raising and lowering said scraper bowl relative to said front frame.

4,052,805

CARD AND BULLETIN DISPLAYER MOUNTING ON WALL OR DOOR

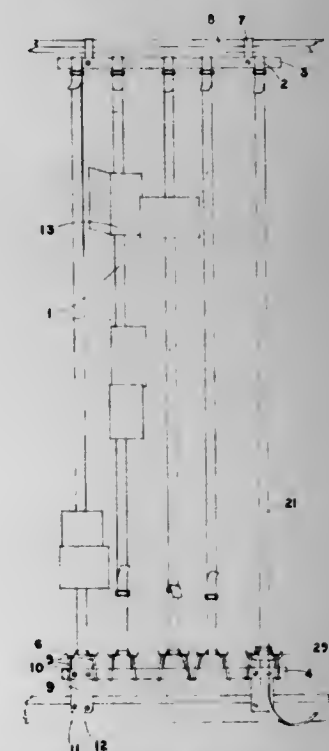
Glenn James Potter, 1332 S. Hope St., No. 302, Los Angeles, Calif. 90015

Filed Nov. 26, 1975, Ser. No. 635,669

Int. Cl.² G09F 1/10

U.S. Cl. 40-124

6 Claims



1. Structures for displaying cards and bulletins comprising the combination of: a plurality of common sturdy tapes on

which a plurality of cards are affixed each of said tapes is stretched out and held in a recoverably displaceable manner in a substantially vertical plane; a first fixation means mounted on a building comprising a crossbar holding a first end of at least one of said tapes; a linkage means holding said one tape at its second end, said linkage means comprising: a double hook member having hooks adjacent each side of said tape and joined by a rigid medial elongation member adapted to engage and hold said tape, and a pair of elastic bands each looped over one of said hooks and over a crossbar rigidly joined to a second fixation means mounted on said building said elastic bands are held in tension between said hooks and crossbar thereby causing said linkage to resiliently stretch said tape tautly; adjustment means for changing and maintaining the effective length of said tape between said first fixation means and said linkage means comprising a plurality of buckles for adjusting and maintaining said effective lengths of said plurality of tapes when said tapes are doubled back to form end loops; said second fixation means comprising spacer means whereby said tapes are held away from said building far enough that a jaw of a common stapler may be inserted behind said tapes for removably affixing a plurality of cards along the length of each said tape.

4,052,806

DISPLAY DEVICE WITH ADJUSTABLE ATTACHMENT MEANS

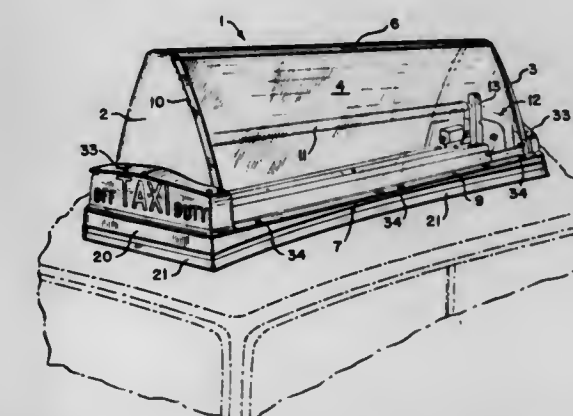
James Rembrandt George, Garden City, N.Y., assignor to Vango Media, Inc., New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,275

Int. Cl.² E05D 15/20

U.S. Cl. 40-129 C

13 Claims



1. A display device for displaying information bearing materials for viewing comprising:
a. a first end member defining a front end;
b. a second end member defining a rear end, each said first and second end members including a surface for supporting said information bearing materials, sections of which cooperate with end illuminating means for illuminating said sections independently of each other such that as one section is illuminated, another section is generally unaffected by the section which is illuminated;
c. a pair of side members supported between said first and second end members, said side members disposed at an angle one to the other and also having a surface for supporting said information bearing materials, and each said side surface between an upper and lower end being generally outwardly convex;
d. a bottom member secured to each said side member and to said first and second end member;
e. a top portion likewise secured thereby defining a substantially closed member in said display device;
f. illuminating means disposed in said chamber comprising a substantially continuous source of illumination extending substantially from said front end to said rear end and located substantially midway between said other members and top portion for rear illumination by substantially an

equal amount of lumens every portion of said side surfaces for ease in viewing the same and said information bearing materials thereon from a multitude of attitudes; and g. attachment means for attaching said display device to the roof of a vehicle, said attachment means being carried by said bottom member.

4,052,807

DATA CARRIER HOLDER WITH IDENTIFICATION STRIP

Dieter Klaus-Jürgen Schweinsberg, Lautertal-Unterlauter, Germany, assignor to Eichner Organisation KG, Coburg, Germany

Filed May 18, 1976, Ser. No. 687,597

Claims priority, application Germany, Feb. 2, 1976, 2603793
Int. Cl.² B42F 21/00

U.S. Cl. 40—359

2 Claims



1. A holder for the filing of data carriers such as documents or film sheets which comprises a relatively flat member having a plurality of separate compartments for receiving the data carriers; one of the edges of said relatively flat member being formed along its entire length with a transparent material in the shape of a hollow profile edge; and an identification strip positioned within said hollow profile edge and of a sufficient length to extend along the entire length of said profile edge; said identification strip being folded along a center fold line extending along its longitudinal axis such that it is divided into halves, each half having a visible outside surface and a non-visible inside surface facing the non-visible surface of the other half, said identification strip also containing laterally extending separating perforations on at least one of said halves spaced at predetermined distances along the length thereof to provide individual letter sections, said letter sections each carrying different indicia on the inside surface thereof, said identification strip also carrying the same indicia on the other divided half of the inside surface thereof at the same length therealong and at the same level, and at least one of said separating perforations being cut and at least one of said letter sections being folded towards the outside so that the indicia on the folded letter section is made visible as well as the corresponding indicia on the other divided half of the identification strip through the hollow profile edge.

4,052,808

COLLAPSIBLE FISH SPEAR

Philip G. Crabtree, 5820 16th NE., Seattle, Wash. 98105

Filed Sept. 7, 1976, Ser. No. 720,899

Int. Cl.² A01K 81/04

U.S. Cl. 43—6

4 Claims

1. A collapsible fish spear for use in underwater sports fishing comprising:
a series of lengths of rod adapted to telescopically interlock together in end-to-end relation into a single length of rod, including a forward length having a spear unit extending therefrom, a terminal length and one or more intermediate lengths;
elastic means secured at one end to the forward length, at the other end to the terminal length and, extending under tension through the intermediate lengths; and
an elastic loop secured to the spear for propelling the spear through water when tensioned by the holder and released, the spear transportable in collapsed condition with the lengths of rod pulled apart and held substantially parallel

to each other, the lengths of rod, when released, joining together in end-to-end relation to form a single length of



rod due to the tension exerted thereon by the elastic means.

4,052,809

FISHING LURE

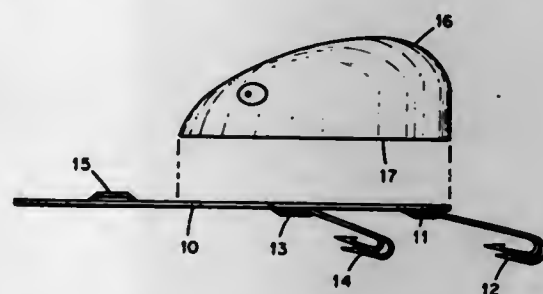
Paul W. Reinhardt, Rte. No. 4, Box 355, Kingston, Tenn. 37763

Filed July 30, 1976, Ser. No. 710,316

Int. Cl.² A01K 85/00

U.S. Cl. 43—42.22

4 Claims



1. An artificial fishing lure characterized by adjustable vertical and horizontal instabilities, and automatically-compensating lateral stability, during retrieval through water by an angler, which comprises:

- a planar, highly reflective, nonbuoyant spoon of uniform thickness;
- a streamlined buoyant body member having a planar lower surface, said surface attached to and substantially covering a rearward portion of a first surface of the spoon leaving an exposed forwardly-extending planar bill portion of the spoon;
- a first loop extending upwardly on the bill portion of the spoon on the first surface, at a position substantially midway between the body and a forward end of the bill portion, for the attachment of a fishing line;
- a second loop on a second surface of the spoon extending downwardly at a rearward end of the spoon;
- a fish hook attached to the second loop; and
- wherein the spoon is sufficiently thin whereby the bill portion may be finger-manipulated by the angler for adjusting the retrieval characteristics of the lure.

4,052,810

SNELLED HOOK HOLDER

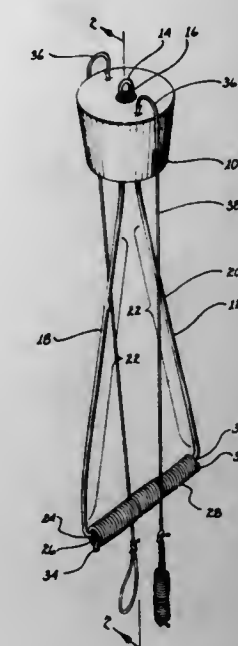
Curtis A. Stevenson, 13229 N. 41st Place, Phoenix, Ariz. 85032

Filed Aug. 19, 1976, Ser. No. 715,912

Int. Cl.² A01K 97/06

U.S. Cl. 43—57.5 R

5 Claims



1. A device for releasably holding snelled fish hooks, each fish hook having a leader extending therefrom, said device comprising in combination:

- a. a hook holder means for releasably receiving the point of each fish hook;
- b. coil spring means for compressively engaging the leader of each hook attached to said hook holder means intermediate adjacent coils of said coil spring means, said coil spring means including a longitudinally extending internal channel;
- c. a spacer member for maintaining said coil spring means in spaced relationship to said hook holder means, said spacer member comprising:
 - i. first and second arm means extending from said hook holder means;
 - ii. first leg means extending from said first arm means in a first direction through said channel of said coil spring means and second leg means extending from said second arm means in a second direction through said channel of said coil spring means, whereby, said first and second leg means longitudinal segregate said coil spring means into halves and permit insertion of different leaders from opposed sides of said coil spring means and intermediate the same adjacent coils without having the leaders tangle with one another; and
 - iii. first bend means extending from said first leg means for engaging one end of said coil spring means and second bend means extending from said second leg means for engaging another end of said coil spring means, whereby, said coil spring is maintained upon said first and second leg means intermediate said first and second bend means.

4,052,811

INSECT CATCHING DEVICE

Esther B. Shuster, and Jacob Shuster, both of 1904 Reedie Drive, Silver Spring, Md. 20902

Filed Aug. 16, 1976, Ser. No. 714,346

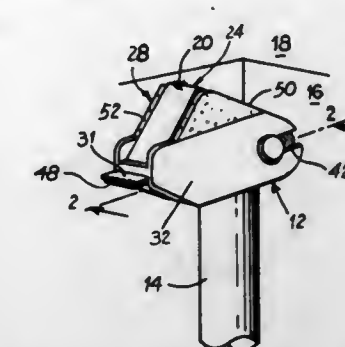
Int. Cl.² A01M 1/16

U.S. Cl. 43—136

8 Claims

1. An insect catching device, comprising a rigid body, a resilient support projecting from said rigid body, a flexible sheet of material having a tacky surface, means anchoring said flexible sheet to the rigid body in overlying relation to said resilient support with a portion of the tacky surface exposed thereon, said portion of the exposed tacky surface projecting

from the rigid body on the resilient support for contact with insects, said flexible sheet being an elongated adhesive tape



having a non-adhesive backing surface in contact with the resilient support.

4,052,812

TOY OBJECT THAT REPEATEDLY SUBMERGES AND RISES IN THE WATER

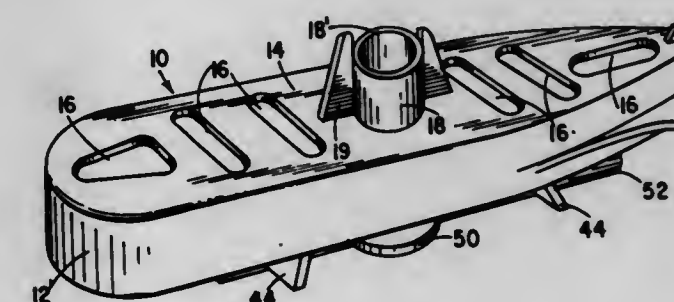
Sam Kupperman, Chicago, and Dennis I. Kupperman, Glenview, both of Ill., assignors to R B Toy Development Co., Skokie, Ill.

Filed May 25, 1976, Ser. No. 689,941

Int. Cl.² A63H 23/04

U.S. Cl. 46—94

11 Claims



9. A toy object that repeatedly submerges and rises in water, comprising a body having only one chamber therein and a pivot member extending outwardly from said body, a cap having an aperture therein for sealing said chamber and providing communication between the water and said chamber through said aperture, a bubble retaining chamber separate from said body for accommodating a gas bubble during the growth thereof, and a ballast which in combination with said body provides an average density greater than water, said body and pivot member and ballast cooperating to ensure said toy object during operation thereof remains substantially submerged, whereby said toy object with a gas producing material in said chamber sealed by said cap sinks in water until a bubble in said retaining chamber formed by coaction of water and the gas producing material in said retaining chamber is sufficiently large to cause said toy object to rise until said pivot member breaks the water surface permitting said toy object to pivot about said pivot member releasing the gas bubble resulting in said toy object sinking.

4,052,813

ANIMATED TOY

Philip Warren Crain, Redondo Beach; Otto Leonhard Gabler, Lawndale, and Eugene Joseph Kilroy, Jr., Inglewood, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 10, 1976, Ser. No. 740,505

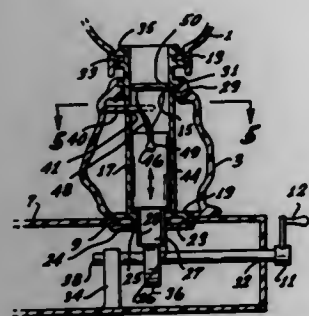
Int. Cl.² A63H 11/00

U.S. Cl. 46—119

9 Claims

1. An animated toy FIGURE which comprises:
a hollow torso portion having a passage therethrough;
a head portion;
an elongated hollow cylindrical support member extending through said torso portion, said support member having

an arcuate slot through a cylindrical wall thereof extending partially about the axis of said support member; said support member further containing a base portion at its lower end having an opening, said opening being of smaller diameter than said cylindrical portion; means attaching said head portion to an upper end of said cylindrical member; means for rotatably supporting said torso portion to said support member for rotation about the axis of said support member; a protruding web member coupled to an inner surface of said torso portion, said forklike member having two spaced pronglike ends extending radially inwardly; plunger means, said plunger means having a small diameter elongate first portion extending through said opening in said base member, and an elongate larger second portion received within said cylindrical member; said plunger means adapted for reciprocal movement along the axis of said support member; a cylindrical passage through said larger plunger portion transverse the axis thereof at a predetermined distance



from an end, and a slot transverse the axis extending between the end of said plunger and said cylindrical passage to provide entry into said cylindrical passage and define a keyhole-like cross-section, said slot being narrower than the diameter of said passage;

an elongate web member of relatively stiff material, said web member being formed into a twisted geometry to form a twist about its axis; a first pin attached axially to one edge end of said web and a second pin attached axially to the other edge end of said web, one of said pins being fitted within the passage in the end of said plunger means with said web member extending through said slot, whereby said web is carried by said plunger and extends along the axis of said support member; said forklike member extending through said arcuate slot with the prongs of said forklike member straddling said web in a direction transverse the axis of said web, whereby reciprocal movement of said plunger forces the surface of said striplike member to engage and rotate said forklike member about the axis of said plunger and the carried torso portion similarly rotates.

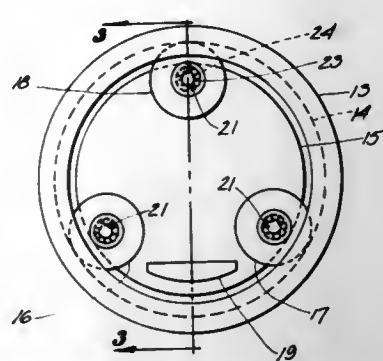
4,052,814
HOOP GUIDE ROD AND HOOP ROLLING GAME APPARATUS
Steve Hall, R.R. No. 2 Box 225, Walton, Ky. 41094
Filed Mar. 22, 1976, Ser. No. 669,157
Int. Cl.² A63H 33/02

U.S. Cl. 46-220

5 Claims

5. In a game apparatus of the type comprising a circular hoop and a rod for rolling and guiding said circular hoop, the improved hoop construction comprising:

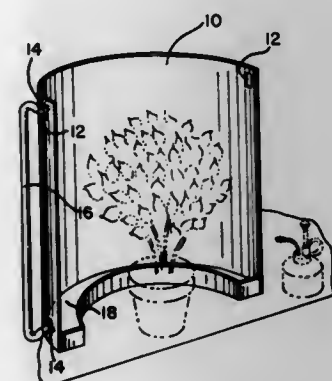
a. a circular rim having an annular groove extending circumferentially about the inside diameter thereof; and



b. a disc-shaped member of smaller dimensions than said rim and seated within said groove for travel thereabout as said circular rim is rotated.

4,052,815
MIST SHIELD FOR HOUSE PLANTS
Karen Clark, 18037 Torrence Ave., Lansing, Ill. 60438
Filed Feb. 27, 1976, Ser. No. 662,225
Int. Cl.² A01G 25/00, 25/14, 1/00
U.S. Cl. 47-1 R

1 Claim



1. A plant mist shield or guard comprising a semi-cylindrical body portion of approximately 180° and open at the top, a trough, closed at its ends, provided and encompassed by the lower edge of said body portion, openings at the upper and lower corners of each end of said body portion, and a resilient handle having ends fitting the openings at either end of said body portion and which may be removably sprung into place in said openings, whereby said shield or guard may be manually placed or held behind a plant while misting or spraying the same, to catch any fluid which passes through the plant and deposits on the shield or guard, and runs down into the trough.

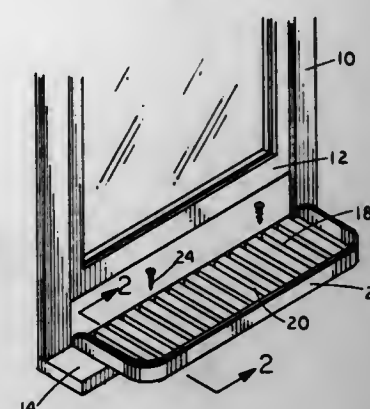
4,052,816
WINDOW STAND FOR PLANTS
Frank Perez, 661 2nd Place, Garden City South, N.Y. 11530
Filed Apr. 2, 1976, Ser. No. 673,213
Int. Cl.² A47G 7/00; A01G 9/02

U.S. Cl. 47-40

6 Claims

1. A window stand for potted plants comprising an elongated shelf member bounded by an outside longitudinal edge, an inside longitudinal edge, and two ends, the shelf member being formed into alternating ridges and valleys extending transversely between said inside and outside longitudinal edges, the tops of the ridges lying in a common plane, and the bottoms of the valleys being inclined with respect to said plane downward from the inside edge to the outside edge of the shelf member; and a continuous upright flange formed integrally with the shelf member, the flange enclosing the inside edge and the two ends of the shelf member and extending above the plane of the ridge tops, and the flange having a lower edge at each of said ends adapted to support the shelf member on an inside horizontal sill of a window with the plane of said ridge tops parallel to and spaced above the plane of the sill and with

the outside edge of the shelf aligned with the outside edge of the sill adjacent to the inner face of a window sash, whereby potted plants placed on the shelf will stand upright on the ridge



tops without tilting and will be protected by the flange from falling off the shelf, and the valleys will provide parallel drainage paths for excess water from such pots to the outdoors over the edge of the sill.

4,052,817
PROCESS FOR STORING AND RECOVERING PLANT TISSUE

Michael Selbert, Lynnfield, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.
Continuation-in-part of Ser. No. 660,289, Feb. 23, 1976, abandoned. This application Oct. 12, 1976, Ser. No. 731,146
Int. Cl.² A01G 1/00

U.S. Cl. 47-58

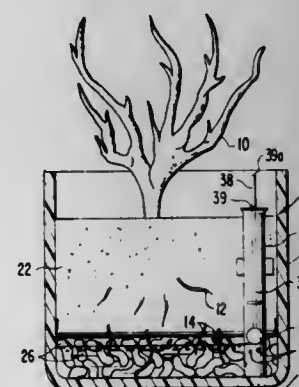
5 Claims

1. A process for providing herbaceous plants which comprises cold treating a donor herbaceous plant without damaging the meristematic tissue of the plant, excising the meristematic tissue of the donor plant, placing the tissue in a composition comprising a rinsing solution and a cryoprotectant, rapidly freezing the tissue and composition to a temperature below about -70° C, thawing the tissue and composition at an average warming rate of at least about 24° C/min when the tissue is at a temperature between about -70° C and about -10° C and exposing the thawed tissue to an environment of temperature, light, humidity and growth medium which promotes growth of the tissue to a mature plant.

4,052,818
METHOD AND APPARATUS FOR CONTAINERIZING PLANTS WITH A SELF-WATERING SYSTEM
Mary L. Hagerty, 10 1/2 LeGare St., Charleston, S.C. 29401
Continuation-in-part of Ser. No. 566,138, April 8, 1975, abandoned. This application July 6, 1976, Ser. No. 702,445
Int. Cl.² A01G 27/00

U.S. Cl. 47-81

12 Claims



1. A planter combination including a container having bottom and upstanding side walls defining a space for receiving a plant and growing mediums, a coarse growing medium located in the bottom of the container and evenly distributed throughout to define a horizontal plane at the top of the coarse grow-

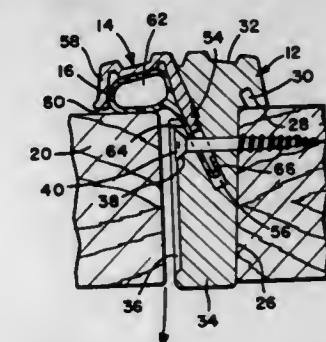
ing medium, a screen located in the container in said horizontal plane and being supported by said coarse growing medium and dividing the container into upper and lower compartments with the coarse growing medium located in the lower compartment, a fine growing medium located in the container in the upper compartment and being supported by said screen and ultimately said coarse growing medium, a watering tube extending generally vertically in the container through the upper and lower compartments and through said screen and having an open upper end and outlet means in a lower end portion for introducing water into the lower compartment, a float located in the passage of the watering tube, said float including a float member and a stem fixed to the float member and projecting upwardly therefrom in the passage of the watering tube, and indicia means on an upper end portion of the stem cooperable with the upper end of the watering tube for indicating when the lower compartment is either empty of water, or contains a maximum predetermined desired level of water situated adjacent to but spaced below said screen to prevent capillary action through said screen, or an excessive level of water above said maximum predetermined desired level, and wherein said indicia means includes a first mark located on the stem to lie generally at the level of the open end of the watering tube when the water in the lower compartment reaches said maximum predetermined desired level spaced below the screen, a second mark on the stem above said first mark adapted to lie generally at the level of the open end of the watering tube when the second compartment is empty of water.

4,052,819
DOUBLE DOOR ASTRAGAL
Jerome K. Beischel, Cincinnati, and William M. Bursk, Middletown, both of Ohio, assignors to Pease Company, Fairfield, Ohio

Filed Jan. 17, 1977, Ser. No. 764,899
Int. Cl.² E06B 7/16

U.S. Cl. 49-368

11 Claims



1. An astragal for use with a double door installation including an active door and an inactive door having substantially abutting generally vertical edge portions, comprising: rigid support means securable to said vertical edge portion of said inactive door and extending substantially the entire height of said door for sealingly engaging said door; rigid cover means extending for substantially the entire length of said support means and releasably securable to said rigid support means in a plurality of positions for engaging said vertical edge portion of said active door along its height when said doors are in abutting relation; and flexible sealing means mounted on said cover means and disposed between said cover means and said vertical edge portion of said active door for sealingly engaging substantially the entire height of said edge portion of said active door when in said abutting relation.

4,052,820

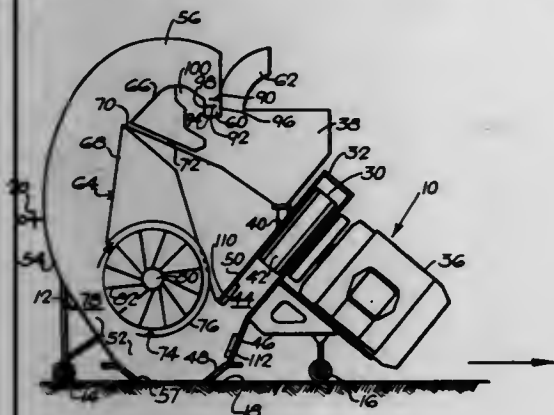
PORTABLE SURFACE TREATING APPARATUS

John C. Bergh, Elkhart, Ind., assignor to Wheelabrator-Frye, Inc., Hampton, N.H.

Filed Jan. 21, 1976, Ser. No. 651,183
Int. Cl.² B24C 3/00

U.S. Cl. 51-423

13 Claims



1. A portable apparatus for treatment of horizontally disposed surfaces comprising:
 1. a housing;
 2. means on said housing above the surface for projecting abrasive particles downwardly onto the surface at an angle with the surface:
 - 2a. a hopper on said housing for feeding abrasive particles to said projection means;
 3. a rebound corridor in said housing extending angularly upwardly from the surface into which the abrasive particles rebound upon striking said surface;
 4. means on said housing at the end of the rebound corridor for returning abrasive particles passing through the corridor to the hopper; and
 5. means extending into the rebound corridor for a short distance from the wall of the corridor for intercepting abrasive particles which do not possess sufficient kinetic energy to rebound through the corridor to prevent return of said abrasive particles to the surface.

4,052,821

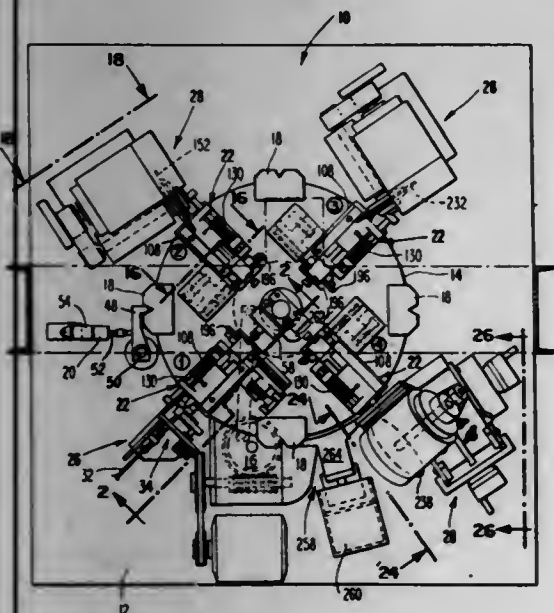
AUTOMATIC BUR GRINDING MACHINE

William McCandless, Toledo; Robert F. Lea, Delta, both of Ohio; Ernest A. Kroder, Felton, Pa., and Charles J. Tomecek, Cartice, Ohio, assignors to Dentsply Research & Development Corporation, Milford, Del.

Filed Mar. 15, 1976, Ser. No. 666,848
Int. Cl.² B24B 3/02, 3/60

U.S. Cl. 51-53

23 Claims



1. A machine for grinding a multi-tooth bur automatically

and comprising in combination, a base, a table supported for rotation about an axis perpendicular to said table, a plurality of grinding units supported upon said base adjacent the periphery of said table, a plurality of work heads mounted upon said table and having axes extending substantially radially from the axis of said table, said work heads and grinding units being spaced substantially even distances circumferentially around the periphery of said table, whereby when said table is positioned in operative relationship relative to said grinding units said work heads will be aligned radially therewith to effect grinding of bur blanks, said work heads each supporting a collet arranged to securely and accurately position the head of a bur blank in position to be ground by rotatable grinding discs supported upon said grinding units for movement toward and from said blanks, and means engageable with said work heads and operable to move said work heads and the collets thereon radially outward during the grinding of bur heads supported by said collets at said grinding units, means operable automatically to index said work heads and collets when positioned adjacent said respective grinding units to grind a series of circumferentially arranged grooves in the heads of said burs to form corresponding teeth thereon, and power means connected to said table and operable to advance said table and the work heads supported thereby sequentially and respectively to said grinding units, whereby a plurality of burs are ground simultaneously by said machine.

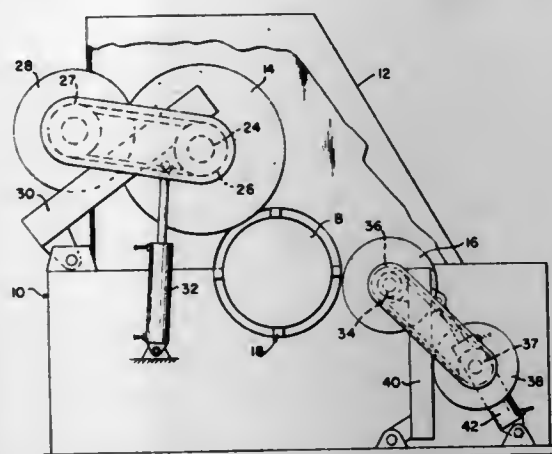
4,052,822

METHOD AND APPARATUS FOR ABRASIVELY CUTTING OBJECTS

Robert F. Obear, Rolling Hills Estates, Calif., assignor to Western Gear Corporation, Everett, Wash.

Filed Mar. 15, 1976, Ser. No. 667,107
Int. Cl.² B24B 27/04, 1/02, 27/06; B23B 5/14
U.S. Cl. 51-88

20 Claims



1. The method of abrasively cutting elongated metal objects, comprising:
 - rotating the object about its longitudinal axis,
 - moving a used, small, rigid abrasive cutting wheel, worn from a larger cutting wheel, into engagement with the object in a direction parallel to the plane of the cutting wheel to make a scoring cut around the object,
 - moving a larger diameter, more flexible cutting wheel of the type from which the smaller wheel was formed into engagement with the object also in a direction parallel to the plane of the larger cutting wheel and into the scoring cut formed by the smaller cutting wheel,
 - rotating the larger cutting wheel at one angular velocity and rotating the smaller cutting wheel at a generally higher angular velocity to produce peripheral surface speeds at the cutting surfaces of the two cutting wheels which are the preferred speeds for the respective size abrasive wheels, and
 - limiting the rotational speed of the object to below 4 rpm so that a deep spiral band cut is produced by the cutting wheels.

4,052,823

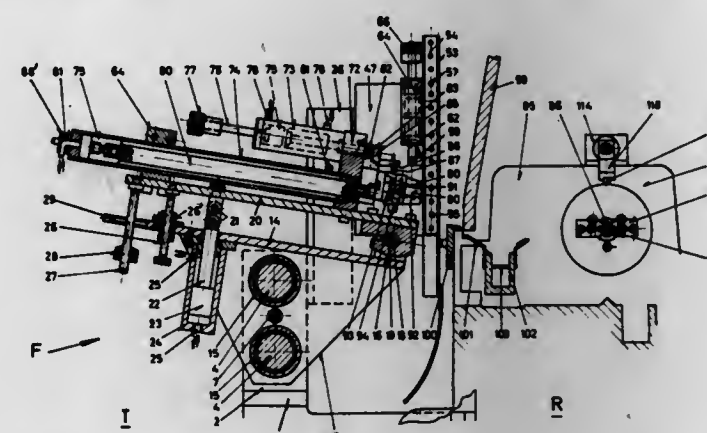
TAP TRANSPORT DEVICE

José Fernández García, Barcelona, Spain, assignor to Ferg S.L., Vich, Spain

Filed Sept. 9, 1976, Ser. No. 722,335
Claims priority, application Spain, Dec. 29, 1975, 443918
Int. Cl.² B24B 3/18, 47/02

U.S. Cl. 51-95 TG

15 Claims



1. In combination with a thread-cutting machine having a chuck adapted to hold a workpiece to be threaded and to rotate same about a threading axis, a tap transport device comprising:
 - a support frame adjacent said machine;
 - a carrier displaceable on said frame in a first direction transverse to said axis;
 - a workpiece feed gripper and a workpiece removal gripper mounted on said carrier;
 - means on said support frame and spaced in said first direction from said axis for holding a plurality of unthreaded workpieces and feeding same to said workpiece feed gripper;
 - means connected to said workpiece feed gripper for opening and closing same and thereby grasping and releasing a workpiece;
 - means connected to said workpiece removal gripper for opening and closing same and thereby grasping and releasing a workpiece;
 - means for displacing said carrier in a second direction transverse to said axis and to said first direction between a feed position with said feed gripper aligned in said first direction with said axis and a removal position with said removal gripper aligned in said first direction with said axis;
 - means for displacing said carrier in said first direction between an outer end position with said grippers aligned in said second direction with said axis, whereby when in said inner end position displacement of said carrier into said feed position aligns a workpiece in said feed gripper with said axis and displacement of said carrier into said removal position aligns a workpiece in said removal gripper with said axis; and
 - means for displacing said carrier in a third direction generally parallel to said axis.

4,052,824

ABRADING TOOL SUCTION SYSTEM

Donald H. Hutchins, Sierra Madre, Calif., assignor to Hutchins Manufacturing Company, Pasadena, Calif.

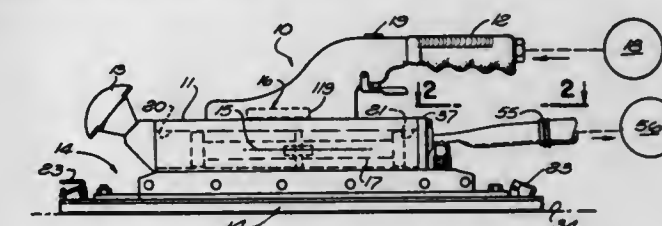
Filed Nov. 29, 1976, Ser. No. 745,656
Int. Cl.² B24B 23/00, 55/06

U.S. Cl. 51-170 MT

14 Claims

1. A portable abrading tool comprising:
 - a body to be held by a user;
 - a shoe structure adapted to carry a sheet of abrading material and mounted to the underside of said body for abrading movement relative thereto, and containing passage

means through which air and abraded particles are drawn from near the shoe structure;
an air motor in said body for driving the shoe relative to the body;
said body having an end surface facing in generally a predetermined direction, and said body having a flange projecting in said direction beyond said end surface at a location near but above said shoe structure;
a conduit structure carried by said body and into which a primary flow of air discharged from said motor passes, said conduit structure projecting from said body in said predetermined direction and beyond said end surface at a location spaced above said flange;
a seal part carried at the underside of said flange and free for slight upward and downward movement relative thereto



and relative to said conduit structure and containing a passage communicating with said passage means in the shoe structure to receive air and particles therefrom; said seal having an undersurface slidably engaging an upper surface of said shoe structure about said passage means and said passage to form a seal therebetween as the shoe structure moves relative to the flange and seal part; additional conduit means extending upwardly from said seal part past said flange and connected to said first mentioned conduit structure;
said conduit structure forming at the upper end of said additional conduit means an aspirator by which said primary flow of air induces a secondary flow of air and particles from said shoe structure and through said additional conduit means for intermixture with and discharge with the primary flow.

4,052,825

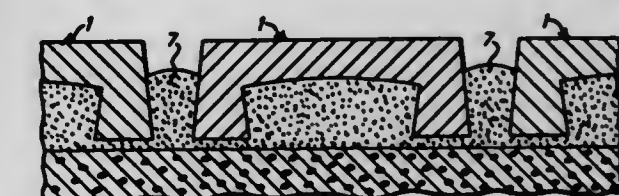
METHOD IN THE PRODUCTION OF A WALL ELEMENT AND A WALL TILE FOR USE IN CONNECTION WITH THE METHOD

Nils Östen Arnold Larsson, Linköping, Sweden, assignor to AB Östgöga-Byggen, Linköping, Sweden

Filed Sept. 3, 1974, Ser. No. 502,490
Claims priority, application Sweden, Sept. 3, 1973, 7311988
Int. Cl.² E04B 1/35; E04C 1/12

U.S. Cl. 52-98

10 Claims



1. A wall-tile of brick or other suitable wall-facing material, which is rectangular and intended to be bedded by means of mortar, together with other such tiles, in rows with joint spacing on a prefabricated wall element, wherein the tile is substantially U-shaped in cross-section having a web and legs, the front face of the tile defining the outer face of the web, while the outer sides of the legs consist of one pair of the opposing sides of the tile which slope outwardly from the front face of the tile.

4,052,826

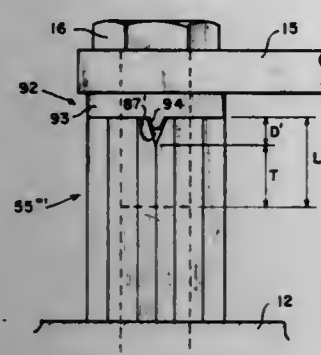
BREAKAWAY COUPLING ASSEMBLY WITH FRACTURE-INITIATING WASHER

Douglas E. Chisholm, 1906 Memory Court, Vienna, Va. 22180
Continuation-in-part of Ser. No. 669,476, March 23, 1976, Pat. No. 4,007,564, which is a continuation-in-part of Ser. No. 519,670, Nov. 12, 1974, abandoned, and Ser. No. 628,641, Nov. 4, 1975, abandoned, which is a continuation of Ser. No. 539,089, Jan. 7, 1975, which is a continuation of Ser. No. 350,173, April 11, 1973, said Ser. No. 519,670, is a division of said Ser. No. 350,173.

This application July 29, 1976, Ser. No. 709,943
Int. Cl.² E04B 1/36

U.S. Cl. 52—98

10 Claims



1. An upright standard assembly comprising the combination of
 - a. a generally vertical standard,
 - b. a base member,
 - c. a connection member,
 - d. means affixed to one of said base member or said standard for receiving said connection member to releasably attach said standard to said base member, and having a generally vertical axis of connection extending through said connection member, said means comprising
 - i. coupling means for receiving said connection member and for fracturing radially with respect to said axis of connection in response to an impact force applied to said standard in a generally horizontal direction generally normal to said axis of connection, said coupling means comprising a coupling body generally symmetrically disposed about any plane containing said axis of connection, said body having a first end in operative association with said base member, and a second end in operative association with said upright standard, at least one of said first and second end defining a connection member receiving opening therein, said connection member extending into said body a predetermined length along said axis of connection, said body having a plurality of grooves which define regions of minimum strength, said grooves surrounding said connection member receiving opening of said coupling body and extending from said connection member receiving end of said body parallel to said axis of connection and extending at least the length of said predetermined length of said connection member received by said body, and extending so that upon an impact force in a generally horizontal direction acting upon said standard, said coupling means will radially fracture to thereby release said connection member and thereby provide detachment of said standard from said base member, and
 - e. means for initiating the radial fracture of said coupling body member, said means comprising (i) at least one fracture-initiating slot formed in at least one of said grooves and extending from the end of said coupling body defining said connection means receiving opening parallel to said axis of connection, said at least one slot extending a distance less than said predetermined length of said connection member received by said coupling body, and (ii) a radial fracture-initiating washer having at least one radially extending tooth formed thereon for

receipt by said at least one fracture-initiating slot, said washer disposed between one of said generally vertical standard and said base member, and said coupling body, and said connection member extending through said washer.

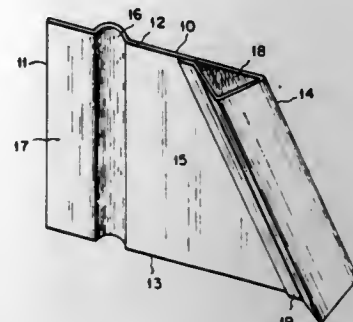
4,052,827

GROUND ANCHOR AND FOUNDATION SUPPORT

Charles R. Yancey, 1322 Hondo St., Lockhart, Tex. 78644
Continuation of Ser. No. 545,773, Jan. 31, 1975, abandoned. This application May 14, 1976, Ser. No. 686,459

Int. Cl.² E02D 5/74

11 Claims



1. An improved ground anchor and support device of the type having a body portion and drivable anchoring stakes affixable thereto wherein the improvement comprises: a body portion including: a centrally disposed elongate vertically positioned tubular core, the height of said core being a plurality of times its diameter, and a plurality of vertically positioned wing segments, radiating outwardly from the tubular core, in a symmetric spacing, said wing segments being each substantially quadrangular in shape, and having top, bottom, inner and outer sides; the inner side of each wing segment being fixedly secured to the periphery of said tubular core for substantially the entire height of both of said members, the wing segment having a short top side, and a relatively long bottom side, both of which extend at substantially right angles from the inner perpendicular side, so that the outer side slopes outwardly and downwardly from the top corner to the bottom corner of the wing segment, said outer side having means providing an elongate tubular socket sleeve along its marginal areas for substantially the entire length of such outer side, and the short top side being only wide enough to provide adequate room for the upper end of the tubular sleeve, each of said tubular socket sleeves forming snug and elongate support means for receiving an anchoring stake driven through the socket sleeve from top to bottom and into the ground surrounding the anchor body, so that the plurality of the stakes lend their unified strength to the anchor body so as to resist any force that tries to move the anchor from its position in the ground, and means on the central core for affixing appropriate attachment hardware to said central core for fastening structures thereto.

4,052,828

STRUCTURAL MEMBER

Robert Mancini, 8 Stepheny Drive, Toronto, Ontario M8W 2N5, and Vincenzo Gentile, 94 Bowie Ave., Toronto, Ontario M6E 2P7, both of Canada

Filed Dec. 16, 1974, Ser. No. 533,147
Int. Cl.² E04F 19/04

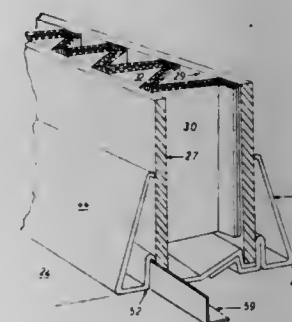
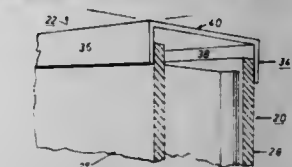
U.S. Cl. 52—242

7 Claims

1. The combination of an inverted U-channel ceiling member for mounting a structural member and first and second floor mounting components, said structural member comprising two sheets of material sandwiching a corrugated core between a floor and ceiling, the structural member being shorter than the distance between the floor and ceiling, said first component being adapted to be affixed to the floor, said first and second components each comprising a generally horizontally disposed component, each having inner and outer

ends, and a generally vertically disposed component attached at the outer end of each horizontal component for engagement with an outer surface of the structural member when said components are used to mount the structural member, support means secured to each horizontally disposed component for supporting the structural member, said support means comprising a crimp disposed a predetermined distance along each horizontal component from the juncture of the horizontal component and the generally vertical component, and means on the inner end of the horizontal component of each of the components to be inter-engaged to secure the structural member, said last means comprising, resilient means on said first component, forming an obtuse angle with the horizontal component when the structural member has not been mounted

to define the outer periphery of a building, a plurality of formed metal steel beams spanning and secured to upper end portions of opposite side walls of said building outer periphery and arranged in spaced, parallel relation thereupon, a plurality of spaced, parallel formed sheet metal roofing rib members fixed upon and secured to said roof beams in perpendicularly crossing relation with respect thereto, a covering of uniformly apertured sheet metal secured against the underside of said roofing ribs, a coating of cementitious material on the underside of said apertured sheet metal covering said roofing ribs, a filling of cementitious material between said roofing ribs above said roofing rib apertured sheet metal covering and providing a roof deck, and an outer layer of roof sealant applied to the outside of said roof deck.



thereon, but deflected downwardly when the structural member has been mounted thereon, and engaging means on the second component, to underlie the resilient means when said resilient means is deflected downwardly by the structural member, thereby locking said second component and thus said structural member against movement until the structural member is lifted causing the resilient means to spring upwardly towards its initial position, thereby permitting the second component and thus the structural member, to be easily removed, the distance between the crimps when the resilient means of the first component overlies the engaging means of the second component, being equal to the thickness of the structural member so that the outer surfaces of the structural member abut the crimps.

4,052,829

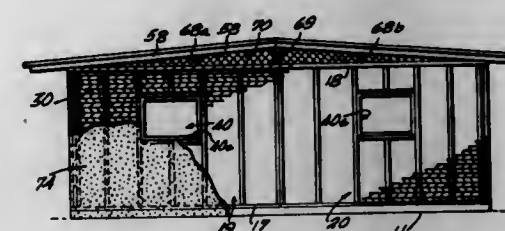
SEMI-PREFABRICATED MONOLITHIC STEEL-REINFORCED CEMENT BUILDING CONSTRUCTION

Ward W. Chapman, 2700 W. 3rd Court, Hialeah, Fla. 33010
Filed Mar. 17, 1976, Ser. No. 667,653

Int. Cl.² E04B 1/00, 5/00

U.S. Cl. 52—285

10 Claims



1. A monolithic steel reinforced cementitious material building structure, comprising, in combination, a plurality of outer wall panels, each wall panel comprising a plurality of formed sheet metal ribs of U-shaped cross-section arranged in spaced, parallel relation and defining a predetermined interior wall thickness, a covering of uniformly apertured sheet metal secured directly against one side of each of the ribs of said wall panels, a coating of cementitious material on the outside of said apertured sheet metal covering, a monolithic filling of cementitious material between the ribs of each of said wall panels and extending through to the other side of each of said ribs, said panels being secured in end-to-end abutting relation

CORNER FILLETS

Ken Smith, Leeds, England, assignor to John Barry Potter, Leeds, England

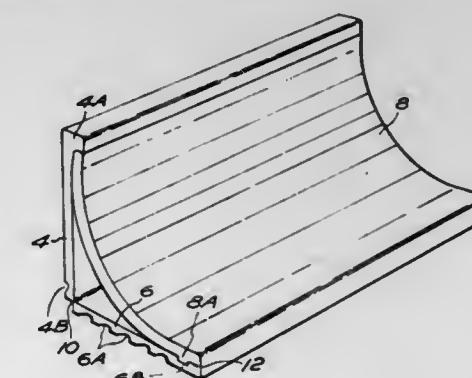
Filed May 17, 1976, Ser. No. 687,412

Claims priority, application United Kingdom, May 17, 1975, 21097/75

Int. Cl.² E04C 19/02

U.S. Cl. 52—288

12 Claims



1. A corner fillet composed of an elongated one-piece member that consists of a mid section and one end section on each side of the mid section, said end sections being joined to said mid section by two spaced apart hinge means that are parallel to each other and parallel to the longitudinal axis of said elongated one-piece member, said end sections being adapted to fold toward each other along said hinge lines so as to interengage along a line that is adjacent to the longitudinal outer side edges of said end sections to thereby form a corner fillet.

4,052,831

PANEL BUILDING CONSTRUCTION AND METHOD, AND CLIP

Frank William Roberts, 380 E. 7500 S., Midvale, Utah 84047; Richard Allen Roberts, 2551 Milo Way; Waldo Calvin Roberts, 4906 Regency, both of Salt Lake City, Utah 84117, and Robert Howard Blaupied, 519 Barnard, Centerville, Utah 89014

Filed June 1, 1976, Ser. No. 691,609

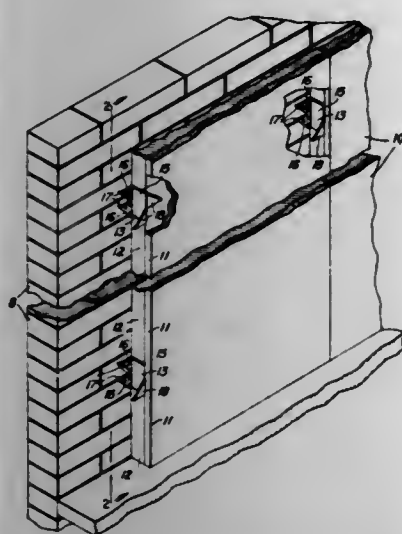
Int. Cl.² E04F 13/00

U.S. Cl. 52—309.8

9 Claims

1. Panel building construction, comprising a supporting structure in the nature of a wall, ceiling, or roof structure having a panel-receiving face comprising a substantially flat surface; retainer clips for composite insulating panels each of said clips having a flat web strip and flanges extending from opposite lateral edges thereof, said flanges including a securement flange extending from one of the lateral edges of the web strip substantially perpendicular to the web strip, and a pair of flanges extending mutually oppositely from the other lateral edge of the web strip substantially perpendicular to the web strip, the securement flange having its free terminus turned outwardly of the web strip to provide an entry ramp for a receiving pocket defined between that flange and the corresponding flange of said pair of flanges; fastener means rigidly attaching the securement flanges of said retainer clips to said

flat surfaces of the supporting structure with their free termini resting on said flat surfaces and providing entry ramps; and composite insulating panels fitted into and held by the retainer clips edge-face to edge-face with the web strips therebetween, said panels each comprising a rigid board facing backed by a layer of foamed plastic insulating material adherent thereto,

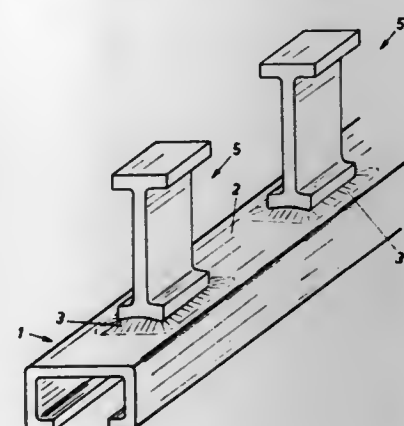


thereby connecting said members against relative displacement in the transverse plane; and said slots being formed in said members so that said composite slot configuration defines dihedral angles between interior surface portions of the slots of opposite members that are greater than corresponding dihedral angles between the surfaces of said connector legs that seat thereagainst such that when said connector is inserted into said slots said larger dihedral angles of said interior surface portions of the slots of opposite members cause said connector legs to be wedged against said interior surface portions of such slots to clamp said members together.

4,052,833

TRACK ASSEMBLY WITH ANCHORING DEVICE
Karlheinz Beine, Am Ehrkamper Bruch 9, 4030 Ratingen, Germany

Filed Sept. 14, 1976, Ser. No. 723,282
Claims priority, application Germany, July 13, 1976, 2631396
Int. Cl.² E04B 1/38; E04C 5/00
U.S. Cl. 52—710 13 Claims



the said pair of oppositely extending flanges of each clip penetrating said insulating material of adjoining panels at and along respective interfaces between the rigid board facings and the layers of said insulating material thereof, with either said layer or said facings of one of said adjoining panels fitting into the receiving pockets of the corresponding clips and spaced from the supporting structure by the entry ramps thereof.

4,052,832

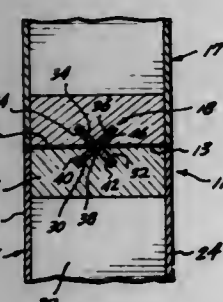
JOINT AND METHOD FOR CONNECTING STRUCTURAL MEMBERS

James W. Jungers, Arlington, and Edwin R. Hoyt, Everett, both of Wash., assignors to Pioneer Manufacturing Inc., Arlington, Wash.

Filed May 3, 1976, Ser. No. 682,566
Int. Cl.² E04B 2/32, 2/62

U.S. Cl. 52—496

6 Claims



1. In combination, first and second structural members adapted to be joined and connected together along predetermined, longitudinally extending surface portions thereof, an elongate connector having a transverse section in the shape of a cross that includes first and second pairs of outwardly diverging legs joined at the center of the cross, each said member having a pair of connector receiving slots that extend both longitudinally along the respective said surface and inwardly thereof to define in a transverse section therethrough a V-shape in which the apex of the V lies generally at said surface and the legs of the V diverge inwardly therefrom, said members when arranged with said surfaces abutting and with said V-shaped slots in mutually opposed registration defining a composite slot configuration that in transverse section is the complement of the cross shape of said connector so that said connector is insertable endwise into said slots with the first pair of connector legs transversely interlocking with the slots of one of said members and with the second pair of connector legs transversely interlocking with the slots of the other member

4,052,834

METHOD OF ERECTING A ROOF STRUCTURE
Peter Edington Ellen, 16 Cornwall Avenue, Turramurra, 2074 Sydney, Australia

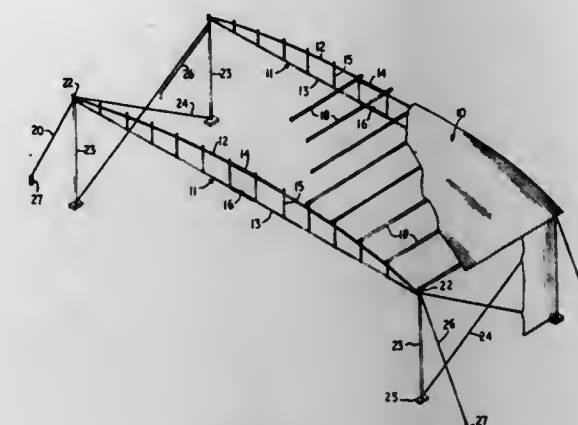
Filed Feb. 10, 1976, Ser. No. 656,950
Claims priority, application Australia, Feb. 13, 1975, 0598/75
Int. Cl.² E04B 1/35

U.S. Cl. 52—741

2 Claims

1. A method of erecting a roof structure consisting of
a. constructing at least two trusses each having a top compression member and a bottom tension tube connected together by vertical tension struts and joined at their ends, the top compression member being substantially straight

and the bottom compression tube being downwardly bowed,
b. interconnecting said struts by means of purlins connected thereto,
c. applying a sheet metal covering material to said purlins,
d. threading high tension steel cable through the bottom tension tubes,
e. tensioning said cables to bring the structure to a configuration in which said top compression members and the covering are upwardly bowed and the bottom tension tubes are substantially straight or slightly upwardly bowed,
f. anchoring the ends of said cables at the ends of said bottom tension tubes.



e. tensioning said cables to bring the structure to a configuration in which said top compression members and the covering are upwardly bowed and the bottom tension tubes are substantially straight or slightly upwardly bowed,
f. anchoring the ends of said cables at the ends of said bottom tension tubes.

4,052,835

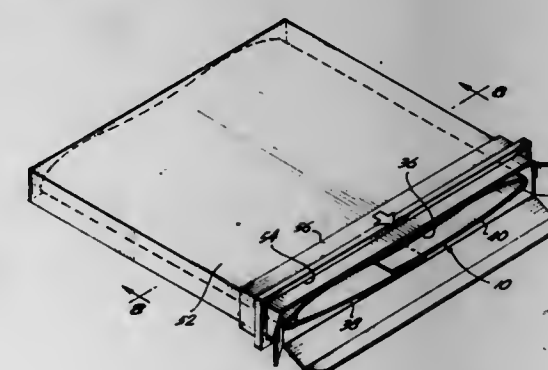
PREFORMED ONE-PIECE WALL COVERING FOR A BATHTUB RECESS

Melvin A. Stratis, 138 Beach Drive, Edmonds, Wash. 98020
Filed June 23, 1976, Ser. No. 698,951

Int. Cl.² B65B 1/24, 63/04, 63/08

U.S. Cl. 53—21 FW

3 Claims



1. A method of packaging a preformed wall covering for the side and end walls of a tub-recess, comprising:
providing a one-piece wall covering that was formed from a single sheet of plastic laminate material having a decorative layer on one side and a backing layer on its opposite side, which wall covering comprises a pair of end walls which project outwardly from an interconnecting side wall, and which end walls meet said side wall at rounded corners, with the decorative layer of the plastic laminate material being on the inside of the wall covering and the backing layer being on the outside thereof,
partially folding said preformed wall covering by lapping one end wall thereof over the other end wall thereof, to produce a configuration of said wall covering in which the side wall thereof bows outwardly in one direction and the partially overlapped end walls thereof bow outwardly in the opposite direction,
substantially maintaining this configuration of the wall covering while introducing one end thereof into an open end of a normally rectangular box that is wider than the width of the partially folded wall covering and of a normal

depth that is substantially smaller than the depth dimension of the partially folded wall covering,
pushing the wall covering into the box, so that the outwardly bowing side and end walls of the wall covering will in turn bow the adjacent side walls of the box outwardly,

forcing inwardly and reshaping both the side walls of the box and the side and end walls of the wall covering therein, and in so doing sliding the end walls of the wall covering in position an amount sufficient to cause the side and partially overlapped end walls of the wall covering to bow inwardly until the wall covering has assumed a new configuration which is substantially within the normal rectangular shape of the box, and
closing the ends of the box, with the frictional contact between the backing layer of the wall covering and the inner surfaces of the box in contact therewith serving to hold the wall covering in such new configuration, so that the box will retain a substantially rectangular shape.

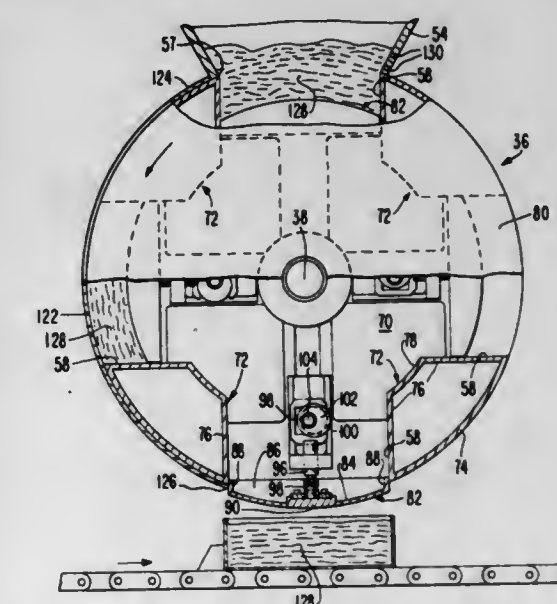
4,052,836

PACKAGE FILLING MACHINE AND METHOD
Richard A. Shaw, Watsonville, Calif., assignor to Richard A. Shaw, Inc., Watsonville, Calif.

Filed Sept. 15, 1976, Ser. No. 723,406
Int. Cl.² B65B 63/08, 3/10

U.S. Cl. 53—25

11 Claims



8. A method of packaging a wet, sticky, pre-cooked food product comprising: depositing a volume of the food product in a confined region having a lower opening; successively moving a plurality of spaced pockets along a first path and into registry with the opening; allowing a mass of the food product to gravitate into and substantially fill each pocket, respectively, as the same moves into registry with said opening; moving a number of spaced, open packages along a second path convergent with said first path with the speed of movement and the spacing of the packages being correlated with the speed of movement and the spacing of the pockets; holding each food product mass in the respective pocket as the latter moves away from said opening and toward said second path; progressively removing the holding action on each food product mass as it approaches and moves into registry with a respective package on said second path; depositing each food product mass in the respective package in the form of a mat as the holding action on the food product mass is progressively removed and as the food product mass is in registry with the respective package; and closing and freezing each package with the food product mass therein.

4,052,837

MULTIPLE POUCH BAGGING APPARATUS

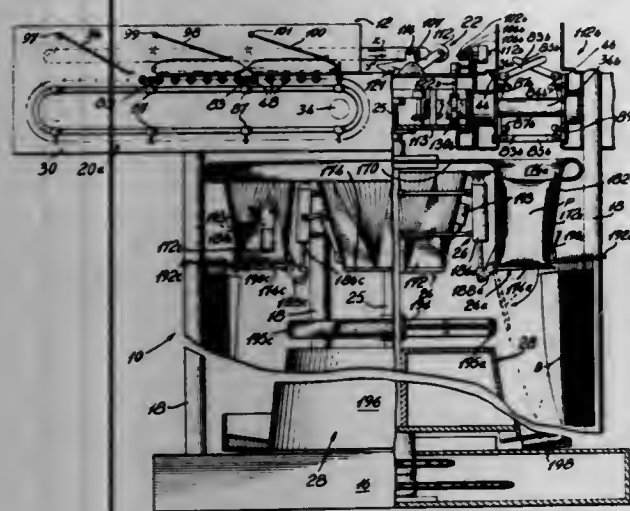
Jerome Saintonge, 100 Cote Vertu, Apt. 907, St. Laurent, Quebec, Canada (H4N 1C7)

Filed Sept. 13, 1976, Ser. No. 722,377

Int. Cl.² B65B 57/10, 35/30

U.S. Cl. 53—62

7 Claims



1. An apparatus comprising a frame, at least one feed conveyor for advancing liquid filled pouches, a rotary chute assembly having a plurality of chute groups with each chute group including a number of adjacent vertically extending chute sections corresponding to the number of pouches to be filled in a bag, each chute group including an outer bag holding station below the chute group, and means for opening said outer bag to receive a number of pouches from the particular chute group, each chute group in a bag holding assembly being adapted to rotate about a circular locus passing under the discharge of the feed conveyor, and cooperating means causing the feed conveyor to advance when there is a predetermined number of pouches on the feed conveyor and there is a chute group passing below the discharge of the feed conveyor so as to receive a number of pouches being fed by the feed conveyor.

4,052,838

APPARATUS FOR PACKAGING NESTED, UNIFORMLY SHAPED ARTICLES

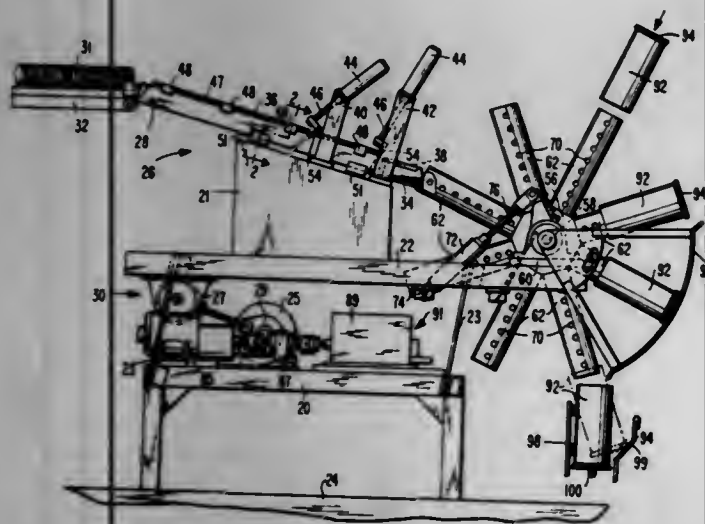
Barney W. Hilton, and William E. Bemberek, both of Dallas, Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed May 4, 1976, Ser. No. 682,905

Int. Cl.² B65B 35/34, 39/06, 5/06

U.S. Cl. 53—159

17 Claims



1. Apparatus for inserting individual charges of nested, uniformly-shaped articles into containers comprising: transfer and metering means for sequentially metering and separating individual charges of nested, uniformly-shaped

articles from a supply thereof, including downwardly inclined conveyor means along which said individual charges move, said conveyor means having a lower discharge portion;

packaging means comprising a rotatably mounted hub member; and a plurality of sleeve members on said hub member, said sleeve members extending radially outwardly from said hub member and the outer end of said sleeve members being open and adapted to receive a said individual charge, said hub member being rotatably mounted adjacent said transfer and metering means for cooperation therewith to bring said outer end of respective ones of said sleeves adjacent said discharge of the conveyor means as said hub member rotates into the charge-receiving position in which said cooperating sleeve inclines downwardly from its outer end, said cooperating packaging means and said transfer and metering means being adapted for an individual charge to be transferred from said conveyor means discharge into the cooperating one of said sleeves, said sleeve members during rotation of said hub member moving intermittently to said charge-receiving position and in sequence thereafter to an upper container-receiving position and in which the sleeve in container-receiving position is in the upper portion of the path of rotation of said sleeves, and is adapted for a container to be passed over said sleeve member, and to a discharge position in which the container with the charge contained therein is discharged from said sleeve member when the latter is positioned in the lower portion of said path of rotation;

rotating means for rotating said hub member to sequentially move each said sleeve member in a step-wise fashion to said charge-receiving position, upwardly to said container receiving position, and downwardly to said container discharge position, said transfer and metering means including means for metering a said individual charge into said cooperating sleeve in charge-receiving position; and receiving means adjacent said discharge position of the sleeves for receiving containers with a charge of nested, uniformly-shaped articles therein.

4,052,839

COIN-PACKAGING MACHINE

Erwin Gross, Karlsruhe, Germany, assignor to Standardwerk Eugen Reis GmbH, Bruchsal, Germany

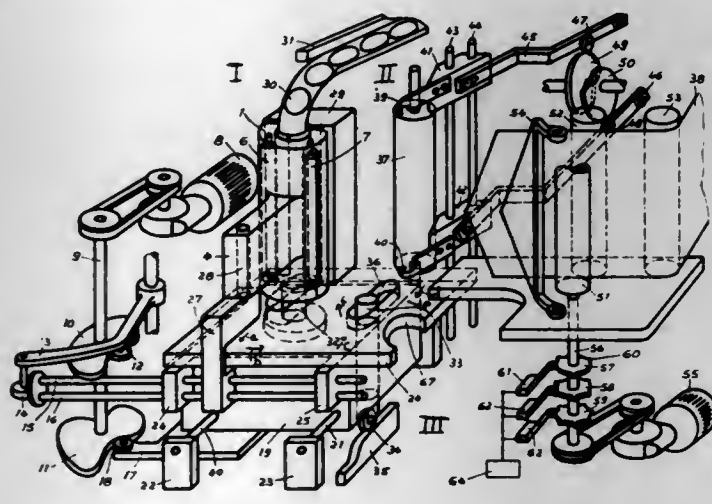
Filed July 27, 1976, Ser. No. 709,099

Claims priority, application Germany, Aug. 16, 1975, 2536427

Int. Cl.² B65B 11/04

U.S. Cl. 53—212

14 Claims



1. Apparatus for packaging a stack of coins into a roll comprising a flat supporting plate, a hollow cylindrical tube member open at both ends movably mounted above said plate, one end of said tube being in slidable contact with said plate, said tube extending perpendicularly therefrom for receiving coins in said other end, said coins being supported in stacked condi-

tion on said plate, a first station having means for feeding a predetermined number of coins to said tube, a second station having means for feeding a wrapper and wrapping said coins, and a third station having means for discharging said wrapped coins, said stations being disposed spaced from each other about the plate and means for conveying said tube and the coins therein in slidable contact with said plate sequentially from said first to second to third positions and thereafter said tube free of coins from said third to first position.

4,052,840

APPARATUS FOR SEVERING AND OVERLAPPING MATERIAL WEB SECTIONS, ESPECIALLY FOR A PACKAGING MACHINE FOR TOBACCO PRODUCTS

Ernst Schneeberger, Neuchatel, Switzerland, assignor to Molins Limited, London, England

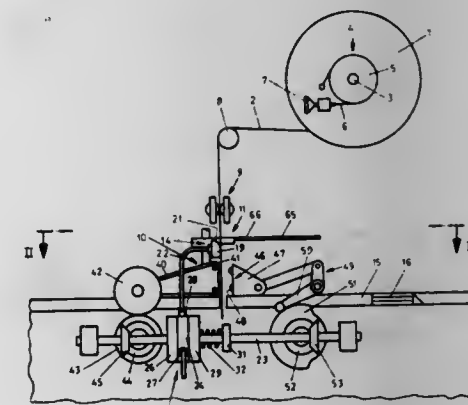
Filed July 1, 1976, Ser. No. 701,949

Claims priority, application Switzerland, July 4, 1975, 8761/75

Int. Cl.² B65B 41/18; B26D 7/06

U.S. Cl. 53—389

18 Claims



1. Apparatus for severing sections of a material web and for overlapping the severed sections in pairs, especially for a packaging machine for the packaging of products which can be smoked, comprising a supply roll for supplying a material web, a withdrawal device for withdrawing the material web from the supply roll, a cutter device for cutting sections from the material web, a conveyor device for conveying the cut sections, a holder device comprising a suction nozzle arranged between the cutter device and the conveyor device adjacent the plane of travel of the material web, a control device comprising a pneumatic valve for operating the holder device by control of the application of suction through said nozzle such that said holder device fixedly holds a cut section for overlapping the same until the material web which continuously moves has displaced over the fixedly held cut section by an amount corresponding to a predetermined overlapping width, said pneumatic valve including means to vent said suction nozzle to atmosphere after fixedly holding said cut portion to precisely control said overlapping width.

4,052,841

MECHANISM FOR OPENING AND CLOSING A CROP MATERIAL ROLL FORMING REGION IN A ROLL FORMING MACHINE

Robert L. Rice, New Holland, and Aquila D. Mast, Lancaster, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Feb. 9, 1976, Ser. No. 656,753

Int. Cl.² A01D 39/00

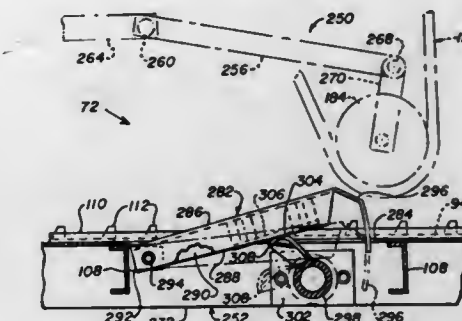
U.S. Cl. 56—341

20 Claims

1. In a crop material roll forming machine, the combination comprising:

a mobile frame adapted to move across a field;
crop material delivery means supported by said frame;
upper flexible means movably mounted by said frame above

said delivery means to define a roll forming region therebetween having inlet and discharge ends;
said delivery means including conveying means operable to move crop material in a predetermined direction along a path from adjacent said inlet end toward said discharge end of said region;
said upper flexible means being movable in a direction opposite to said predetermined direction for performing roll forming operation at said region;



ramp means positioned at said discharge end of said region and mounted to said frame for movement between a lowered position in which said ramp means is disposed adjacent said path and thereby facilitate the opening of said discharge end of said region and a raised position in which said ramp means extend generally into said path and thereby facilitate the closing of said discharge end of said region to the passage of crop material therethrough; and means being movable relative to said frame for moving said ramp means between said positions.

4,052,842

CIRCUIT FOR ELECTRONIC WATCHES

Jean-Luc Béguin, Neuchatel, and Willy Droz, Hauterive, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

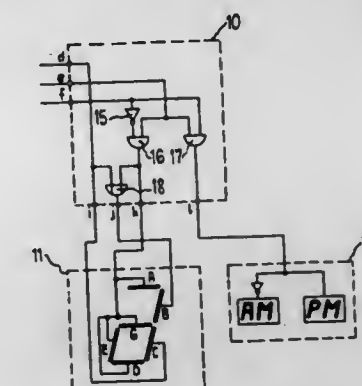
Filed Dec. 29, 1975, Ser. No. 644,443

Claims priority, application Switzerland, Jan. 31, 1975, 1185/75

Int. Cl.² G04B 19/30

U.S. Cl. 58—50 R

3 Claims



1. An electronic timepiece having a digital display, an AM-PM indicator, an hour units counter, and means to enable selection by way of a control input between a 24 hour clock display mode and a 12 hour clock display mode, the improvement wherein said selection means comprises a first and a second flip-flop circuit, a decoder circuit coupled between outputs of said flip-flop circuits and a digital display and AM-PM indicator for driving said display and indicator, and logic means coupled with the counter and said flip-flop circuits and responsive to the control input for interconnecting said flip-flop circuits to form a counter for the tens of hours when said 24 hour clock display mode is selected, and for connecting said first flip-flop circuit to count the tens of hours and said second flip-flop circuit to control the AM-PM indicator when said 12 hour clock display mode is selected.

4,052,843

APPARATUS FOR PREVENTING SURGING OF A GAS TURBINE

Masaki Takizawa, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kaisha, Ltd., Tokyo, Japan

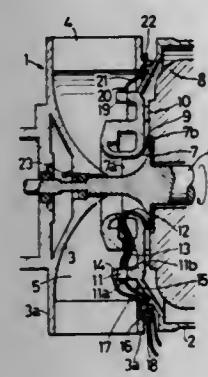
Filed Sept. 23, 1975, Ser. No. 616,016

Claims priority, application Japan, June 4, 1975, 50-67978

Int. Cl.² F02C 9/08

U.S. Cl. 60-39.28 R

6 Claims



1. Apparatus for preventing surging of a gas turbine for an automobile, said gas turbine having an inlet air filter, a compressor and a bell-mouthed air intake positioned between said inlet air filter and said compressor, said apparatus comprising:
 - a differential pressure gauge which transmits an electric output signal responsive to the differential pressure ΔP between the air pressure immediately downstream of said air filter and the air pressure at the inlet of said compressor;
 - a function generator which receives each number N of rpm of the engine as an electric signal and transmits an output signal corresponding to the critical differential pressure ΔP_c which causes surging at said number N of rpm of said gas turbine; and
 - a comparator-function generator which receives ΔP and $-\Delta P_c$ as input signals and transmits an output signal to control fuel control means when ΔP approaches ΔP_c .

4,052,844

GAS TURBINE COMBUSTION CHAMBERS

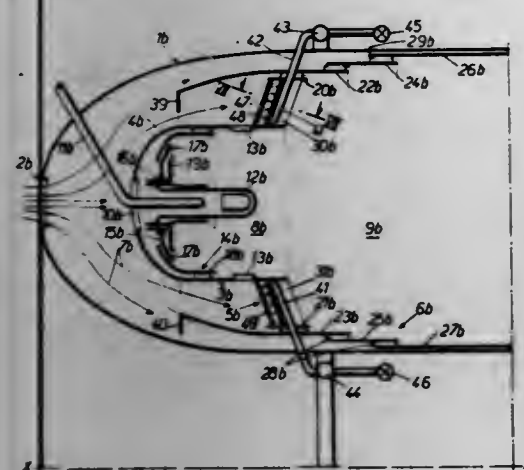
Jacques Emile Jules Caruel, Dammarie-les-Lys; Hervé Alain Quillevér, Issy-les-Moulineaux, and Philippe Marc Denis Gastebois, Melun, all of France, assignors to Société Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed June 2, 1975, Ser. No. 583,189

Int. Cl.² F02C 7/22

U.S. Cl. 60-39.65

17 Claims



1. A combustion chamber comprising:
 - a stepped flame tube placed in an air stream and comprising:
 1. an upstream section bounding a first combustion zone extending parallel to the air stream,
 2. a downstream section wider than the upstream section

and bounding a second combustion zone extending parallel to the air stream, said downstream section having an upstream portion which extends over a major length thereof and has imperforate generally annular walls and passages therebetween for the entry of cooling air flowing film-like along said imperforate walls, and

3. shoulder means extending outwardly of the first combustion zone and generally transversely of the air stream direction, to form a step between said upstream and downstream tube sections, said step having a multiplicity of air intake apertures therethrough to admit into said second combustion zone a flow of air taken from said air stream and flowing substantially parallel thereto, and solid portions between said intake apertures to produce wakes in said flow of air,
- b. fuel injection means in the first combustion zone for emitting jets of fuel towards the upstream end of said first combustion zone,
- c. means for supplying the injection means with fuel at an idling flow rate,
- d. air inlet means for feeding the first combustion zone with combustion air, said air inlet means comprising means for directing air from the air stream substantially parallel thereto along said upstream tube section, and a plurality of openings through said flame tube, adjacent the downstream end of said upstream section, for introducing air from the air stream substantially radially into the first combustion zone, whereby the combustion air is entrained by said jets of fuel and recirculated in said first combustion zone, said air inlet means being so dimensioned that the combustion air forms a substantially stoichiometric mixture with the fuel at said idling flow rate, the first combustion zone having such a volume that combustion of the stoichiometric mixture takes place within the first combustion zone, and
- e. means for injecting a supplementary flow of fuel in said flame tube upstream of said second combustion zone to cause combustion of said supplementary flow of fuel in said wakes behind the said portions of said shoulder means, the volume of said second combustion zone being such that the combustion chamber has an overall volume sufficient to ensure re-ignition in flight.

4,052,845

VARIABLE RATIO BYPASS GAS TURBINE ENGINE WITH FLOW DIVERTER VALVE

Julius W. Tumavicus, Old Saybrook, Conn., assignor to United Technologies Corporation, Hartford, Conn.

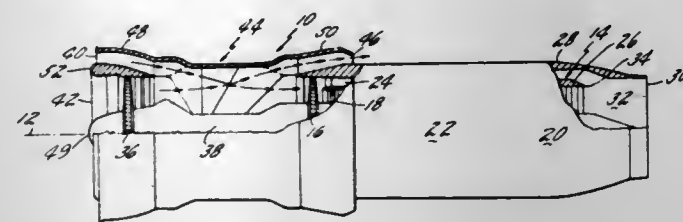
Division of Ser. No. 481,439, June 20, 1974, Pat. No. 3,972,349.

This application Jan. 22, 1976, Ser. No. 651,671

Int. Cl.² F02K 3/06

U.S. Cl. 60-226 R

12 Claims



1. A variable bypass ratio turbojet engine including:
 - A. a front fan mounted for rotation about the engine axis,
 - B. an annularly shaped auxiliary inlet concentrically enveloping said front fan,
 - C. an engine fan concentrically enveloping said engine axis in spaced axial relation downstream of said front fan,
 - D. an annular thrust nozzle enveloping said engine fan and concentric therewith,
 - E. an annular inverter valve system concentric about the engine axis and positioned between said forward fan and auxiliary inlet and said engine fan and thrust nozzle so as

to be downstream of said front fan and auxiliary inlet and upstream of said engine fan and said thrust nozzle and communicating with each for inverting the flow relationship between the front fan and auxiliary inlet fluid streams comprising:

1. a fixed, annularly shaped upstream member shaped to define:
 - a. a first duct system having a first annular inlet communicating with said auxiliary air inlet to receive all fluid flow therefrom and a first outlet comprising a plurality of radially extending and circumferentially spaced outlets communicating with said first inlet,
 - b. a second duct system having a second annular inlet communicating with said front fan to receive all fluid therefrom and concentrically enveloping said first annular inlet to cooperate therewith in defining an annular inlet for said upstream member and a second outlet comprising a plurality of radially extending and circumferentially spaced outlets communicating with said second inlet and arranged alternately with said first outlets to define an annular outlet for said upstream member,
2. a fixed, annularly shaped downstream member positioned axially downstream in spaced relation to said upstream member and shaped to define:
 - a. a third duct system having a third inlet comprising a plurality of radially extending and circumferentially spaced inlets and a third annular outlet communicating with said third inlet and with said annular thrust nozzle so that all fluid flowing through said third annular outlet passes through said thrust nozzle,
 - b. a fourth duct system having a fourth inlet comprising a plurality of radially extending and circumferentially spaced inlet ports arranged alternately with said third inlet ports to define an annular inlet for said downstream member and communicating with a fourth annular outlet concentrically enveloping said third annular outlet and cooperating therewith in defining an annular outlet for said downstream member and also communicating with said engine fan so that all fluid passing through said fourth annular outlet will flow through said engine fan,
3. a plurality of flapper valves actuatable to join the outlet of said first duct system to the inlets of said fourth duct system while the outlets of said second duct system are joined to the inlets of said third duct system when said flapper valves are in a first position so as to place said inverter valve system in parallel flow condition and said engine in high bypass ratio take-off condition, and actuatable to a second position wherein the outlets of said first duct system are joined to the inlets of said third duct system while the outlets of said second duct system are joined to the inlets of said fourth duct system so as to place said inverter valve system in series flow condition and said engine in low bypass ratio cruise condition.

4,052,846

BAFFLED COMBUSTION CHAMBER

Klaus Schadow, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 8, 1976, Ser. No. 647,524

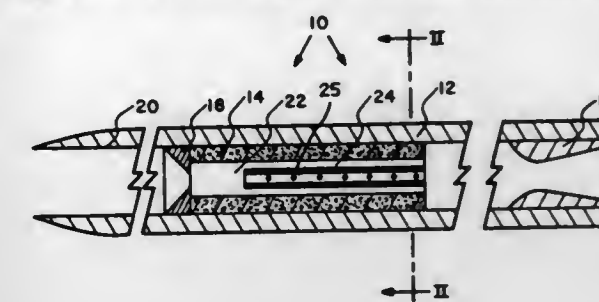
Int. Cl.² F02K 9/04

U.S. Cl. 60-251

3 Claims

1. In a solid fuel ramjet engine having a combustion chamber defined between a forward injector plate, which contains an air inlet to enable the passage of ram air into the engine and to act further as a flame retarder, and an after nozzle and surrounded by a solid fuel grain, the improvement comprising:
 - a baffle means fastened within said chamber between said injector plate and a point near the aft end of said grain; and

said baffle extending from said point near the aft end of said fuel grain to a point spaced from said injector plate and



comprising interposing baffle surfaces between the inner surface of said grain and longitudinal axis of said chamber,

4,052,847

GAS TURBINE ENGINE GAS FLOW DUCTS

Leonard John Rodgers, Spondon, and Alan Stuart, Ashby-de-la-Zouch, both of England, assignors to Rolls-Royce Limited, London, England

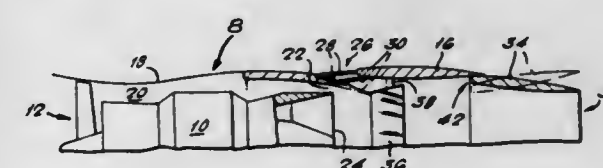
Filed Feb. 2, 1976, Ser. No. 654,169

Claims priority, application United Kingdom, Feb. 14, 1975, 6321/75

Int. Cl.² F02K 3/06, 1/02

U.S. Cl. 60-262

10 Claims



1. An exhaust flow duct for receiving fan air and exhaust gases from a ducted fan gas turbine engine power plant, said exhaust flow duct comprising:
 - a. an augmentor air intake positioned within the length of the exhaust flow duct and through which ambient air may flow into the exhaust flow duct;
 - b. a flow mixing device comprising a generally annular shaped member mounted coaxially within said exhaust flow duct in radially spaced apart relationship therewith, said generally annular shaped member having its upstream end positioned downstream of said augmentor air intake and having lobes formed at least in its downstream end portion with a converging exterior surface for causing flow exterior of said annular shaped member to converge in a downstream direction and a diverging interior surface for causing flow interior of said annular shaped member to diverge in a downstream direction and to mix with the converging exterior flow downstream of said annular shaped member; and
- flap means for selectively opening and closing said augmentor air intake, said flap means being movable between a first position closing said augmentor air intake and permitting fan air and exhaust gases to respectively flow over the exterior and interior of said annularly shaped member and a second position wherein said augmentor air intake is opened to permit only ambient air to flow over the exterior of said annular shaped member and to direct fan air and exhaust gases to flow through the interior of said annular shaped member.

4,052,848

ANTI-AFTERBURN SYSTEM

Hiroaki Ono, Katsuragocho, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

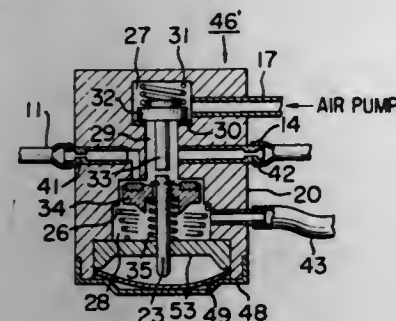
Filed Aug. 6, 1975, Ser. No. 602,263

Claims priority, application Japan, Feb. 27, 1975, 50-24572

Int. Cl.² F02B 75/10

U.S. Cl. 60-290

5 Claims



1. An anti-afterburn system for an engine having an air pump, comprising a control valve for controlling secondary air supply from said pump to an exhaust system of the engine, a pressure differential responsive member dividing a housing into two chambers and being connected to said control valve, conduits connecting respectively said chambers with an intake manifold of the engine, a first orifice provided in one of said conduits so that said control valve is operated by abrupt variation of a pressure in said intake manifold to interrupt or reduce said secondary air supply, and a thermo valve means having a first chamber defined in a casing and supplied with an air pump pressure, a passage operatively connecting said first chamber with one of said two chambers, a first valve member opening and closing said passage, and a temperature sensing means responsive to a predetermined temperature to move said valve member so as to supply the air pump pressure to said one chamber, thereby operating said control valve to interrupt said secondary air supply, and said thermo valve means comprises a second chamber connected to said one chamber through said passage and to said first chamber which continuously communicates with the air pump pressure, said first valve member being located in said first chamber and normally closing the supply of said air pump pressure to said one chamber through said second chamber, a valve stem being slidably received in said casing adjacent to said sensing means, one end of said stem extending into said chamber and operatively connected to said first valve member to open the latter when the sensing means senses said predetermined temperature.

4,052,849

MECHANICAL WORK GENERATING MEANS

George D. Dumbaugh, Louisville, Ky., assignor to Vibrationics, Inc., Louisville, Ky.

Filed Oct. 20, 1975, Ser. No. 623,735

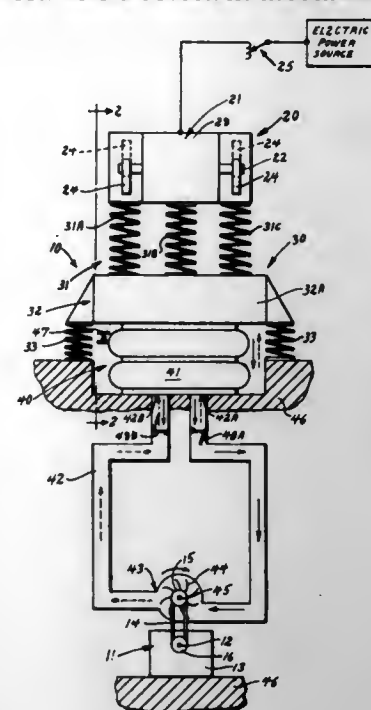
Int. Cl.² F03B 17/00

U.S. Cl. 60-325

9 Claims

1. Mechanical work generating means, comprising:
a. first means for mechanically generating a heat component of work including excitor means provided with rotatable eccentrically-mounted weights;
b. second means, mechanically interconnected to said first means, for mechanically generating a non-heat component of work comprising yieldable means that are tuned to be substantially at their natural vibratory frequency and inertia absorbing means; and
c. third means, mechanically interconnected to said first and

second means, for combining said heat and non-heat components of work into a resultant mechanical work output,



d. said third means comprising fluid-containing pump means and there being action caused upon the fluid contained therein by said heat and non-heat components of work.

4,052,850

THRUST GENERATOR

Udo H. Mohaupt, Cambridge, Canada, assignor to Institute of Gas Technology, Chicago, Ill.

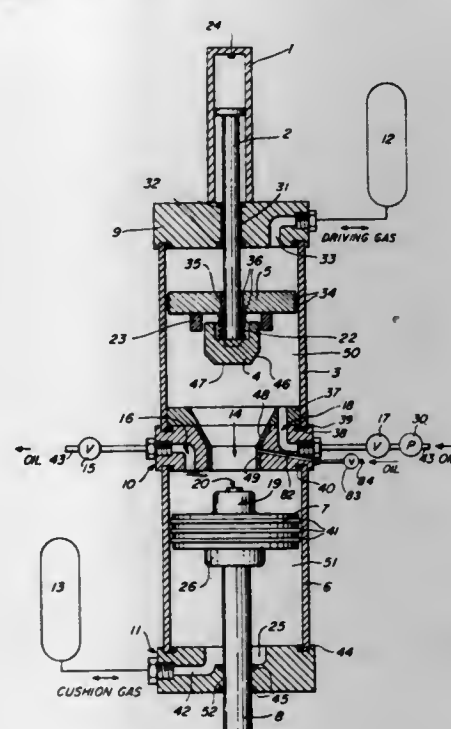
Continuation-in-part of Ser. No. 621,687, Oct. 14, 1975, Pat. No.

3,999,384. This application Nov. 1, 1976, Ser. No. 737,717

Int. Cl.² F15B 1/02, 15/22

U.S. Cl. 60-327

11 Claims



1. A thrust generator comprising:
a. substantially gas-tight driving cylinder, a floating piston adapted for substantially gas-tight reciprocating movement within said driving cylinder, a driving gas accumulator means in communication with a first end of said driving cylinder, the second end of said driving cylinder having a driving port;
b. substantially gas-tight cocking cylinder, a power piston adapted for substantially gas-tight reciprocating movement within said cocking cylinder, a cushion gas accumulator means in communication with a first end of said

cocking cylinder, the second end of said cocking cylinder having a driving port in communication with the driving port of said driving cylinder, said power piston having a poppet actuator means on the side of the piston toward said second end and a power piston rod on the other side of said piston adapted for substantially gas-tight reciprocating movement through a power piston rod hole in said first end delivering thrust from said thrust generator;
a. poppet valve adapted for seating in substantially fluid-tight relation with a seating means in said driving port towards said driving cylinder, the other end of said poppet valve having a poppet valve rod adapted for substantially gas-tight reciprocating movement through a poppet rod hole in said floating piston and said first end of said driving cylinder, the other end of said driving port adapted for clearance passage of said poppet actuator;
a. bleed port in communication with said driving port between said poppet actuator and said poppet valve when both said poppet actuator and said poppet valve are within said driving port and pressurized hydraulic fluid supply means and valve means to provide pressurized hydraulic fluid to aid in dislodgement of said poppet valve from said driving port;
a. hydraulic fluid reservoir in communication with a hydraulic fluid pump and supply valve means in communication with said second end of said cocking cylinder and said pump whereby high pressure hydraulic fluid is delivered to the second end of said driving cylinder by said pump, passes through said driving port providing the force to move said power piston and drain from the second end of said cocking cylinder through said hydraulic fluid drain valve means to said reservoir; and
control means for operation of said hydraulic fluid supply valve and drain valve means.

4,052,851

HYDRAULIC BRAKE BOOSTER HAVING INDEPENDENT RESERVE SYSTEMS

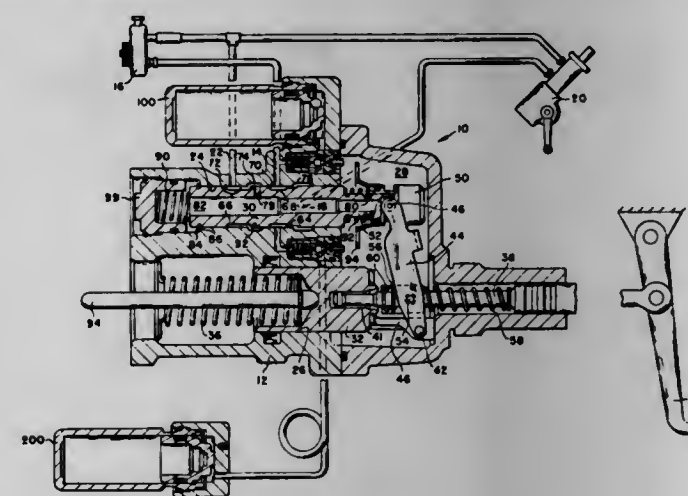
Arthur K. Brown, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Oct. 4, 1976, Ser. No. 729,556

Int. Cl.² F15B 1/02, 20/00

U.S. Cl. 60-404

9 Claims



1. A hydraulic brake booster comprising:
a. housing defining a pressure chamber;
a. spool valve slidably mounted within the housing; said spool valve being movable to open and close communication to the pressure chamber;
a. piston forming a portion of the pressure chamber and being responsive to the pressure within the pressure chamber to move relative to the housing for actuating braking;
a. first accumulator connected to the housing and communicating with the pressure chamber when the pressure in the pressure chamber is below that required to move the piston; and
a. second accumulator communicating with the pressure chamber.

chamber when the pressure in the pressure chamber is below that required to move the piston.

4,052,852

CONSTANT PRESSURE SEALED FLUID STORAGE TANK FOR HYDRAULIC SYSTEMS

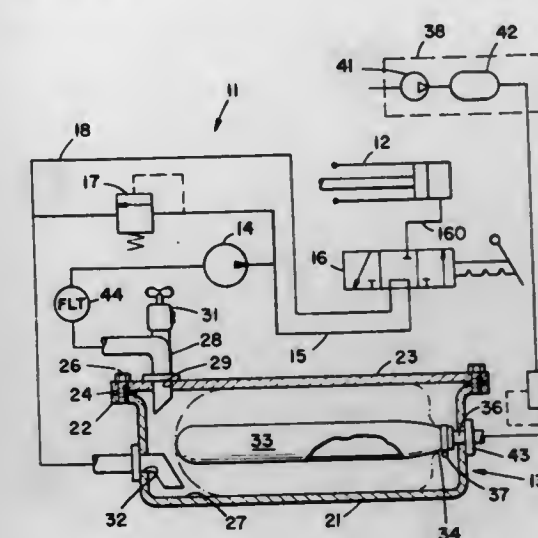
Cullen P. Hart, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 22, 1976, Ser. No. 744,073

Int. Cl.² F15B 1/06

U.S. Cl. 60-478

10 Claims



1. An operating fluid storage for a hydraulic system having variable operating fluid requirements comprising:
a. rigid closed tank defining an interior chamber for storing said operating fluid and having first port means for receiving and releasing said fluid and having second port means for connection to a source of pressurized gas,
an expandable and contractable fluid-tight bladder disposed within said chamber of said tank and being communicated with said second port means to receive and release said gas as operating fluid is withdrawn and received at said tank, and
means for maintaining a predetermined substantially constant gas pressure within said bladder as the volume of operating fluid in said tank and the volume of said bladder undergoes changes.

4,052,853

HOT-GAS RECIPROCATING MACHINE COMPRISING TWO OR MORE WORKING SPACES, PROVIDED WITH A CONTROL DEVICE FOR THE SUPPLY OF WORKING MEDIUM TO THE SAID WORKING SPACES

Jacobus Hubertus Abrahams, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Sept. 9, 1976, Ser. No. 721,671

Claims priority, application Netherlands, Sept. 19, 1975, 7511043

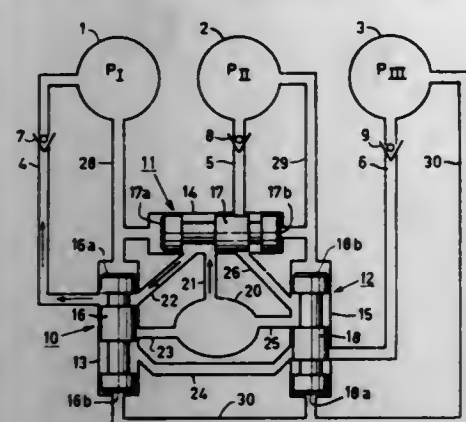
Int. Cl.² F02G 1/06

U.S. Cl. 60-521

2 Claims

1. A hot-gas reciprocating machine comprising two or more working spaces, the volumes of which can be varied at a mutual phase difference by piston-like bodies which are coupled to a crank shaft; a working medium performing a thermodynamic cycle in each of the said working spaces during operation, each of the working spaces being connected, via an associated supply duct which includes a non-return valve which opens in the direction of the relevant working space, to a control device which, during each revolution of the crank shaft, successively connects each of the supply ducts separately to a source of pressurized working medium; said control device comprising at least one control member which is slidable in a housing in the direction of its longitudinal axis under the influence of medium pressures which act on the control member in a mutually opposed sense, said housing comprising at least one inlet

port which is connected to the source and at least one outlet port which is connected to the supply duct, characterized in that the control device is constructed so that each control



member is controlled exclusively as a slide by two mutually phase-shifted cycle pressures which are associated per control member with different working spaces or, relative to the control members mutually, with different pairs of working spaces.

4,052,854

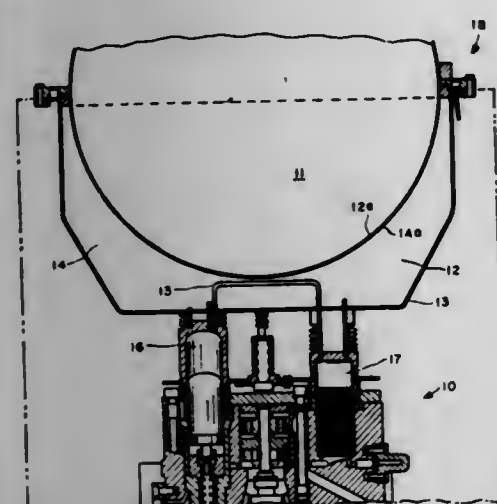
HEAT TRANSFER INTERFACE BETWEEN A HIGH TEMPERATURE HEAT SOURCE AND A HEAT SINK
Frits K. de Pré, and Hendrik A. Jaspers, both of Ossining, N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed July 22, 1974, Ser. No. 490,725

Int. Cl.² F02G 1/04; F28D 13/00; F28F 13/00

U.S. Cl. 60-524

7 Claims



1. A Stirling engine comprising a heat source, working gas for the engine, a heater part in which working gas for the engine is heated, and a heat transfer interface, wherein the interface comprises a pair of adjacent and closely spaced walls formed as generally adjacent flanged peripheries, metallic means for sealing said flanged peripheries together while defining a gap in the range of 0.002 to 0.009 inches between said hemispherical walls, a quantity of gas sealed within said gap, and means for releasably securing together said flanged peripheries to seal said gap while maintaining said spacing between said walls, and the inner one of said concentric walls is a boundary wall of said heat source, and the other of said walls is a boundary wall of said heater part.

4,052,855

BRAKE MASTER CYLINDER CONSTRUCTION

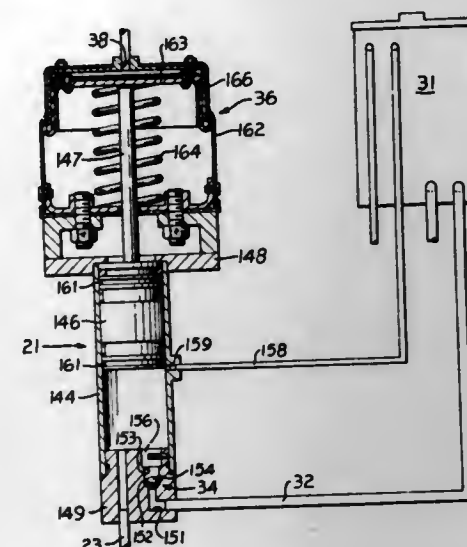
Peter F. M. Prillinger, Peoria Heights; Paul C. Rosenberger, and Alfred W. Sieving, both of Decatur, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 450,974, March 14, 1974, Pat. No. 3,901,556. This application Apr. 23, 1975, Ser. No. 571,026

Int. Cl.² B60T 13/00

U.S. Cl. 60-547

1 Claim



1. A master cylinder for applying hydraulic pressure to a vehicle brake with fluid derived from a make-up fluid tank comprising an upright cylindrical housing having an upper end closure and a lower end closure, a piston slidable vertically within said housing, means forming a breather port opening at the wall of said housing in position to communicate with the fluid volume therein only when said piston is substantially fully raised away from said lower end closure and forming an upwardly extending breather conduit from said opening to said make-up fluid tank which conduit is free of obstruction between said opening and said make-up fluid tank at all times, resilient means urging said piston upwardly towards said upper end closure, air pressure-operated means for urging said piston downward towards said lower end closure against the force of said resilient means in response to a braking signal to generate hydraulic pressure in said housing, means forming a first port at said lower end closure of said housing for transmitting said hydraulic pressure to said vehicle brake, means forming a second fluid port at said lower end closure of said housing for receiving fluid from said make-up tank, and check valve means within said lower end closure for blocking return fluid flow towards said make-up tank through said second fluid port when said cylinder is pressurized in response to said braking signal, said check valve means having an annular valve seat communicated with said second port by a first passage in said lower end closure and a spherical valve element seatable against said valve seat in response to said hydraulic pressure in said cylinder and being freely liftable from said valve seat in response to reversed hydraulic pressure, said check valve means having a rapid refill passage in said lower end closure extending upward from said valve seat and said valve element to communicate with the interior of said housing below said piston, at least the uppermost portion of said refill passage being of substantially larger diameter than said valve seat and said valve element to prevent said valve element from slowing the rate of flow of make-up fluid when said valve element lifts from said valve seat, said check valve means being situated below the level of said make-up fluid tank and below the level of said breather port whereby a static fluid pressure head from said make-up fluid tank acts against the underside of said spherical valve element to aid lifting of said valve element from said valve seat when said reversed hydraulic pressure occurs within said cylinder.

4,052,856

METHOD AND APPARATUS FOR HARNESSING THE POWER OF MOVING WATER

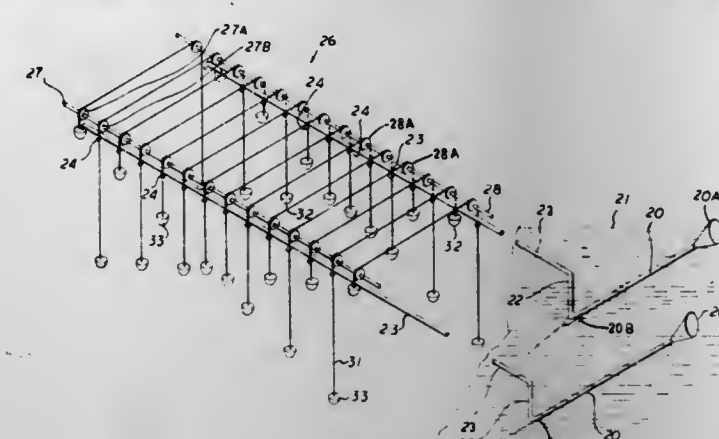
Robert Trotta, 2954 W. 8th St., Brooklyn, N.Y. 11224

Filed Oct. 30, 1975, Ser. No. 627,237

Int. Cl.² F03G 3/02, 3/04

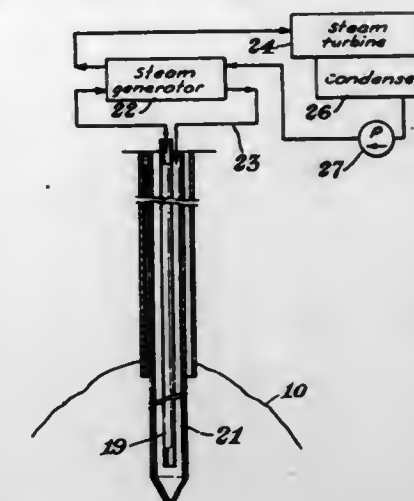
U.S. Cl. 60-639

16 Claims



1. A system for the harnessing the power of moving liquid for producing useful work comprising:
a pair of spaced apart drive shafts,
a plurality of rotary means journaled on each of said drive shafts at spaced apart intervals to effect the drive thereof whereby the rotary means on one of said drive shafts has an opposite complementary rotary means on the other shaft,
a unidirectional clutch means operatively connecting each such rotary means to its respective drive shaft whereby one drive shaft is rotated in one direction and the other drive shaft is driven in opposite direction as said rotary means is actuated,
a flexible drive threaded over the respective complementary pairs of oppositely disposed rotary means,
said flexible drive having opposed end portions,
a container connected to each portion of the respective flexible drives,
and means for alternately charging and discharging said containers disposed on opposite ends of said flexible drive with liquid in a predetermined sequence to effect the cascading of said containers in predetermined timed relationship over the respective drive shafts so that said cascading containers effect a continuous, uniform drive of the respective drive shafts.

pipe, said closed end pipe and said insulated pipe thus forming, in combination, a double pipe heat exchanger;



e. circulating a heat exchange fluid through both the double pipe heat exchanger and through an energy extracting means; and
f. recovering energy from the heat exchange fluid.

4,052,858

METHOD AND APPARATUS INTEGRATING WATER TREATMENT AND ELECTRICAL POWER PRODUCTION

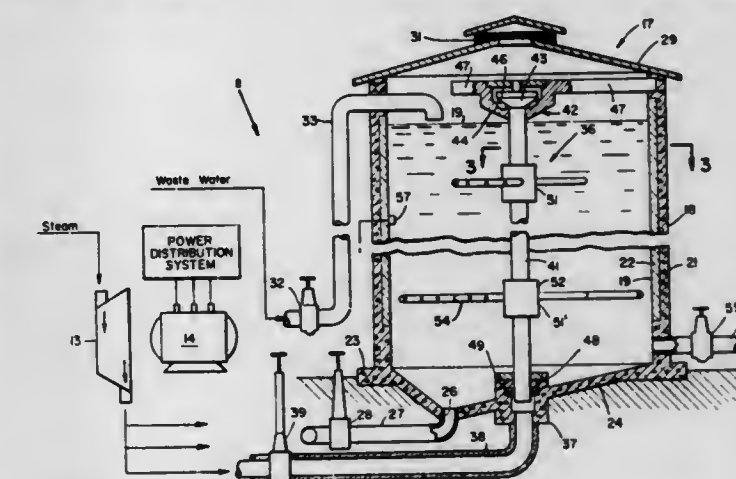
Morris R. Jeppson, Box 4943, Carmel, Calif. 93921

Filed Jan. 8, 1975, Ser. No. 539,338

Int. Cl.² F01K 17/02

U.S. Cl. 60-648

44 Claims



1. A process integrating power production and water treatment, comprising:
bringing unsterilized water into proximity to an electrical power generating station of the form operated from a source of steam;
converting a first portion of the energy content of said steam to electrical energy in said power generating station;
utilizing another portion of said energy content of said steam to heat said unsterilized water to a temperature range at which living organisms therein are destroyed, said temperature range being below the boiling point of said unsterilized water;
maintaining said water in liquid condition at said temperature range for a period of time sufficient to sterilize said water, said step of maintaining said water at said temperature range being accomplished at least in part by restricting the conduction of heat away from said water; and
delivering said sterilized water to a water distribution system.

4,052,857

GEOHERMAL ENERGY FROM SALT FORMATIONS
Sidney J. Altschuler, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 6, 1976, Ser. No. 730,050

Int. Cl.² F03G 7/04

U.S. Cl. 60-641

6 Claims

1. A method of extracting geothermal energy comprising the steps of:

- a. drilling and casing a well into a rock salt formation to a depth at which the rock salt behaves plastically;
- b. inserting a closed end pipe into the well said pipe being filled with removable weighted material;
- c. sinking the pipe in the plastic salt to a depth at which the calculated energy output is of a selected value;
- d. inserting an insulated pipe within the sunken closed end

4,052,859

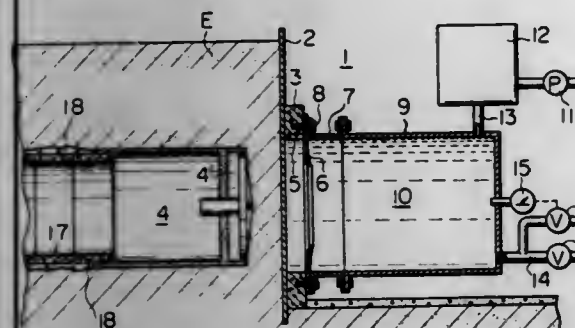
METHOD AND APPARATUS OF COMPLETING SLURRY SHIELD TUNNELING AT VERTICAL SHAFT
Yasuyuki Iwamitsu, Ichikawa, and Shigeru Kobayashi, Tokyo, both of Japan, assignors to Tekken Construction Co. Ltd., Japan

Filed Oct. 13, 1976, Ser. No. 732,045

Claims priority, application Japan, Feb. 12, 1976, 51-13155
Int. Cl.² E21D 9/04

U.S. Cl. 61-42

13 Claims



1. A method of completing at a vertical shaft a tunneling through a highly water containing soft ground with a slurry shield type tunneling machine comprising steps of
 - a. providing a side wall having an initially closed final tunnel port of a diameter larger than that of said tunneling machine at a position along a vertical shaft wall where said tunneling machine is to reach,
 - b. defining a liquid-tight chamber inside the shaft and communicating with said tunnel port,
 - c. filling said liquid-tight chamber with a liquid under a pressure capable of resisting a pressure applied to said side wall by the soft ground,
 - d. opening the tunnel port with advances of the tunneling machine through the ground and tunnel port into the liquid-tight chamber while keeping said liquid pressure in the chamber substantially constant, and
 - e. closing clearances between tunnel wall segments installed behind the machine and peripheral edges of the tunnel port in a liquid-tight manner.

4,052,860

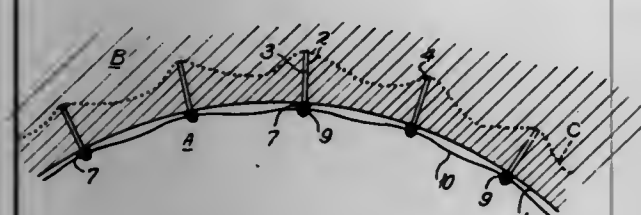
CONSTRUCTION OF UNDERGROUND TUNNELS AND ROCK CHAMBERS

Israel Alterman, Savyon, Israel, assignor to Environmental Engineering Dr. Ing. Alterman Ltd., Savyon, Israel
Filed Nov. 13, 1975, Ser. No. 631,445

Claims priority, application Israel, Dec. 9, 1974, 46208
Int. Cl.² E21D 20/00

U.S. Cl. 41-45 B

9 Claims



1. A method of converting the walls of a rock cavity into a load-bearing structure by prestressing comprising the steps of: making a plurality of long bores in the walls along the entire cavity to be prestressed, said bores being angularly disposed in relation to the wall surface, and said bores being arranged in the shape of a one-sheet hyperboloid around and coaxial with said cavity, inserting into each bore a tension member of high tensile strength and rigidly connecting a predetermined length thereof adjoining its inner end to the bore end portion, leaving a remaining part of said tension member unat-

tached to the bore and causing the outer end of said tension member to protrude out of the bore into the cavity, forcefully elongating the tension member by biasing the protruding end thereof against the rock surface, said elongation step being adapted to provide a resulting compression of the rock pattern adjacent the bore and the tension member therein at least commensurate with the largest tensile stress liable to appear in this region.

4,052,861

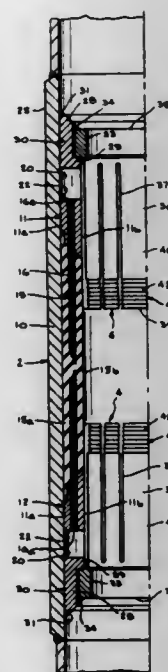
INFLATABLE SECURING ARRANGEMENT
Billy C. Malone, and Malcolm G. Coone, both of Houston, Tex., assignors to Lynes, Inc., Houston, Tex.

Filed Aug. 4, 1975, Ser. No. 603,138

Int. Cl.² E02B 17/00

U.S. Cl. 61-86

5 Claims



1. An inflatable securing arrangement comprising:
 - a. support means;
 - b. an annular elastomer body carried by said support means;
 - c. gripping means carried by said support means and extending longitudinally within said annular elastomer body whereby said elastomer body and gripping means may be moved inwardly relative to said support means; and
 - d. reinforcing means extending longitudinally of said elastomer body, said reinforcing means having a pair of reinforcing sheaths each having first ends secured to said support means and second ends terminating in spaced relation to each other.

4,052,862

METHOD OF SUBMERGING PIPELINES
Jacques Edouard Lamy, Fontenay-aux-Roses, France, assignor to Compagnie Generale pour les Developpements Operationnels des Richesses Sous-Marines "C.G. Doris", Paris, France
Filed May 28, 1976, Ser. No. 690,873

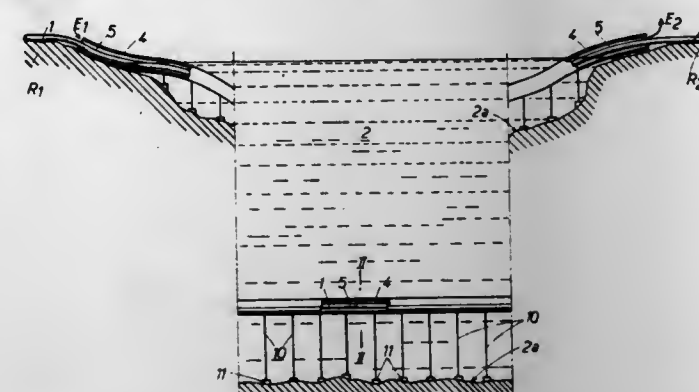
Claims priority, application France, May 30, 1975, 75.16962
Int. Cl.² F16L 1/00

U.S. Cl. 61-112

12 Claims

1. In a method of laying a pipeline in a body of water having a bed, the improvement comprising the steps of (a) enclosing the pipeline over the whole of its length within a ballast tube such that an intermediate space is created between the pipeline and the ballast tube, (b) filling said intermediate space with a liquid less dense than water, to give the assembly of said pipe-

line and ballast tube a positive buoyancy while said assembly is being laid, and (c) replacing said liquid in said intermediate



space with a medium denser than said liquid, to cause said assembly to rest on said bed.

4,052,863

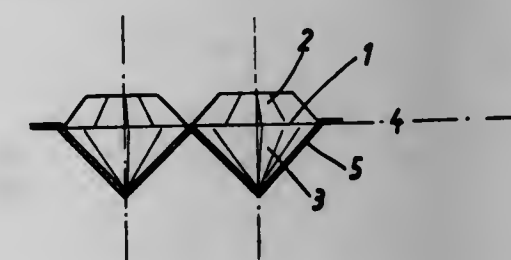
MULTIPLE GEM SETTING HAVING A COMPONENT OF GEMS SET IN FUSION ADHESIVE FOIL
Martin Poll, Fritzens, Austria, assignor to D. Swarovski & Co., Wattens-Triol, Austria

Filed Nov. 4, 1975, Ser. No. 628,665

Claims priority, application Germany, Nov. 4, 1974, 2452250
Int. Cl.² A44C 17/02

U.S. Cl. 63-28

18 Claims



1. A component comprising a plurality of gemstones containing visible faces and seating faces, said gemstones being mounted by their seating faces in a given arrangement and with a given mutual spacing therebetween in respective recesses in a support, said support being a continuous foil of fusion adhesive.

4,052,864

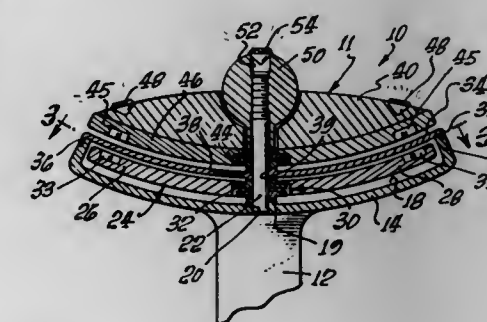
MOBILE JEWELRY MOUNTING MOVED BY UNBALANCED MAGNETIC MEMBER
Werner K. Hofsaess, 2903 Palmer Drive, Los Angeles, Calif. 90065

Filed Sept. 23, 1976, Ser. No. 725,863

Int. Cl.² A44C 17/02

U.S. Cl. 63-31

10 Claims



1. A mobile jewelry mounting mechanism comprising:
 - a mounting base member;
 - an unbalanced rotatable member supported on said base member in freely rotatable relation thereto;
 - a first magnetic means arranged within said unbalanced rotatable member to rotate therewith;
 - a jewelry-setting support means rotatably mounted on said

base member and superposed over said unbalanced rotatable member;

a second magnetic means arranged within said jewelry-setting support means wherein said first and second magnetic means provide corresponding repelling forces to each other; and means for securing said unbalanced rotatable member and said jewelry-setting support means in relatively rotatable relation to one another, and in a relation whereby movements of said unbalanced rotatable member are transmitted to said jewelry-setting support means by interaction of said first and second magnetic means.

4,052,865

THREAD-GUIDING MECHANISM FOR FLAT-BED KNITTING MACHINE

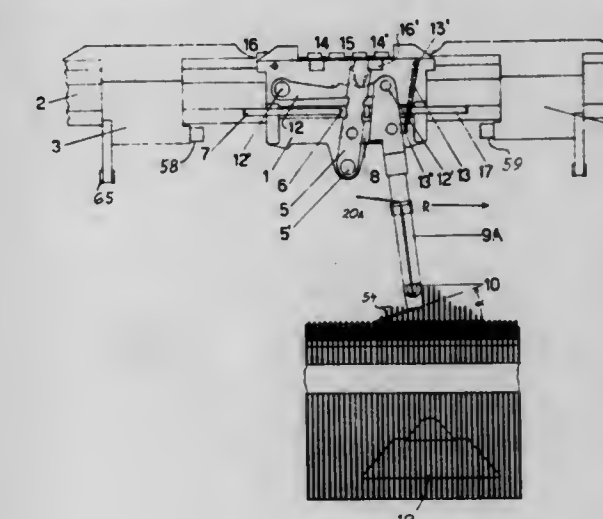
Gino Zamarco, Via Cavour 11, Somma Lombardo (Varese), Italy (21019)

Filed Apr. 29, 1976, Ser. No. 681,590

Claims priority, application Italy, Apr. 29, 1975, 22832/75
Int. Cl.² D04B 15/52

U.S. Cl. 66-128

10 Claims



1. In a knitting machine provided with a flat needle bed carrying a multiplicity of knitting needles, feed means for supplying thread to said needles, and reciprocating drive means for successively displacing an active group of said needles to draw the supplied thread into a row of loops during each machine cycle, the improvement wherein said feed means comprises:

a plurality of slides each provided with a thread guide; support means enabling the displacement of said slides adjacent one another across said needle bed with entrainment of respective threads past said needles, each thread guide being movable on its slide between two positions relatively offset in the direction of slide displacement;

a pair of end stops for each slide; transport means coupled with said drive means for entraining each slide during a machine cycle along a path limited by said end stops to extend over only a fraction of said row of loops, with presentation of the corresponding thread to less than all the needles of said group, the distances traveled by said slides complementing one another with limited overlap whereby said row of loops is formed from a succession of different threads; and

switchover means on each slide controlled by the associated end stops for moving the thread guide thereof from one of said positions, advanced in the direction of slide displacement, to the other of said positions at the end of its path, with resulting removal of the corresponding thread from the reach of needles engaging the thread of another slide starting on a continuation of said path.

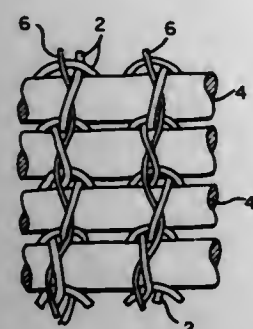
4,052,866

HIGH-RECOVERY FORCE WARP KNIT STRETCH FABRIC WITH LENGTHWISE STABILIZATION

Linda Anne Saunders, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Sept. 27, 1976, Ser. No. 727,364
Int. Cl.² D04B 23/08, 23/10

U.S. Cl. 66—193

5 Claims



1. A high recovery force warp knit fabric suitable for dispensing application, comprising chain stitches of inelastic yarn, elastomer yarn laid into each course of said chain stitches to provide said fabric with widthwise stretch of at least 200% and recovery force of at least 750 g per cm of fabric length at 100% stretch of said fabric, said elastomer yarn being present in at least 20,000 denier per cm of length of said fabric, and substantially inextensible yarn laid lengthwise in said chain stitches to limit the stretch of said fabric in the direction of said chain stitches upon the stretch of said fabric in the elastomer yarn direction.

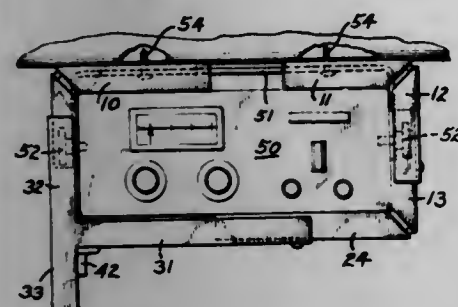
4,052,867

LOCKING SECURITY FRAME

John Ray Faunce, Graver & Ervin Roads, Pipersville, Pa. 18947
Filed Aug. 2, 1976, Ser. No. 710,713
Int. Cl.² E05B 73/00

U.S. Cl. 70—58

5 Claims



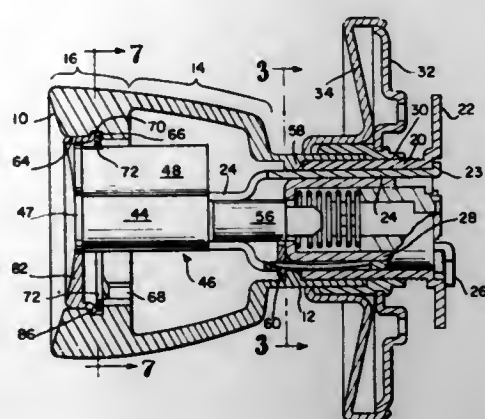
1. A locking security frame comprising four frame sides defining an open center which will receive a four sided article to be secured against theft, each side frame including two parts which are adjustable lengthwise of each other to fit the size of the article, said parts being of channeled cross section with the opening facing inwardly of the frame, the two channel parts at one side frame being disposed to enclose and prevent access to the means used to attach the article to a fixed body, the two channel parts at each of the other three side frames having a sliding fit within each other so that they telescope relative to each other, and releasable securing means for retaining the two parts of each of said three side frames in a fixed lengthwise position, said channelled parts of said other three side frames serving to enclose said releasable securing means and thereby preventing access to said securing means to prevent their release.

4,052,868

DOOR KNOB CONSTRUCTION

Walter E. Best, and R. Gene McCullum, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.
Continuation-in-part of Ser. No. 523,570, Nov. 14, 1974, Pat. No. 3,955,387. This application Apr. 16, 1976, Ser. No. 677,727
Int. Cl.² E05B 63/10, 3/04

19 Claims



1. A knob construction, comprising a knob body having an outer end opening of circular cross section, the wall of said opening being formed with an axially-outward-facing stop shoulder and a radially-inward-opening groove forward of such shoulder, and an end face member having a peripheral skirt extending toward said stop shoulder, said skirt being pressed toward said shoulder so as to deform the same outward into said groove to secure the member in place in the end opening of the body.

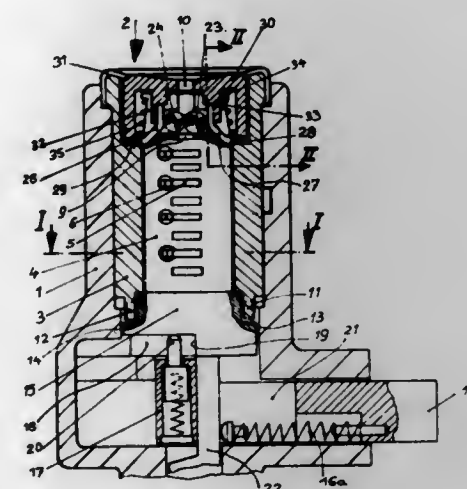
4,052,869

ANTI-THEFT DEVICE HAVING A CYLINDER LOCK

Günter Weber, Wuppertal, Germany, assignor to Neiman S. A., Courbevoie, France
Filed Aug. 5, 1975, Ser. No. 602,035
Claims priority, application Germany, Aug. 29, 1974, 2441463
Int. Cl.² E05B 65/12

U.S. Cl. 70—252

8 Claims



1. An anti-theft device comprising a lock body, a cylindrical barrel rotatably mounted in said body and including an axial passage for insertion of a key, locking means in said barrel engaging said body to prevent rotation of said barrel, said locking means being operable by insertion of a correctly coded key to free the barrel for rotation within the body, said barrel being axially slidable within said body between an outer, locked position and inner, operative position, closure means disposed at an entrance end of said axial passage and movable between a first position in which said means is effective to prevent insertion of a key into said passage in said outer position of said barrel and second position to allow insertion of the key into said passage in the inner, operative position of said barrel.

key into said passage in the inner, operative position of said barrel, and means biasing said closure means towards said first position, pressure applied to said closure means against the action of said biasing means by the leading end of the key, moving said barrel to said operative position and thereafter moving said closure means to said second position to allow insertion of said key into said passage, said barrel including an operating part rotatable therewith and cooperating with a bolt element to move that element between locking and releasing positions, said barrel being formed at that end thereof from which a key is inserted therein, with a T-sectioned slot, said closure means being guided for axial radial movement therein, a thrust ring disposed between opposed surfaces of said body and barrel and rotatable with said barrel, said ring including elements projecting into said slot and cooperating with said closure means, means biasing said barrel towards said outer position, and wherein a cap is rotatably mounted at that end of the barrel from which said key is inserted and between the thrust ring and a ring protecting said body, said cap being coupled to rotate with the barrel by lugs positively engaged in the T-shaped groove, said lugs being radially and axially contiguous with free ends of said parts of the thrust ring.

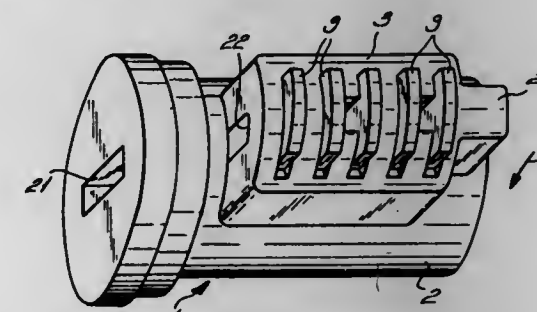
4,052,870

BARREL HAVING TUMBLER PLATES FOR A CYLINDRICAL LOCK

Guy Degeye, Meru, and Roger Filaine, Chaumont-en-Vexin, both of France, assignors to Paul Journee S.A., Courbevoie, France
Filed Sept. 18, 1975, Ser. No. 614,452
Claims priority, application France, Oct. 3, 1974, 74-33301
Int. Cl.² E05B 27/00

U.S. Cl. 70—364 R

1 Claim



1. A barrel having tumbler plates for a cylindrical lock, said barrel comprising a cylindrical body having a center cavity communicating laterally of the axis of the body with two diametrically opposed cylindrical surfaces of the body to form openings in said surfaces, and a core of plastic material insertable at one end of said center cavity and passing thereto to occupy said cavity, and having a plurality of radial slots said slots registering with said openings, a plurality of tumbler plates each tumbler plate being received within a corresponding one of said slots and a plurality of return springs each one of which is associated with a corresponding one of said plates, each of said springs extending between an opposed shoulder of its associated tumbler plate and a shoulder within the slot within which the plate is located to bias the plate outwardly of the slot, a substantially rigid second shoulder on the plate facing in the direction in which the plate is biased by said spring, an elastically deflectable boss formed on a surface of said slot and defining a shoulder confronting said rigid shoulder of said plate whereby said plate is insertable into said slot only from that end towards which the plate is biased by the spring and only upon deflection of said boss and after insertion into slot is prevented from being removed by interengagement of said second shoulder of the plate and said shoulder of the boss, said center cavity of the body comprising at least one ramp extending from said one end of said cavity and which terminates in a shoulder and said core comprising a complementary profile which terminates in a projection which clips onto the shoulder of said ramp at the end of the introduction of the core into said body to prevent the removal of said core from said one end, a stop means within the cavity against which the core abuts when inserted to limit the extent to which said core can be inserted into said cavity from said one end.

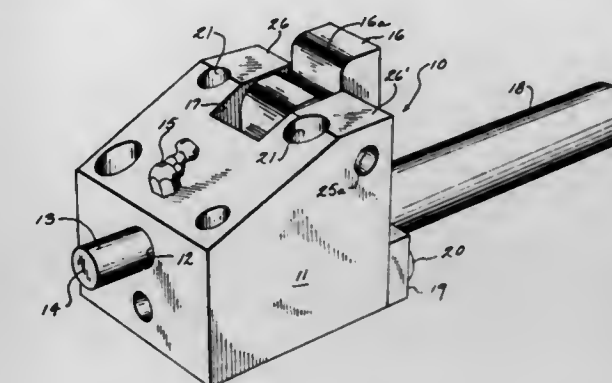
4,052,871

STOCK-PIERCING PUNCH MECHANISM

James E. Persik, and Gerald E. Persik, both of Menomonee Falls, Wis., assignors to J. J. & M., Milwaukee, Wis.
Filed Aug. 13, 1976, Ser. No. 714,186
Int. Cl.² B21D 28/14

U.S. Cl. 72—44

1 Claim



1. A stock-piercing punch mechanism for converting the vertical stroke of a press ram into a nonvertical stock-piercing stroke, which punch mechanism includes:

- a base member provided with a cam trigger-receiving slot and a stock-piercing punch-receiving bore;
- a punch assembly including a punch plate and an elongated punch member having a stock-piercing tip at its outer end positioned in said bore for reciprocal movement; said punch member being removably connected at its inner end to the punch plate so that the elongated punch member having the stock-piercing tip can be replaced without completely disassembling the punch mechanism;
- a cam trigger pivotally mounted in the cam trigger-receiving slot in said member, said trigger having a first convex surface which is adapted to receive a stock-piercing force from a press ram to cause the trigger to pivot and a second convex surface which as the trigger pivots in response to the stock-piercing force transmits that force to the punch plate so as to move the punch member partially out of the bore to a stock-piercing position, said cam trigger being further provided with a radially extending stop member which contacts the punch member and limits the extent of the movement of the trigger when the stock-piercing force is relieved so that when the punch member returns to its original position in the bore the trigger is properly aligned to receive a stock-piercing force;
- compression spring means which restore the punch and the cam trigger to their original position upon relief of the stock-piercing force; and
- lubrication means which include a lubricant reservoir consisting of an annular groove in the base member which is located intermediate the length of said bore and surrounds the outside of the punch member, said lubrication means further including a first passage leading from the outside of the base member to the groove so that lubricant can be introduced through said passage into said groove and a second passage leading from the groove so that lubricant can leave the groove, said groove being adapted to receive and hold lubricant so that the movement of the punch member within the bore will pick up and distribute lubricant from said groove along the outer surface of the punch member and the interior surface of the bore so as to reduce frictional wear.

4,052,872 STANCHIONS

Peter Erwin Herr, Sandton, Transvaal, South Africa, assignor to Springbok Appointments (Proprietary) Limited, Johannesburg, Transvaal, South Africa

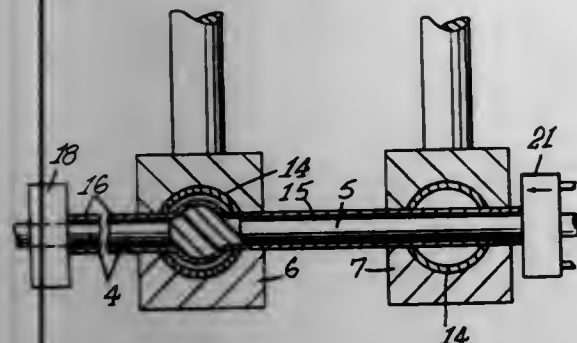
Filed Dec. 1, 1975, Ser. No. 636,796

Claims priority, application South Africa, Dec. 3, 1974, 74/7674

Int. Cl.² B21D 22/10

U.S. Cl. 72-62

6 Claims



1. A method of manufacturing a stanchion or tube having at least two integral bulbous portions thereon comprising the steps of:

- providing at least two spaced fixed split cavities on the outside of a stanchion tube, the inner surfaces of the cavities being shaped to define the outer contours of the integral bulbous portions of the completed stanchion;
- applying a compressive force to a predetermined quantity of flowable and substantially incompressible material within the tube between the inner ends of two rods extending into the tube from the ends thereof, and one of which rods passes completely through the region of one of the cavities, this first compression being effected in the region of the other of the cavities to cause the tube to deform into substantial conformity with the inner surface of the said other cavity;
- releasing the compressive force between the rod ends;
- withdrawing the rod passing completely through the said one cavity such that its end is at least in the region of the end of the said one cavity most remote from the already formed bulbous portion;
- moving the other rod into the region of the said one cavity;
- applying a compressive force to a predetermined quantity of flowable and substantially incompressible material in the latter region to cause the walls of the tube to deform into substantial conformity with the said one cavity, and
- releasing the compressive force on the rods and moving them apart at least sufficiently to enable the tube to be removed therefrom after the split cavities are moved apart to an open position.

4,052,873

APPARATUS FOR CONTINUOUS PRESSING OF BOLTS, SCREW BLANKS OR SIMILAR PARTS

Horst Muzia, and Gunter Grygo, both of Karl-Marx-Stadt, Germany, assignors to Veb Schraubenkombinat, Karl-Marx-Stadt, Germany

Filed July 6, 1976, Ser. No. 702,862

Claims priority, application Germany, July 3, 1975, 187060

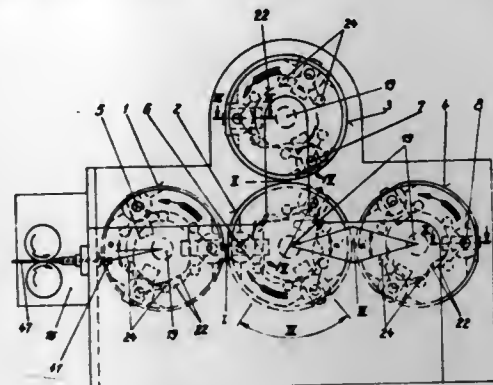
Int. Cl.² B21J 9/18

U.S. Cl. 72-185

7 Claims

1. Apparatus for shearing blanks from elongated rod-shaped workpieces and for pressing such blanks into bolts or similar configurations in a continuous operation, comprising a plurality of rotary elements arranged closely adjacent each other rotatable about parallel axes, each of said rotary elements being provided in the region of its periphery with blank receiving means, said rotary elements cooperating in pairs with each other and including a central rotary element, the blank receiving means of which are receiving blanks after the latter are

sheared off and maintain said blanks during the pressing thereof until the final discharge of the formed blanks, and a plurality of additional rotary elements arranged about the circumference of said central rotary element, one of said additional elements serving to shear blanks from the elongated rod-shaped workpieces and to transfer such blanks to the blank receiving means of the central rotary element, and at least two additional rotary elements for partly forming said blanks; drive means for rotating said rotary elements about their axes in such a manner that the rotary elements of cooperating pairs are respectively driven in opposite directions and so that the blank receiving means on one rotary element of each pair will become successively aligned with corresponding blank receiving means on the other rotary element of the respective pair;



means coordinated with said blank receiving means of said one additional rotary elements for shearing blanks from elongated rod-shaped workpieces; and means coordinated with said blank receiving means of all rotary elements for applying axial forces to such blanks for transferring such blanks from said one additional rotary element to said central element, for applying opposite axial forces to said blanks as said blank receiving means on said central rotary element and the other additional rotary elements approach each other for pressing said blanks, and for discharging said blanks from the blank receiving means of said central element after pressing when said blank receiving means of said central element pass through a discharge zone displaced in the direction of rotation of said central element downstream of the last of said additional rotary elements.

4,052,874

METHOD OF PRODUCING TUBULAR BODY IN A PRESS ROLL PIERCING MILL

Seishiro Yoshiwara; Minoru Kawaharada, and Samon Yanagimoto, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

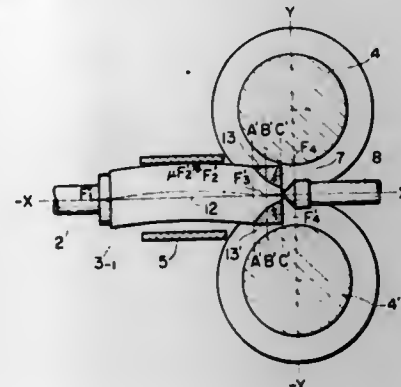
Filed July 19, 1976, Ser. No. 706,563

Claims priority, application Japan, July 18, 1975, 50-88031

Int. Cl.² B21B 17/04

U.S. Cl. 72-209

1 Claim



1. In a method for producing a cylindrical metallic tubular body by rolling a polygonal billet in a press roll piercing mill, the improvement comprising: first causing only the rolls of the press roll piercing mill to roll the front end of the billet prior to contact the center

portion of the front end of the billet with the tip of the piercing plug for preventing bending of the billet by the pressing force and maintaining the axis of the billet on the pass center line; and

bringing the front end of the billet into contact with the piercing plug of the press roll piercing mill to begin the piercing operation on the pass center line only after the billet has moved into the pass a distance at least 0.15 times the outside diameter of the rolled tubular body from the point of the start of rolling of the front end of the billet by the rolls of the press roll piercing mill, whereby non-uniformity of the wall thickness of the hollow shell is reduced to no more than 25%.

4,052,875

SMALL SIZE, PORTABLE BENDER

Kaneaki Sakamoto, Chigasaki, Japan, assignor to Kabushiki Kaisha Ogura Chuck Seisakusho, Japan

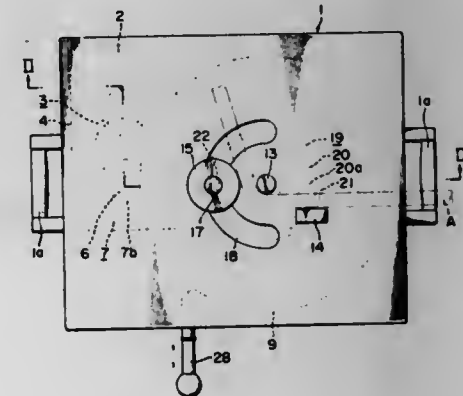
Filed Aug. 6, 1976, Ser. No. 712,144

Claims priority, application Japan, Aug. 30, 1975, 50-105325; Nov. 21, 1975, 50-139997

Int. Cl.² B21D 7/024

U.S. Cl. 72-217

4 Claims



1. A portable bender having a case body which is small in both size and weight enough to permit transportation of said bender by the hands of a user, and therein comprising a miniature, single-phase commutator motor, a drive shaft, a reduction gear mechanism for transmitting a rotational drive force from said motor to said drive shaft, clutch means for connecting and disconnecting the transmission of said rotational drive force to said drive shaft, a stationary shaft disposed coaxially of said drive shaft to protrude through said case body, stopper block means for a member to be bent disposed on the outer surface of said case body to be spaced at a determined distance from said stationary shaft, a slot formed in said outer surface arcuately elongated around the center of said stationary shaft, a bending roller provided on said outer surface and so linked to said drive shaft as to be turned along said arcuately elongated slot for applying a bending force to a member to be bent, bending angle control means operable to cause said clutch means to disconnect said rotational drive force from said drive shaft when said drive shaft has turned to a determined angle, and elastic means for restoring said drive shaft to the initial position when said clutch has disconnected said rotational drive force from said drive shaft.

4,052,876

BEDPLATES FOR A ROLLING MILL OR THE LIKE

Friedrich Rotter, Kreuztal Kredenbach, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Germany

Filed Dec. 5, 1975, Ser. No. 638,130

Claims priority, application Germany, Dec. 20, 1974, 2460313

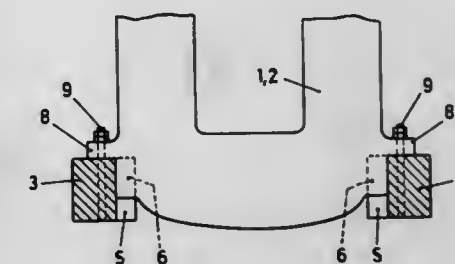
Int. Cl.² B21B 31/00

U.S. Cl. 72-237

1 Claim

1. A rolling mill or the like comprising: a pair of vertically arranged spaced apart housings one behind the other, each having a window extending

through the housings from its front side to its back side for receiving rolls of the mill, horizontal extending feet formed on the opposite outer sides of the lower portion of each said housing, and having straight supportable horizontal surfaces, a vertical projection extending perpendicularly downwardly from each said feet and each having three vertical engageable surfaces, a pair of elongated bedplates, one bedplate engaging said supportable horizontal surfaces of said housings on similar opposite side thereof, and the other bedplate engaging said supportable horizontal surfaces of said housings on said other similar opposite side thereof, said bedplates being formed of an as cast or as a hot rolled product having a rectangular cross section shape throughout their lengths, a vertical groove for each vertical projection formed in each of said bedplates, said groove each having three straight



vertical engageable surfaces, two of which are constructed and arranged to engage two corresponding surfaces of an associated said vertical projection, each said grooves being made so that one of its straight engageable surfaces provide a space between a said remaining surface of said straight engageable surface of a said vertical projection of said housings, filler means, of wedge like configuration for each groove, each filler means having opposed straight engageable surfaces, each said filler means locatable in a groove between one of said straight vertical surfaces thereof and said remaining straight engaging surface of a vertical projection of a housing for stabilizing said housings, each bedplate having a surface for supporting said supportable horizontal surfaces of an associated horizontal foot of said housings and thereby carrying the weight of said housings, and means for securing each of said feet to said associated bedplate.

4,052,877

EXTRUSION PRESS FOR INDIRECT EXTRUSION

Franz Josef Zilges, Monchengladbach, and Klaus Siegert, Berlin, both of Germany, assignors to Schldemann-Siemag Aktiengesellschaft, Germany

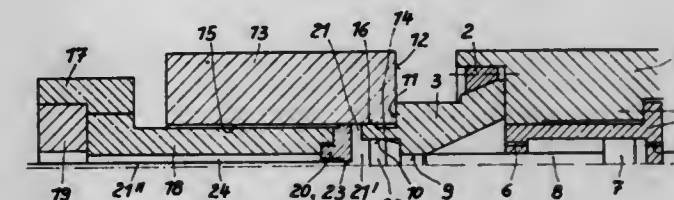
Filed Feb. 24, 1976, Ser. No. 660,936

Claims priority, application Germany, Mar. 5, 1975, 2509490

Int. Cl.² B21C 23/02, 35/04, 35/06

U.S. Cl. 72-253 A

5 Claims



1. An extrusion press for indirect extrusion comprising a counter platen a cylinder cross-head tie-rods connecting the counter platen and cylinder cross-head a moving cross-head

a ram mounted on the cylinder cross-head for moving the moving cross-head.
 a hollow stem mounted on the counter platen and extending towards the moving cross-head
 an extrusion die at the end of the hollow stem
 a billet container between the moving cross-head and the counter platen, which has a billet-receiving bore and which can be moved by the moving cross-head over the die and hollow stem to perform an extrusion operation
 a sealing plate for sealing one end of the said bore
 a hollow cylindrical portion provided on the sealing plate for projecting into said bore, and defining a cylindrical recess with an aperture at the bottom thereof
 a dummy block to be received in said cylindrical recess, and
 a piston arranged in said aperture, and actuable to push the dummy block out of the recess.

4,052,878

TUBE BENDING APPARATUS

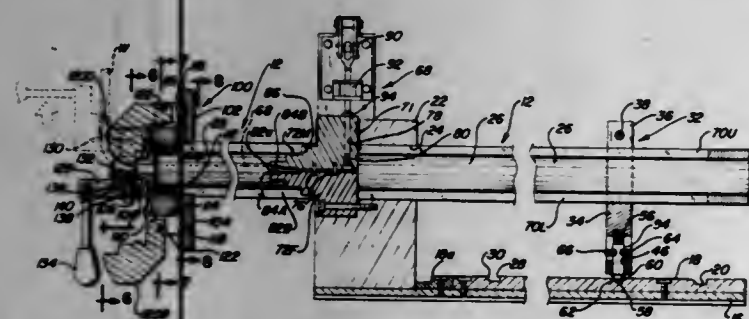
Dennis E. Connelly, 3305 S. Clermont, Denver, Colo. 80222

Filed Aug. 2, 1976, Ser. No. 710,728

Int. Cl.² B21D 7/04

U.S. Cl. 72-293

13 Claims



1. Apparatus for bending tubular goods comprising: a bedplate having an upwardly facing surface; an upstanding support member attached atop said bedplate, said support member having a horizontally-disposed bore therethrough; a tubular slide mounted within the bore for longitudinal slidable movement in overhanging relation above the upwardly facing surface of the bedplate, said slide having a pair of diametrically-opposed parallel slots extending in the direction of the length thereof; releasable stop means carried by the slide and coacting with the bedplate to temporarily hold said slide in selected longitudinal positions; clamping means associated with the support member including opposed jaws disposed within the slots in the slide for relative movement toward and away from one another, said jaws preventing rotational movement of the slide relative to the support member while permitting relative longitudinal movement therebetween, and said jaws being operative upon actuation to clamp upon a tubular workpiece and hold same in coaxial relation within the slide for conjoint longitudinal movement; means for actuating the jaws of the clamping means; means carried by the slide in longitudinally spaced relation to the jaws of the clamping means coacting therewith to maintain the workpiece in coaxial relation; a radial flange fastened to one end of the slide; a first ring mounted for rotational movement in face-to-face coaxial relation to said flange; means interconnecting said first ring and flange for releasably maintaining them in selected angularly adjusted positions; arcuately-grooved anvil-forming means depending from said first ring for rotational movement therewith and hinged movement relative thereto between a disengaged position and an operative position in supporting relation to that portion of a tubular workpiece projecting beyond the adjacent end of the slide; a second ring mounted on the side for relative rotational movement thereto and to said first ring; means defining a bending tool mounted on said second ring for rotational movement therewith and for independent hinged movement relative thereto and to the anvil when rotated into a position in opposed relation to the groove in the latter, said tool cooperating with said anvil upon actuation to bend a

workpiece located therebetween through at least a portion of the arc defined by the groove in the latter.

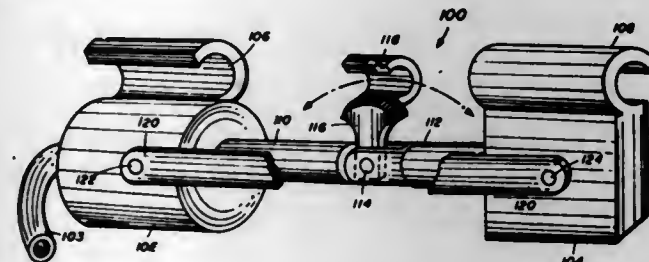
4,052,879

CABLE BENDER

Silas R. Crees, Eau Gallie, Fla. 32935
 Division of Ser. No. 581,035, May 27, 1975, Pat. No. 3,988,918, which is a division of Ser. No. 434,365, Jan. 17, 1974, Pat. No. 3,888,101. This application Aug. 31, 1976, Ser. No. 719,314
 Int. Cl.² B21D 7/024

U.S. Cl. 72-318

3 Claims



1. A power bender for electrical cable and the like, comprising:
 a hydraulic cylinder having a shaft extending axially into said cylinder, said shaft movable responsive to hydraulic pressure within said cylinder;
 a first bending shoe with said cylinder and shaft combination and opened along one side in a direction substantially parallel with said shaft;
 a second bending shoe spaced from, and pivotal with respect to said shaft about a pivot axis between said second bending shoe and said shaft, said pivot axis extending substantially normal to the axis of said shaft, said second bending shoe opened along a second side opposing said first side in a direction substantially parallel with said shaft;
 a bending knuckle adjacent said pivot axis and between said first and second bending shoes;
 a tie arm pivotably coupled at one end to said hydraulic cylinder and pivotably coupled at the other end to said second bending shoe at a point on said second bending shoe spaced from said pivot axis; and wherein
 cable to be bent is inserted in said first and second bending shoes by placing said cable across said bending knuckle at a slight angle with respect to the axis of said shaft and thereafter rotating either said cable or said bender slightly so as to align said cable within said first and second bending shoe in a direction substantially parallel with the axis on said shaft, and wherein said cable may subsequently be bent by applying internal hydraulic pressure within said cylinder, causing said shaft to extend from said cylinder and cooperate with said tie arm to drive said second bending shoe in a predetermined curved path about said pivot axis.

4,052,880

PIPE PERFORATING MACHINE

Robert L. Cullinan; Ronald W. Jay; Keith Beck, and Lloyd J. Miller, all of Paxton, Nebr., assignors to Noah E. Foulks, Dodge City, Kans.

Filed Aug. 10, 1976, Ser. No. 713,240

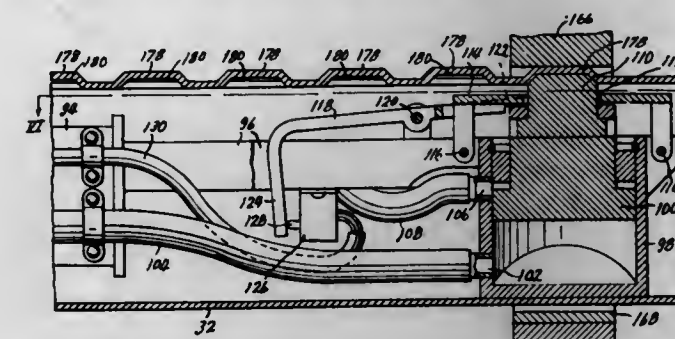
Int. Cl.² B21D 28/10, 28/28

U.S. Cl. 72-326

12 Claims

1. A pipe perforating machine comprising:
 a. a frame operable to support a pipe in a stationary position,
 b. cooperating die members carried by said frame and including a male die supported by said frame for movement in a straight line radial to said pipe, said male die having a pair of generally parallel, closely spaced apart cutting edges of a length at least several times the lateral spacing therebetween, the central portions of said cutting edges extending generally at right angles to the radial movement

of said die, and the end portions thereof being inclined obtusely away from a plane established by the central portions of said cutting edges, and away from the confronting wall surface of said pipe, to a radial distance from said plane greater than the wall thickness of said pipe, and
 c. power means operable to move said male die radially of said pipe to engage a wall of said pipe and to form a perforation in said wall, the radial movement of said die,



after it initially engages said pipe wall, being greater than the wall thickness of said pipe, but less than the radial spacing between the central portions and the extreme ends of said die cutting edges, whereby the central portion of the strip of pipe wall between said die cutting edges is offset laterally from the pipe wall by a distance greater than the wall thickness, and the ends of said pipe wall strip are left connected to the standing portion of the pipe wall.

4,052,881

PROCESS FOR PROVIDING OFFSET BENDS OF THE CORRECT DIMENSION IN PIPE AND THE LIKE

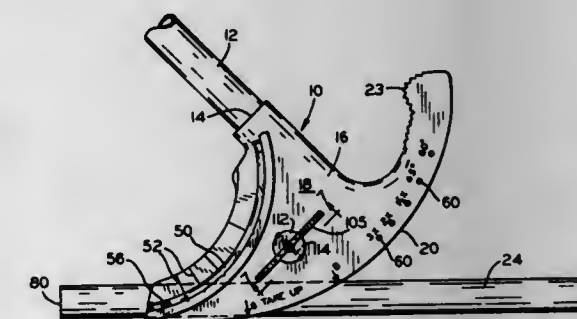
Ralph W. Mount, R.D. 1, Zellenople, Pa.

Continuation of Ser. No. 322,026, Jan. 8, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,358

Int. Cl.² B21D 7/14; B21C 51/00

U.S. Cl. 72-459

2 Claims



1. The process for effecting offset bends in pipe and the like with a bending tool having an arcuate concave anvil surface with pairs of predetermined stop location openings disposed angularly about said anvil, comprising the steps of inserting a cross member through a selected pair of aligned openings in the walls of the concave anvil surface to form a stop and at an anvil location corresponding to the ratio of the offset to the distance between the respective bends, disposing the bending tool at a predetermined distance from the end of the pipe at the location where the first bend is to be effected, and with the bending tool and anvil in position, wrapping the pipe around the anvil until contacting said stop to perform a first bend, relocating the anvil to a second location on the pipe where reverse bending is to be performed determined by the value of said ratio and wrapping the pipe around the anvil until the pipe comes in contact with said stop to effect a combination of offset bending which is determinative of the ratio of the offset of the respective bends and the distance between said bends, and following the bending operation, reaming the end of the pipe or conduit with a reamer integral with the bending tool.

4,052,882

TESTING AND CALIBRATING INSTRUMENT

Ulrich Wittkowski, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

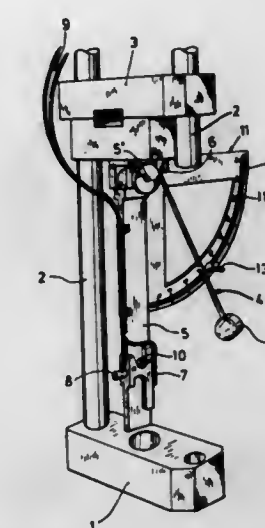
Filed Dec. 15, 1975, Ser. No. 640,852

Claims priority, application Germany, Dec. 14, 1974, 2459194

Int. Cl.² G01P 21/00

U.S. Cl. 73-1 D

9 Claims



1. A testing and calibrating instrument comprising, in combination:

- support means;
- a pendular hammer mounted on and suspended from said support means for pivotal movement in a given plane;
- an elongated pendular anvil mounted on said support means for pivotal movement in at least approximately the same plane, the length of said anvil extending generally downwardly from the point where it is suspended from said support means, said anvil being rigid throughout its length and said hammer and anvil being dimensioned and positioned with respect to each other such that said hammer strikes said anvil at a given impact point which lies at least approximately at the level of a nodal point of bending oscillations which arise in said anvil when the same is struck by said hammer; and
- means for attaching a test acceleration sensor as well as a standard acceleration sensor to said anvil at the level of said impact point.

4,052,883

STATIC FREE MAGNETIC HOLDING AND RELEASE MEANS

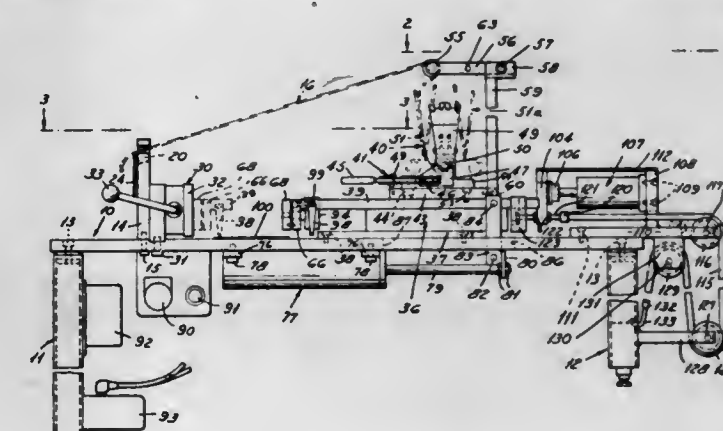
Angelo Turnas, St. Clair Shores, Mich., assignor to Ring Tool and Die Company, Detroit, Mich.

Filed Oct. 12, 1976, Ser. No. 731,228

Int. Cl.² G01N 3/30

U.S. Cl. 73-12

8 Claims



1. In a static free magnetic holding and release means, the combination of:

- a. a permanent magnet means operable between an energized condition and a de-energized condition;
- b. a preloaded holding means movable to a first position in engagement with said permanent magnet means for a holding engagement with the permanent magnetic means when it is in an energized condition, and movable to a second position by the preload thereon when the permanent magnet means is in a de-energized condition for releasing the holding means;
- c. preload means for imparting a preload in one direction on the holding means to move it to said second position when the permanent magnet is in a de-energized condition, and;
- d. said preloaded holding means including a steel plate engageably by said permanent magnet means, and an aluminum plate secured to the steel plate for operative connection to said preload means.

4,052,884

METHOD AND APPARATUS FOR DETERMINING STRAIN DATA DURING PILING

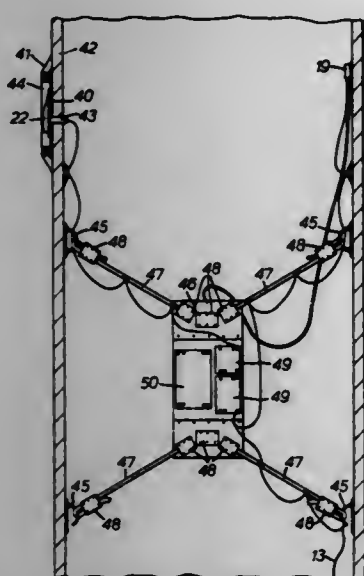
Lionel John Milberger, Bryan, and Richard Allen Zimmer, College Station, both of Tex., assignors to The British Petroleum Company Limited, London, England

Filed Feb. 25, 1976, Ser. No. 661,374

Int. Cl.² G01L 5/00

U.S. Cl. 73—12

11 Claims



1. A method of determining strain data during piling comprising the steps:
- mounting a strain gauge transducer directly to a pile;
 - exciting the strain gauge transducer with alternating current signals;
 - sensing the output of the strain gauge transducer during piling;
 - amplifying the sensed output from the strain gauge transducer;
 - demodulating the amplified sensed output so as to produce demodulated signals in which voltage is proportional to strain;
 - utilizing said demodulated signals to control the output of a voltage controlled oscillator;
 - feeding the output from the voltage controlled oscillator to a telemetry transmitter, and
 - feeding the output from the telemetry transmitter to an antenna mounted directly to said pile.

4,052,885 PORTABLE DEVICE AND METHOD FOR DETERMINING PERMEABILITY CHARACTERISTICS OF EARTH FORMATIONS

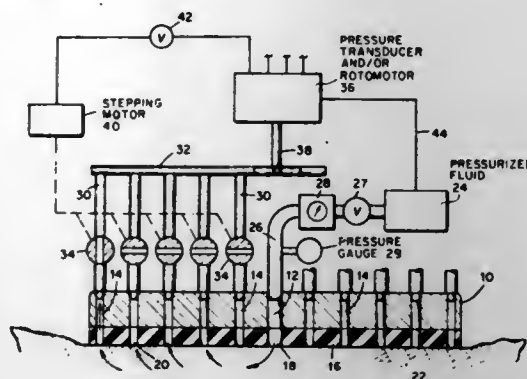
Lowell Z. Shuck, Morgantown, W. Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 24, 1976, Ser. No. 717,429

Int. Cl.² G01N 15/08

U.S. Cl. 73—38

7 Claims



1. A device for determining maximum permeability direction and magnitude of permeability of an earth formation, comprising a housing having a planar surface, a fluid-injecting passageway in said housing in open registry with said surface, a plurality of fluid-monitoring ports in said housing in open registry with said surface, with said fluid-monitoring ports being spaced apart from one another and said fluid-injecting passageway in a predetermined array, seal means carried by said housing in an abutting relationship with said surface for providing a substantially fluid-tight seal with said earth formation when said housing is positioned in a contiguous relationship with a surface of said earth formation, said seal means having a plurality of apertures therethrough in respective registry with said fluid-injecting passageway and each of said plurality of fluid-monitoring ports, a fluid reservoir means coupled to said fluid-injecting passageway for injecting a fluid into said earth formation, at least one of a fluid flow measuring means and a fluid pressure measuring means, and means selectively coupling said at least one of said measuring means to each of the fluid-monitoring ports for selectively measuring said at least one of pressure and flow characteristics in a selected manner of the injected fluid emanating from said earth formations into said fluid-monitoring ports.

4,052,886

ENCAVITATED STEEL RULE DIE

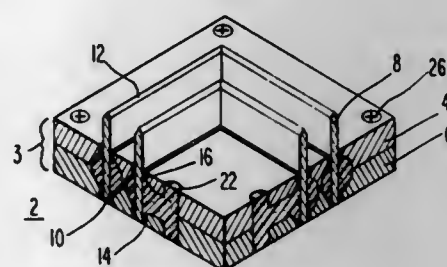
James A. Buick, Telford, Pa., assignor to Best Line Warehouse, Inc., Telford, Pa.

Filed June 18, 1976, Ser. No. 697,312

Int. Cl.² B31B 1/20

U.S. Cl. 93—58.3

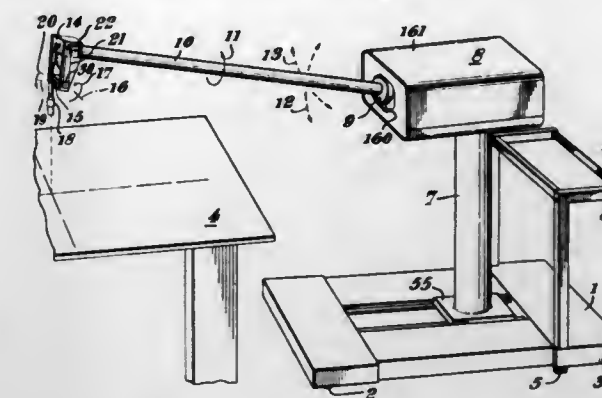
24 Claims



1. A die used for cutting and scoring paperboard and plastic material comprising:
- a unitary, substantially solid base member having at least one slot cut in a surface thereof;
 - a steel rule having a base edge and an operative edge;
 - a cavity formed in said base member to communicate with

- said slot, said slot and said cavity defining a passage through which said rule is inserted so that said operative edge of said rule extends up through the top surface of said base member;
- d. semi-rigid filling material filling said cavity, said semi-rigid material filling said cavity adapted to anchor said steel rule to said base member by engaging the opposed surfaces of said rule and said cavity substantially throughout the surface areas of said opposed surfaces.

being fixed in the column, wherein means are provided to produce electrical signals defining the instantaneous position of



4,052,887

ULTRASONIC TESTING DEVICE AND METHOD

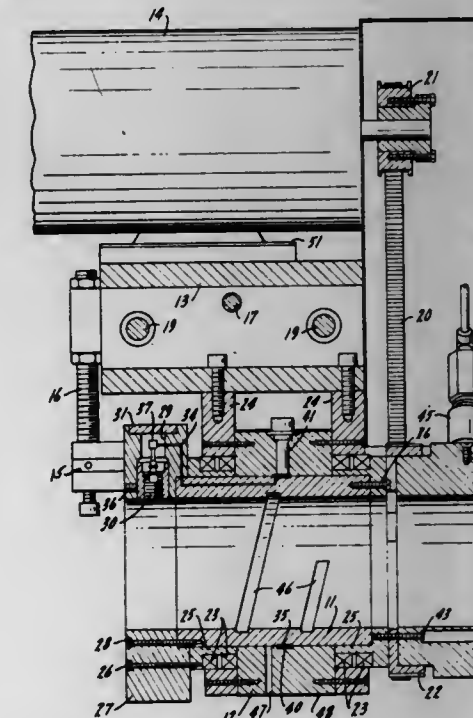
Lee A. Sheridan, Lombard; Gary S. Kovener; Bernard Ostrofsky, both of Naperville, and Hilbert J. Nebelsiek, Aurora, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Apr. 5, 1976, Ser. No. 673,706

Int. Cl.² G01N 29/00

U.S. Cl. 73—67.8 S

20 Claims



1. An apparatus for the ultrasonic non-destructive testing of elongated bodies or coatings thereon comprising a rotating member holding one or more cylindrical focus transducers, said transducers capable of sending ultrasonic pulses and receiving corresponding echo pulses back as said rotating member is rotated on the axis relative to the body being tested while said body moves axially with respect to said rotating member, said apparatus containing water resistant bearings, functionally disposed for supporting the rotating member.

4,052,888

APPARATUS FOR THE ULTRASONIC EXAMINATION OF BODIES HAVING NON-PLANAR SURFACES

Thomas Graham Brown, Aberdeen; Damir Josip Miroslav Skrgatic, Livingston; Graeme William Younger, Newbridge, and John Cook Fortune, Edinburgh, all of Scotland, assignors to Sonicaid Limited, Bognor Regis, England

Filed July 8, 1976, Ser. No. 703,635

Claims priority, application United Kingdom, July 12, 1975, 29390/75

Int. Cl.² G01N 29/04

U.S. Cl. 73—67.8 S

27 Claims

1. Apparatus for the ultrasonic examination of bodies having non-planar surfaces, including a longitudinally extending probe which directs a beam of ultrasonic pulses into the body and receives reflected pulses from the body, wherein the probe is mounted on a boom so that it is pivotable about first and second mutually perpendicular axes fixed in the boom, said boom being mounted on a column so that it is pivotable about a third axis perpendicular to the axis of the boom and a fourth axis perpendicular to said third axis, said third and fourth axes

a point on the longitudinal axis of the probe and the instantaneous attitude of said axis with reference to a coordinate system.

4,052,889

SYSTEM FOR MEASUREMENT OF SUBSURFACE FATIGUE CRACK SIZE

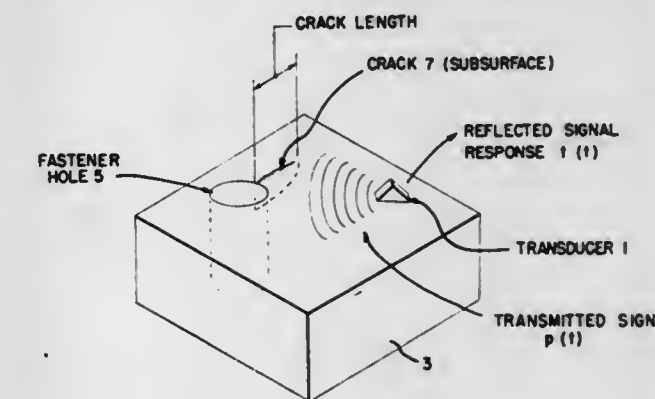
Anthony N. Mucciardi, Silver Spring, Md., and Ramesh Shankar, Reston, Va., assignors to Adaptronics, Inc., McLean, Va.

Filed June 10, 1976, Ser. No. 694,546

Int. Cl.² G01N 29/00

U.S. Cl. 73—67.8 S

24 Claims



1. A system for measurement of surface and subsurface material flaw size which comprises,
- means for obtaining data as a function of a flaw in a medium,
 - means to perform spectral analysis on said data,
 - means to perform a cepstral analysis on said data,
 - means responsive to the output of both (b) and (c) to provide a set of parameters; and
 - means responsive to predetermined ones of said parameters to provide an estimated flaw length indication

4,052,890

MEASURING THE TENDERNESS OF COOKED BEEF

Henry W. Kammlah, Scottsdale; Harold K. Herring, Paradise Valley, both of Ariz., and Duane E. Koch, Jefferson, Wis., assignors to Armour and Company, Phoenix, Ariz.

Filed Feb. 18, 1976, Ser. No. 658,888

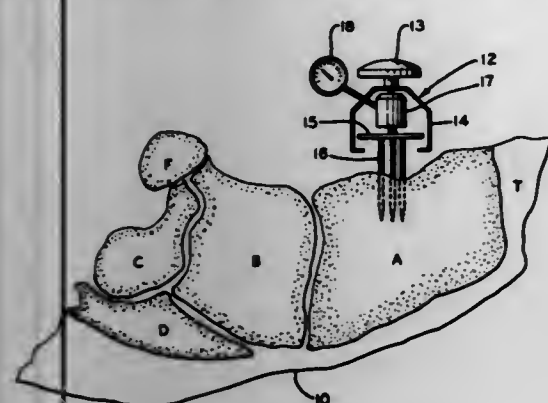
Int. Cl.² G01N 3/42

U.S. Cl. 73—81

3 Claims

1. In a process for determining the tenderness of cooked

rounds of beef, the steps of pressing a pointed probe into the proximal end portion of the Semimembranosus muscle of



cooked beef to a predetermined depth, and measuring the maximum force of penetration.

4,052,891

WEB TENSION MONITOR

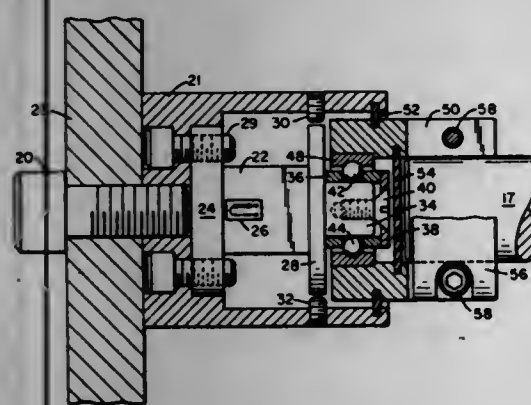
Edward C. Bartlett, Skyline Terrace Rte. No. 1 Box 133B, Claremont, N.H. 03743

Filed Oct. 14, 1976, Ser. No. 732,535

Int. Cl.² G01L 5/10

U.S. Cl. 73-144

6 Claims



1. In a web tension monitor which includes at least a tension monitoring guide roll over which said web is movable, a frame, and shaft means for mounting said roll for rotation relative to said frame, a system for continuously monitoring the tension in said web comprising at least one housing having a base attached to said frame and having an open end formed therein, a strain member cantilever-mounted within said housing and extending in a direction away from said frame, at least one strain gauge mounted on said strain member, an electrical circuit connected to said strain gauge to indicate its output, a first ring extending from said strain member, a second ring at the end of said shaft means, said second ring surrounding said first ring, each of said rings having two diametrically opposed confronting openings formed therein, a bearing ball being disposed in each pair of confronting openings, whereby said two rings are coupled together, deflection of said web in response to web tension causing said shaft means to apply cantilever loading force to said strain member, the electrical characteristics and output of said strain gauge thereby being varied.

4,052,892

PRESSURE AND VOLUME RECORDING APPARATUS

Lawrence T. Browne, Santa Barbara, Calif., assignor to Browne Engineering Corporation, Santa Barbara, Calif.

Filed Nov. 15, 1976, Ser. No. 741,810

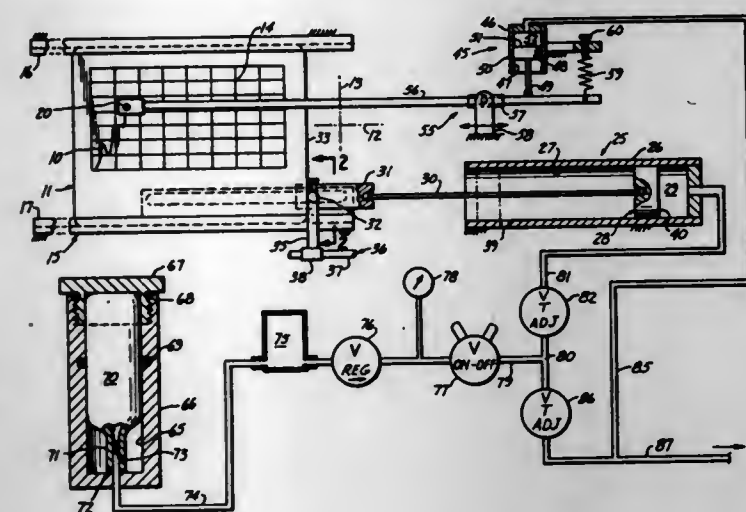
Int. Cl.² G01F 17/00

U.S. Cl. 73-149

9 Claims

1. Apparatus for supplying a flow of fluid under pressure to a delivery conduit, and measuring the total volume of fluid passed by the delivery conduit and also the resistance to the

discharge of said flow from the delivery conduit, said apparatus comprising: pressure-regulated fluid supply means; chart recorder means comprising a first axis drive motor, and a second axis drive motor, said motors being actuable by fluid under pressure; a first axis conduit and a second axis conduit connecting the respective first and second drive motors to said fluid supply means; a first axis restrictor and a second axis restrictor in the respective first and second axis conduits between the respective motor and the fluid supply means, chart support means for supporting a chart for movement along said



first axis, said first axis drive motor being adapted to move the chart and said chart support means relative to one another, marker support means for holding a marker against the chart, said second axis drive motor connected to said marker support means to move the marker and the chart relative to one another, said delivery conduit interconnected to said second axis conduit, said first axis drive motor operating unidirectionally in response to fluid delivered to it, and said second axis drive motor operating bi-directionally in response to pressure in said second axis conduit.

4,052,893

MEASURING RESERVOIR OIL SATURATION

Robert P. Murphy, and William W. Owens, both of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sept. 29, 1976, Ser. No. 727,929

Int. Cl.² E21B 47/10

U.S. Cl. 73-155

6 Claims

1. A method of logging a subsurface formation to determine both residual and mobile oil saturations comprising: drilling a well through the subsurface formation using an oil-base drilling fluid; producing fluids from the subsurface formation to remove drilling fluid filtrate from the formation; logging the formation with, in any order, a short range electrical resistivity logging device and a pulsed neutron capture log; injecting into the formation sufficient salt water to displace mobile formation fluids at least two feet from the bore hole, the salinity of said salt water being greater than 100,000 ppm NaCl; logging the formation with, in any order, a short range electrical resistivity logging device and a pulsed neutron capture logging device; injecting into the formation sufficient fresh water to displace mobile formation fluids at least two feet from the bore hole, said fresh water having a salinity of less than 5,000 ppm NaCl; and, logging the formation with a pulsed neutron capture logging device.

4,052,894

VELOCITY VECTOR SENSOR FOR LOW SPEED AIRFLOWS

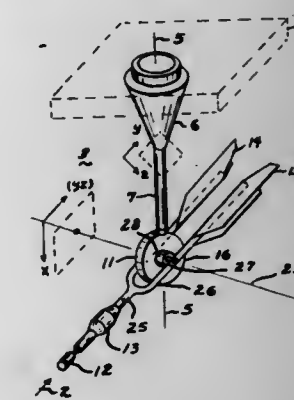
William R. Pinnell, Dayton, and James E. Leger, Enon, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 2, 1976, Ser. No. 737,946

Int. Cl.² G01W 1/02

U.S. Cl. 73-189

1 Claim



1. A velocity vector sensor for measuring the velocity and vectorial direction of the flow of an air mass relative to a payload body moving through the said air mass, the said payload body having a determined three-dimensional reference space, the said velocity vector sensor comprising:

- a. an air vane having an upstream end and an axis of rotation;
- b. an anemometer head positioned at the upstream end of the said air vane and having:
 1. a first thermistor bead exposed to the said air mass flow;
 2. a second thermistor bead shielded from said air flow;
- c. means including an electrical bridge circuit cooperating with the said first and the said second thermistor beads for providing an indication of the velocity of said air flow over said first bead;
- d. rotating assembly attached to said air vane providing freedom of movement of the said air vane in a plane containing the said vane axis of rotation;
- e. a first photopotentiometer positioned in the said rotating assembly providing an output voltage responsive to the directional position of the said vane in the said plane that contains the vane and the said axis of rotation of the vane;
- f. a base assembly attached to the said payload body;
- g. a shaft rotatably positioned on said base assembly and attached to said rotating assembly; and
- h. a second photopotentiometer positioned in said base assembly cooperating with the said rotatable shaft providing an output voltage responsive to the position of the plane containing the said vane in the said reference space.

4,052,895

OBSTACLE ASSEMBLY FOR VORTEX-TYPE FLOWMETER

Peter J. Herzl, Morrisville, and Warren Strohmeler, Warminster, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa.

Filed Jan. 12, 1977, Ser. No. 758,849

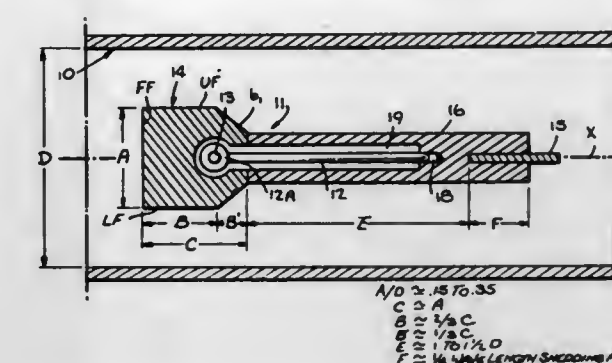
Int. Cl.² G01F 1/32

U.S. Cl. 73-194 VS

6 Claims

1. A vortex-type flowmeter in which a fluid to be metered is conducted through a flow tube of relatively small diameter having an obstacle assembly therein to cause vortex shedding at a frequency which is a function of flow rate, said assembly including a block fixedly mounted across the tube at right angles to the direction of flow, the block having a flat front face which is presented to the incoming fluid and a flat rear face parallel thereto which is spaced from the front face by a distance equal to the height of the front face, the block having upper and lower side surfaces with bevelled rear corners connecting the side surfaces to the flat rear face, the bevelled rear corners occupying a rear zone which lies in a zone about one-third the distance between the rear of the front faces of the

block, the resultant block configuration acting to enhance the shedding characteristics of the assembly and to produce substantially linear flow rate measurements at low Reynolds numbers.



4,052,896

ULTRASONIC FLOW METER

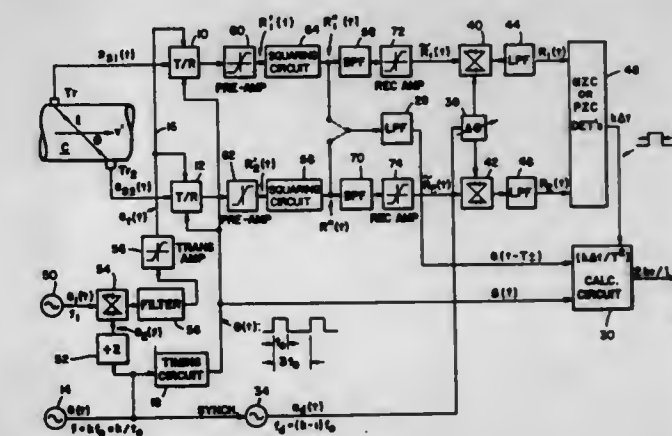
Bock W. Lee, El Cerrito, Calif.; William H. Vander Heyden, and Stephen S. Bell, both of Tulsa, Okla., assignors to Badger Meter, Inc., Richmond, Calif.

Filed Nov. 26, 1975, Ser. No. 635,737

Int. Cl.² G01F 1/66

U.S. Cl. 73-194 A

23 Claims



1. A flow detecting apparatus for measuring fluid flow in a conduit comprising:

- a. a pair of compressional energy transmitting and receiving transducer means adapted to be disposed adjacent said conduit for transmitting compressional energy signals along a path having a component axially of said conduit and a component transversely of said conduit, and for receiving said compressional energy signals transmitted along said path,
- b. means for generating a first signal having a frequency, f , less than a predetermined upper limit, for providing unambiguous phase detection between signals received by said transducer means,
- c. means for generating a second signal having a frequency f_1 ,
- d. means for mixing said first and second signals to produce sideband frequencies $f_1 + f$ and $f_1 - f$, said frequency f_1 selected so that said sideband frequencies $f_1 + f$ and $f_1 - f$ are transmitted over a selected part of the spectrum,
- e. means for applying at least one of said sideband frequencies to said transducer means, for transmitting signal bursts in opposite directions along said path, and
- f. means for processing said received signals for providing a signal corresponding to (1) the transit time, t , of one of said signals along said path, (2) the square of the transit time t^2 , and (3) the difference in transit time Δt between said received signals, said processing means further providing a quotient signal proportional to Δt divided by t^2 , said quotient signal being substantially proportional to the

velocity, v , of fluid flow such that Δt divided by l^2 is proportional to v divided by l , where l is the length of said path.

4,052,897

METHODS AND APPARATUS FOR DETERMINING TOTAL FLOW RATE OF GASEOUS FLUIDS

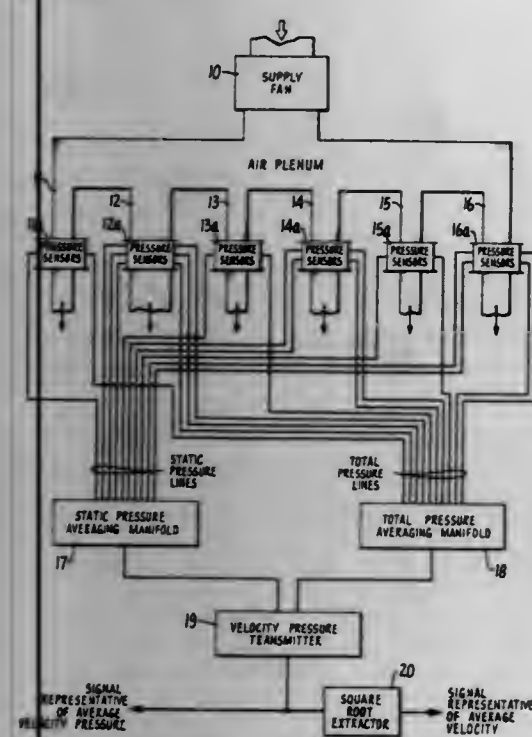
Kenneth W. DeBaun, Santa Rosa, Calif., assignor to Air Monitor Corporation, Santa Rosa, Calif.

Filed Oct. 28, 1976, Ser. No. 736,327

Int. Cl.² G01F 1/46

U.S. Cl. 73-212

10 Claims



1. A method for determining the total flow rate of gaseous fluid passing through a plurality of conduits comprising the steps:

sensing the total and static pressures in each conduit using a plurality of total and static pressure sensing probes, the number of total pressure sensing probes utilized in each conduit being selected and deployed to cover cross-sectional areas of substantially equal size, connecting the total pressure sensing probes of all conduits to one pressure averaging manifold, connecting the static pressure sensing probes of all conduits to a second pressure averaging manifold, then comprising the pressure difference between the average total pressure of the one manifold with the average static pressure of the second manifold to determine the pressure difference.

4,052,898

CRANK DRIVE SYSTEM FOR COLD PILGER MILLS DRIVE OR THE LIKE

Charles Leroy Miller, New Wilmington, Pa., and Harry Calhoun Ledebur, Canfield, Ohio, assignors to Wean United, Inc., Pittsburgh, Pa.

Filed Sept. 13, 1976, Ser. No. 722,906

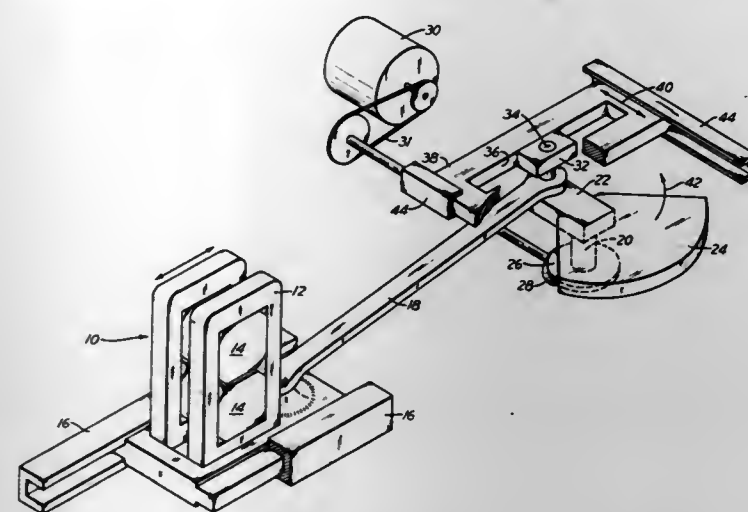
Int. Cl.² B21B 17/00, 35/00

U.S. Cl. 72-214

10 Claims

10. In combination with a reciprocating mass such as a cold pilger rolling mill having a pass line, a drive means for said mill, a crank means connected to said drive means, means for connecting said crank means to said mill to effect said reciprocation thereof, a first counterweight means arranged in a plane parallel to the direction of movement of said reciprocating mill, means for connecting said first counterweight means to said crank means in a manner to impart an oscillatory movement to said counterweight means, said oscillatory move-

ment being in a perpendicular direction relative to said direction of movement of said mill, and which oscillatory movement has a cycle substantially equal to that of the reciprocating movement of said mill and which is out of phase with said reciprocating movement of said mill, whereby the acceleration and deceleration torques of said counterweight means compensate, respectively, the acceleration and deceleration torques of said reciprocating movement of said mill, and



a second counterweight means connected to said crank means in a manner to balance at least a portion of the inertia of the throw of said crank means, said mill, and said means for connecting said crank means to said mill, said two counterweight means and said means for connecting said first counterweight means to said crank means being arranged in a plane substantially coincident to said pass line with due allowance for passage of the product.

4,052,899

DEPTHOMETER FOR UNDERWATER IMMERSION

Francesco Longhetto, Turin, Italy, assignor to Semperit Anstalt, Schaan, Liechtenstein

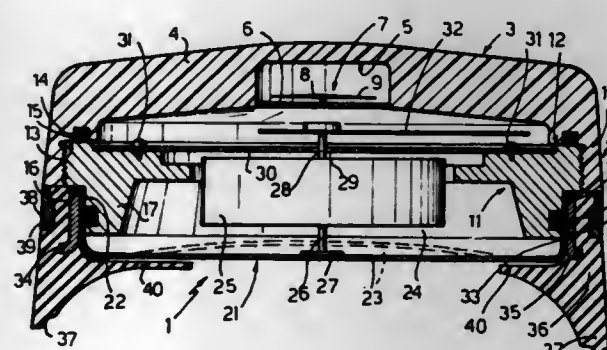
Filed Mar. 31, 1976, Ser. No. 672,238

Claims priority, application Italy, Apr. 4, 1975, 67865/75

Int. Cl.² G01F 23/14; G01L 7/08

U.S. Cl. 73-300

15 Claims



1. Depthometer for underwater immersion of the type comprising an outer waterproof casing, at least a portion of which consists of transparent material; a graduated dial visible from the outside through the transparent portion of the casing; an element deformable in accordance with the external pressure; and a mechanical transducer, the inlet of which is connected to the deformable element, and the outlet of which is connected to an indicator element to move the latter along the dial in accordance with the deformation of the deformable element; the depthometer being characterized in that said deformable element consists of an elastic end wall of a metal cup member including a peripheral lateral wall extending from the periphery of the end wall and integral with it, supporting means rigid with the lateral wall and supporting the mechanical trans-

ducer, the cup member forming part of and sealed to the outer casing; and stiffening means cooperating with said lateral wall to make this latter indeformable with the end wall.

4,052,900

TRANSDUCERS

William Ganderton, Yarm, England, assignor to Tioxide Group Limited, Billingham, England

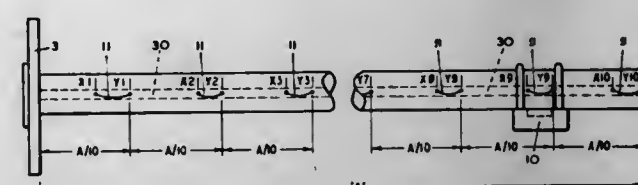
Filed Jan. 9, 1976, Ser. No. 647,817

Claims priority, application United Kingdom, Jan. 11, 1975, 01234/75

Int. Cl.² G01F 23/12

U.S. Cl. 73-313

23 Claims



1. A transducer comprising a support member having a hollow opening therein for receiving a movable core, said support member having mounted thereon a primary coil connectable to a source of alternating electric current, a secondary coil mounted around the primary coil, a plurality of electrically conductive links axially spaced along the length of the secondary coil each link connecting spaced turns of the secondary coil and the ends of the secondary coil being connectable to output means responsive to the electric current induced in said secondary coil to generate an output voltage having predetermined characteristics, whereby the number and position of said electrically conductive links in said secondary coil determine said characteristics of said output voltage.

4,052,901

LEVEL DETECTING

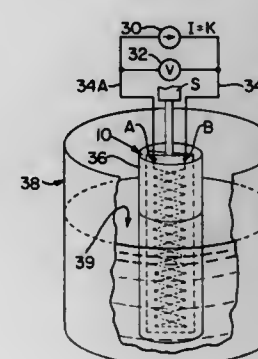
Albion P. Bjork, Tower Road, Lincoln, Mass. 01773

Filed July 29, 1976, Ser. No. 709,796

Int. Cl.² G01L 1/20; H01C 3/06, 3/10

U.S. Cl. 73-313

9 Claims



1. Pressure detection apparatus comprising, a transducer element for immersion in a pressure medium, or a fluent environment or subjection to a like activating force, comprising means defining an extended length of springy lengthwise folded sheet material for extending into the pressure medium with its folded portions contacting each other face to face at portions exposed to a pressure above a predetermined threshold on the backs of said folded portions or other activating force, the springy character of the folded sheet material and geometric loading arrangement holding the folded portions apart in other portions thereof, means defining elongated conductors on opposing front faces of the folded portions comprising a periodic zig-zag waveform conductive path on each facing portion of the folded sheet arranged in complementary form so that the two conductive paths for X intersections to short out the

conductive paths by butting contact wherever the facing portions are pressed together, so that the remaining portions of the conductive paths define resistive lengths in a circuit to the extent they are not essentially shorted out of said circuits by butting contact with each other, and means for applying an electric current to the conductors and for measuring a parameter of said circuit as an indication of the pressure or other activating force which presses the portions together, and wherein an insulator sheet with openings is placed between the folded portions.

4,052,902

STATIC FRICTION FREE ALTIMETER

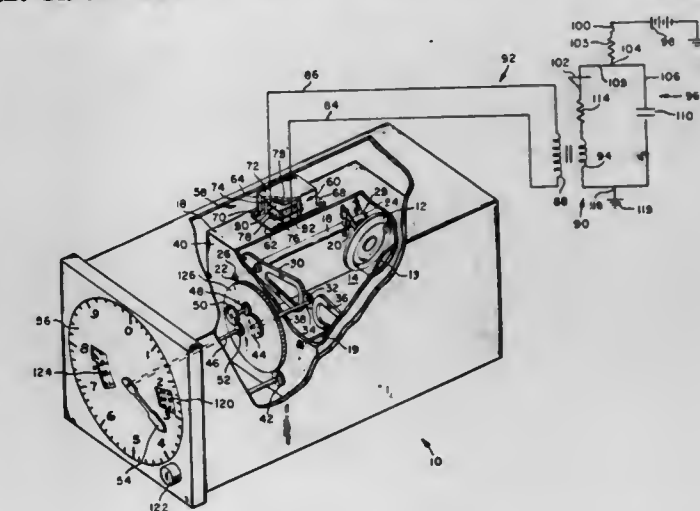
Paul W. Moseman, Jr., and Russell F. Hart, both of Davenport, Iowa, assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 29, 1976, Ser. No. 755,277

Int. Cl.² G01L 7/12

U.S. Cl. 73-387

7 Claims



1. In an altimeter having a gear train driven by an altitude responsive member, means for attenuating the frictional resistance of said gear train comprising:

a housing connected to said gear train, said housing having a chamber located therein; a piezoelectrical transducer located in said chamber; and energy control means for supplying said piezoelectrical transducer with cyclic electrical signals, said cyclic electrical signals causing the physical dimensions of said piezoelectrical transducer to change and transmit vibratory motion through the housing to the gear train to eliminate the effect of static friction thereon.

4,052,903

PRESSURE SENSOR

Petur Thordarson, Seattle, Wash., assignor to Thor Instrument Company, Inc., Seattle, Wash.

Filed Dec. 6, 1976, Ser. No. 747,488

Int. Cl.² G01L 7/08

U.S. Cl. 73-406

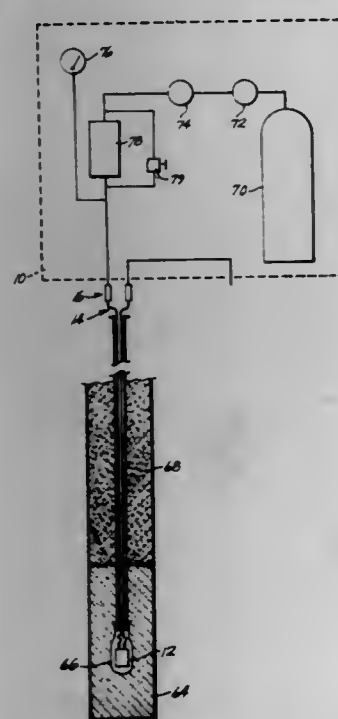
10 Claims

1. A pressure sensor, comprising: a support member having an axially elongated cylindrical end portion; a cup-shaped elastomeric diaphragm mounted onto said support member and including an inboard portion and an outboard portion which is snugly fitted over the cylindrical end portion of said support member, said outboard portion having an outer surface which during use is subjected to a pressure to be measured; means establishing a fluid seal between the inboard portion of said diaphragm and said support member, with the outboard portion of said diaphragm being free of attachment to the cylindrical end portion of said support member; said support member including a gas delivery passageway therein and gas delivery port means extending outwardly

from said gas delivery passageway through the end portion thereof towards a wall part of the outboard portion of said diaphragm;

said support member also including a gas return passageway therein and gas return port means extending inwardly through the end portion thereof from another wall part of the outboard portion of said diaphragm to said gas return passageway;

with the outboard portion of said diaphragm normally overlying and substantially closing both the delivery port means and the return port means but being free to bulge outwardly during use in response to gas pressure within said passageway, an amount sufficient to open both of said port means and allow flow between the gas delivery port means and the gas return port means;



wherein said gas delivery port means comprises at least one axial gas delivery port extending outwardly from the gas delivery passageway to an end wall part of the outboard portion of said diaphragm, and further including at least one axially extending gas return port extending from another end wall part of the outboard portion of said diaphragm inwardly into said gas return passageway; wherein said gas delivery port means includes a plurality of radial ports extending from the gas delivery passageway to a cylindrical side wall part of the outboard portion of said diaphragm, and wherein the gas return port returns also includes a plurality of radial ports extending from the gas return passageway to a cylindrical side wall part of the outboard portion of said diaphragm; and wherein the gas delivery ports and the gas return ports are substantially identical.

4,052,904

APPARATUS FOR OBTAINING A RELATIVELY PARTICLE-FREE SAMPLE OF A LIQUID

Jack Kuebler, Lindenhurst, and Henry G. Zvirblis, Neenah, both of N.Y., assignors to Delta Scientific Corporation, Lindenhurst, N.Y.

Continuation-in-part of Ser. No. 501,875, Aug. 30, 1974, Pat. No. 3,999,945. This application Nov. 23, 1975, Ser. No. 635,901 Int. Cl.² G01N 1/20

U.S. Cl. 73—421 R

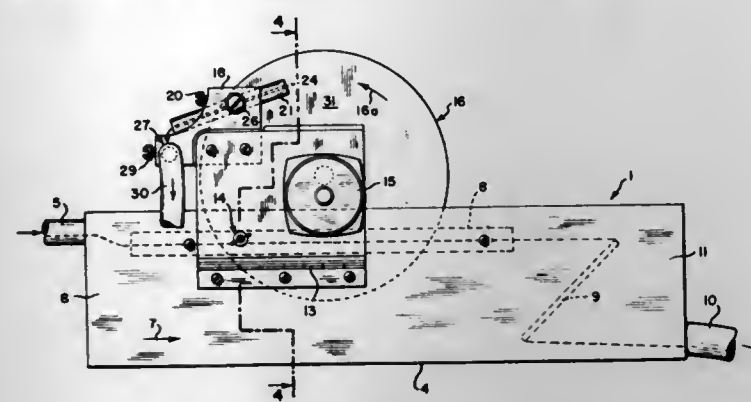
6 Claims

1. In an apparatus for obtaining a sample of a liquid and having a disc with a planar fluid wettable side surface and means for rotating said disc with the peripheral portion thereof submerged in said liquid; the improvement comprising:

a. blade means having an edge bearing against said planar side surface, said blade means and edge extending downwardly beyond the periphery of the disc for collecting

liquid removed from the side surface of the disc and directing it along the blade toward its lower end,

1. said blade bearing against the exposed side surface of the disc at a location where the side surface is moving in a direction having a downward component;
- b. receiving means disposed at the lower end of said blade for receiving liquid collected on said blade at the lower end thereof;
- c. a trough in which a portion of the liquid to be sampled flows in a predetermined direction and in which the disc is disposed in a plane generally parallel to said predetermined direction,



1. said disc being mounted for rotation in a direction causing the submerged portion thereof to move in said predetermined direction of flow of said liquid;
- d. drive means connected to said disc to rotate it at a speed whereby the linear velocity of the submerged portion is lower than the velocity of the liquid flowing through said trough; and
- e. baffle means disposed partially submerged beneath the surface of said liquid and disposed upstream of the disc for deflecting particles floating on the surface of said liquid away from the surface of the disc.

4,052,905

TIRE BALANCING TRANSDUCER

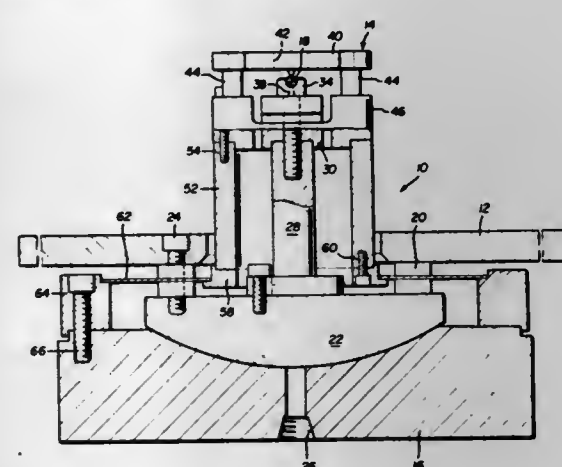
Albert E. Brendel, Lake Orion, and Stanley J. Rykwalder, Farmington, both of Mich., assignors to Lebow Associates, Inc., Troy, Mich.

Filed June 14, 1976, Ser. No. 695,664

Int. Cl.² G01M 1/12

U.S. Cl. 73—483

5 Claims



1. An improved moment sensing device for use in a system for measuring the magnitude of moments about each of first and second mutually perpendicular axes, comprising:

1. a rigid hub;
2. a rigid annular ring member concentrically surrounding said hub and radially spaced therefrom relative to the third mutually perpendicular axis;
3. a rigid force transmitting member spaced along said third axis from said hub and ring member;
4. a first pair of bendable beams interconnecting said hub

4,052,907

PUMPING DEVICE FOR WELLS, SUCH AS OIL WELLS

Jél Chardonneau, Orvault, and Claude Sable, Reze, both of France, assignors to Centre d'Etudes et de Realisations Industrielles de l'Atlantique (Ceria), Nantes, France
Filed Jan. 19, 1976, Ser. No. 650,264

Claims priority, application France, Jan. 23, 1975, 75.02075

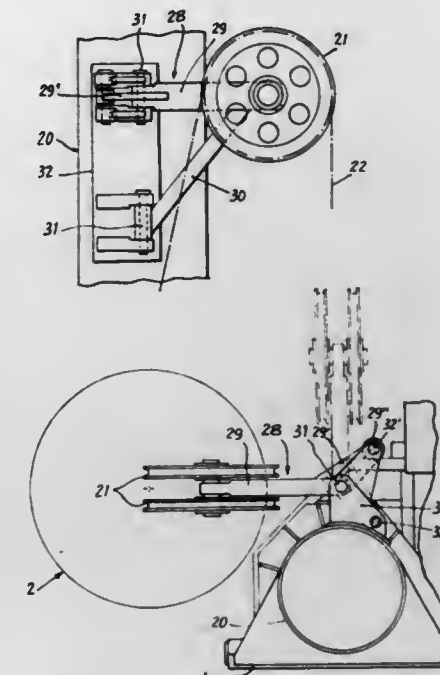
Int. Cl.² F16H 27/02

U.S. Cl. 74—89.22

7 Claims

with said force transmitting member, said beams being symmetrically located on opposite sides of said third axis and having a neutral axis coincident with said first axis and being bendable only to response to bending moments about said first axis;

5. a second pair of bendable beams interconnecting said ring member with said force transmitting member, said beams being symmetrically located on opposite sides of said third axis and having a neutral axis coincident with said second axis and being bendable only in response to bending moments about said second axis;
6. said first and second pairs of bendable beams and said force transmitting member forming the only interconnection between said hub and said ring;
7. said first and second pair of bendable beams each being adapted to be instrumented to produce a signal proportional to their bending stress about their respective bendable axes;
8. whereby when moments about said first or second axes are applied to one of said hub or said ring, with the other of said hub or said ring providing a reaction moment, the appropriate pair or pairs of bendable beams will bend in such a manner to cause the instrumentation to produce a signal proportional to the magnitude of the applied moment.



1. An improved pumping apparatus for a well, comprising: a vertically extending tubular mast; at least one guide pulley having a horizontal axis of rotation; means supporting said guide pulley outwardly from the mast, said supporting means being pivotally joined to said mast about a vertical axis to permit said pulley to be selectively positioned in alignment with a shaft of said well; means for locking said supporting means in positions in and out of alignment with said shaft;
- a driving plant;
- a flexible connection extending from said driving plant and passing over said guide pulley, said connection being selectively joined to pumping means immersed within the well; and
- means joined to said driving plant for counterbalancing forces exerted on said flexible connection.

4,052,908

V-BELT TYPE AUTOMATIC TRANSMISSION DRIVE CLUTCH DEVICE

Izumi Takagi, and Haruo Kital, both of Akashi, Japan, assignors to Kawasaki Heavy Industries, Ltd., Japan

Filed Jan. 13, 1976, Ser. No. 648,807

Claims priority, application Japan, Jan. 14, 1975, 50-7583[U] Int. Cl.² F16H 55/52

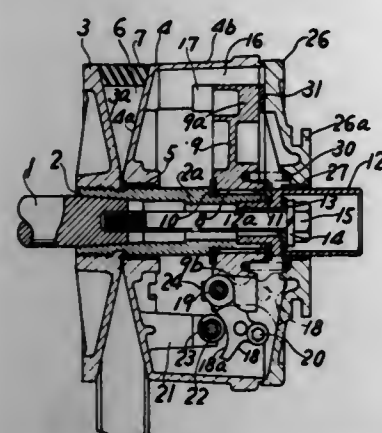
U.S. Cl. 74—230.17 E

1 Claim

1. Mechanism for controlling the motion of weft carrying grippers in continuous weft feed looms, comprising a main rotary shaft of the loom, a crank carried by said shaft, a connecting rod pivotally secured to the crank, a slider pivotally connected to the end of the connecting rod remote from the crank, a screw passing through said slider and fixed at one end to a gear wheel that rotates in opposite directions to advance and retract a weft-carrying gripper, said screw being a cam screw with variable pitch that rotates about its own axis, means mounting said slider only for rectilinear motion parallel to the screw, and at least one pair of opposed rollers or wheels mounted for rotation on said slider about axes that are fixed relative to the slider, said slider wheels or rollers engaging said variable pitch screw to rotate said gear wheel with variable angular velocity upon rotation of said shaft.

1. In a drive clutch device for the V-belt type automatic transmission having a driving shaft, a stationary sheave having a sheave surface and fixed to the driving shaft, a movable sheave having a sheave surface and a hollow cylindrical portion which extends in the opposite direction from the sheave surface and has the free end thereof open, said movable sheave being rotatably and axially slidably mounted on the driving shaft with the sheave surface thereof opposed the stationary sheave, said sheave surface of the movable sheave and said sheave surface of the stationary sheave defining therebetween a V-shaped groove in which a V-belt is positioned, a bracket fixed to said driving shaft for transmitting rotation of the driving shaft to said movable sheave, a spring interposed between said bracket and said cover in for biasing the movable sheave in a direction away from the stationary sheave, a roller rotat-

ably mounted on said movable sheave, and a cam weight acting as a centrifugal weight and pivotally supported on said bracket for swinging movement radially outwardly of said driving shaft and having a concave cam surface in engagement with said roller for urging said movable sheave to slide along said driving shaft against the force of said spring toward said sta-



tionary sheave when centrifugal force caused by rotation of said cam weight swings said cam outwardly, thereby varying the pulley diameter; the improvement comprising a cover enclosing the open end of the cylindrical portion of the movable sheave and also being slidable along the driving shaft, and having a starter pulley integrally cast thereon.

4,052,909

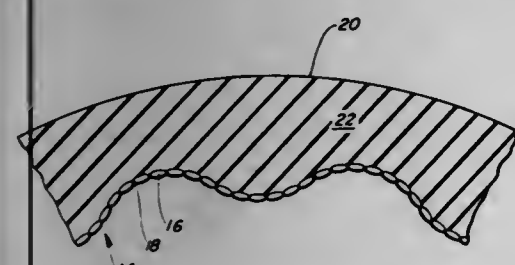
POWER TRANSMISSION BELT

John Craig Warner, Ithaca, N.Y., and Mark William Gravel, Keokuk, Iowa, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 13, 1976, Ser. No. 722,938
Int. Cl.² F16G 1/00

U.S. Cl. 74—231 P

4 Claims



1. A power transmission belt which comprises an elastomeric body and a longitudinally flexible and lateral stiff member bonded to said elastomer of said body, said member being of a plastic and having alternate relatively thin laterally extending portions and relatively thick and rod-like laterally extending portions, said member being of one piece and of a single plastic, said relatively thin portions acting as living hinges providing the longitudinally flexibility of the belt while said rod-like portions provide the lateral stiffness thereof.

4,052,910

GOVERNOR AND DECELERATOR CONTROL LINKAGE

Arthur E. Ott, Jr., Pekin, and Richard Vanrossem, Canton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

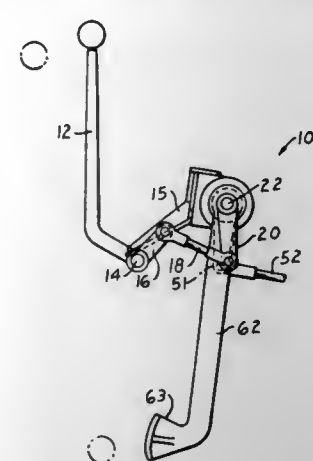
Filed Aug. 23, 1976, Ser. No. 716,845
Int. Cl.² G05G 1/14, 11/00

U.S. Cl. 74—482

7 Claims

1. An engine control linkage comprising:
a housing;
a first shaft rotatably mounted in the housing;
a second shaft rotatably mounted in the housing;
coupling means associated with the housing and associating the first shaft with the second shaft for allowing rotation of the second shaft relative to the housing only upon rotation of the first shaft;

first lever means fixedly associated with the second shaft for rotation therewith;
second lever means rotatably mounted about the second shaft;
third lever means rotatably mounted about the first shaft;
said first and third lever means each engageable with the



second lever means for rotating said second lever means in a first rotative direction relative to the second shaft; and resilient means associated with the second shaft and the first and second lever means for urging the second lever means in a second rotative direction to engage the first lever means in a predetermined position relative to the first lever means.

4,052,911

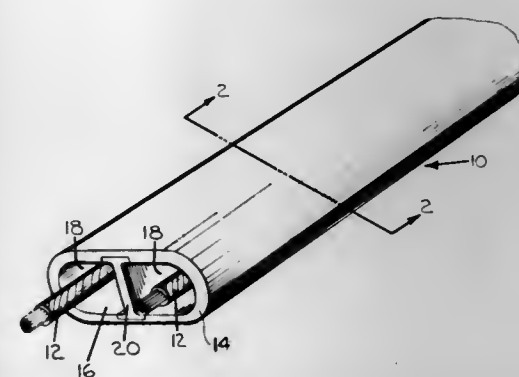
CABLE CORE CONDUIT

George Feldstein, Lansdale, Pa., assignor to Incom International Inc., Pittsburgh, Pa.

Continuation of Ser. No. 361,780, May 18, 1973, abandoned.
This application Feb. 6, 1975, Ser. No. 547,538
Int. Cl.² F16C 1/10

U.S. Cl. 74—501 R

10 Claims



1. A push-pull cable core conduit for a motion transmitting system comprising an outer casing of resilient plastic material having an inner plastic wall, said casing having a central longitudinally extending cavity, said cavity separated by a resilient metallic strength member into a plurality of longitudinally extending pathways each of which pathways are bounded by portions of the metallic strength member and the inner plastic wall, a like plurality of motion transmitting cable cores positioned severally in the pathways and spaced from the resilient metallic strength member and from the plastic wall of the outer casing for slidable movement therein, said inner plastic wall of said outer casing providing the bearing surfaces for said slidable cores.

4,052,912

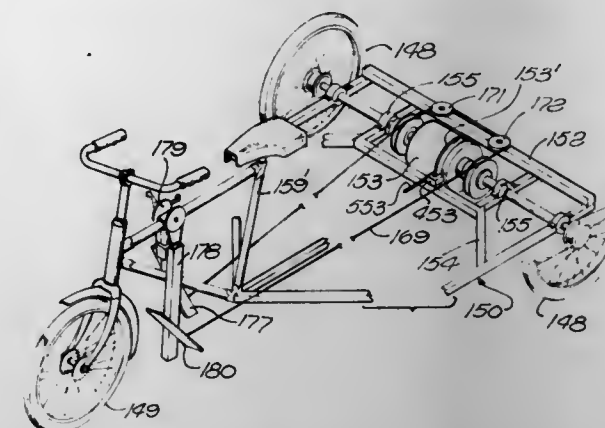
PEDAL ACTUATED DRIVE MECHANISM

Peter Vukelic, 924 Milwood Ave., Venice, Calif. 90291

Filed May 27, 1975, Ser. No. 580,748
Int. Cl.² G05G 1/14

U.S. Cl. 74—512

18 Claims



1. A drive assembly comprising:
a foot actuated structure mounted to swing about an axis alternately in opposite directions, and including a pedal against which force is exerted by a user's foot to swing the structure about said axis;
a movable member to be driven by said structure;
mechanism for driving said member in response to oscillation of said foot actuated structure in said opposite directions about said axis;
means connecting said mechanism operatively to said structure for actuation thereby at a location offset from said axis, and mounted for shifting movement in a relation moving the operative connection between said structure and said mechanism toward and away from said axis to thereby vary the effective length of lever arm of said structure and correspondingly alter the transmission ratio of said drive assembly;
a second of said foot actuated structures swinging oppositely from said first structure;
second connecting means connecting said mechanism to said second structure for actuation thereby and in a relation enabling shifting movement of the effective point of operative connection of said mechanism to said second structure toward and away from the axis about which said second structure swings; and
control means actuable by an operator to simultaneously shift the point of connection of said mechanism to both of said structures toward or away from the axes of said structures.

4,052,913

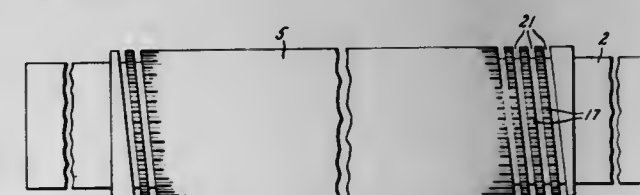
POLAR WEAVE FLYWHEEL ASSEMBLY

Frederick E. Schultz, Devon, and Albert M. Garber, Wynnewood, both of Pa., assignors to General Electric Company

Filed Dec. 23, 1975, Ser. No. 643,906
Int. Cl.² G05G 1/00, 3/00

U.S. Cl. 74—572

17 Claims



1. A flywheel comprising:
a. an inner hub; and
b. an outer composite portion woven in intimate locking engagement with said hub, said composite comprising a plurality of three mutually orthogonal bundles of elements with said bundles of elements being respectively aligned

and positioned in directions parallel to polar coordinate axis.

4,052,914

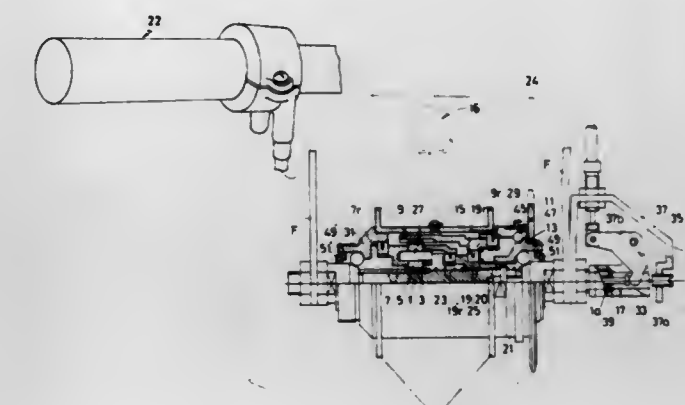
INTERNALLY ACCOMMODATED SPEED CHANGE MECHANISM APPLICABLE TO A BICYCLE, ETC.

Kazuo Nakajima, Kodaira, Japan, assignor to Xenos Co., Hagashi Yamato, Japan

Filed Apr. 10, 1975, Ser. No. 566,722
Claims priority, application Japan, Jan. 25, 1975, 50-10724
Int. Cl.² F16H 3/44

U.S. Cl. 74—750 B

5 Claims



1. An internally accommodated speed change mechanism for a bicycle or the like, comprising:

a hub axle;
a hub body freely rotatable on said hub axle;
first and second sun gears each of which is mounted in axially fixed position on said hub axle and each of which is selectably rotatable relative to said hub axle;
a first planetary gear meshing with said first sun gear;
a second planetary gear meshing with said second sun gear;
a first ring gear meshing with said first planetary gear;
a second ring gear meshing with said second planetary gear;
a first carrier supporting said first planetary gear for free rotation and being integral with said second ring gear;
a second carrier supporting said second planetary gear for free rotation and being integral with said first sun gear;
a drive sprocket rotatably mounted relative to said hub axle;
an input member mounted on said hub axle, to be rotatably driven by said driving sprocket;
a first speed change rod supported for axial movement relative to said hub axle and being selectably axially movable from a first position inwardly to a second or third axial position;
a second speed change rod supported for axial movement relative to said hub axle and being selectably axially movable to either a first or second axial position;
means associated with said second speed change rod to fix said first sun gear to said hub axle and to release said second sun gear for rotation about said hub axle when said second speed change rod is in said first position, and to fix said second sun gear to said hub axle and to release said first sun gear for rotation about said hub axle when said speed change rod is in said second position;
a sleeve axially movable on said hub axle in response to said axial movement of said first speed change rod and rotatably driven by said input member;
a first ratchet rotatably driven by said input member and operative to rotate said first ring gear;
a second ratchet mounted on said first ring gear in position to drivingly engage said hub body when said first speed change rod is in either said second or third axial position, and to be disengaged from said hub body in said first axial position;
a third ratchet mounted on said second ring gear in position to engage said hub body; and
a fourth ratchet carried by said sleeve and engageable to

rotate said first carrier only when said first speed change rod is in said third position.

4,052,915

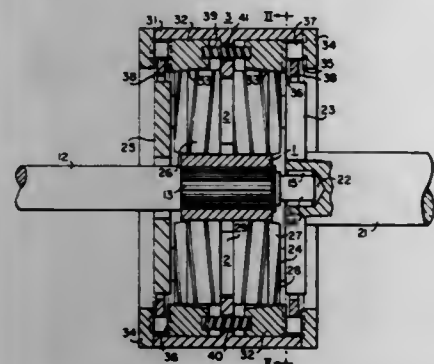
TRACTION ROLLER TRANSMISSION

Charles E. Kram, Austin, Tex., assignor to Excelermatic, Inc., Leesburg, Va.

Filed July 12, 1976, Ser. No. 704,438
Int. Cl.² F16H 13/06, 13/10, 13/14

U.S. Cl. 74-798

6 Claims



1. In a traction roller transmission comprising: a traction ring structure including two traction rings having opposite conical inner traction surfaces; a sun roller centrally disposed within the traction ring structure and having a circumferential traction surface spaced from the traction surfaces of said traction rings; planetary traction rollers supported in the space between the sun roller and the traction ring structure, each of said traction rollers having a cylindrical central section in engagement with said sun roller and axially outer conical sections in engagement with the conical traction rings, and engagement means for forcing said traction rings toward each other and into firm compressive engagement with the traction rollers and said traction rollers into frictional engagement with said sun roller; the improvement residing in the cone angle of said conical traction ring surfaces and the conical surface sections of the traction rollers being relatively small so as to prevent substantial spin at the conical surfaces of the traction rollers and the traction rings and separating means being disposed between the traction rings for axially forcing said traction rings apart for disengagement of said traction rings from said traction rollers.

4,052,916

PROCESS FOR MAKING A DIE PUNCH

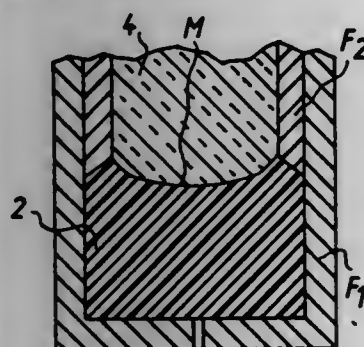
Paul Fenchberg, Planegg, Germany, assignor to AGFA-Gevaert AG, Leverkusen, Germany

Filed Mar. 4, 1976, Ser. No. 663,815

Claims priority, application Germany, Mar. 27, 1975, 2513773
Int. Cl.² B21K 5/20

U.S. Cl. 76-107 R

6 Claims



1. A process for making a concave die or die punch of the type required in the formation of highly specific silicone elastomer contact lenses of negative power of refraction in which the curvature of the marginal zone must be greater than the curvature of the central zone,

the said process comprising

- making a convex die negative of desired differential curvature from gals or a vitreous ceramic;
- providing the negative with a metal coating of a thinness to permit it fully to conform to the surface curvatures of the die negative;
- placing a concave die positive consisting of a heat hardenable resin in uncured condition in an open top mold; and
- introducing the die negative into the mold and bringing the said metal coated surface of the die negative within the constrained space of the mold into close contact with the die positive while heating the said resin to harden it, thereby causing the metal coating to become detached from the die negative and to adhere to the die positive, thus transferring the metal coating to the die positive so that the surface of the die negative is reproduced on the die positive.

4,052,917

JAR AND BOTTLE CAP OPENER

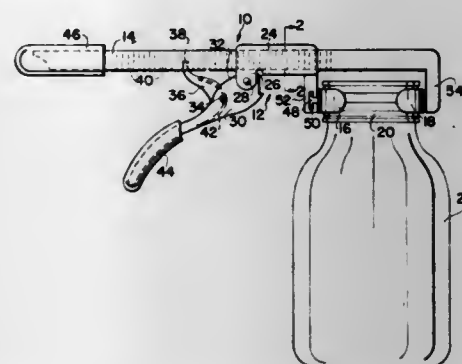
Beryl Gee, Scarborough, Canada, assignor to Beryl Gee, Scarborough, Canada

Filed Jan. 21, 1977, Ser. No. 761,061

Int. Cl.² B67B 7/18

U.S. Cl. 81-3.42

5 Claims



1. A jar and bottle cap opener comprising: an elongated handle having a depending lug at the front thereof; a slide on said handle having a depending lug at the front thereof; a slot in the side of each of said lugs, the slot on one of said lugs being on a side opposite to the slot on the other of said lugs; a pair of arcuate jaws for gripping therebetween a cap on a bottle or jar; means on each of said jaws slidably received within one of said slots for mounting a jaw on each of said lugs; and means pivotally mounted on said slide for urging said jaws into gripping relation with a cap on a bottle or a jar and for locking said jaws in gripping relation.

4,052,918

TOOL HEAD MOUNTING ARRANGEMENT FOR A LATHE

Hermann Schmitz, Mettmann, and Ferdinand Wellisch, Nenns, both of Germany, assignors to Sandvik Aktiebolag, Aand-viken, Sweden

Filed July 7, 1976, Ser. No. 703,223

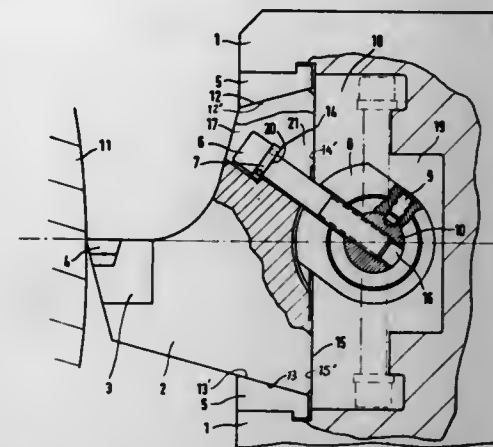
Claims priority, application Germany, July 25, 1975, 2533393
Int. Cl.² B23B 29/00

U.S. Cl. 82-36 R

10 Claims

1. A tool heading mounting arrangement in a turning machine of the type having a carrier and tool head clamped against seating surfaces therein, said tool head being adjustable in position relative to the workpiece, said carrier containing an opening for receiving said tool head, said opening including an upper seating surface and a lower seating surface against which

said tool head rests, a rotatable clamping means provided in the carrier for retaining said tool head in place, said clamping means comprising a body having a transversely running threaded bore for receiving a clamping screw for clamping the



tool head, said body being mounted rotatably in the carrier, said carrier being provided with a recess dimensioned so that the clamping screw can be moved selectively into upper and lower positions in which it is displaced from the guide opening in the carrier to permit insertion and removal of a tool head.

4,052,919

MOTOR-DRIVEN BOLSTER PLATE

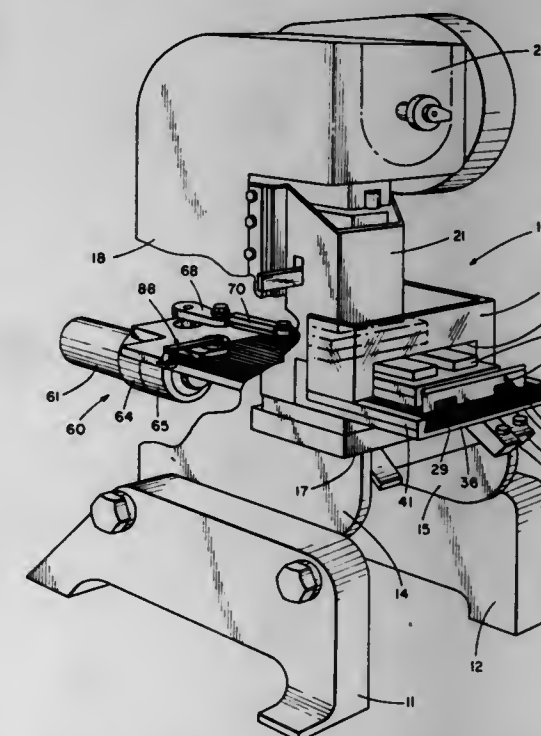
Patrick G. McKinnack, Gary, Ind., assignor to The Anderson Company, Gary, Ind.

Filed Sept. 15, 1976, Ser. No. 723,433

Int. Cl.² B26D 7/24

U.S. Cl. 83-205

10 Claims



1. In a press including a supporting frame, a bed mounted on the frame, a bolster plate, a first die member carried by the bolster plate, means for mounting the bolster plate on the bed for sliding movement between a work position in the press and a withdrawn load position out of the press, a ram, a second die member carried by the ram, means for mounting the ram on the frame for movement between a raised open position and a lowered closed position, and means for reciprocating the ram between its raised and lowered positions, the press operating to move the ram to its lowered position with the second die member in engagement with the first die member when the bolster plate is positioned at its work position, the improvement comprising:

a drive assembly for reciprocating the bolster plate between

its work and withdrawn positions, said drive assembly including a constant speed motor, a clutch, and a brake; a crank having one end connected to said drive assembly so that the other end is rotated circuitously about said one end; a connecting arm between the bolster plate and said other end of said crank; and a bolster plate positioning control mechanism including a reciprocable shot pin carried by the frame, means for reciprocating said shot pin, the bolster plate having an opening for receiving said shot pin, said opening being aligned with said shot pin when the bolster plate is at its work position, first switch means operated when the bolster plate is at its work position to activate said brake and disengage said clutch to end movement of said bolster plate, said switch means activating said shot pin reciprocating means to move said shot pin into said opening, second switch means operated when said shot pin is extended into said opening to actuate the ram reciprocating means to move the ram to its lowered position, third switch means operated when the ram is returned to its raised position to activate said shot pin reciprocating means to retract said shot pin from said opening, fourth switch means operated when said shot pin is retracted from said opening to deactivate said brake and engage said clutch so that said drive assembly operates to move said bolster plate to its load position and fifth switch means operated when the bolster plate is moved to its load position to activate said brake and disengage said clutch to terminate movement of said bolster plate.

4,052,920

MACHINE FOR PERFORATING HIGH DENSITY POLY-ETHYLENE FILM OR THE LIKE FILM MATERIAL

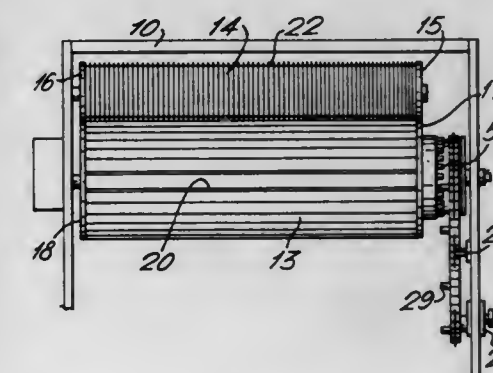
Vernon Gerald Ralph Dixon, Wisborough Green, England, assignor to Paclene Company Limited, Ennis, Ireland

Filed Aug. 31, 1976, Ser. No. 719,482

Claims priority, application Ireland, Sept. 1, 1975, 1907/75
Int. Cl.² B26F 1/24

U.S. Cl. 83-337

5 Claims



1. A machine for perforating high density polyethylene film material or the like, comprising a feed roller for supplying film material to be perforated from a roll thereof, cooperating male and female rollers between which film material from the feed roller passes for perforation, and a take up means for receiving the perforated film material, the male roller carrying for rotation therewith a plurality of circumferentially spaced blade members, means for mounting each blade for reciprocal motion relative to the surface of the male roller between a first position wherein the blade member projects from the surface of the male roller and a second position wherein the blade member is retracted into the male roller, means for biasing each blade member into one of its first and second positions, an independently operable actuating member linked respectively to each blade member for forcing the associated blade member into the other of its first and second positions in opposition to the biasing means, an indexing mechanism including a plurality of selectively located actuating means mounted for movement

in coordination with the rotation of the male roller and arranged to cooperate with the actuating members of the blade members in such manner that upon rotation of the male roller the actuating means are brought successively into engagement with selected actuating members whereby the associated blade members are successively forced into their other positions, means for causing the actuating means to remain in engagement with the actuating members during a partial rotation of the male roller and for thereafter being successively disengaged from the actuating members to allow the biasing means to return the blade members to their one positions, the angular distance over which the actuating means remain in engagement with the selected actuating members being chosen such that, in the vicinity of the female roller, the blade members linked with the selected actuating members are in their projecting position for perforation of film material passing between the male and female rollers and the blade members linked to the non-selected actuating members are in their retracted position, recesses within the female roller which are entered by the selected blade members during perforation of the film, and means for adjusting the indexing means whereby the spacing and number of actuating means may be changed to vary the selection of blade members.

4,052,921

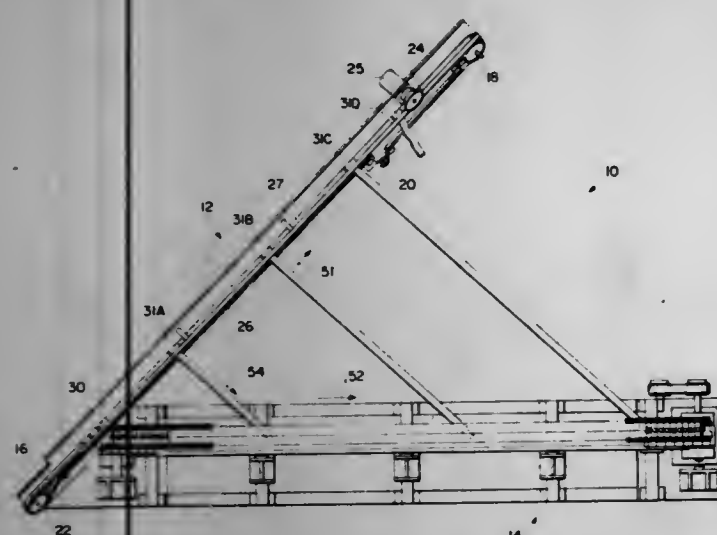
APPARATUS FOR REMOVING WEBS FROM CARTRIDGES

Gurdip Singh Sethi, Rochester, and Thomas Walter Cole, Avon, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1976, Ser. No. 737,259
Int. Cl.² B26D 7/06

U.S. Cl. 83-409

9 Claims



1. Apparatus for pulling webs from respective cartridges, each web having an end portion protruding from its respective cartridge, said apparatus comprising:
means for advancing the cartridges in a first direction; and
means for engaging the end portion of each web and for advancing the end portion so engaged in a second direction at an acute angle with respect to said first direction, whereby as the cartridges and the respective web end portions are advanced along said first and second directions respectively, each web is pulled from its respective cartridge.

4,052,922

HYDRAULICALLY-ACTUATED CABLE CUTTER
Robert A. Buh, Gibsonia, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

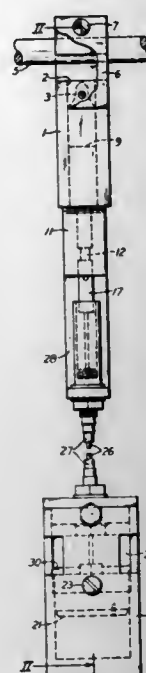
Filed Dec. 1, 1976, Ser. No. 746,399
Int. Cl.² B26D 5/12

U.S. Cl. 83-439

10 Claims

1. A hydraulically actuated cable cutter, comprising a cable holder, a cable cutting member in the holder adapted to be

driven forward to cut a cable, an explosive charge for driving said member forward, a firing pin slidably mounted in said holder behind the charge for detonating it, a spring urging the pin forward toward the charge, a firing pin retractor slidably mounted in said holder behind said pin and detachably connected with the pin for retracting it a predetermined distance to compress said spring, the connection between the retractor and firing pin being such that when the pin has been retracted said predetermined distance the retractor will release the pin, a



cylinder separate from the cable holder spaced behind said retractor and having a front end and a closed rear end, a piston in the cylinder normally spaced from its opposite ends, tension means extending through an opening in the front end of the cylinder and connecting said retractor with the piston, the cylinder being intended for submersion in a body of water and having an opening for the water between its front end and the piston, whereby a predetermined increase in water pressure at the cylinder will move the piston rearwardly therein to retract said retractor until the firing pin is released.

4,052,923

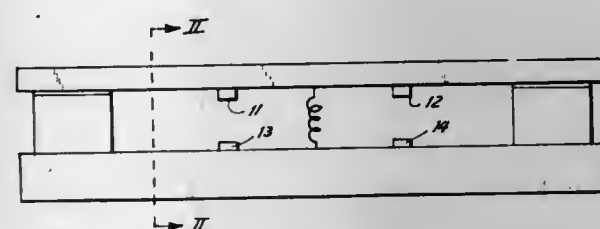
ELECTRICAL CONTROL DEVICES

James Myron Cohn, 1125 Lexington Ave., New York, N.Y. 10021

Filed June 22, 1976, Ser. No. 698,644
Int. Cl.² G10H 3/00

U.S. Cl. 84-1.07

11 Claims



1. An electrical control device comprising a base member, an elongate support member mounted to be movable transversely of its length with respect to said base member, biasing means to bias the support member against movement away from a null position in one direction transversely of its length, and a potentiometer comprising an elongate resistive member supported by and extending along the length of the support member and a sensing electrode which can be applied to the resistive member at a position intermediate its ends when said ends are connected to opposite respective poles of a voltage source to tap off a voltage which is selectively variable by varying the position along the support member at which the sensing electrode is applied to the resistive member, said resistive member being so arranged with respect to said support

member that application of the sensing electrode to the resistive member tends to bring about movement of said elongate member with respect to said base member in said one direction, in opposition to said biasing means, and the device also comprising position pick-up means having a first part connected to said support member and a second part connected to said base member, said parts being arranged and connected to generate an electrical analog signal dependent on the position of said support member with respect to said base member, and the device also being provided with means for generating a predetermined response when said support member is moved from said null position through an initiating threshold position against said biasing means and for terminating said predetermined response when said support member is returned from beyond said initiating threshold position towards said null position through a termination threshold position.

4,052,924

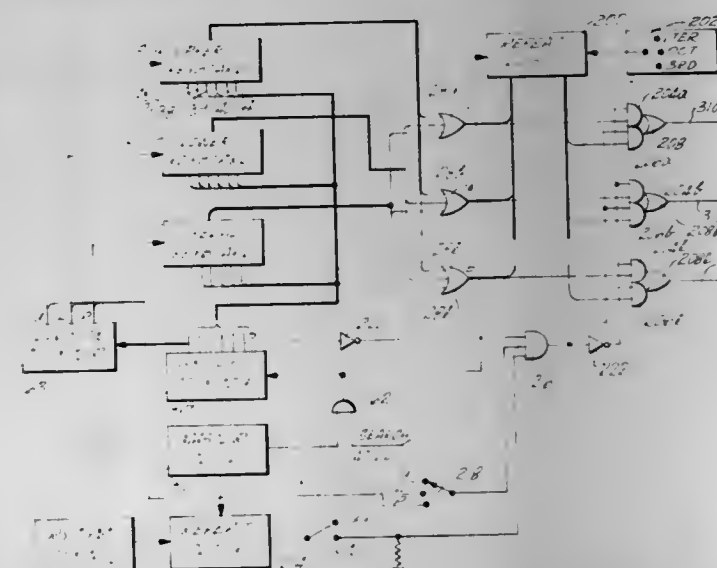
INTERVAL REPEAT GENERATOR FOR KEYBOARD MUSICAL INSTRUMENT

Ralph Deutsch, and Leslie J. Deutsch, both of Sherman Oaks, Calif., assignors to Kawai Musical Instrument Mfg. Co. Ltd., Hamamatsu, Japan

Filed Aug. 9, 1976, Ser. No. 712,744
Int. Cl.² G10H 1/02

U.S. Cl. 84-1.24

9 Claims



1. In a polyphonic tone synthesizer in which individual notes are generated in response to pressing selected keys, the keys being arranged in groups corresponding to octaves and the groups being arranged in divisions corresponding to separate keyboards, the groups of keys in the several divisions being repetitively pulsed in time sequence and the status of all the keys in a group being read out in the form of a parallel pattern of output pulses coincident with the sequential pulsing of each of said groups, apparatus for generating notes in a repetitive pattern in response to operation of a single key in a selected keyboard, comprising: a repeat signal generator for generating a repeat clock signal having a repetitive rate that is different than the rate at which any particular group is repetitively pulsed, and switching means operated by said repeat signal generator for periodically interrupting said sequence of parallel patterns of output pulses during the normal time period for the associated group of keys.

4,052,925

EXPANSION STUD

Edward P. McCarthy, York, Pa., assignor to U.S. Expansion Bolt Company, York, Pa.

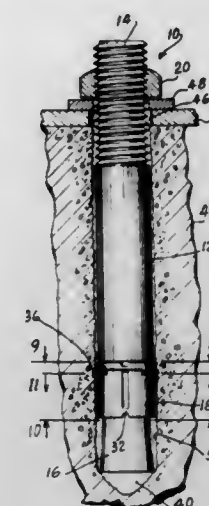
Filed Nov. 5, 1975, Ser. No. 629,050
Int. Cl.² F16B 13/06

U.S. Cl. 85-77

8 Claims

1. An expansion stud which is adapted to be inserted into, and to expand in, a bore hole in a concrete anchorage or the like, said expansion stud comprising:

- a cylindrical shank,
- the upper end of said cylindrical shank being threaded for engagement with a nut,
- the lower end of said shank having a wedge tip which is conically tapered throughout its length up to said lower end of said shank, said wedge tip oriented with its smaller end directed upwardly and joined directly to the shank, its larger end directed downwardly away from the shank, and the maximum diameter of said wedge tip being substantially no greater than the diameter of said shank,
- an expansion sleeve mounted, when in unexpanded state, on the smaller upper end of said wedge tip,
- said expansion sleeve, in unexpanded state, having a conically tapered axial bore the conical angle of which is substantially the same as the conical angle of said wedge tip, and a substantially cylindrical outer configuration having a diameter which corresponds, substantially, to the diameter of the shank,
- whereby causing the cylindrical shank and the wedge tip to move upwardly and axially relative to the expansion sleeve causes expansion thereof in opposite radial directions perpendicular to the shank axis,
- the length of the wedge tip exceeding the length of the expansion sleeve approximately twice the length of the expansion sleeve,
- whereby, when expanded to full capacity, the expansion sleeve remains fully supported on the wedge tip.



- the length of the wedge tip exceeding the length of the expansion sleeve approximately twice the length of the expansion sleeve,
- whereby, when expanded to full capacity, the expansion sleeve remains fully supported on the wedge tip.

4,052,926

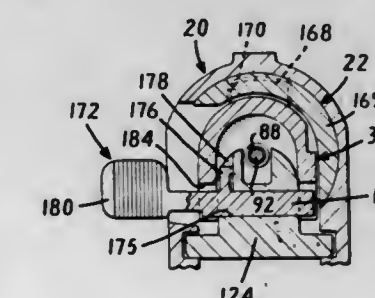
CHARGING HANDLE FOR A GAS-OPERATED SHOTGUN

James Tollinger, Ithaca, N.Y., assignor to Ithaca Gun Company, Inc., Ithaca, N.Y.

Division of Ser. No. 525,072, Nov. 19, 1974, Pat. No. 4,014,247.
This application Dec. 22, 1976, Ser. No. 753,189
Int. Cl.² F41C 19/14

U.S. Cl. 89-1 K

2 Claims



1. In a gas operated firearm having a receiver, a barrel removably mounted in said receiver, a slide, and a bolt operated by said slide, the improvement comprising:
a charging handle having a body portion with a non-circular cross-section;

means, including an upper edge, defining a recess in said bolt through which said charging handle extends; means in said slide defining a laterally extending bore having a non-circular cross-section alike the cross-section of said charging handle body portion; a vertical step in said body portion having an upper extremity normally extending within said bolt above said upper edge; said bolt being pivotally mounted in said receiver such that, when said barrel is removed from said receiver, said bolt may be tilted upward to raise said upper edge above the upper extremity of said step, whereby said charging handle may be withdrawn from said slide, bolt and receiver.

4,052,927

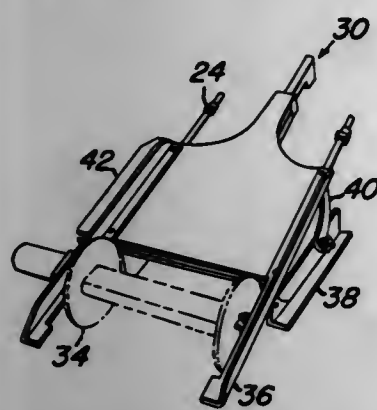
AUTOROTOR LAUNCHING SYSTEM

Abraham Platan, Edgewood, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 1, 1966, Ser. No. 578,958

Int. Cl.² F41F 5/00

U.S. Cl. 89—1.5 R



1. An autorotor launcher adapted to be mounted in an airborne vehicle, comprising in combination:
 - a. means to rotate said autorotor to a predetermined angular velocity prior to ejection from said vehicle,
 - b. means to launch said rotating autorotor from said airborne vehicle, whereby said autorotor body is stabilized and glides to the target area in a predetermined trajectory.

4,052,928

CAM-TYPE GEARING AND THE LIKE

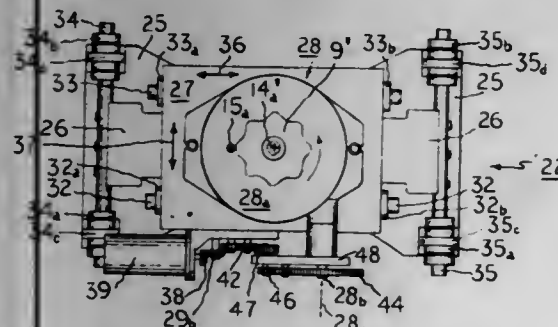
Michel A. Piarrot, and Carl J. Holt, Jr., both of Andover, Mass., assignors to COMPUDRIVE Corporation, North Billerica, Mass.

Filed Feb. 18, 1976, Ser. No. 658,887

Int. Cl.² B23F 5/02, 5/20

U.S. Cl. 90—3

8 Claims



8. The method of contouring peripheral lobes of a cam-type gear or the like which comprises supporting a cam blank on a movable mount, providing a source of rotational motive power in fixed relation to and movable with the movable mount, using motive power from the source to rotate the cam blank on the mount in one angular direction about a first axis normal thereto at a first angular rate while restraining rotation of the mount in relation to a base by restricting the movements of the mount to two mutually-perpendicular paths normal to the first axis, using motive power from the same source movable with the

mount to develop forces relative to the base which orbit the first axis and the cam blank and the mount along a circular path lying in a plane normal to the first axis, as allowed by movements of the mount along said mutually-perpendicular paths, and at a second angular rate which is an integral multiple of the said first rate and synchronous therewith, said circular path of the orbiting having a diameter which is small in relation to the diameter of the cam blank and which is equal to the depth of lobes being contoured, and removing material from a periphery of the cam blank at a fixed position in relation to which the cam blank is simultaneously orbited and rotated in the opposite directions, the removing of material being performed along a path having a curvature of substantially the same radius as that of circular-curvature cam surfaces which are to mesh with the lobes of the cam-type gear.

4,052,929

HYDRAULIC CONTROL MEANS, ESPECIALLY A STEERING MEANS

Johannes Vaga Bastrup, Sonderborg, and Thorikild Christensen, Nordborg, both of Denmark, assignors to Danfoos A/S, Nordborg, Denmark

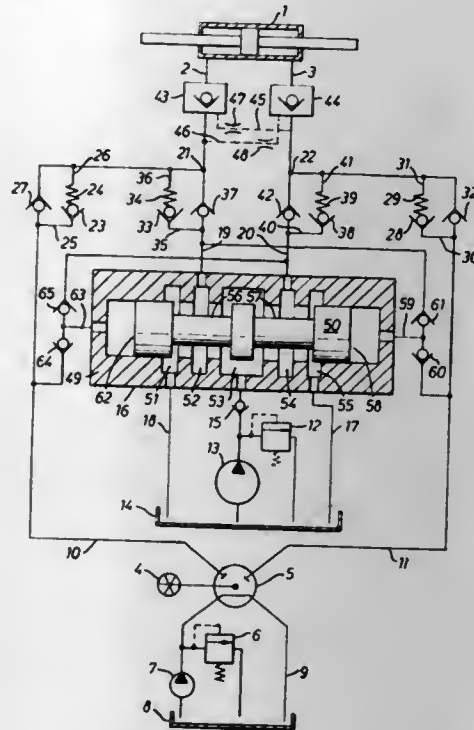
Continuation of Ser. No. 438,004, Feb. 6, 1974, abandoned. This application June 20, 1975, Ser. No. 588,623

Claims priority, application Germany, Feb. 7, 1973, 2305798

Int. Cl.² F15B 13/042

U.S. Cl. 91—29

2 Claims



1. A power steering assembly comprising a motor having expandable chamber means, first and second pressurized fluid source means, manually controlled rotary metering means controlling said first source means, control and power passage means extending respectively in parallel from said two source means to a junction upstream from said chamber means, pilot operated reciprocating comparator valve means in said power passage means having a pressure operated movable valve member for modulatingly controlling the flow of pressurized fluid in said power passage means to said chamber means, first branch passage means between said control passage means and a first pressure responsive portion of said comparator valve means for pilot fluid pressure biasing said valve member in an opening direction, second branch passage means between said power passage means downstream of said comparator valve means and a second pressure responsive portion of said comparator valve means for fluid pressure biasing said valve member in a closing direction, first and second throttle check valves biased by resilient means respectively, in said control and power passage means between said branches and said junction, said throttle valves presenting selected resistances to flow to

obtain selected predetermined flow relationships between the respective fluid flows in said control and power passage means.

4,052,930

ELECTRIC AND HYDRAULIC SERVOMECHANISM CONTROLLING DEVICE

Takeo Hiramatsu, Kyoto, and Yasuhiko Fujita, Moriyama, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

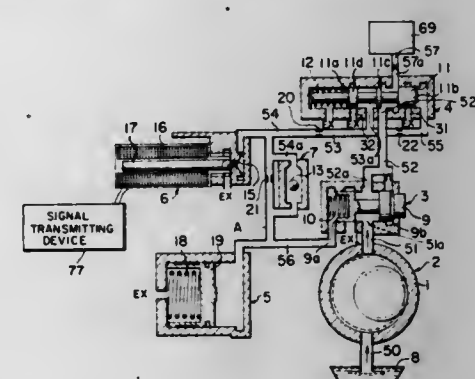
Filed May 15, 1975, Ser. No. 577,765

Claims priority, application Japan, May 16, 1974, 49-54850

Int. Cl.² F15B 11/08, 13/043

U.S. Cl. 91—446

2 Claims



1. An electric and hydraulic servomechanism control device comprising: a hydraulic pressure source for supplying pressurized oil and including a pump (2) and an oil reservoir (8); a hydraulic servomechanism actuated by hydraulic pressure; a pressure governor valve (3) having an inlet portion (51a) connected to the output side of said pump, a first controlled flow outlet port (52a), an excess flow outlet portion (EX1) for returning the oil to said oil reservoir (8), a first slidable valve rod (9) with lands thereon disposed for opening and closing said outlet port, (EX1) for controlling the fluid flow from said inlet port (51a) to each of said outlet port (52a, EX1) and having two pressure-receiving surfaces (9a, 9b) one (9b) of which is defined by an annular portion of said first valve rod and responds to the hydraulic pressure in said first controlled flow outlet port (52a) for urging said first slidable valve rod (9) in one direction and the other (9a) of which responds to hydraulic pressure for urging said first slidable valve rod (9) in the other direction, and first means (10) for pressing said first slidable valve rod (9) in said other direction; a change-over and pressure-reducing valve (4) having an inlet port (52b) connected to said first controlled flow outlet port (52a), an outlet port (57a) connected to said hydraulic servomechanism, two exhaust ports (31, 32) for returning the oil to said oil reservoir (8), a second controlled flow outlet port (53a), a second slidable valve rod (11) with multiple lands thereon slidably disposed for selectively changing the flow direction from said inlet port (52b) to said outlet port (57a) or said second controlled flow outlet port (53a) and having a pressure-receiving surface 11b which responds to the hydraulic pressure in said second controlled flow outlet port (53a) for urging said second slidable valve rod (11) in one direction, and second means (12) for pressing said second slidable valve rod (11) in the other direction which is opposite to the direction in which the hydraulic pressure fed from said second controlled flow outlet port (53a) is applied thereto; a signal transmitting device (77) for transmitting electrical signals; a solenoid valve (6) having an orifice (15) connected to said oil reservoir (8) and which is opened and closed according to said electrical signals applied thereto from said signal transmitting device (77); and a hydraulic passage A interconnecting a hydraulic pressure supplying passage (56) leading to said hydraulic pressure-receiving surface 9a with said orifice (15) of said solenoid valve (6) and with said second controlled flow outlet port (53a); whereby when said solenoid valve (6) closes said orifice (15) and the hydraulic pressure in said hydraulic passage A rises, said second slidable valve rod (11) of said change-over valve (4) slides to a first position where the force applied on said second slidable valve rod (11)

by the hydraulic pressure of said second controlled flow outlet port (53a) balances with the force applied by said second means (12) thereby communicating said inlet port (52b) and said outlet port (57a) connected to said hydraulic servomechanism and controlling the hydraulic pressure in the hydraulic passage A to a given level lower than the hydraulic pressure in said first controlled flow outlet port (52a) by discharging the excess oil in said hydraulic passage A through one 32 of said two exhaust ports of said change-over valve (4), said pressure governor valve (3) raises the hydraulic pressure in said first controlled flow outlet port (52a) when the hydraulic pressure in said hydraulic passage (A) rises, and said second slidable valve rod (11) slides to a second position when said solenoid valve (6) opens said orifice (15) to permit the oil to flow out of said hydraulic passage (A) to lower the hydraulic pressure therein thereby disconnecting said inlet port (52b) from said outlet port (57a) to effect discharge of the oil from said hydraulic servomechanism through one (31) of said two exhaust ports of said change-over valve (4) thereby communicating said inlet port (52b) with said second controlled flow outlet port (53a).

4,052,931

METHOD AND APPARATUS FOR LINING CONTAINERS

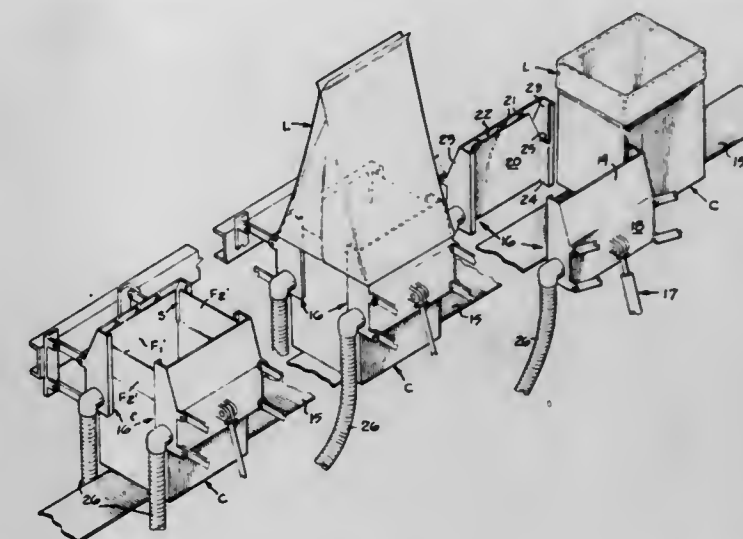
Hugh B. Morse, San Jose; Robert B. Johnson, Santa Clara, and Helmut E. W. Masch, San Jose, all of Calif., assignors to Helmut E. W. Masch, San Jose, Calif.

Filed Sept. 24, 1976, Ser. No. 726,269

Int. Cl.² B31B 7/74

U.S. Cl. 93—36.01

18 Claims



1. A method for applying a bag-type liner interiorly of a container comprising the steps of: inserting an open end of said liner over an open end of said container, and creating a pressure within said container from a top portion thereof and within said liner which is less than ambient pressure exteriorly thereof and simultaneously drawing said liner within said container.

4,052,932

FOLDING MACHINE FOR BOX BLANKS

Johannus Martinus Huiskes, Borne, Netherlands, assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 6, 1976, Ser. No. 674,293

Claims priority, application Netherlands, Apr. 1, 1975, 7503837

Int. Cl.² F01B 19/00

U.S. Cl. 93—49 R

11 Claims

1. Apparatus for folding the front and rear panels of a succession of advancing box blanks comprising: first pull roll means for serially advancing said blanks, first moveable folding means downstream from said first pull roll means for partially folding said front panel upwardly

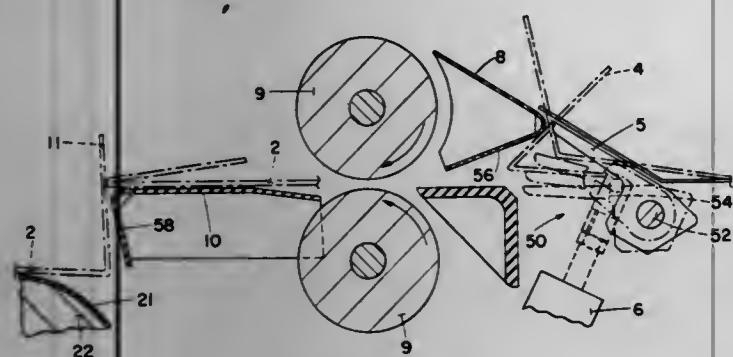
along a front transverse score line in each of said blanks successively engaging said first moveably folding means; drive means for moving said first moveable folding means into operable contact with said front panel; sensing means adapted to sense the position of said advancing blanks, and provide a signal for actuating said drive means for moving said first moveable folding means into operable contact with said front panel of said advancing blanks;

a first rigid folding member downstream from said first moveable folding means for engaging the partially folded front panel and bending it further toward the body portion of the blank being folded, said first pull roll means continuing to advance said blank;

second pull roll means downstream from said first rigid folding member for continuing advancement of each successive blank and for pressing said first panel firmly against the body portion of said blank;

stop means downstream from said second pull roll means for temporarily stopping the advance of each succeeding blank by engaging the fold line along which said first panel is folded;

drive means for moving said stop means into and out of engagement with said stop means;



second sensing means adapted to sense the position of an advancing blank and provide a signal to said drive means to move said stop means into engagement with said blank;

a second rigid folding member adjacent the downstream side of said second pull roll means for supporting the unfolded rear panel of a blank, stopped by said stop means, above an endless conveyor means positioned below said second rigid folding member;

second moveable folding means engageable with the body portion of the blank having its rear panel supported by said rigid folding member adjacent a rear transverse score line in said blank, for urging said body portion against said conveyor means to fold said rear panel upwardly by virtue of its engagement with said second rigid folding member, said rear panel being folded forward and downward against the body portion of said blank by the advance of the next succeeding blank engaging the upwardly folded rear panel; and

third sensing means adapted to sense the folding of said rear panel of said blank engaged by said stop means and provide a signal to move said stop means out of engagement with said blank.

4,052,933

TRAY FORMING METHOD

Thomas B. Royal, Homestead, Fla., assignor to International Paper Company, New York, N.Y.
Division of Ser. No. 526,826, Nov. 25, 1974, Pat. No. 3,978,774.
This application July 15, 1976, Ser. No. 705,619

Int. Cl.² B31B 1/46

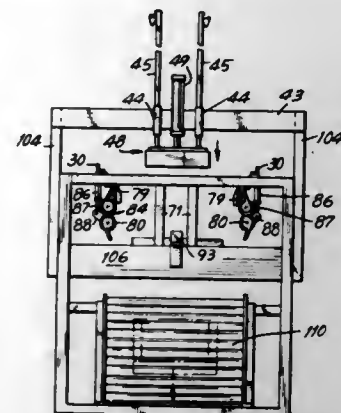
U.S. Cl. 93-51 M

2 Claims

1. The method of forming a tray having horizontal shoulder panels from a flat blank having a bottom panel, side panels and end panels foldably connected to opposite edges of said bottom

panel, and a pair of shoulder panels connected to respective side edges of said side panels, said method comprising:

- disposing said blank in a horizontal plane;
- pushing said blank downwardly with an expanded expandable mandrel;
- folding said side panels as said blank moves downwardly;



- perpendicularly folding said end panels;
- adhesively connecting said end panels and said side panels;
- folding said shoulder panels to a position perpendicular to said side panels; and
- contracting said expandable mandrel and withdrawing said mandrel from said tray.

4,052,934

DEVICE FOR ATTACHMENT TO A FRYING PAN, COOKING POT OR LIKE COOKING UTENSIL

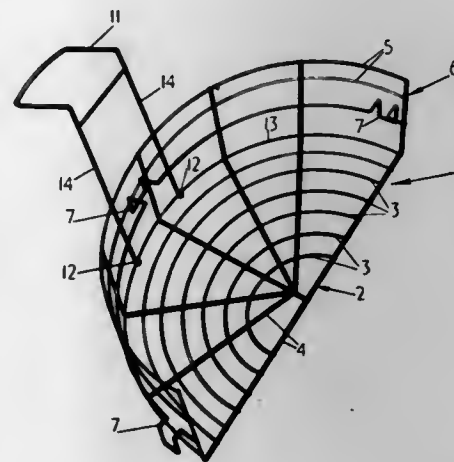
Sidney Shinman, 102 Sharps Lane, Ruislip, Middlesex, England
Filed Jan. 21, 1976, Ser. No. 650,903

Claims priority, application United Kingdom, Jan. 23, 1975, 3027/75

Int. Cl.² A47J 36/20

U.S. Cl. 99-355

6 Claims



1. A device for attachment to a frying pan, cooking pot or like cooking utensil, the device comprising an open-work metal base member which is substantially flat and of circular segment shape, a flange upstanding from the curved radially outer limit of the base member, support means disposed adjacent the said outer limit for supporting the device on the rim of such a cooking utensil in an easily attachable and detachable manner, and a handle pivotally mounted on the device for movement in a plane perpendicular to the base member between a first stored position in which at least a portion of the handle lies on the base member and a second carrying position in which at least a portion of the handle rests against the flange.

4,052,935

PRINTING DEVICE

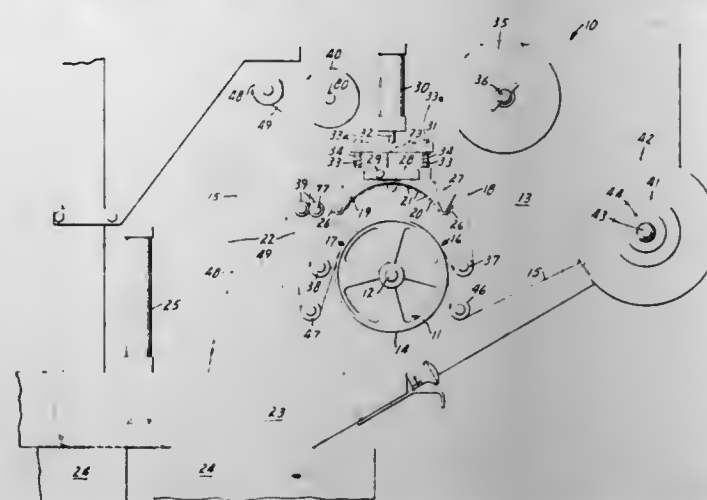
John R. Ward, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1975, Ser. No. 630,986

Int. Cl.² B44B 5/00

U.S. Cl. 101-11

3 Claims



1. A device for printing a predetermined message at spaced intervals in the backing of a pressure sensitive adhesive tape by selectively heating portions of a dye-web bearing a heat volatilizable or sublimable dye pressed against said backing and adapted for use with a tape applying apparatus which pulls a said tape from the device as the tape is applied, wherein said device comprises:

a frame;

a wheel rotatably mounted on said frame and having a cylindrical periphery adapted for contact by the adhesive surface of a said tape;

means adapted for guiding a said tape along a tape path including an arcuate segment of the cylindrical periphery of said wheel extending from a first position to a second position relative to said frame, said means guiding the tape so that the adhesive surface of the tape is guided into contact with said wheel adjacent said first position and is peeled out of engagement with said wheel adjacent said second position;

means adapted for guiding a said dye-web along a dye-web path with a length of the dye-web contacting the backing of the length of a said tape contacting said arcuate segment of the wheel;

a printing plate having a curved concave contact surface with a radius corresponding to the radius of said cylindrical periphery, said contact surface being defined by projecting portions of said printing plate providing said message;

means for heating the contact surface of said printing plate to a predetermined temperature required to volatilize or sublime the dye in a said dye-web;

means mounting said printing plate on said frame for movement for a release position with said contact surface spaced from said arcuate segment of the wheel to afford movement of a said tape and a said dye-web along said paths and a printing position with said contact surface pressed against the length of the dye-web contacting the length of the tape along said arcuate segment of the wheel;

means adapted for intermittently rotating said wheel to intermittently advance a said tape along said path by adhesive contact between the tape and said wheel and to provide a dwell period between successive advancements;

means for moving said printing plate from its release position to its printing position and back to its release position during each of the dwell periods; and

means for advancing a said dye-web during each of the advancements of a said tape for a distance substantially less than said predetermined distance;

and wherein said means for guiding said tape further includes an arm supporting a guide member adapted to guide the length of a said tape between a said tape applying

apparatus and said second position along said tape path, said arm being mounted on said frame for movement between an extended position for said arm with said guide member positioned to provide a path portion of an extended length between said second position along said tape path and the tape applying apparatus, and a retracted position for said arm with said guide member positioned to provide a path portion of a length substantially shorter than said extended length between said second position along said tape path and the tape applying apparatus; means for biasing the arm toward its extended position; means for deactivating said device when said arm is in its extended position, and means for retaining said printing plate in its release position and for continuously rotating said wheel to advance said tape along said tape path when said arm is in its retracted position while affording operation of said device to print said message at spaced intervals in the backing of said tape when said arm is between its extended and retracted positions.

4,052,936

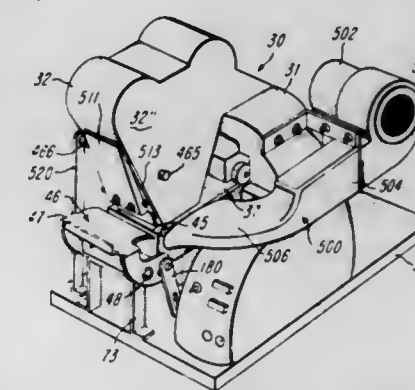
PRINTING APPARATUS

Robert M. Pabodie, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Division of Ser. No. 329,771, Feb. 5, 1973, Pat. No. 3,902,412, which is a continuation-in-part of Ser. No. 215,820, Jan. 6, 1972, Pat. No. 3,767,098. This application Jan. 17, 1975, Ser. No. 541,963

Int. Cl.² B41F 1/08

U.S. Cl. 101-93.07

12 Claims



1. Printing apparatus for forming printed records from a web of record material, comprising: at least one printing member having a plurality of printing elements, means for advancing the printing member to bring the selected printing elements to a printing position in a printing zone while the other printing elements are in a non-printing position, means for inking the printing member, a severing zone having severing means in proximity to the printing zone and operable to sever a printed record from the web, a paper-dust shield adjacent and between both the printing and severing zones and in contact with at least one printing element in the non-printing position adjacent the severing zone during the severing operation to protect the printing member from accumulating paper dust created during the severing operation.

4,052,937

PRINTING PLATE WATER SENSING MEANS AND METHOD

Leslie Edward Lawson, Orpington; John Sleeman Rogers, and Peter Edward Watts, both of Reading, all of England, assignors to Vickers Limited, London, England
Continuation of Ser. No. 396,245, Sept. 11, 1973, abandoned.
This application July 22, 1975, Ser. No. 597,989
Claims priority, application United Kingdom, Sept. 12, 1972, 42390/72

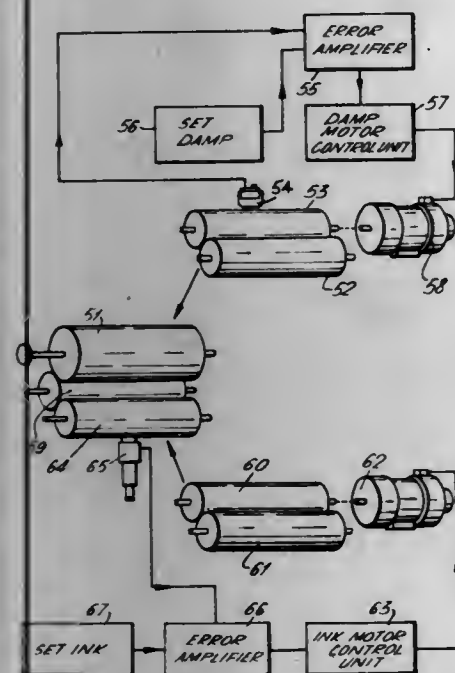
Int. Cl.² B41L 25/02; B41M 1/06; G01N 21/48

U.S. Cl. 101-147

8 Claims

1. A method of determining the amount of water present on

the surface of a printing plate during lithographic printing, which method comprises directing radiation only onto another surface which is separated from the surface of the printing plate and which carries an amount of water related to the amount of water present on the surface of the printing plate, said other surface being grained to an extent to provide surface



irregularities which will be incompletely filled by the amount of water desired on the printing plate, whereby variations in the amount of water present will vary the reflectivity of said other surface, and detecting the amount of radiation reflected from said other surface to obtain a measure of the amount of water present on the surface of the printing plate.

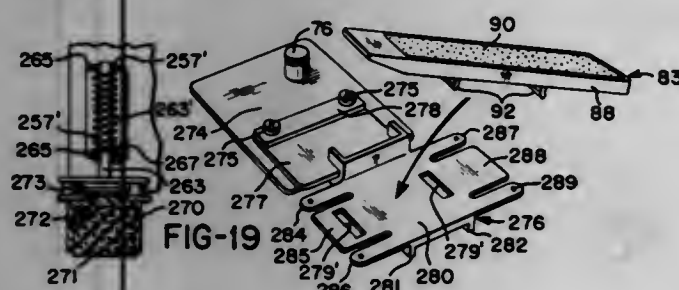
4,052,938

PRINTING APPARATUS

Raymond L. Kirby, Vandalia, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Continuation-in-part of Ser. No. 537,630, Dec. 30, 1974, Pat. No. 3,933,092. This application Dec. 18, 1975, Ser. No. 642,037
Int. Cl.² B41F 1/06, 1/40

U.S. Cl. 101-291

14 Claims



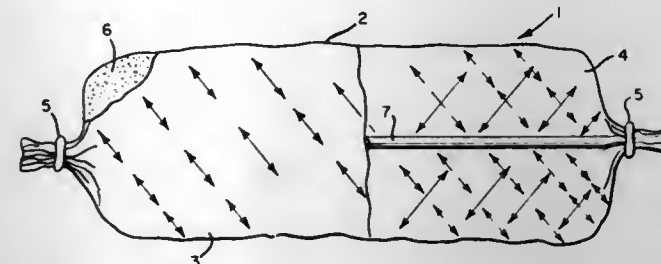
1. Printing apparatus including printing means having a print head and a platen, one of the print head and the platen being movable and the other being fixed, an ink cartridge having a cartridge body and an ink receptive pad carried by the cartridge body, a traveling inker including an ink pad alternately cooperable with the cartridge pad and the print head, and means removably mounting the cartridge body to the movable one of the print head and the platen for canting movement upon contact with the ink pad to provide uniform pressure contact between the ink pad and the cartridge pad, the improvement comprising a support for the cartridge body, post means secured to the support, guide means for guiding the post means for movement, means providing a loose fit between the guide means and the post means to enable the cartridge to cant relative to the ink pad, and spring means for urging the cartridge toward the ink pad but enabling the cartridge and the support to yield when acted upon by the ink pad.

4,052,939
TAMPABLE CHUB CARTRIDGE

Walter John Simmons, Martinsburg, and Frank Maraden Willis, Hedgesville, both of W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 1, 1976, Ser. No. 672,726
Int. Cl.² F42B 3/00

U.S. Cl. 102-24 R

13 Claims



1. A blasting cartridge comprising a tube of plastic film gathered and closed at both ends and filled with a water-bearing blasting agent, said film comprising a cross-laminate of oriented film layers of like composition and pliability, said layers being adapted to fail in different directions along at least one unlaminate zone so as to rupture said cartridge upon the application of end pressure thereto in a borehole with a tamping rod, said unlaminate zone(s) being formed in said cross-laminate prior to or in conjunction with the application of end pressure to said cartridge.

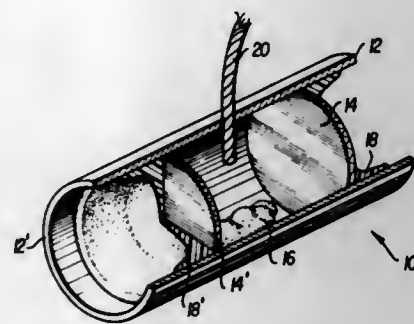
4,052,940

METHOD AND ARTICLE OF MANUFACTURE OF A PYROTECHNIC DEVICE

Gerald B. Gitz, Riverside, and Daniel L. Deverich, Lyons, both of Ill., assignors to Apollo of the Ozarks, Inc., Stanton, Mo.
Filed Oct. 16, 1975, Ser. No. 622,803
Int. Cl.² C06D 1/06, 1/08

U.S. Cl. 102-33

1 Claim



1. A pyrotechnic device having maximal audible effect upon detonation comprising:
a frangible tubular casing, 1-1½ inches in length by ½ to 1 inches inside diameter;
an explosive charge within said casing, said charge being no greater than 2 grains;
a disc within said casing between said charge one open end with said disc and sealant closing off said one open end of said casing and at least a sealant closing off the other end of said casing, said sealants being axially spaced from each other to define a hollow cavity containing said explosive charge whose volume is substantially larger than the volume occupied by the mass of explosive charge with said cavity extending approximately one-third the length of said casing;
said casing being of 0.015 to 0.040 inches in thickness and said disc having a thickness of from 0.010 to 0.125 inches;
a fuse secured within said casing in communication with the explosive; and
wherein each of said sealants is in contact with said casing on opposite sides of said explosive charge and constituting a longitudinally extending solid fillet with the periphery of

the fillet contacting the interior of the frangible tubular casing over 15% to 20% of the longitudinal interior depth of the casing; wherein the resistance of the casing and the resistance of the sealants is such as to provide a balanced inertial resistance to insure bursting of the casing upon detonation of the explosive charge.

4,052,943

COATING COMPOSITION AND METHOD FOR IMPROVING PROPELLANT TEAR STRENGTH

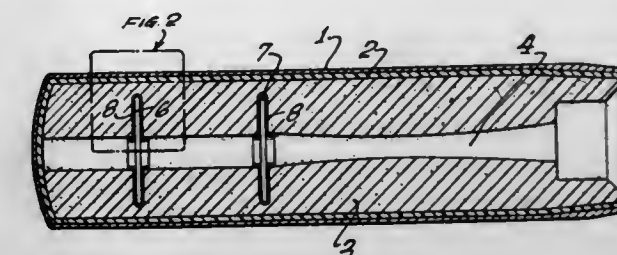
Donald E. Elrick, Rawlins, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 16, 1976, Ser. No. 723,696

Int. Cl.² F42B 5/16

U.S. Cl. 102-103

11 Claims

4,052,941
PRODUCTION OF ELECTROLESS METAL COATINGS ON NITROCELLULOSE BASE PROPELLANTS AND ARTICLE

Scott I. Morrow, Denville, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 24, 1976, Ser. No. 689,288

Int. Cl.² C23C 3/02

U.S. Cl. 102-39

12 Claims

1. In a method for producing a metal coating on a nitrocellulose base propellant substrate, wherein the metal is deposited on the nitrocellulose substrate from an electroless metal plating bath, the improvement which comprises incorporating in the nitrocellulose substrate to be coated an effective amount of a particulate ammonium perchlorate to increase the adhesion of the metal coating produced.

1. A method of increasing the tear strength of the propellant of a rocket motor in which the propellant is a molded structure formed with an axial gas-conducting port, said method including the steps of:
dissolving in a volatile solvent stoichiometric quantities of a polyglycol adipate and an isocyanate with said quantities being adjusted to provide a ratio of 1-2 isocyanate groups to one hydroxyl group,
applying said solution as a coating on selected areas of said port surfaces,
evaporating said solvent, and
aging said coating sufficiently to achieve an essentially complete reaction between said hydroxyl and isocyanate groups for forming on said selected surface areas a tear-inhibiting polymeric gel, said polyglycol adipate having a relatively high functionality for assuring a cross-linked protective coating.

4,052,942

GRENADES PROVIDED TO BE LAUNCHED BY A BULLET

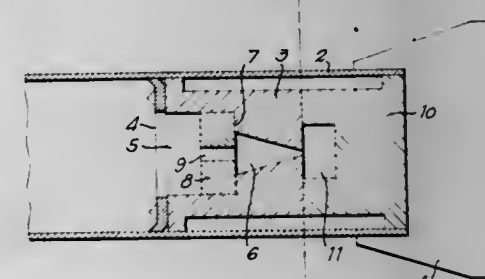
Jean A. Pelousse, Brussels, Belgium, assignor to "S.A.PRB", Société Anonyme, Brussels, Belgium

Filed May 24, 1976, Ser. No. 689,683

Claims priority, application Belgium, May 29, 1975, 254367
Int. Cl.² F42B 11/42

U.S. Cl. 102-65.2

1 Claim



1. In a grenade adapted to be launched by a bullet, of the type having at least one bullet capturing part which is distorted by the stress of the driving bullet when the grenade is launched, the improvement comprising
a support element secured to said grenade;
a bore in said support element and having a shoulder against which said bullet capturing part is seated;
a conical hole in said support element, extending from said shoulder and tapering away from said bore, said bullet capturing part having an opening therethrough, of less diameter than the base of said conical bore adjacent said shoulder, said opening communicating directly with said conical bore; and
the small diameter end of said conical bore, remote from said shoulder, communicating with a blind chamber, of greater diameter than said small diameter end.

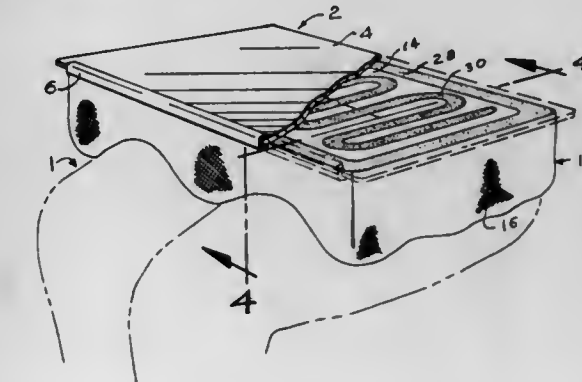
4,052,944

PORTABLE SHUFFLE DESK

Russell A. Jennings, 1513 Tilden, Wichita Falls, Tex. 76309
Filed Nov. 20, 1975, Ser. No. 633,945
Int. Cl.² A47B 23/00

U.S. Cl. 108-43

11 Claims

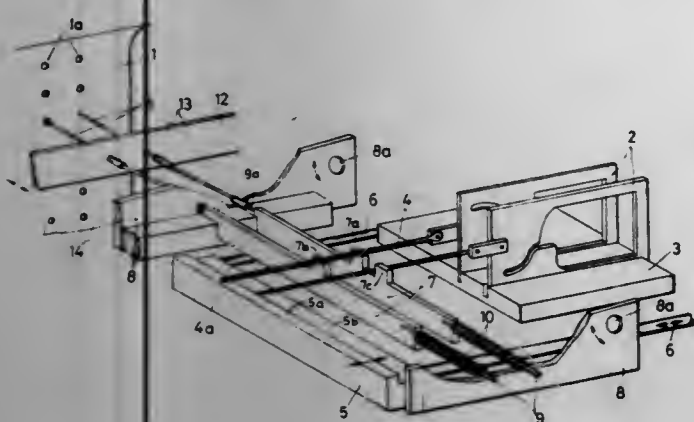


1. A lightweight portable desk adapted to be placed on and conform to regular and irregular base surfaces, comprising planar hard desk surface means, flexible casing means attached to the bottom periphery of said desk surface means, said flexible casing means attached to the periphery of partially rigid sheet means which is substantially coplanar with said desk surface means and secured to the bottom thereof, said casing means being substantially filled with a lightweight flowable granular material, said granular material having a suitable density and looseness whereby said desk can be placed on any base surface and said desk surface can be adjusted to a desired angular position by readily shifting said lightweight flowable material within said flexible casing to thereby conform said

casing and flowable material to the contour and shape of said base surface.

4,052,945 PATTERN CONTROL MECHANISM FOR EMBROIDERING MACHINE

Wolfgang Teetz, Kerken, Germany, assignor to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Germany
Filed Sept. 16, 1976, Ser. No. 724,104
Claims priority, application Germany, Sept. 17, 1975, 2541418
Int. Cl.² D05C 5/00
U.S. Cl. 112—86 14 Claims



1. A mechanism for selectively driving pairs of cam slides of a pattern generating apparatus of the type which is used in automatic embroidering machines, for example, where cyclical movements of any of a large number of different magnitudes are generated by a gear-type analog computer whose input is mechanically derived from an advancing stroke, or from the absence of an advancing stroke, of a row of cooperating longitudinally guided cam slide pairs, as each cam slide pair produces a positive, or a negative, or zero unitary motion input, in accordance with pattern information which is fed to the device by a punched tape, the cam slide driving mechanism comprising in combination:

- an elongated slide mover pivotally attached to one end of each cam slide and extending in general alignment with the direction of cam slide movement, each slide mover being pivotable over a small angle, between a selected position for driving engagement and a non-selected position in which it is to remain non-driven; the slide movers of a pair of cam slides forming a slide mover pair;
- a plurality of elongated selector bars, equal in number to the number of slide movers and extending transversely to the latter in a plane which is substantially parallel to the general plane defined by the slide movers; pairs of selector bars being operatively associated with corresponding pairs of slide movers;
- means for guiding the selector bars for longitudinal movements between an advanced selector bar position and a retracted selector bar position;
- selecting means carried by the selector bars for selection interaction with the slide movers, so as to determine the position of the latter, each of a pair of selector bars interacting with each one of an associated pair of slide movers, so that, when one of the two selector bars is in its advanced position and the other is in its retracted position, one of the two associated slide movers will be selected and the other will not be selected, while in all other selector bar positions neither slide mover will be selected, thereby precluding the simultaneous selection of both slide movers of a slide mover pair;
- a slide mover drive bar extending transversely to the slide movers, including means for guiding and driving said drive bar in a synchronized reciprocating motion along a path of which at least a major motion component corresponds to the direction of cam slide movement, and of which the reversal point from a return stroke to a drive stroke is so related to the slide mover positions that the drive bar, in its drive stroke, engages and advances those

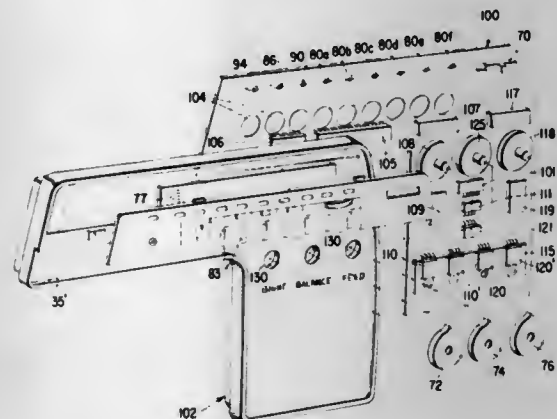
slide movers which are in said selected position, while missing those slide movers which are in the non-selected position;

a punched tape, including a likewise synchronized, intermittently operating punched tape indexing drive, the punched tape having a hole track for each selector bar; and

punched tape sensing means, including a feeler needle connected to each selector bar and biased towards the punched tape, in alignment with a hole track thereof, so as to move the selector bar to its advanced position in the presence of a hole in said hole track, while holding it in its retracted position in the absence of a hole in said track; said punched tape sensing means including a feeler needle drive bar executing a likewise synchronized reciprocating motion in which it withdraws all the needles from the punched tape, while the latter is advanced by its indexing drive.

4,052,946 ELECTRONIC CONTROL PACKAGE FOR SEWING MACHINE

John Stephen Rydz, Scotch Plains, and John Whilldin Wurst, Dover, both of N.J., assignors to The Singer Company, New York, N.Y.
Filed Mar. 26, 1976, Ser. No. 670,778
Int. Cl.² D05B 3/02
U.S. Cl. 112—158 E 8 Claims

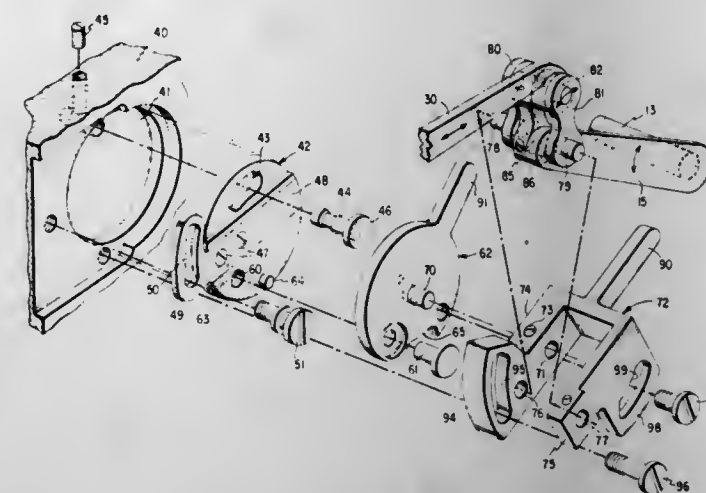


1. In a sewing machine having a frame with at least one opening in a portion accessible to a sewing machine operator, said frame including a bed supporting functional components including a feed system and sewing instrumentalities, a standard rising from said bed and terminating in an arm overhanging said bed; said arm carrying functional components including a needle carrying needle bar for endwise reciprocation in cooperative arrangement with said sewing instrumentalities in said bed; said frame supporting functional components including at least a drive system for reciprocating said needle bar and driving said feed system, and regulating means for said feed system; wherein the improvement comprises:
- an electronic control unit, one of a plurality of possible electronic control units, each having electronic means including control components and electronic circuitry selectively effective to influence said functional components and panel means providing operator access to said electronic means for selective control of said functional components; means interchangeably supporting said electronic control unit with said panel means in said at least one opening in said frame; and means interconnecting said electronic control unit and said functional components.

4,052,947 ZIGZAG CONTROL DEVICE FOR SEWING MACHINES

Reinhold Papajewski, Buchig, and Helmer Heinz Holl, Karlsruhe, both of Germany, assignors to The Singer Company, New York, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,826
Int. Cl.² D05B 3/02
U.S. Cl. 112—158 R 4 Claims

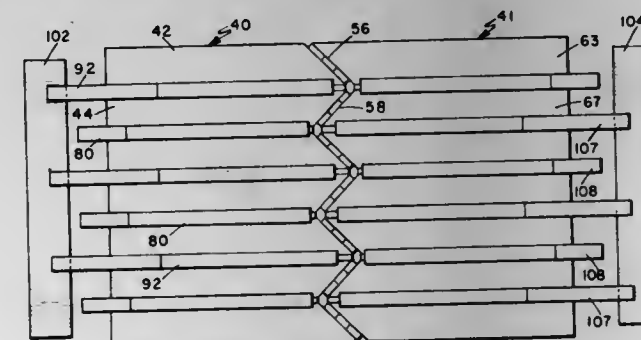


1. A zigzag control mechanism for a sewing machine having a needle bar supported for lateral zigzag movement, said zigzag control mechanism comprising a bight adjusting member (72) for controlling the width of zigzag stitching, a position adjusting member (62) for controlling neutral position within the range of zigzag movement at which straight stitches will be formed when the width of zigzag stitching is reduced to zero by the bight adjusting member, and a width limiting member (42) for limiting the width of zigzag stitching which may be set by said bight adjusting member (72) and for simultaneously effecting that adjustment of the position adjusting member (62) which will locate the neutral position of needle vibration at the extreme left and right hand edges of zigzag sewing regardless of the total width of zigzagging.

4,052,948 METHOD AND APPARATUS FOR MAKING RECTANGULAR CORRUGATED EXPANSION JOINTS

George Thomas Straza, and Edward Leon Parr, both of El Cajon, Calif., assignors to Straza Enterprises, Ltd., El Cajon, Calif.

Filed Feb. 9, 1976, Ser. No. 656,130
Int. Cl.² B21D 13/10
U.S. Cl. 113—116 B 8 Claims



1. The method of making a corrugated corner piece comprising the steps of,
- laying out a pair of substantially identical hinge plate members, each hinge plate member comprising a plurality of plate members joined on adjacent sides by substantially parallel tubular hinge elements, and having at a location across the width and intermediate the ends thereof, cross tubular hinge elements in a zig-zag pattern at intersecting angles, dividing the plate members into pairs of hingedly interconnected die members,
- placing a metal sheet blank between said hinge plate mem-

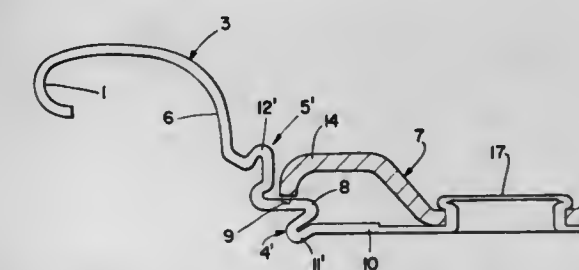
bers, with the hinge plate members being aligned with each other,

placing clevises over the hinge portions of each of the adjacent pairs of hinge elements, holding said hinges together with said metal blank sandwiched therebetween,

and holding stationary every other clevis on one of said die members, while simultaneously moving the alternate clevises on the other die member to pivot said hinge plate members about said zig-zag cross tubular hinge elements, causing the plate members to fold in corrugated configuration with the blank therebetween and with a corrugated corner portion formed between the cross tubular hinge elements.

4,052,949 METHOD FOR MAKING EASY OPEN CONTAINER END WITH PROTECTIVE EDGES FOR ITS SEVERED SCORE

Keith R. Woodley, San Francisco, Calif., assignor to Wescan, Inc., San Francisco, Calif.
Division of Ser. No. 698,093, June 21, 1976, Pat. No. 4,017,000.
This application Dec. 30, 1976, Ser. No. 755,746
Int. Cl.² B21D 51/44
U.S. Cl. 113—121 C 2 Claims



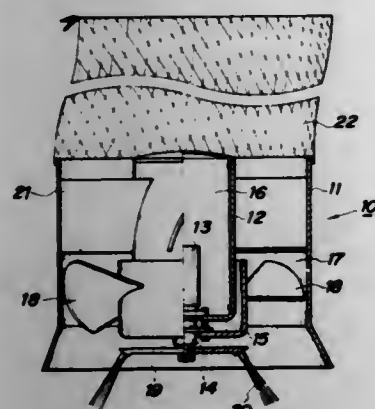
1. A method of making an easy opening container end and comprising steps of
- providing a piece of sheet material including an annular radial section joined by an annular first connecting section to an axially displaced center section, and a generally curved section joined to said annular radial section by a second annular connecting section;
- providing an annular inwardly opening locking bend in said second connecting section;
- providing an annular outwardly opening bead in said second connecting section spaced from said locking bend toward said center section;
- converting said first connecting section into a generally axial wall and an expansion rib which circumscribes said center section;
- forming a score line of weaknesses in said radial section to define a panel at least partially removable from the piece of sheet material;
- axially compressing said expansion rib to force the end of said axial wall adjacent said expansion rib radially outwardly to form a Z-bend;
- clamping said locking bend;
- axially compressing said bead to form an outer double-reverse fold having the compressed bead overlying said score line;
- clamping said center section;
- axially compressing said Z-bend to form an inner double-reverse fold having the compressed lower bend of said Z-bend underlying said score line.

4,052,950 CLEANING DEVICE

Kiichi Hirata, 3-50, Hemi, Yokosuka, Kanagawa, Japan
Filed May 3, 1976, Ser. No. 682,707
Claims priority, application Japan, May 6, 1975, 50-53228
Int. Cl.² B60S 3/02
U.S. Cl. 114—222 11 Claims

1. A device for cleaning materials attached to a vessel and a

building structure below water level comprising a generally cylindrical outer shell and a central chamber arranged concentrically within the outer shell, said chamber having an impeller means for discharging the attached materials together with water through a circular space between the outer wall of the chamber and the inner wall of the shell, said device itself being absorbed and adhered onto a cleaning surface of the vessel and



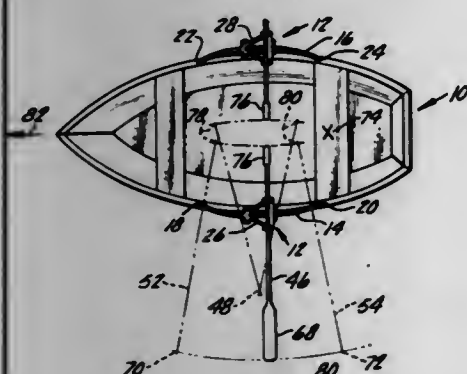
the building structure during operation of said impeller means, and a cleaning means for removing the materials on the surface of the vessel and the structure, a plurality of guide vanes being arranged in the circular space to support the chamber within the outer shell, said guide vanes being inclined relative to the direction of the axis of the chamber whereby a vortex flow caused by the impeller means is regulated along the axis.

4,052,951
ROWING DEVICE FOR A FORWARD FACING ROWER
Alton E. Furr, 14050 B Marquess Way, Marina del Rey, Calif. 90291

Filed Jan. 9, 1976, Ser. No. 647,916
Int. Cl.² B63H 16/10

U.S. Cl. 115—24.1

11 Claims



1. A rowing device which enables the rower to pull the handle of a substantially straight and continuous oar backward while facing the direction of motion of the boat comprising: a rail connected to the boat; and a carriage including means for connecting said carriage said rail for predetermined movement about and along said rail, said last named means including at least three rollers which ride on said rail to restrain said carriage to longitudinal movements along said rail and rotational movements about said rail and restraint means on said carriage for engagement with a substantially straight and continuous oar and including at least two oarlocks connected to said carriage and positioned so that the oar is restrained so as to remain generally perpendicular to said rail during normal operation of said device.

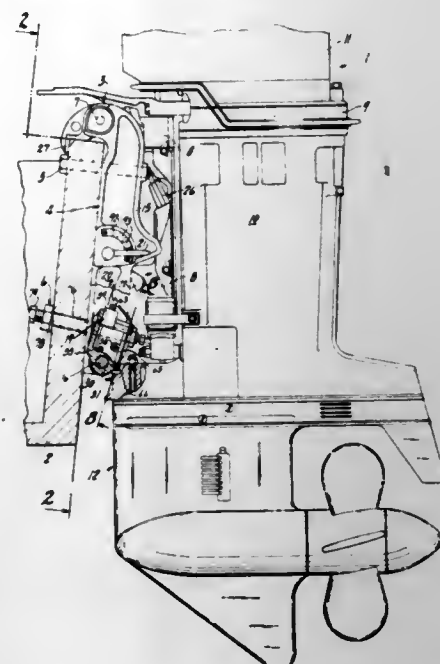
4,052,952
HYDRAULIC POWERED TRIM AND TILT APPARATUS FOR MARINE PROPULSION DEVICES

David Jerry Hale, Pickett; William B. Mayer, and Delhardt K. Kollman, both of Oakbrook, Ill., assignors to Brunswick Corporation, Skokie, Ill.

Filed Sept. 4, 1975, Ser. No. 610,318
Int. Cl.² B63H 5/12

U.S. Cl. 115—41 HT

31 Claims



1. An outboard motor apparatus comprising a clamp bracket means, an outboard motor pivotally attached to the upper end of said bracket means and having a drive shaft housing extending in the rear of said bracket means, and a plurality of combined power trim actuating and shock absorbing piston-cylinder units mounted to the front of and in alignment with said housing between the bracket means and housing, each of said piston-cylinder units having a cylinder member and a piston member mounted in said cylinder member with a piston rod member extending outward, one member pivotally attached to said motor, the opposite member pivotally attached to the bracket means, each of said piston-cylinder units having shock absorbing means, and a hydraulic supply connection means connected to said shock absorbing piston-cylinder units to selectively position and hold the outboard motor in any one of a plurality of angular positions relative to said bracket means for trim positioning of the outboard motor during propulsion, said hydraulic supply connection means including a manifold coupled to and moving with said piston-cylinder units, said manifold having a plurality of supply ports connected by interconnecting passageway means within the manifold to a plurality of output ports, means for connecting the supply ports to a supply of hydraulic fluid, and means connecting said output ports to said piston-cylinder units for supplying a hydraulic fluid to said piston-cylinder units.

4,052,953
FLUSHING DEVICE FOR OUTBOARD MOTORS
Raman A. Patel, Oak Park, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

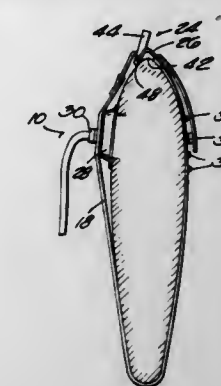
Filed Apr. 19, 1976, Ser. No. 678,027
Int. Cl.² B08B 3/02, 9/00

U.S. Cl. 134—167 R

16 Claims

15. A flushing device for supplying fluid to a water intake port on a lower unit of a marine propulsion device, said flushing device comprising a flexible strap, fastening means connected to said strap for securing said strap around the lower unit, a member connected to said strap and adapted for sealing engagement with the lower unit and for covering the water intake port, said member including a conduit adapted for communication with the water intake port and with a source of fluid, locating means connected to said strap for engagement

with the lower unit in a position to locate said member with respect to the lower unit so that said member covers the water intake port, and means for releasably taking up slack in said



strap when said strap is secured around the lower unit by said fastening means to thereby prevent displacement of said locating means from said position locating said member with respect to the lower unit.

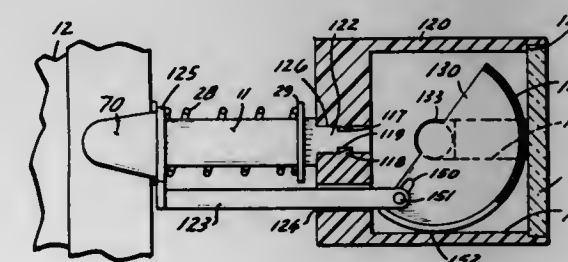
4,052,954
PUSH BUTTON SWITCH MODE INDICATOR ELEMENT
Kenneth Lee Roy, Menomonee Falls, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed May 13, 1974, Ser. No. 469,228

Disclosure was also published under second Trial Voluntary Patent Program on Feb. 17, 1976
Int. Cl.² G09F 9/00; H01H 9/16

U.S. Cl. 116—124 L

2 Claims



1. A mode indicating device for a pushbutton switch, said switch having a body and a reciprocating slider moveable between a first position in which said switch is in one mode and a second position in which said switch is in a second mode, said indicating device comprising:

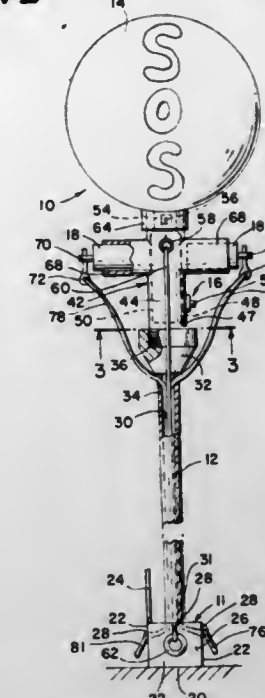
- a lens having a leg portion extending therefrom;
- a hollow housing attached to said slider, said housing having an opening receiving said lens in one end, an aperture at the opposite end, a bearing compartment disposed on a wall of said hollow housing, and a slot extending from said bearing compartment to said one end of said housing [and receiving said lens leg portion], said lens leg portion forming a wall of said bearing compartment;
- a mode indicator rotatably mounted within said housing adjacent the interior of said lens, said indicator being rotatable about an element having an axis which is fixed relative to said housing, said element extending transverse to the direction of movement of said slider between opposed walls of said housing and having a shaft portion thereof disposed in said slot in said bearing compartment and adjacent said lens leg portion, said mode indicator having a rounded surface formed about said fixed axis and having mode indicating indicia formed thereon; and
- actuator means having one end coupled to said switch body and the other end extending through said aperture and means pivotally coupled to said mode indicator for pivoting said indicator in response to movement of said slider and housing to position said indicia adjacent said lens when said switch is in said second mode.

4,052,955
EMERGENCY BALLOON DEVICE
Nathan Hanzhalter, Box 7772, Longview, Tex. 75601

Filed Sept. 8, 1976, Ser. No. 721,352
Int. Cl.² G08B 5/00; G09F 9/00

U.S. Cl. 116—124 B

6 Claims



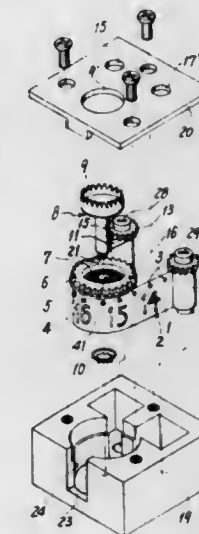
1. An emergency balloon device comprising: a balloon, a T-shaped tubular member having a stem and a cross-bar, a cartridge having a gas lighter than air removably disposed within said stem, at least one cannister having a smoke substance disposed therein removably received within said cross bar for selective emission of said smoke means on said T-shaped tubular member for joining said cartridge and said balloon so that gas in said cartridge can selectively inflate said balloon, a flexible cable joined at one end by a sleeve member to said T-shaped tubular member, a weighted base joined to the other end of said flexible cable, and valve release means between said cartridge and balloon for selective deflating said balloon after said balloon has been inflated.

4,052,956
CHANNEL INDICATOR
Hitooshi Kurohata; Jan Kawai, and Nobuyoshi Hizuka, all of Aichi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed June 2, 1976, Ser. No. 692,048
Claims priority, application Japan, June 11, 1975, 50-71116
Int. Cl.² H03J 1/08

U.S. Cl. 116—124.1 A

3 Claims



1. A channel indicator comprising: a thin film tape having channel numbers printed thereon;

a sprocket drum for advancing said thin film tape by its rotation;
 a pair of reels to which both ends of said thin film tape are fixed, respectively;
 a linking means for rotating said reels in response to the rotation of said sprocket drum;
 a housing which encases the above-mentioned elements and has a window for indicating said channel number on the thin film tape therefrom;
 a channel selector, a shaft of which has tuning means, the tuning frequency of which is controlled by revolving said shaft;
 a gear means linked to said shaft; and
 an adjustable engaging means including a pair of engaging members both having radial notches on engaging faces, respectively, and a spring means which pushes said engaging members toward each other so that said radial notches on said engaging faces are pressed to each other with a specified force thereby engaging said pair of engaging members, said engaging means rotatably linking said gear means and said sprocket drum.

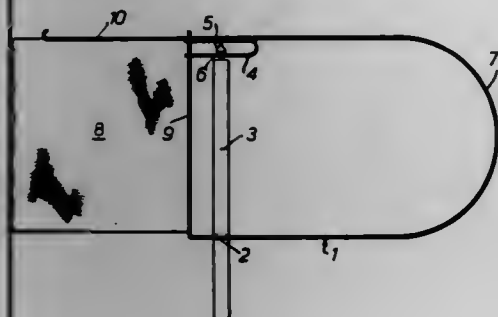
4,052,957 BURGEES

George Herbert Lee, Willowbrook, Lon Hawen, Abersoch, Pwllheli, Gwynedd, Wales (LL53 7EW)

Filed Dec. 11, 1975, Ser. No. 639,731
 Int. Cl.² G01W 1/00; G09F 17/00

U.S. Cl. 116—174

5 Claims



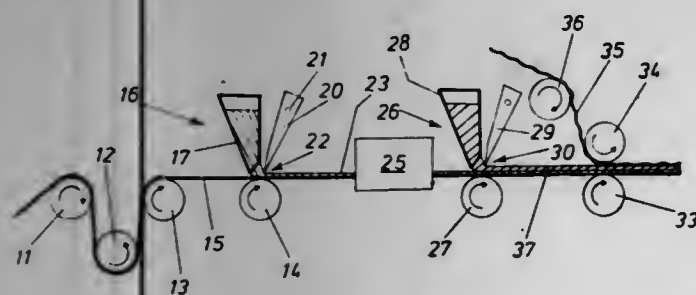
1. A burgee comprising a flag, frame means on which the flag is carried, a staff on which the frame means is supported for rotational movement about the axis of the staff, and pivot bearing means effective between said frame means and the upper end of the staff, said frame means comprising a length of wire extending to one side of the staff for securingment of the flag thereto and extending on the opposite side of the staff to provide a balance weight, the length of said frame means being variable so as to vary the balance of said burgee.

4,052,958

APPARATUS FOR CONTROLLING THE SIZE OF A GAP
 Elsworth Richard Delves, Lower Hackworth Village, England,
 assignor to Purpos Engineering Limited, Little Eaton, England
 Filed Dec. 29, 1975, Ser. No. 645,286
 Int. Cl.² B05C 11/04

U.S. Cl. 118—119

8 Claims



1. In an apparatus for forming a continuous layer of material on a major surface of a web, a combination comprising a laying head for discharging the material; means for continuously advancing the web past said laying head so that the material discharged by the latter deposits on one major surface of the

web; means for forming the deposited material into a layer on the one major surface of the web, including a support and a forming member mounted on said support for movement toward and away from the one major surface of the web in juxtaposition therewith to bound an extrusion gap with the same; and means for moving said forming member relative to the web to thereby control the size of said extrusion gap and thus the thickness of the layer being formed, including an elongated cylinder-and-piston unit having a housing mounted on said support and a plurality of cylinder-and-piston sub-units accommodated in said housing longitudinally adjacent one another, a terminal one of said sub-units having a projection extending longitudinally outwardly of said housing, said moving means further including means for admitting pressurized medium into said housing to act on said sub-units to extend and retract the same, switching valve means in said admitting means for individually controlling the admission of the pressurized medium to said sub-units to individually extend and retract the same and thus incrementally extend and retract said projection, and a wedge member on said projection having a ramp in contact with said forming member, said ramp converting the incremental extension and retraction of said projection into a proportionally reduced incremental movement of said forming member.

4,052,959

ELECTROPHOTOGRAPHIC APPARATUS

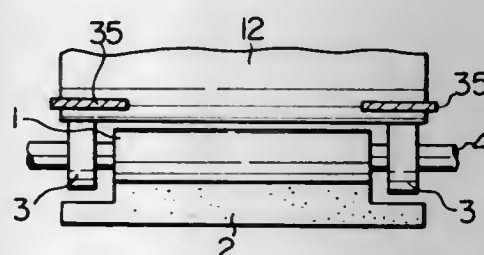
Toshio Hayashi, Kazuo Goto, and Osamu Haruyama, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1976, Ser. No. 653,875

Claims priority, application Japan, Jan. 31, 1975, 5013567
 Int. Cl.² G03G 15/10

U.S. Cl. 118—644

8 Claims



1. In electrophotographic apparatus having a movable photoconductive member:

a roller disposed adjacent to the photoconductive member and a rotatable in a direction so that a peripheral portion of the roller nearest to the photoconductive member moves in a direction opposite to a peripheral portion of the photoconductive member nearest to the roller;

a shaft on which the roller is fixed for unitary rotation; two bearings supporting opposite ends of the shaft respectively, a diameter of the bearings being greater than a diameter of the roller by a predetermined value, each of the two bearings comprising: an inner race fixed to the shaft; an outer race in rolling contact with the photoconductive member; rolling elements operatively disposed between the inner and outer races; and seal means to enclose the rolling element; and

a wiper engaging the photoconductive member upstream of each of the two bearings respectively.

4,052,960

FISH REARING SYSTEM

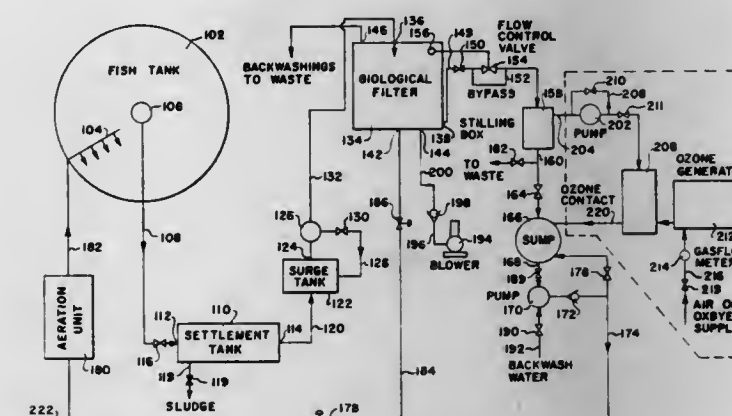
Alexander E. Birkbeck, Delta, and Cecil Craig Walden, Vancouver, both of Canada, assignors to Province of British Columbia, Canada

Filed Oct. 7, 1975, Ser. No. 620,398

Claims priority, application Canada, Oct. 2, 1975, 236,875
 Int. Cl.² A01K 63/00

U.S. Cl. 119—3

9 Claims



1. A fish rearing system in which water can be recycled, the system comprising the following components in combination:
 a. a fish tank containing fish and having a recycle water inlet and an outlet;

b. primary filtration means having an inlet communicating with the outlet of the fish tank, a sludge outlet and a second outlet for recycling water, the primary filtration means being able to remove a substantial proportion of particulate matter from the water coming from the fish tank with low retention time of the water in the primary filtration means and without blinding of the filtration means;

c. a surge tank having an inlet communicating with the second outlet of the primary filtration means, a first outlet for waste and a second outlet;

d. a pump communicating with the second outlet of the surge tank and having an outlet;

e. a biological filter for oxidizing toxic ammonia nitrogen into the non-toxic nitrate form, said filter communicating with the outlet of the pump, the filter comprising a container having a false floor an inlet for recycled water above the false floor and an outlet for backwashings above the false floor, an outlet for recycled water, an inlet for backwash air and an inlet for backwash water below the false floor;

f. a particulate filter medium having particles of a size in the range 0.5 to 10 mm. positioned on the false floor;

g. water backwash means whereby backwash water can be forced through the inlet for backwash water in the biological filter and through the particulate medium of the filter to clean the medium when required;

h. air scour means whereby air can be forced through the inlet for backwash air in the biological filter and through the particulate medium of the filter to lift and expand the medium and agitate the medium vigorously to permit adequate backwashing of the medium by the backwash water;

i. a stilling box communicating with the outlet for recycled water of the biological filter, the stilling box having an outlet;

j. a sump communicating with the outlet of the stilling box and having an outlet;

k. a recycle pump communicating with the outlet of the sump;

l. an ozone contact unit in which a predetermined amount of recycling water is contacted with ozone in an amount sufficient to lower the total nitrite content of the water to

a level acceptable to fish but which amount does not leave free ozone in the water re-entering the rearing tank;
 m. an aeration unit positioned between the filter outlet for recycled water and the recycled water inlet of the fish tank whereby water in the system can be aerated and stripped of carbon dioxide;
 n. a fresh water inlet in the system; and
 o. conduit means whereby water can be fed throughout the system.

4,052,961

APPARATUS FOR PLANTING SEED OYSTERS

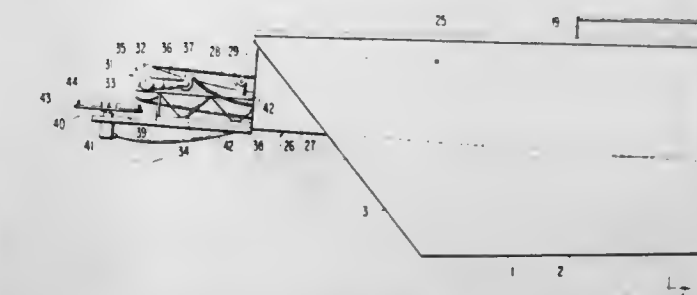
Frederick L. Garrett, Jr.; Frederick L. Garrett, III, and Gordon M. Birkett, all of Garrett's Marina, Bowler's Wharf, Va. 22560

Filed June 14, 1976, Ser. No. 695,448

Int. Cl.² A01K 61/00; 119 2-4

U.S. Cl. 119—4

6 Claims



1. In an apparatus for uniformly distributing seed oysters over a previously prepared oyster seed bed, comprising:
 a vessel having a bow and stern of conventional design, and a V-shaped hold; adapted to contain seed oysters
 a substantially U-shaped structure having sides and a bottom defining a channel in the lower portion of the hold, running substantially the length of the vessel, the sides and bottom of the U-shaped structure extending through and a short distance beyond the bow;

an endless conveyor mounted in said channel;
 a centrifugal spinner disk mounted on a bracket projecting from the bow of the vessel, located below the discharge end of the conveyor, the upper surfaces of the conveyor and the spinner disk being coated with a soft resilient material to prevent injury to the seed oysters;
 a series of short plates resting on the lower surfaces of the V-shaped hold, above the conveyor, said plates being readily removable to expose progressively portions of the conveyor as the load of seed oysters is distributed;
 power means for operating the conveyor and the spinner disk, and
 an inboard-outboard motor mounted at the stern of the vessel to enable the same to the readily maneuvered over the oyster bed during the seeding operation.

4,052,962

ECONOMIZER DEVICE FOR EXPLOITING THE THERMAL OUTPUT OF HEATING INSTALLATIONS
 Roger Dauthuille, 24 rue Romain Rooland, 93410 Vanjourn, France

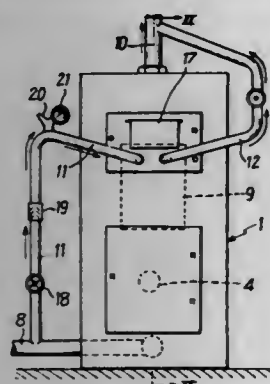
Filed Dec. 30, 1975, Ser. No. 645,468
 Int. Cl.² F22B 7/00, 33/02

U.S. Cl. 122—20 A

1 Claim

1. An economizer device for fully exploiting the thermal output of central heating installations, the latter incorporating a boiler having water-circulation pipes between a cold-water feeding point and hot-water utilization points, employing both heating radiators and hot-water feeding devices of the type including: an adjustable heat source working intermittently and consisting of a sprayer for fuel oil, releasing hot combustion gases; a chamber disposed in proximity to said heat source

for collecting said gases, said chamber being fitted with pipes within which latter water circulates and flows towards the utilization points; the economizer device being formed of a long nest of continuously connected gilled tubes disposed in said chamber for bypassing said water-circulation pipes; circulation water inlet and outlet pipes each respectively connected to associated inlet and outlet tubes of said gilled tubes for directing water into and out of said economizer; refractory material means encapsulating said tubes and filling the whole available volume of said chamber, in such a way that the most



part of the thermal energy contained in the hot combustion gases, released by said sprayer is stored in said mass of said refractory material means before those gases leave said chamber then they are progressively transferred to the water flowing in said gilled tubes, so that this thermal energy is brought by the water flowing in said gilled tubes to the water flowing in said circulation pipes, leading to said utilization points, as a function of the consumption at these points, while said sprayer works with various outputs, after said sprayer has come to a total stoppage.

4,052,963

INTERNAL COMBUSTION ENGINE FOR COMBUSTION OF POWDERED SOLID FUEL

Anton Steiger, Illnau, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

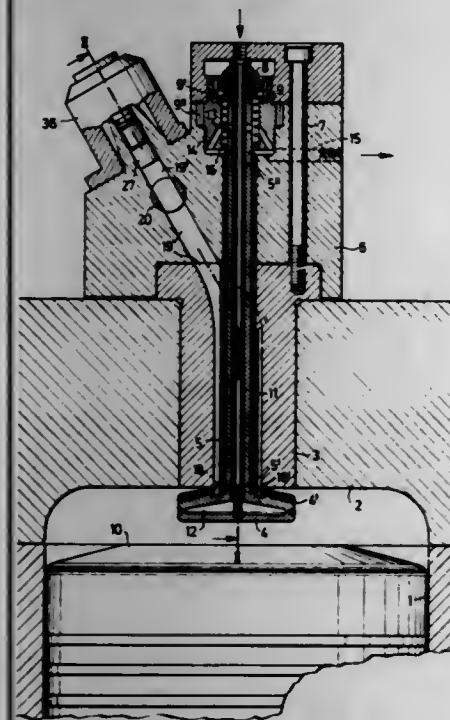
Filed Aug. 30, 1976, Ser. No. 718,515

Claims priority, application Switzerland, Mar. 5, 1976, 2751/76

Int. Cl.² F02B 45/02; F02D 19/04

U.S. Cl. 123—23

17 Claims



1. In an internal combustion engine having at least one cylinder defining a combustion chamber and having a reciprocating piston slidably mounted therein, the combination comprising means for feeding a powdered solid fuel to said cylinder, said

means including a pressurized storage chamber for the fuel and a first duct connected to said storage chamber; a control slider disposed at an end of said first duct spaced from said storage chamber for opening and closing said first duct; a second duct disposed in selective communication with said first duct to receive fuel therefrom and extending to said combustion chamber; a rotatable ejection means disposed in said combustion chamber at an end of said second duct; and a plunger in said second duct at an end opposite said ejection means for pushing the fuel cyclically to said ejection means for ejection into said combustion chamber.

4,052,964

CORONA DISCHARGE FLUID FLOW TRANSDUCERS AND FUEL INJECTION SYSTEMS INCORPORATING SUCH TRANSDUCERS

John Howard Moore, Redditch, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

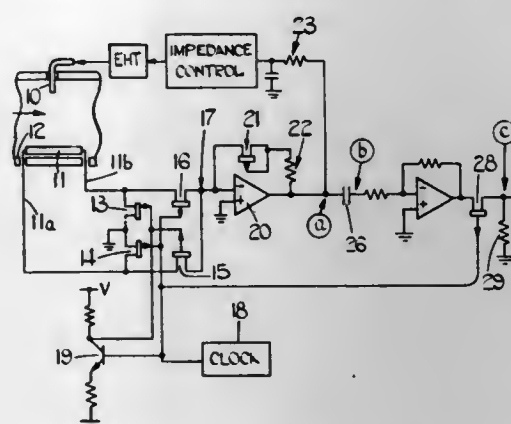
Filed Feb. 5, 1976, Ser. No. 655,656

Claims priority, application United Kingdom, Feb. 12, 1975, 5884/75

Int. Cl.² F02B 3/00, 33/00

U.S. Cl. 123—32 EJ

7 Claims



1. A corona discharge type fluid flow transducer comprising first and second electrodes between which the fluid flow to be measured is passed and between which a corona discharge current through the fluid is maintained, in use, the second electrode having two terminals and the difference between the current drawn from said terminals being representative of the fluid flow between the electrodes, in combination with a current difference measurement circuit including a current-to-voltage converter, cyclically operable switch means for alternatively connecting the two terminals of the second electrode to the current-to-voltage converter, and further switch means a.c. coupled to the current-to-voltage converter and operable in synchronism with said switch means to produce an output signal having a d.c. component related to the magnitude and sign of the difference between the voltage at the input of the current-to-voltage converter when the one terminal of the second electrode is connected to the input of the current-to-voltage converter and the voltage when the other terminal is so connected.

4,052,965

ENGINE COOLING SYSTEM VENT MEANS

Charles S. Morris, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 28, 1975, Ser. No. 626,420

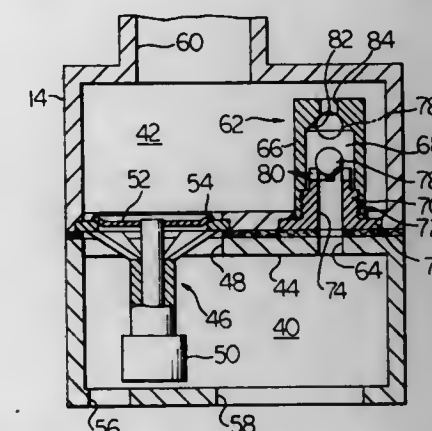
Int. Cl.² F16K 31/18; F01P 7/02

U.S. Cl. 123—41.05

6 Claims

1. In an engine cooling system, a thermostat housing having first and second chambers, a coolant inlet in said second chamber, a coolant outlet in said first chamber, a first aperture intermediate said chambers, a thermostat means in said housing intermediate said chambers for controlling coolant flow from

said inlet to said outlet through said first aperture, a second aperture in said housing intermediate said chambers, the improvement which comprises fluid flow responsive vent valve means in said housing for closing off said second aperture when the coolant level rises in said housing as when coolant is flowing in said system while allowing air to escape through said second aperture as during filling of the coolant system, wherein said vent valve means comprises a valve housing defining a chamber therein, a valve inlet and a valve outlet in



said valve housing, a valve seat adjacent said valve outlet, and a means for closing said valve outlet, said means for closing said outlet comprising a spherical ball float adapted to float in the coolant and seal against said valve seat, said valve housing further comprising a generally cylindrical adapter having a bore therethrough of smaller diameter than the diameter of said spherical ball float, and groove means on one end of said adapter for permitting air to escape from said first chamber through said bore and said groove means to said second chamber.

4,052,966

PROCESS FOR THE CONTROL OF OXIDES OF NITROGEN FROM INTERNAL COMBUSTION ENGINES

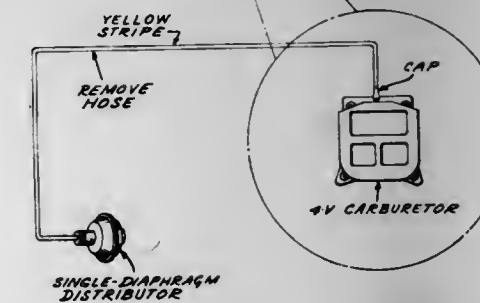
Jack L. Gockel, Montebello, Calif., assignor to Air Quality Products, Inc., Orange, Calif.

Filed Mar. 15, 1973, Ser. No. 341,503

Int. Cl.² F02P 5/04

U.S. Cl. 123—117 A

4 Claims



1. An improved method for reducing NO_x emissions on American manufactured automobiles made before 1970 and which include a system for vacuum advance of ignition, and a single diaphragm distributor, directly connected by a vacuum hose to a carburetor vacuum source outlet without any intermediate deceleration switch, comprising: permanently disconnecting the vacuum hose between the carburetor and the distributor; permanently capping off the vacuum source outlet at the carburetor; determining the automobile manufacturer's recommended timing setting; and adjusting the timing of the engine when operating at the speed recommended by the manufacturer according to the following procedure: if the manufacturer's recommended timing setting is more

retarded than about one degree before top dead center, set the timing at about the manufacturer's recommended setting;

if the manufacturer's recommended timing setting is one degree before top dead center, to about 7.5° before top dead center, set the timing at about 1° before top dead center; and

if the manufacturer's recommended timing setting is more advanced than about 7.5° before top dead center, set the timing at about one-half of the advance recommended by the manufacturer.

4,052,967

DIGITAL ELECTRONIC IGNITION SPARK TIMING SYSTEM

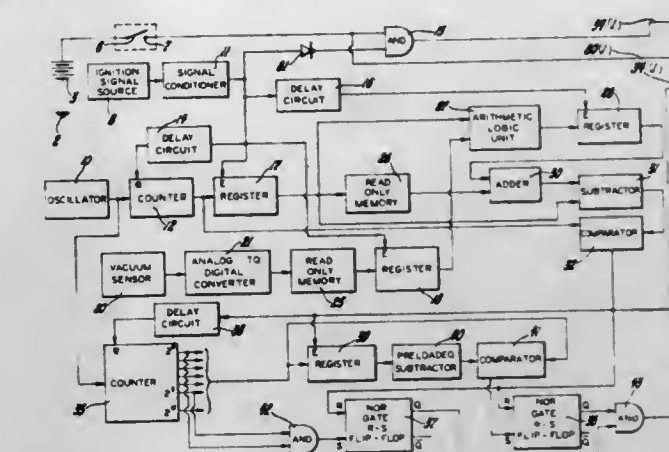
Ronald L. Colling, Millington; Myron U. Trenne, Utica, and Timothy R. Schlax, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 24, 1976, Ser. No. 699,506

Int. Cl.² F02P 5/04

U.S. Cl. 123—117 D

7 Claims



1. A digital electronic ignition spark timing system applicable to an associated internal combustion engine for producing ignition initiating signals for effecting the interruption of the engine ignition system ignition coil primary winding energizing circuit, comprising:

means for producing a series of electrical signal pulses of a substantially constant preselected frequency;

means for producing a timing signal for each cylinder of said engine at a selected engine crankshaft position in degrees relative to piston top dead center;

means for counting said electrical signal pulses during each engine timing count period between successive said timing signals and producing a running total output binary coded number of said electrical signal pulses counted;

circuit means for accepting upon the initiation of each said engine timing count period the said running total output binary coded total number of said electrical signal pulses counted during the previous said engine timing count period and for storing this binary coded number until the initiation of the next said engine timing count period;

means responsive to said stored binary coded number for producing an output first binary code representation of the fractional portion of said stored binary coded number that the predetermined number of crankshaft degrees ignition spark engine speed advance corresponding to the engine speed at which said stored binary coded number of said electrical signal pulses may be counted during one said engine timing count period is of the number of engine crankshaft degrees between successive said timing signals;

means responsive to the intake manifold vacuum of said engine for producing digital signal representations thereof;

means responsive to said digital signal representations of intake manifold vacuum for producing output ignition spark vacuum advance binary code representations of the predetermined number of crankshaft degrees ignition

spark vacuum advance corresponding to the said intake manifold vacuum;
 means responsive to one of said ignition spark vacuum advance binary code representations and said stored binary coded number for producing a second binary code representation of the quotient of the product of said ignition spark vacuum advance binary code representation multiplied by said stored binary coded number divided by the number of engine crankshaft degrees between successive said timing signals;
 means for producing a third binary code representation of the sum of said first and second binary code representations;
 means for producing a fourth binary code representation of the difference between said stored binary coded number and said third binary code representation;
 a comparator circuit responsive to said fourth binary code representation and said running total output binary coded number for producing an ignition initiating signal when one of said running total output binary coded numbers is equal to said fourth binary code representation; and
 circuit means responsive to each of said ignition initiating signals for interrupting said engine ignition system ignition coil primary winding energizing circuit.

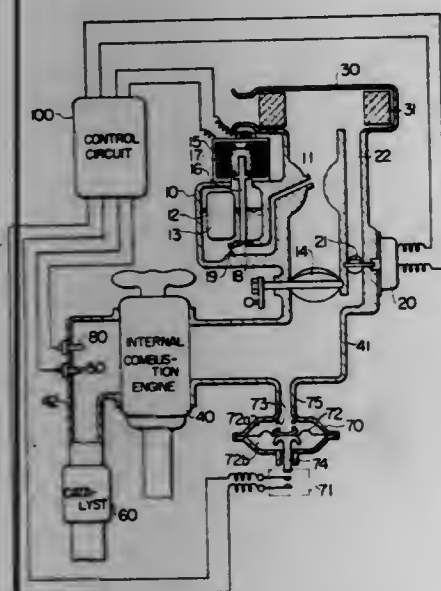
4,052,968

AIR-TO-FUEL RATIO ADJUSTING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tadaaki Hattori, Nishio, Shigetaka Takada, Oobu, Fumio Sagi, Okazaki, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
 Filed Aug. 15, 1975, Ser. No. 605,175

Claims priority, application Japan, Aug. 19, 1974, 49-95355

Int. Cl.² F02D 1/04, 35/00, 33/00; F02B 15/00
 U.S. Cl. 123-119 EC 10 Claims



1. An air-to-fuel ratio adjusting system for an internal combustion engine comprising:
 a carburetor connected to an intake pipe of an internal combustion engine for supplying air-fuel mixture to said engine;
 said carburetor including
 a main passage provided with a throttle valve for controlling the amount of the air-fuel mixture;
 a bypass air passage provided with a bypass valve for compensating the air-to-fuel ratio of the air-fuel mixture by controlling the amount of air flowing therethrough;
 a main fuel jet for supplying fuel through a nozzle opening to said main passage, the amount of said fuel being in proportion to the amount of air flowing through said main passage to produce an air-fuel mixture having an air-to-fuel ratio slightly higher than the stoichiometric one, and
 an auxiliary fuel jet provided with a jet valve means for compensating the amount of fuel supplied through said

nozzle to produce an air-fuel mixture having an air-to-fuel ratio slightly lower than the stoichiometric one;
 an air-to-fuel ratio detecting means mounted in an exhaust pipe of said engine for detecting the air-to-fuel ratio of the air-fuel mixture supplied to said engine;
 a bypass valve control circuit connected to said air-to-fuel ratio detecting means for producing a bypass valve control signal in accordance with the output of said air-to-fuel ratio detecting means;
 a driving means coupled to and driving said bypass valve in response to said bypass valve control signal, whereby the amount of air flowing through said bypass air passage is controlled;
 an engine condition detecting means for detecting a certain operation condition of said engine;
 a jet valve control circuit connected to said engine condition detecting means for producing a jet valve control signal in accordance with the output of said engine condition detecting means; and
 an actuating means for actuating said jet valve in response to said jet valve control signal, whereby the amount of fuel supplied from said auxiliary fuel jet is controlled.

4,052,969

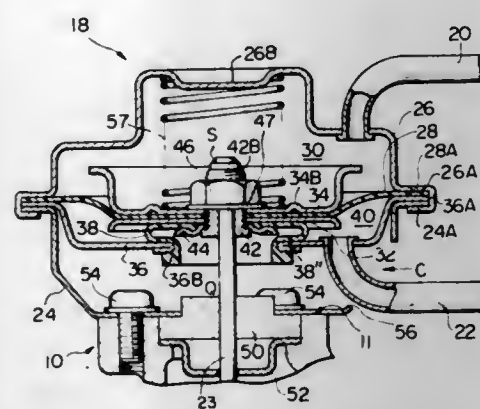
EXHAUST GAS RECIRCULATION VALVE DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Masahisa Ando, Aichi; Keigo Katow, Toyota, and Masami Yamazaki, Toyokawa, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
 Filed June 9, 1976, Ser. No. 694,392

Claims priority, application Japan, Feb. 24, 1976, 51-18418
 Int. Cl.² F02M 25/06

U.S. Cl. 123-119 A

1 Claim



1. A valve device for an exhaust gas recirculation system for an internal combustion engine, comprising:
 a body forming a first passageway adapted for connection with the exhaust line of the engine and a second passageway adapted for connection with the intake of the engine;
 a valve seat between the first and second passageways;
 a valve member adapted for opening or closing the valve seat;
 a diaphragm casing fixed on a surface of the body;
 a diaphragm arranged across the interior of the casing so that a first chamber adapted for connection with an engine port is formed on one side of the diaphragm remote from said surface of the body, said diaphragm being secured to the casing at the periphery of the diaphragm;
 a rod slidably supported by the body, one end of the rod being connected to the valve member;
 a spring member within said first chamber of said diaphragm casing urging said diaphragm toward said body;
 a set of first plates to hold the diaphragm therebetween;
 a second plate having a central circular opening arranged across the interior of the casing between the diaphragm and said surface, the second plate being secured to the casing at the periphery thereof in such a manner that the second plate is parallel to and spaced from said surface;
 a bellows member of sleeve shape made of rubber material

disposed between the diaphragm and the second plate forming on the side of the diaphragm near the body, a second chamber adapted for connection to another engine port, the bellows member having a circular groove on a first end thereof remote from the diaphragm, the circular groove being vacuum tightly fitted to the circular opening in the second plate, so that said first end of the bellows member is fixedly secured to the second plate;
 a sleeve member secured to the other end of the valve rod away from the valve member, said sleeve member having a flange portion and a stem portion having a thread thereon, which stem portion passes through an opening formed on a second end of the bellows member near the diaphragm and through an opening formed on the diaphragm sandwiched by said set of first plates;
 a ring member on said stem portion having a surface engaging said flange portion, said ring member being between said flange portion of the sleeve member and one of said set of first plates facing the opposite side of said surface of said ring member, said ring member having a portion which projects toward said diaphragm and which is fitted to a recess formed on said second end of the bellows member;
 a nut member which is screwed onto said thread so that the second side of the bellows member made of rubber material is fixed to the diaphragm without undue deformation.

4,052,970

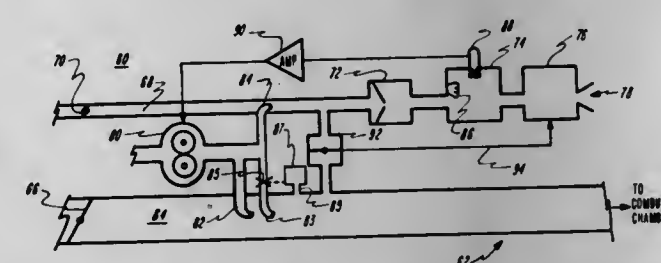
AIR-FUEL RATIO CONTROL SYSTEM UTILIZING OXYGEN SENSOR AND PRESSURE DIFFERENTIAL SENSOR

Frank Nieritt, Webster, and Donald C. Rimlinger, Holcomb, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Feb. 24, 1976, Ser. No. 660,906
 Int. Cl.² F02M 7/16

U.S. Cl. 123-139 AW

4 Claims



1. A method for controlling the air-fuel ratio in an internal combustion engine having a combustion chamber arranged to operate at the subatmospheric pressures, an intake manifold communication with the combustion chamber for providing a flow of air to the combustion chamber, adjustable throttle means in the intake manifold for controlling the flow of air through the intake manifold, a relative vacuum thereby being produced in the intake manifold, and fuel pumping means for providing a flow of fuel into the intake manifold, and producing an air-fuel mixture, the method comprising the steps of:
 drawing a flow of air through an air intake means spaced apart from the intake manifold and having a second throttle adjustable with the first throttle means;
 providing a flow of fuel into the air intake means for producing an air-fuel mixture;
 continuously sampling the air-fuel ratio of the mixture in the air intake means;
 continuously adjusting the air-fuel ratio in the air intake means to a predetermined value by adjusting the flow of fuel into the air intake means;
 continuously equalizing the pressure in the intake manifold and the air intake means by adjusting the rate of flow of air into the air intake means;
 adjusting the flow of fuel into the intake manifold for producing a mixture which has an air-fuel ratio which is significantly less than the predetermined value in the

intake manifold when the relative vacuum in the intake manifold is greater than a preselected amount, and increasing the rate of flow of fuel into the intake manifold for producing a mixture which has an air-fuel ratio which is significantly greater than the predetermined amount only when and as long as the relative vacuum in the intake manifold is less than the preselected amount.

4,052,971

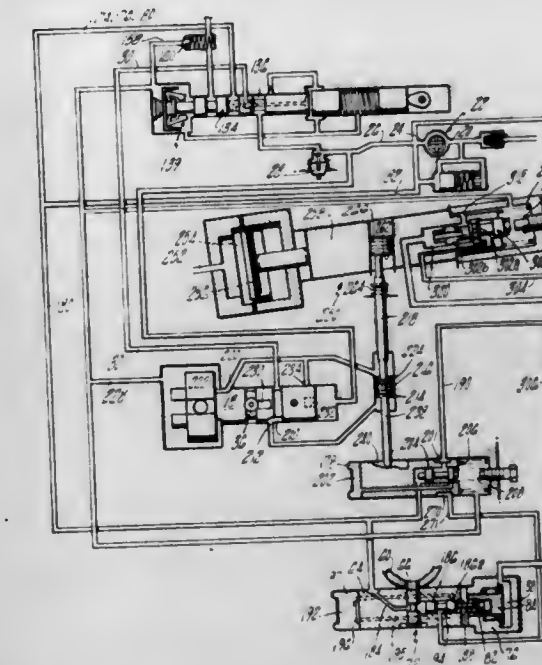
FUEL INJECTION PUMP AND TIMING CONTROL THEREFOR

Daniel E. Salzgeber, Windsor; Robert Raufelsen, and Charles W. Davis, both of Simsbury, all of Conn., assignors to Stannadyne, Inc., Hartford, Conn.

Filed Oct. 10, 1975, Ser. No. 621,608
 Int. Cl.² F02M 59/20

U.S. Cl. 123-139 AQ

17 Claims



1. In a fuel injection pump for an associated internal combustion engine, pump plunger means providing sequential pumping strokes, means for changing the timing of the pumping strokes comprising a cylinder, an advance piston movable in said cylinder, means interconnecting said advance piston with said pump plunger means to advance and to retard the relative timing of the pumping strokes, a first source of fluid having a pressure correlated with engine speed, means operatively connected to said advance piston for moving said advance piston in response to said first pressure to change the relative timing of said pumping strokes including a source of operating fluid under pressure to power said advance piston, a conduit for delivering said operating fluid to said advance piston, and gating means in said conduit responsive to said first fluid pressure for disabling said operation of said advance piston moving means so that said advance piston is in a position corresponding with a fully retarded relative timing of pumping up to a predetermined speed, said gating means comprising a fuel limiting plunger intersecting said conduit to control the flow of said operating fluid to said advance piston, and means operatively connected to said fuel limiting plunger to move the same in response to said first fluid pressure for changing the maximum fuel charge delivered to the pump plunger means.

4,052,972

INTERNAL COMBUSTION ENGINE

Tokuichi Mizumura, Hachioji; Hisamitsu Yamazoe, Oume, and Inno Matsuo, Hachioji, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

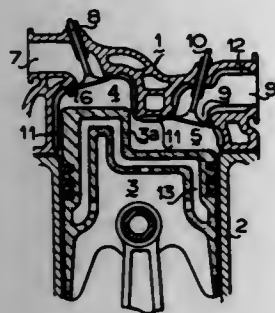
Filed Mar. 8, 1976, Ser. No. 665,103

Claims priority, application Japan, Mar. 14, 1975, 50-35269[U]

Int. Cl.² F02B 23/00; F01B 31/08

U.S. Cl. 123—191 R

5 Claims



1. A heat insulation construction for gasoline engines comprising
 - a cylinder having a top,
 - a piston reciprocally disposed in said cylinder, said piston having a top portion,
 - a sub-piston projecting from said top portion of said piston,
 - a cylinder head secured to the top of said cylinder having an inner wall forming a recess cooperating with said sub-piston such that the latter is inserted therein at a position near a top dead center of a piston stroke to form two independent combustion chambers,
 - an ignition plug means provided in one of said combustion chambers in said cylinder head for igniting said one combustion chamber prior to communication of said two combustion chambers,
 - said cylinder head having an intake passage and exhaust passage operatively communicating with said combustion chambers,
 - first means for forming a heat insulating air layer provided in said top portion of said piston and said sub-piston, and
 - a second means forming a heat insulating air layer adjacent to said inner wall of said cylinder head, said second means constituting a cast formed hollow structure made of steel plates cast in said cylinder head.

4,052,973

INTERNAL COMBUSTION ENGINE AND A PROCESS FOR ITS OPERATION

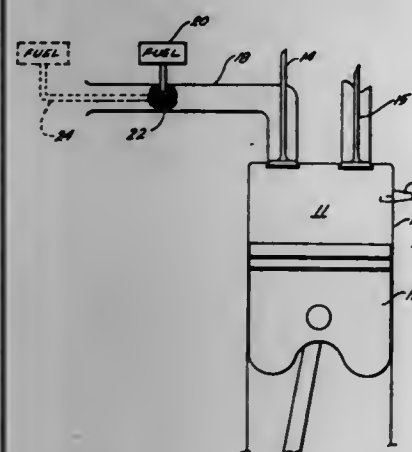
Francis H. Cramer, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed June 28, 1973, Ser. No. 374,799

Int. Cl.² F02B 19/10, 19/16

U.S. Cl. 123—32 ST

15 Claims



1. In a reciprocating internal combustion engine having for each cylinder an inlet valve, single induction channel means

from atmosphere to the inlet valve for fuel and air delivery to the cylinder, a spark plug, and a unitary combustion chamber, an improvement which comprises:

- a. means for injecting fuel into the induction channel means at a preselected location to form a coherent combustible cloud in a formation zone therein during the periods of time that the inlet valve is closed, the amount of fuel injected by the injection means effecting an air-to-fuel ratio in the combustion chamber determined on the basis of a homogeneous charge that just prior to the occurrence of spark is too lean to burn;
- b. the induction channel means providing a space for a cloud free zone for air between the zone of cloud formation and the spark plug such that upon opening of the inlet valve the cloud will be inducted into the combustion chamber serially with air ahead of it for presence of the cloud at the spark plug when spark occurs and presence of the previously inducted air in a fuel-lean zone in the combustion chamber outside the cloud when spark occurs; and
- c. the induction channel means and the combustion chamber having a configuration to avoid substantial dissipation of the cloud during the time of the cloud's formation and induction into the combustion chamber to the spark plug until spark occurs so that the combustion chamber just prior to the occurrence of spark has a heterogeneous makeup of fuel and air with the cloud being fuel-rich relative to stoichiometric and the gases in the fuel-lean zone being fuel lean.

4,052,974

TUBELESS SOLAR COLLECTOR

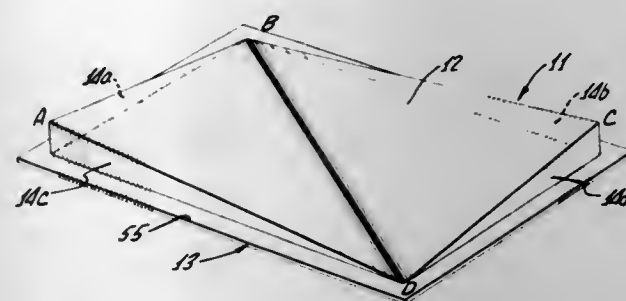
Marcel Vataru, Los Angeles, Calif., assignor to Philip M. Hinderstein, Orange, Calif., a part interest

Filed July 21, 1976, Ser. No. 707,202

Int. Cl.² F24J 3/02

U.S. Cl. 126—270

20 Claims



10. A solar collector comprising:
 - an upper plate, a lower plate, and a plurality of side plates, said plates defining an enclosed chamber, said upper plate being highly absorbent of solar radiation, said upper plate curving inwardly from said side plates so that a central portion thereof extends closely adjacent said lower plate, along a hot line extending across said collector; and
 - means for conducting a fluid into and out of said chamber, on opposed sides of said hot line, said fluid flowing through said chamber, perpendicular to and in a thin sheet past said hot line, and absorbing heat from said upper plate, wherein said lower plate is curved outwardly along said hot line to permit support thereof along the edges only.

4,052,975

SOLAR HEAT COLLECTOR AND STORAGE SYSTEM

John W. Celdeburg, P.O. Box 259, Aptos, Calif. 95003

Filed May 20, 1976, Ser. No. 688,249

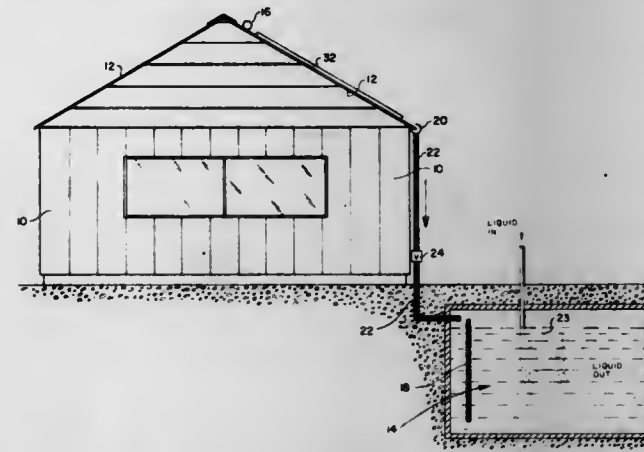
Int. Cl.² F24J 3/02

U.S. Cl. 126—271

6 Claims

1. A solar heat collector and storage system including: a receptacle for a heat storage solution having a relatively low

evaporation rate compared with water; a structure having an inclined roof; a first pipeline extending from the receptacle to an upper position on the roof; an apertured pipeline coupled to said first pipeline and extending along the roof at said upper position thereon; pumping means coupled to the first pipeline for circulating the solution from the receptacle through the first pipeline to said apertured pipeline at the upper position on the roof to permit the solution to pass through openings in said apertured pipeline and to flow freely across the roof in an exposed condition to the atmosphere from the upper position to a lower position on the roof, so that the solution may absorb



heat from the sun as the solution moves across the roof from the upper position to the lower position to have a higher temperature at the lower position as compared with the temperature at the upper position; collector means comprising a slotted pipeline extending along the roof and mounted at the lower position on the roof to collect the heated solution at the lower position; a drain pipe coupled to the slotted pipeline to return the heated solution to the receptacle; means in said receptacle for deriving heat from the heated solution therein; and a diversion valve coupled to the drain pipeline and settable to a position in which the flow of liquid in the drain pipeline is prevented from returning to the receptacle.

4,052,976

NON-TRACKING SOLAR CONCENTRATOR WITH A HIGH CONCENTRATION RATIO

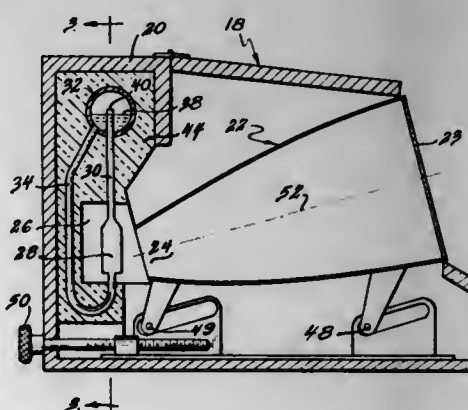
Henry Hinterberger, Batavia, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 30, 1976, Ser. No. 701,480

Int. Cl.² F24J 3/02

U.S. Cl. 126—271

11 Claims



1. In a radiant energy concentration and collection device having a reflector for concentrating incident radiation to a location with the position of the location varying with time, and an energy receiver upon which the location is directed, the improvement in said receiver comprising:

a header, a plurality of bulbs, and thin tubes, each of said thin tube coupling one of said bulbs to said header, said bulbs being positioned in the receiver so that the location is always incident on at least one bulb, said bulbs containing a fluid, with the location incident on a particular bulb the

fluid therein boils, thereby producing heated gas which collects in said header, and utilization means coupled to said header for utilizing said heated gas.

4,052,977

METHODS OF AND APPARATUS FOR ASCERTAINING THE CHARACTERISTICS OF MOTION OF INACCESSIBLE MOVING ELEMENTS

Leslie Kay, 82 Scarborough Road, Christchurch, New Zealand

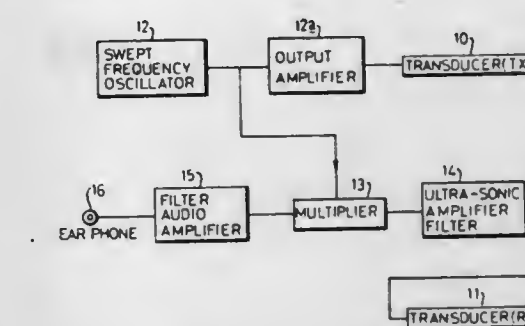
Filed July 17, 1975, Ser. No. 596,656

Claims priority, application New Zealand, July 15, 1974, 174850; United Kingdom, July 24, 1974, 32661/74

Int. Cl.² A61B 10/00

U.S. Cl. 128—2 V

23 Claims



1. A method of obtaining a signal containing information as to the characteristics of at least one oscillator moving element situated internally of a living body, such method comprising:

- a. generating an alternating signal herein called the transmitting electrical signal;
- b. transducing the transmitting electrical signal into stress wave energy and radiating such energy at a transmitting station externally of the body and spaced a distance from the element and in a direction to be incident on the element;
- c. receiving, at a receiving station externally of the body, and spaced a distance from the element, at least part of the wave energy reflected from the element and transducing such received energy into a received electrical signal;
- d. operating on the received electrical signal to produce an electrical output signal of difference frequency as between the then existing transmitting electrical signal and the received electrical signal;
- e. sweeping the frequency of the transmitting electrical signal cyclically in sufficiently long sweeps, with a predetermined frequency vs. time pattern and sufficiently wide band frequency excursion range during each cycle so related to the distances of the transmitting and receiving stations from the element and the movement of the element that the difference frequency is in the audible range of frequencies containing an audibly discernible frequency pattern identifying variations in displacement of the position of the element and motion of the element; and
- f. transducing the audible range of frequencies containing such audibly discernible frequency pattern of the electrical output signal into an audible output signal.

4,052,978

ELECTRO-THERAPY APPARATUS

Amado Eugenio, 2675 Zamora St., Pasay City, Philippines

Filed Jan. 19, 1976, Ser. No. 650,234

Claims priority, application Philippines, Jan. 23, 1975, 16736

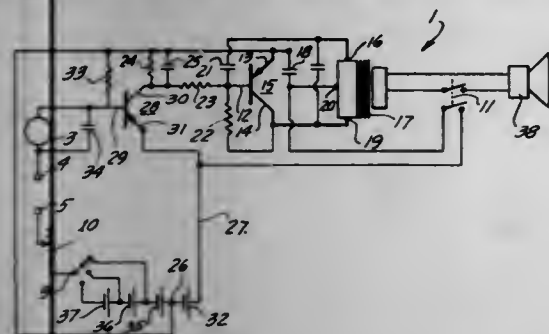
Int. Cl.² A61B 5/05; A61H 39/00

U.S. Cl. 128—2.1 Z

4 Claims

1. An electro-therapy apparatus for detecting malfunction of body organs via the autonomous nervous system, comprising, in combination, a transistorized oscillator-audio amplifier stage including an output transformer operative for dissipating the energy of the oscillator-audio amplifier stage, including an oscillator and audio-amplifier transistor connected to the out-

put transformer and means for feeding back to the base of the transistor a feedback voltage derived from the voltage across the output transformer to cause the oscillator and audio-amplifier transistor to oscillate at a predetermined basic frequency dependent upon the time-constant of the feedback network of the stage; biasing network means for applying biasing voltage to the oscillator-audio amplifier stage; triggering stage means coupled to the biasing network means and operative for varying the biasing voltage thereof, the triggering stage means including a bias voltage network and a series of



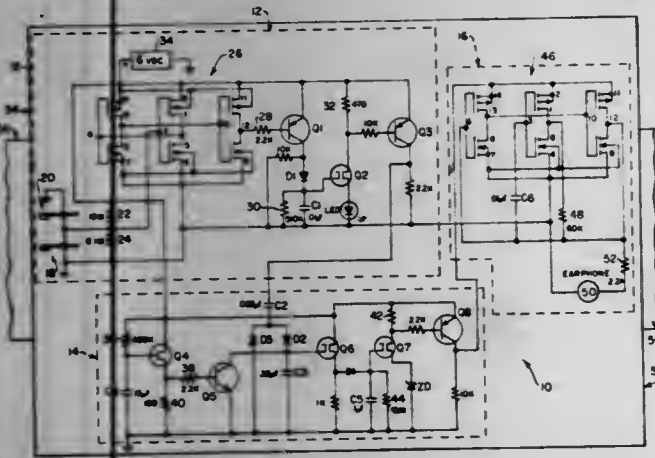
batteries connected thereto and supplying energy thereto; a speaker connected across the output of the output transformer; a pair of electrode jacks connected to the bias voltage network of the triggering stage means, a fixed resistor and an ammeter both connected to the bias voltage network of the triggering stage means; and a pair of electrodes removably connected to the electrode jacks and adapted to be placed upon the surface of the human body for establishing a flow of current in the triggering stage means when contacting an electropneumatic location on the surface of the human body.

4,052,979

JEWELRY AND BRACELET HEARTBEAT MONITOR
Mary Ann Scherr, and Harry L. Hosterman, both of Akron, Ohio, assignors to Mary Ann Scherr, Akron, Ohio
Filed Dec. 4, 1975, Ser. No. 637,726
Int. Cl.² A61B 5/02

U.S. Cl. 128-2.05 P

8 Claims



1. A device for monitoring the heartbeat of an individual at a pulse point and for emitting a warning signal when such heartbeat exceeds a critical rate, comprising:
first and second piezo-electric sensor means differentially connected to each other for presenting an output signal characteristic of the heartbeat;
an amplifier means connected to said first and second sensor means for receiving and amplifying said output signal;
a squaring circuit means connected to said amplifier means for creating a square wave pulse on receipt of the amplified signal from said amplifier means;
a first charging capacitor means connected to said squaring circuit means for receiving said square wave pulses and charging in relation to the receipt of such pulses;
a voltage supply;
a second charging capacitor means connected to said voltage supply and charging at a predetermined rate;

an alarm circuit means for creating an alarm signal upon excitation; and
an alarm excitation circuit means interconnected among said first and second charging capacitor means and said alarm circuit means for exciting said alarm circuit means if said first charging capacitor means reaches a first level of charge before said second charging capacitor means reaches a second level of charge.

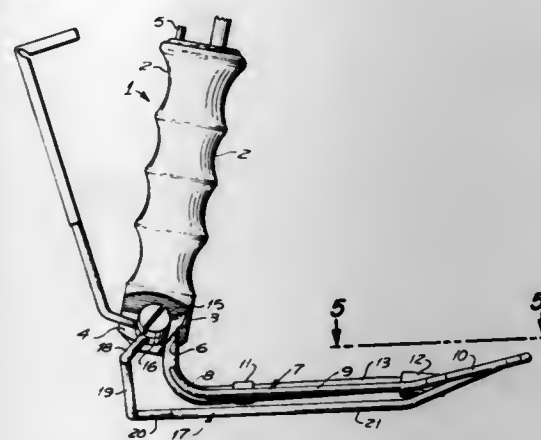
4,052,980

TRIAxIAL FIBEROPTIC SOFT TISSUE RETRACTOR
Guenter A. Grams, Costa Mesa, and Frederick M. Grazer, Newport Beach, both of Calif., assignors to Guenter A. Grams, Costa Mesa, Calif.

Filed June 10, 1976, Ser. No. 694,895
Int. Cl.² A61B 1/06

U.S. Cl. 128-18

10 Claims



1. A surgical instrument for insertion through an incision of minimal dimension into a cavity therebeyond, said instrument comprising:

- a. a handle means;
- b. a set of fingers extending therefrom and normally disposed in contiguous relation for insertion through the incision into the cavity;
- c. means for causing the fingers to diverge with minimal divergence in the region of the incision and maximum divergence at the extremities of the fingers within the cavity thereby to effect retraction of the cavity walls;
- d. the set of fingers including a relatively fixed pair of fingers joined at their extremities and a second pair of fingers;
- e. the diverging means including a pair of pivot members movable about converging axes, and the second pair of fingers are secured thereto for diverging movement from the fixed fingers and from each other;
- f. the diverging means further including a lever member extending alongside the handle means for manual gripping engagement and connected to the pivot members to effect movement thereof.

4,052,981

MASSAGING METHOD AND APPARATUS
Robert J. Bachmann, 635 Highland Ave., Cherry Hill, N.J. 08034

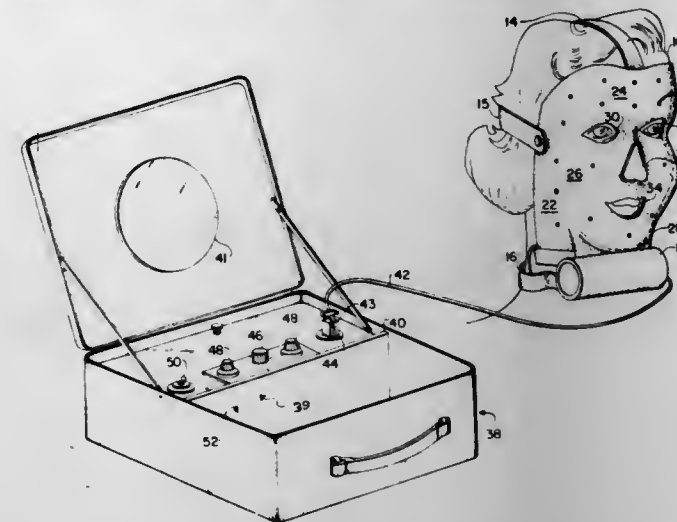
Filed Aug. 3, 1976, Ser. No. 711,298
Int. Cl.² A61H 9/00

U.S. Cl. 128-36

7 Claims

1. A portable device conforming to a body portion of an animal for massaging the body portion, said device comprising:
a means for generating a plurality of vibrations which includes
a housing, and
a plurality of variable speed motors mounted on said housing;
a pliable member with an external surface and an internal surface having a shape conforming to the part of the body to be massaged, said housing being mounted to said pliable member along one edge thereof; and

a plurality of flexible and resiliently compressible finger-like members mounted at one end thereof to said internal



surface of said pliable member, the other end of said finger-like members for engaging the surface of the body portion to be massaged.

4,052,982

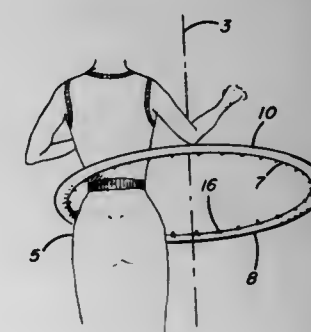
MASSAGE HOOP

Gennady Ozeryansky, Regency Park, 105 E. Guilderland, N.Y. 12084

Filed Oct. 4, 1976, Ser. No. 729,264
Int. Cl.² A61H 15/00

U.S. Cl. 128-57

13 Claims



1. A massage hoop which comprises:

- A. a rigid hoop member having a circumference suitable for rotation about a person's waist by a hula-type motion of the person, said hoop member having an inside outer surface facing the waist; and
- B. a multiplicity of protrusions fitted about and radially extending inwardly from the inside outer surface so that the protrusions successively engage the waist as the massage hoop is rotated, said protrusions having a height, measured from the inside outer surface of the hoop member, of from 3 to about 30 millimeters and having a spacing between a protrusion and a next nearest protrusion sufficient to create a multiplicity of distinct depressions in the waist as said protrusions engage the waist.

4,052,983

NASAL FILTER

Coy R. Bovender, 6123 Auburndale Drive, Greensboro, N.C. 27410

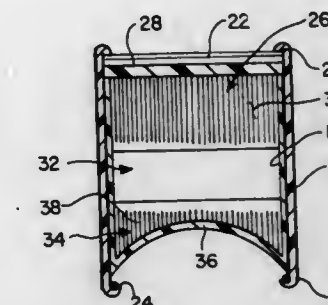
Continuation-in-part of Ser. No. 610,259, Sept. 4, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,631
Int. Cl.² A62B 7/10

U.S. Cl. 128-140 N

7 Claims

1. A filter device for insertion into the nasal passage comprising:
a. a hollow casing formed of a soft pliable material and having an outer transverse dimension shaped substantially

to conform to the contour of the inner wall of the nasal passage and an inner transverse dimension;
b. a removable and disposable filter cartridge means carried within said casing and comprising:
i. a housing having outer transverse dimensions closely corresponding to the inner transverse dimensions of



said casing for removable, yet stationary support within said casing;
ii. at least one filter section formed of a porous membrane extending transversely across said housing;
iii. a multiplicity of minute artificial fibers depending from said membrane, whereby said filter cartridge means simulates the natural cilia of the mucous membrane.

4,052,984

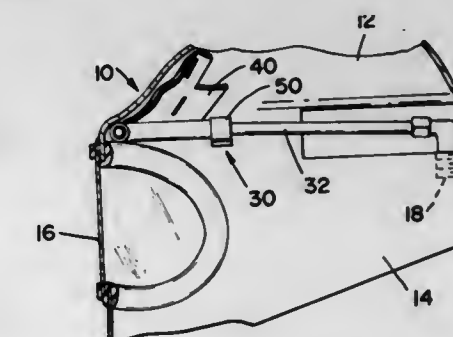
PLENUM TYPE AIR DISTRIBUTION SYSTEM FOR HEAD ENCLOSURE

Brock F. Brockway, Mill Valley, Calif., assignor to E. D. Bulard Company, Sausalito, Calif.

Filed Mar. 25, 1976, Ser. No. 670,190
Int. Cl.² A62B 17/04

U.S. Cl. 128-142.7

11 Claims



1. In combination, a head protective enclosure and apparatus for distributing air and attenuating sound within said enclosure comprising a microporous elastomeric air sack defining a substantially closed volume having walls with an exterior area that is a substantial portion of the area of the interior walls of said enclosure and means for supplying air under pressure to said substantially closed volume whereby air is diffused only through the micropores of said elastomeric air sack and sound is attenuated by the walls of said air sack and wherein said means for supplying air under pressure to said substantially closed volume comprises a tube extending within said volume and having an opening within said volume.

4,052,985

APPARATUS FOR MEDICINALLY SPRAYING AN EYEBALL

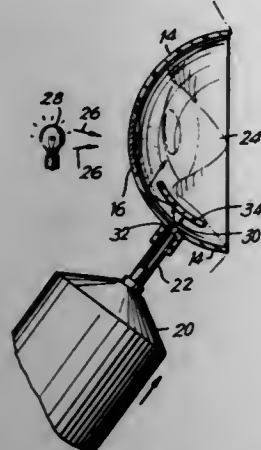
D. Jackson Coleman, 223 Maple St., Haworth, N.J. 07641, and Stephen L. Trokel, 1192 Park Ave., New York, N.Y. 10028
Filed June 28, 1976, Ser. No. 700,481
Int. Cl.² A61M 11/00

U.S. Cl. 128-173 R

15 Claims

1. An ophthalmic spray applicator which comprises a generally hemispherical eyecup, a baffle adjacent the annular periphery of said eyecup and within the lower portion of said eyecup, said baffle being generally parallel to and spaced from the inner

surface of said eyecup with the lateral ends or entire lower periphery of said baffle being attached to the inner surface of said eyecup, means to project an ophthalmic solution into the lower portion of said eyecup opposite said baffle, so that said solution impinges on said baffle rather than directly impinging



on an eyeball, said solution thereby being effectively dispersed into a mist of small droplets within said eyecup, and means in said eyecup to attract vision, said means to attract vision being rearward from both the annular periphery of said eyecup and said means to project an ophthalmic solution.

4,052,986

DEVICE FOR INTRODUCING MEDICAMENTS OR THE LIKE INTO BODY CAVITIES

Colin Smith, Cottingham, England, assignor to Reckitt & Colman Products Limited, London, England

Filed Sept. 19, 1975, Ser. No. 615,104

Claims priority, application United Kingdom, Oct. 9, 1974, 43787/74; Feb. 6, 1975, 5183/75

Int. Cl.² G61M 3/00; B65D 35/20

U.S. Cl. 128—260

7 Claims



1. An improved enema device of the type including a container having a resilient, deformable body portion defining an enclosed space, the improvement comprising:

- a first end having a first frangible closure, said first end having means for admitting air from the exterior of said body portion into said enclosed space and for restraining flow of container contents out of said enclosed space to the exterior of said body portion, said admitting and restraining means including a one-way air inlet valve;
- a second end having means for selectively providing, prior to use, an open dispensing applicator shaped for non-traumatic insertion into an orifice in a body cavity,

said providing means including a second frangible closure for exposing said enclosed space;

- said second end also being shaped to make sealing contact with respect to the orifice in the body cavity.

4,052,987

AUTOMATIC ASPIRATION APPARATUS

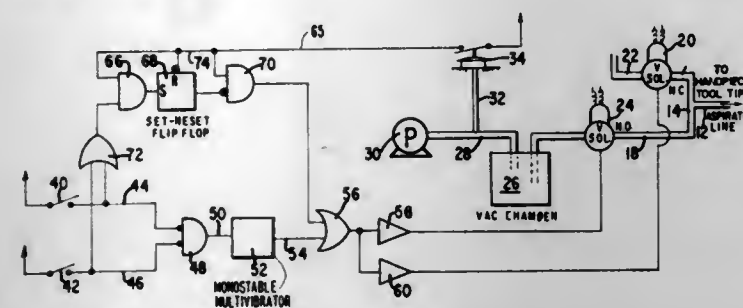
David G. Wachinich, and Alan Broadwin, both of New York, N.Y., assignors to Cavitron Corporation, New York, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,813

Int. Cl.² A61M 1/00

U.S. Cl. 128—276

6 Claims



- Apparatus for controlling aspiration from an operative site during surgery, said apparatus comprising: vacuum source means for providing a vacuum that is available continuously; means connected to said source means for aspirating the operative site that includes (1) a normally open aspiration valve between the operative site and said source means, (2) vacuum pressure sensing means between said aspiration valve and said source means for sensing pressure in said aspiration means, (3) a normally closed venting means between the operative site and said aspiration valve for venting said aspiration means to about ambient pressure, and (4) logic means responsively coupled to said sensing means for automatically opening said venting means and closing said aspiration valve, and activation control means coupled to said automatic logic means for overriding the automatic opening of said venting means and closing of said aspiration valve.

4,052,988

SYNTHETIC ABSORBABLE SURGICAL DEVICES OF POLY-DIOXANONE

Namassivaya Dodd; Charles C. Versfelt, both of Somerville, and David Wasserman, Springfield, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jan. 12, 1976, Ser. No. 648,236

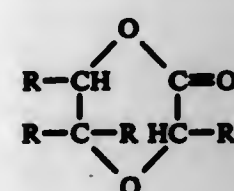
Int. Cl.² A61L 17/00

U.S. Cl. 128—335.5

39 Claims



- A sterile, synthetic absorbable suture comprising oriented fiber of a polymer of a monomer having the formula:



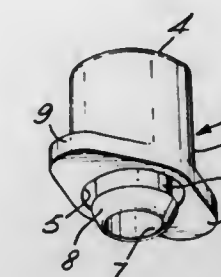
wherein R' and R are individually hydrogen, methyl or ethyl, said suture being dry to the extent of being substantially free of moisture, and characterized by a Young's modulus of less than about 600,000 psi with a correspondingly high degree of softness and flexibility, an initial straight tensile and knot strength of at least about 40,000 psi and 30,000 psi respectively, and substantially complete absorption in vivo within about 180 days.

4,052,990

MEDICO-SURGICAL TUBE AND ADAPTOR
Roy Howard Dodgson, Hythe, England, assignor to Smiths Industries Limited, London, England
Continuation of Ser. No. 461,202, April 15, 1974, abandoned.
This application July 23, 1975, Ser. No. 598,315
Claims priority, application United Kingdom, Apr. 16, 1973, 18193/73

Int. Cl.² A61M 25/00; F16L 55/00
U.S. Cl. 128—351

1 Claim



4,052,989

NEEDLE CATHETER

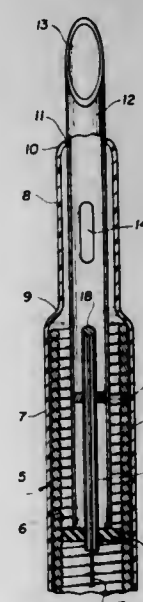
William Mathes Kline, Gloversville, N.Y., assignor to Medical Evaluation Devices and Instruments Corporation, Gloversville, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,066

Int. Cl.² A61M 25/00

U.S. Cl. 128—349 R

2 Claims



1. In a needle catheter wherein is provided a lumen-defining flexible tubular body having proximal and distal ends, a relatively short puncture needle frictionally retained within the distal end portion of said tubular body and means for proximally retracting said puncture needle through the lumen of said tubular body; the improvement in which said tubular body is formed with a lumen having a diameter greater than the outside diameter of said puncture needle and in which at least the distal end portion of said tubular body is transparent whereby to provide a sight zone surrounding the associated portion of said puncture needle, said puncture needle being hollow and being provided with a radial aperture located in registry with a portion of said sight zone for passage of fluid thereinto when said puncture needle is inserted into a fluid-containing vessel, said tubular body comprising an inner wall formed from a continuous helical spring with the helices thereof in contact with each other and an outer sheathing of smooth inert plastic material firmly bonded thereto, said outer sheathing extending distally beyond the distal end of said spring to define a hollow tip having proximal and distal ends, the proximal end of said hollow tip being configured to restrain said spring against axial elongation in a distal direction, the distal end of said hollow tip being configured to define an annular lip of reduced diameter for frictional engagement with and sliding retention of said puncture needle; and in which means slidably retained within said tubular body in association within the proximal end of said puncture needle are provided for preventing fluid flow around the exterior of said needle proximally beyond the proximal end thereof.

1. A tracheal-tube assembly, comprising a tracheal tube of resilient material having an open proximal end, a device retained in said proximal end of the tracheal tube for coupling the tube to a gas-circuit passageway having a diameter larger than that of said tracheal tube, said device having a substantially cylindrical body portion which has a base that is provided with a flared aperture, the diameter of said cylindrical body portion being dimensioned for close-fitting insertion into said gas-circuit passageway to establish said coupling, and said device having an open-ended tubular stem which is integral with and extends in one direction only away from the said base, the diameter of said tubular stem being less than that of said cylindrical body portion and said stem diameter being dimensioned for close-fitting insertion of said stem into said proximal end of the tracheal tube, one end of said tubular stem being located at and integral with said base and opening through said flared aperture in said base, the free end of said tubular stem being located within the tracheal tube in spaced relation to said base and having an integral tubular portion thereof which is turned back on itself to provide an external resilient claw at the free end of said stem for engaging with the inside of the resilient tracheal tube, the exterior of said tubular stem being smooth-surfaced and being tapered toward said free end thereof, said claw extending as a circumferential lip having a smoothly free edge disposed completely around said tubular stem between the opposing ends of said stem and within said proximal end of the tracheal tube, the resilient tracheal tube bearing up over the claw to hug the tubular stem tightly and resiliently between said claw and said base to provide a gas-tight seal therewith, and said resilient claw splaying outwardly from the tubular stem away from the said free end of said stem and being directed toward said base thereby to flexibly engage the interior surface of the tracheal tube for resisting withdrawal of the tracheal tube and stem from one another to maintain said tracheal tube and said device in assembled relation to one another when said cylindrical body portion of said device is inserted into and removed from said gas-circuit passageway.

4,052,991

METHOD OF STIMULATING THE HEART

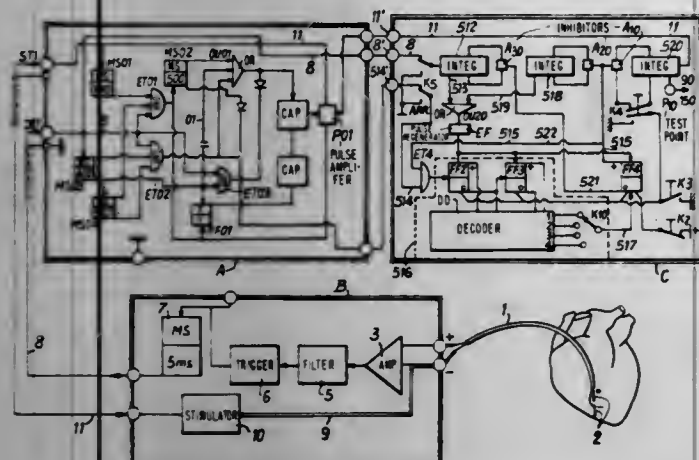
Fred Zaccuto, 16 rue de la Convention, Paris 15, France
Continuation of Ser. No. 536,602, Dec. 26, 1974, abandoned, which is a division of Ser. No. 126,069, March 19, 1971, Pat. No. 3,857,399. This application Sept. 25, 1975, Ser. No. 616,881
Int. Cl.² A61N 1/36

U.S. Cl. 128—419 PG

10 Claims

1. A method of electrically stimulating the cardiac muscle by means of an automatic device comprising heart stimulating and detecting means, which method comprises the steps of:
A. detecting heart signals including spontaneous heart signals,

- B. transmitting electrical stimulating pulses to the cardiac muscle at a predetermined frequency in the absence of a spontaneous heart signal,
 C. suspending the transmission of an electrical stimulating pulse for a waiting period when a spontaneous signal is detected,
 D. detecting among said detected spontaneous heart signals, those which are dangerous,



- E. counting said dangerous heart signals,
 F. and, if a predetermined number of said dangerous heart signals is counted during occurrence of a total predetermined number of said detected heart signals, transmitting electrical stimulating pulses to the cardiac muscle with temporarily increased frequency.

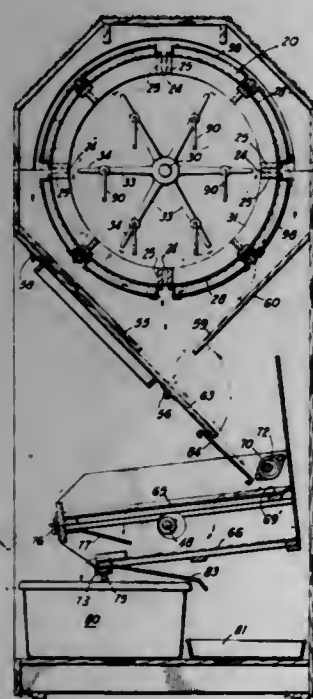
4,052,992

SHELLING MACHINE

George F. Taylor, P.O. Box 625, Moultrie, Ga. 31768
 Continuation-in-part of Ser. No. 596,434, July 16, 1975,
 abandoned. This application Mar. 1, 1976, Ser. No. 662,709
 Int. Cl.² A01F 9/00

U.S. Cl. 134—30 H

11 Claims



1. A machine for shelling beans, peas and other legumes comprising a generally cylindrical, rotatable screen drum; shroud means mounted about said cylindrical screen in spaced relation therewith for restricting the passage of legumes there-through; a plurality of axially spaced sets of paddles mounted for rotation within said cylindrical screen; and drive means for rotating said drum and said sets of paddles.

4,052,993

CINNAMIC DERIVATIVES AS TOBACCO ADDITIVES

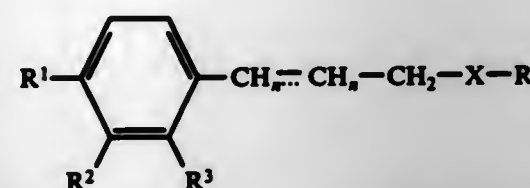
William F. Cartwright, Manchester, Conn.; Richard E. Means; Andrew G. Kallianos, both of Durham, N.C., and J. Bowen Ross, Jr., assignors to Liggett & Myers Incorporated, Durham, N.C.

Division of Ser. No. 486,841, July 9, 1974, Pat. No. 3,943,943.
 This application Dec. 15, 1975, Ser. No. 640,817
 Int. Cl.² A24B 3/12

U.S. Cl. 131—9

18 Claims

15. An improved charcoal filter cigarette wherein the improvement comprises a tobacco composition containing an amount of a cinnamic derivative sufficient to reduce the "charcoal effect" of said cigarette, said cinnamic derivative having the selected formula:



wherein X is sulfur; n is 1; each of R¹, R², and R³, when taken separately, is hydrogen, lower alkyl, hydroxy, lower alkoxy, or lower acyl; and R¹ and R², when taken together, form a divalent radical which forms a fused ring of from 5 to 6 members; and R is hydrogen, lower alkyl, or lower acyl.

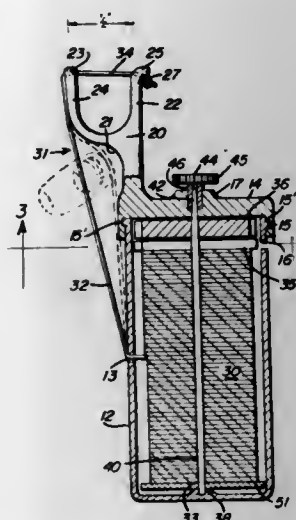
4,052,994

DENTAL FLOSS APPLICATOR

Floyd A. Thun, 645 Adelaide Drive, Santa Monica, Calif. 90402
 Filed Apr. 12, 1976, Ser. No. 676,049
 Int. Cl.² A61C 15/00

U.S. Cl. 132—92 R

5 Claims



1. A dental floss applicator comprising; a floss holding receptacle for receiving a spool of dental floss, a removable cover for the receptacle, means between the cover and the spool of floss contained within the receptacle for applying tension friction thereto, an U-shaped structure mounted on the top of the removable cover for holding a length of floss between the tips of the U-shaped structure, further means for permitting additional tension to be applied to the length of floss between the tips of the U-shaped structure as the applicator is being used for teeth cleaning purposes, the means between the cover and the spool of dental floss for applying friction thereto including a washer of resilient material between the inside of the receptacle cover and the spool of floss, the further means including a recessed outer edge of the dental floss supporting U-shaped structure which is designed for reception and engagement by a user's index finger with a portion of the floss therebetween, the U-shaped supporting structure including an upright extending member with a notch at the outer tip thereof, another extending member projecting outwardly and

upwardly from the first member and parallel thereto at the outer portion thereof, the second outwardly extending member also having a notch on the outer tip thereof, the washer of resilient material being made of sponge rubber, with rewind mechanism associated with the spool of dental floss, the rewind mechanism including a flanged serrated disk at one end of the spool of dental floss, and an access slot appropriately provided in the receptacle so as to be opposite said serrated flange for access to the serrations thereon for the purpose of applying rewind movement to the spool of dental floss.

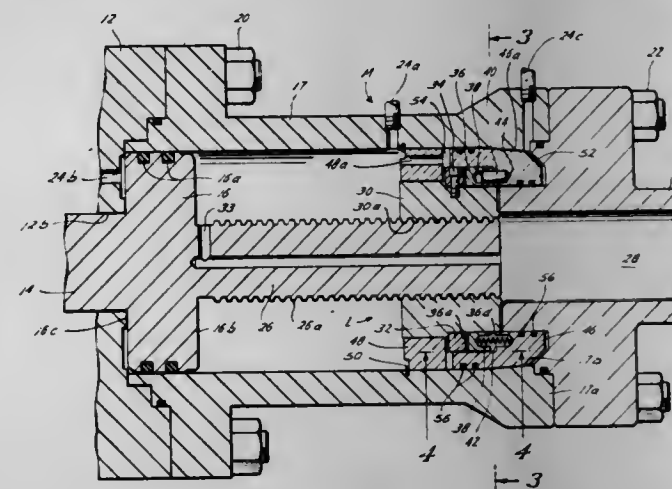
4,052,995

BLOWOUT PREVENTER RAM LOCK AND LOCKING METHOD

C. Mack Ellison, Houston, Tex., assignor to Hydril Company
 Filed Aug. 19, 1975, Ser. No. 605,857
 Int. Cl.² E21B 33/06

U.S. Cl. 137—1

32 Claims



1. In a blowout preventer having at least one blowout preventer ram, a ram lock for locking the ram at an adjustable closed position for sealing contact with a well pipe or the like in a bore of the blowout preventer, comprising:
 a. a ram carrier means comprising a ram piston having a piston rod with a threaded surface formed thereon for moving the ram to an initial closed position in the blowout preventer in response to closing fluid pressure;
 b. lock means continuously engaged with said ram carrier means during movement thereof and permitting movement of said ram carrier means to the initial closed position and the adjustable closed position of the ram to increase the sealing contact thereof to a desired level, said lock means comprising:
 1. a lock nut having a threaded surface formed thereon and engaged by said threaded surface on said ram piston rod for rotational movement with respect thereto during movement of the ram to the closed position;
 2. a lock nut ratchet ring fixedly mounted with said lock nut for movement therewith, said lock nut ratchet ring having ratchet teeth formed thereon;
 3. a restraining ratchet ring having ratchet teeth formed thereon; and
 4. said teeth of said lock nut ratchet ring and said restraining ratchet ring permitting unrestrained movement of the ram to the closed position, and further being energizable to lock the ram against reverse movement; and
 c. means for energizing said lock means to lock the ram in place at the adjusted closed position comprising means responsive to the closing fluid pressure to energize said lock means, wherein the ram is locked at adjustable sealing positions by said lock means.

4,052,996

FLUID PRESSURE RELAY

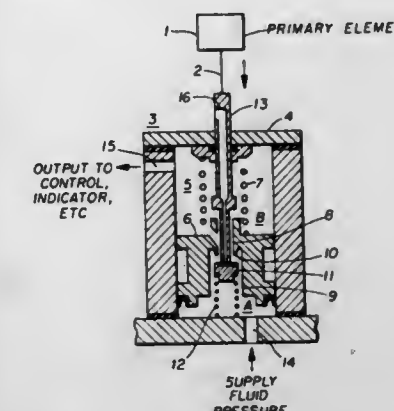
Billy Steve Burrus, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 24, 1976, Ser. No. 689,607

Int. Cl.² G05D 16/10

U.S. Cl. 137—85

3 Claims



1. A fluid pressure, non-bleed, position pilot valve, including,
 a housing having a straight cylindrical bore,
 a piston within the housing bore and sealed to the walls of the housing bore to divide the housing bore into two chambers,
 a bore extended through the piston and parallel to the piston path in the housing bore,
 a seat within the bore through the piston and between the chambers on each side of the piston,
 a plug element positioned within the bore through the piston and urged by a spring toward engaging the seat within the bore through the piston,
 a spring mounted within the housing bore chamber opposite the plug element to exert its force on the piston in moving the piston seat toward the plug element,
 a supply of power fluid connected to the housing bore chamber on the plug element side of the piston,
 an outlet for the fluid pressure generated in the housing bore chamber on the side of the piston opposite the plug element,
 and a tube extending its open end into the piston bore seat to engage the plug element to first move the plug element from the piston bore seat and next move away from engagement with the plug element to vent the housing bore chamber on the side of the piston opposite the plug element,
 whereby each position of the tube will develop a differential pressure across the piston which will move the piston until the plug element engages the piston seat and open end of the tubular positioner to seal the housing chambers on each side of the piston from each other and the chamber opposite the plug element from exhaust through the tubular positioner.

4,052,997

LEAK DETECTION ARRANGEMENT FOR VALVE HAVING SEALING MEANS

Bruce L. De Lorenzo, and Daniel J. McCarthy, both of P.O. Box 72, Clifton, N.J. 07015

Continuation of Ser. No. 309,903, Nov. 27, 1972, abandoned.
 This application Oct. 20, 1975, Ser. No. 624,199

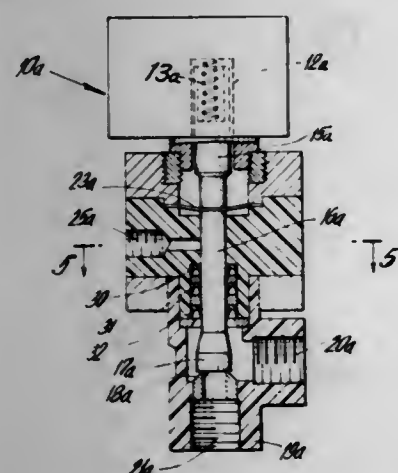
Int. Cl.² F16K 31/06

U.S. Cl. 137—312

4 Claims

1. Valve construction comprising:
 actuating means,
 a valve body having a fluid inlet passage and a fluid outlet passage, a valve seat between said inlet and outlet passages and a bore above the valve seat,
 a valve flow control plunger operatively arranged between the actuating means and the valve seat and extending

through the bore in the valve body in substantially continuous slidable relation therewith and responsive to the actuating means for movement relative to the valve seat for correspondingly controlling fluid flow through the valve seat from the inlet passage to the outlet passage, spaced apart first and second sealing means correspondingly situated in the vicinity of each end portion of the bore for sealing against fluid flow through and bore to the actuating means, the second sealing means sealing against fluid flow along the plunger within the bore beyond the first sealing means, and



a leak detection and relief passage extending from the interior of the valve body outwardly to the exterior thereof and located between the first and second sealing means and communicating directly with the bore for the flow of any fluid leaking past the first sealing means to a visible location outside of the valve body, the valve body being integral in the portion thereof between the first and second sealing means which extends outwardly from the bore and in which the leak detection and relief passage communicates with the bore.

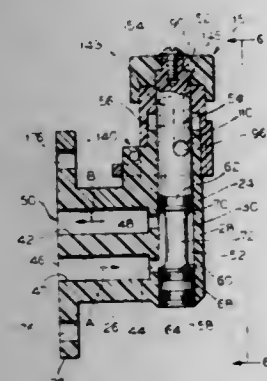
4,052,998

THREE WAY COCK FOR FILTER PRESS PLATES
Hugh S. Robinson, Harbert, Mich., assignor to D. R. Sperry & Co., Amers, Ill.

Filed Aug. 9, 1976, Ser. No. 712,784
Int. Cl.² F16K 11/07

U.S. Cl. 137—625.5

10 Claims



1. A three way cock for securement to the side of a filter press plate, in vertically disposed operating position for controlling fluent discharge from the plate, said cock comprising: a cock body defining a cylinder portion having a rectilinear bore that is vertically disposed in the cock operating position, said body defining a discharge port at the lower end of said bore and being open at the upper end of said bore, said body including a side flange portion coplanar with said bore and extending laterally of said bore, said body further including a planar foot portion paralleling said bore.

with said body flange portion extending between said body cylinder and foot portions, said body defining a pair of spaced apart parallel fluent passages extending normally of said bore and communicating with said bore intermediate said bore ends through said body flange, foot and cylinder portions, to correspondingly located passages in the plate side, a spool valve member reciprocally received in said bore and proportioned lengthwise of said bore such that when the lower end of said spool is disposed at said lower end of said bore, the upper end of said spool projects from and above said upper end of said bore, an end cap received over the upper end of the body cylinder portion and being apertured to freely receive said upper end of said spool,

said body and said end cap including interfitting lug means for keying said end cap to said body, said body adjacent said upper end of said bore and said end cap being formed to define complementing opposed cam surfaces in generally spiralled relation about the axis of said bore for defining the reciprocating movement limits of said spool valve within said bore, said spool valve having a cam follower riding on said cam surfaces, and means for turning said spool valve member about said bore axis for effecting travel of said spool valve cam follower along said cam surfaces to reciprocate said spool valve,

said fluent passages each defining a port in the body cylinder portion opening into said bore, with said ports having a predetermined spacing longitudinally of said bore, said valve member defining a fluid flow accommodating portion of reduced circumferential dimension having a length longitudinally of said bore that exceeds the corresponding distance between said ports, said valve member including first and second fluid seal means respectively disposed adjacent the upper and lower ends of said valve member portion in sealing relation to said body, and a third seal means adjacent the lower end of said valve member in sealing relation to said body and spaced below said second seal means a distance exceeding the width of the lower end of said ports for normally blocking fluent discharge from said body discharge port, said foot portion being formed for securement against the plate side with said body passages aligned with the plate passages,

said cam surfaces being proportioned to, when said valve member is turned about said axis, shift said valve member seal means between a lower valve member position in which said first and second seal means receive said ports therebetween to an upper position in which said third seal means is disposed above the lower of said ports for effecting fluent discharge from said cock through said body discharge port,

said second and third seal means in a third operative position of said valve member intermediate said lower and upper positions being disposed on either side of said lower port for precluding fluid flow into said cock from the plate.

4,052,999

BUMPER WALL FOR PLASMA DEVICE

Thomas A. Coults, Hinsdale, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

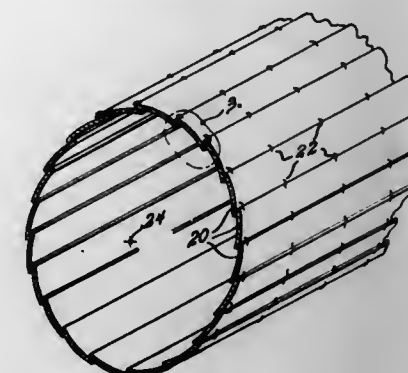
Filed July 15, 1975, Ser. No. 596,043
Int. Cl.² F16L 9/10

U.S. Cl. 138—158

4 Claims

1. An improved bumper wall for placement about a region containing a plasma, the improved bumper wall comprising a plurality of strips of a refractory material, each of the strips overlapping a portion of the next of the strips to form an enclosed region partially surrounding the plasma region;

a plurality of webs, each of the webs connected to one of the strips in an area less than the surface area of the strips; and



an outer structure of circular cross-section connected in rigid engagement to each of the webs, wherein the strips may flex with respect to one another by bending of the webs.

4,053,000

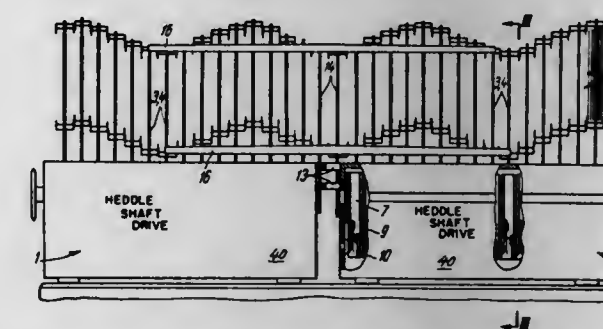
SHEDDING MECHANISM FOR TRAVELLING-WAVE LOOMS

Anatoly Grigorievich Selivanov, Donakaya ulitsa, 24, kv. 110, and Gennady Ivanovich Kovalev, Kronstadsky bulvar, 27, kv. 85, both of Moscow, U.S.S.R.

Filed May 3, 1976, Ser. No. 682,391
Int. Cl.² D03D 47/26

U.S. Cl. 139—436

7 Claims



1. In a fabric-weaving apparatus, at least a pair of systems of main heddle shafts respectively carrying heddles for receiving warp yarns, a pair of drive means respectively connected operatively with said systems of main heddle shafts for operating the latter to participate in the formation of travelling-wave sheds formed by the warp yarns, each system of main heddle shafts and drive means operatively connected thereto forming in itself part of a travelling-wave loom for weaving a fabric of a given width, said systems of main heddle shafts and said pair of drive means respectively connected operatively therewith being situated adjacent but spaced slightly from each other with at least the two adjacent heddles of the two systems of main heddle shafts in line with each other, so that a given space is formed between the pair of systems of main heddle shafts, at least one additional heddle shaft situated in the latter space, and means connecting said additional heddle shaft to at least one of said main heddle shafts of one of said systems for transmitting movement from the latter one main heddle shaft to said additional heddle shaft for operating the latter for participating in the weaving of a fabric having a width greater than the sum of the widths of the fabrics woven by both of said looms.

4,053,001

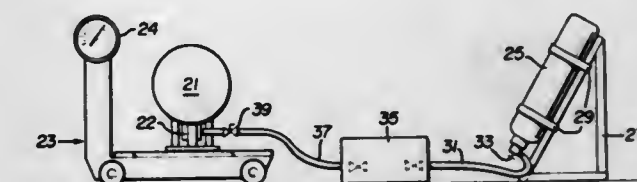
METHOD FOR CHARGING A FIRE PROTECTION SYSTEM

William E. Healey, Morse R. Heineman, both of Bloomfield Hills; Ricky M. Erlich, Southfield, and James H. Remaley, Livonia, all of Mich., assignors to W. E. Healey & Associates, Inc., Bloomfield Hills, Mich.

Filed Apr. 2, 1976, Ser. No. 673,256
Int. Cl.² B65B 1/04, 3/04

U.S. Cl. 141—2

39 Claims



1. A method of charging or recharging an agent storage container with a fluid fire-extinguishing agent from a supply cylinder apparatus comprising the steps of: initially weighing the supply cylinder apparatus; determining the mass of fluid agent which must be transferred from said apparatus to said container to establish a predetermined properly charged state at said container and the desired weight of said apparatus when said determined mass of fluid agent has been transferred from said apparatus; transferring said fluid agent from said apparatus to said container while simultaneously monitoring the decreasing weight of said apparatus as said agent is transferred therefrom until said desired weight is attained indicating that said determined mass has been transferred to said container; and terminating the transfer of fluid agent when said desired weight is attained.

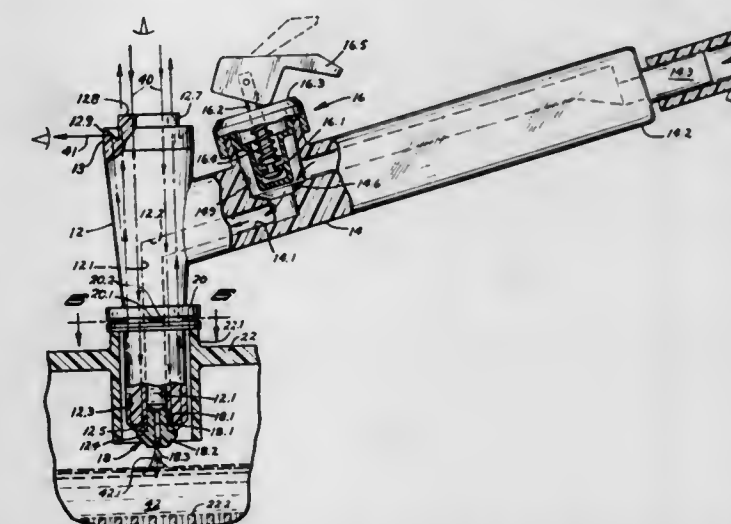
4,053,002

LIQUID DISPENSER WITH LIQUID LEVEL INDICATOR
Thomas B. Ladlow, 1515 Edgewater Ave., St. Paul, Minn. 55112

Filed Jan. 12, 1976, Ser. No. 648,267
Int. Cl.² B67C 3/02; B65B 3/02

U.S. Cl. 141—95

14 Claims



1. A liquid dispenser with a liquid level indicator for introducing liquid into a container, such as battery acid into a battery, and for indicating the level of the liquid pool into which the liquid flows, comprising: a dispensing nozzle and having an elongated, light-transmissive body with an upper light-admitting end and a lower end alternately reflecting and dispersing the light as the lower end is respectively spaced above and immersed in the liquid pool, the upper end of the body having an upwardly facing end surface through which such reflected light may be seen, the presence or absence of reflected light at the outer end of the lighttransmissive

portion indicating to an observer the height of the liquid pool, the light-transmissive body having a central bore opening through the lower end thereof and also opening through one side thereof, the nozzle also having an elongate rigid tube affixed to said one side of the light-transmissive body and having a liquid supply duct communicating with the open bore of the nozzle body, the elongate tube extending transversely of the nozzle body and having a length of the same order of magnitude as the length of the light-transmissive body to provide a handle for manually manipulating the nozzle body, the rigid tube having valve apparatus to open and close the supply duct to control flow of such battery acid to the nozzle body, and the valve apparatus having a valve-operating handle positioned adjacent the upper end surface of the nozzle body to facilitate ready coordinated valve operation in response to observations through said end surface.

4,053,003

MACHINE FOR FILLING CONTAINERS

Oscar Adolfo Ferrero, and Jorge Lorenzo Lodi, both of Buenos Aires, Argentina, assignors to The Coca-Cola Company, Atlanta, Ga.

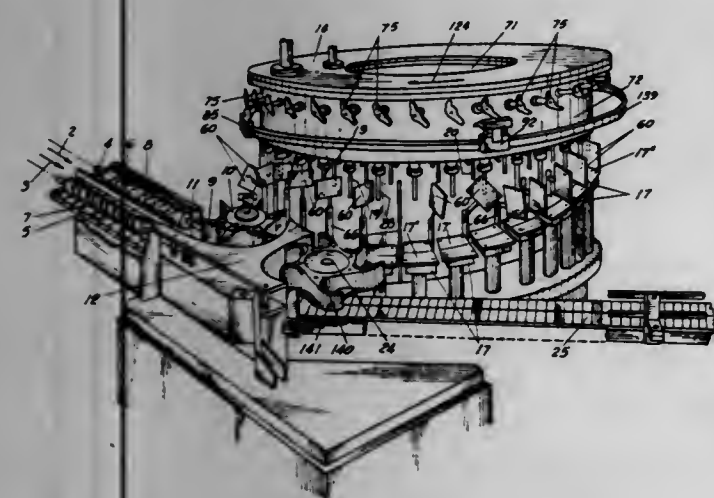
Filed Apr. 11, 1975, Ser. No. 567,218

Claims priority, application Argentina, Apr. 15, 1974, 253295

Int. Cl.² B65B 43/52

U.S. Cl. 141—144

3 Claims



1. A machine for filling a plurality of containers by twos with a liquid which comprises an empty container infed section, a filling section and a full container discharge section, the filling section comprising an annular tank for the liquid, rotatable around its own axis of symmetry, and a number of pairs of filling valves arranged substantially on a radius from the axis of symmetry of the tank and having underneath each pair of valves support mechanisms for the containers, rotatable in conjunction with the valves, which support mechanism receives containers from a transfer means in a first transfer section between the infed and filling sections, the support mechanism comprising apparatus capable of changing vertical position to engage and disengage the filling mouth of the containers with the filling valves before the containers arrive at a second transfer section between the filling section and the discharge section, said empty container infed section being equipped with an infed spider apparatus capable of receiving and discharging empty containers by twos in a substantially radial alignment with respect to the axis of the infed spider and with said infed spider apparatus comprising a star mounted on a propelling axle on which a series of arms are mounted in an angularly movable manner, the arms jutting out from the periphery of the star and supporting a roller each, the rolling surface of each roller resting on a cam surface, stationary with respect to the machine, the aforesaid star apparatus having peripheral cavities which, in combination with the said arms, are capable of receiving two containers, the centers of which are substantially on a radius of the center of the aforesaid tank.

propelling axle, and of delivering them in an arrangement in which their centers are substantially on a radius of said symmetry axis whereby the containers are transferred from the empty container infed section to the container filling section and a full bottle discharge means capable of withdrawing the filled container by twos at a second transfer section between the filling and discharge sections.

4,053,004

HELICAL HEAD COMMUNUTING SHEAR

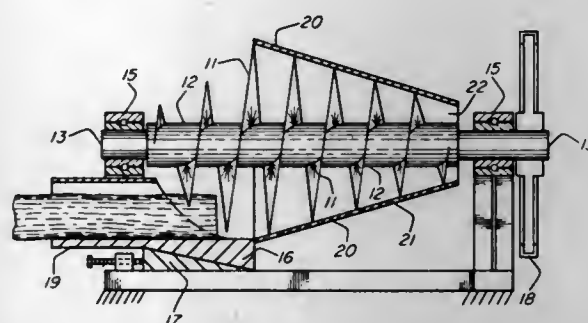
Robert D. Barwise, Bovey, Minn.; Rodger A. Arola, Hancock, Mich., and John R. Erickson, Alexandria, Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 12, 1975, Ser. No. 576,757

Int. Cl.² B27C 1/08; B27L 7/00

U.S. Cl. 144—162 R

12 Claims



8. A cutting apparatus comprised of a helical blade mounted on a drive shaft, said blade having a radial length increasing from zero to a maximum and having an increasing pitch, said shaft rotatably mounted between bearings, an anvil mounted therebelow fitting closely at the point where the blade reaches a maximum radial length, and a means to rotate said shaft.

4,053,005

METHOD OF HARVESTING TREES

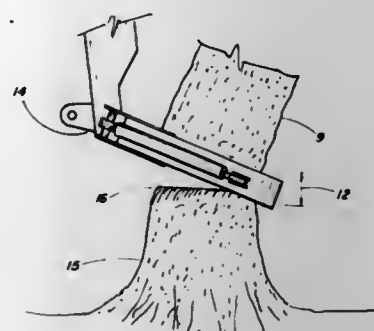
Alva Z. Albright, 2909 Monroe Highway, Pineville, La. 71360

Filed Nov. 4, 1974, Ser. No. 520,823

Int. Cl.² A01G 23/02

U.S. Cl. 144—309 AC

1 Claim



1. An improved method of harvesting trees comprising the steps of:

- Engaging a tree between a pair of double-edged jaws adapted to pivotally open and close and being mounted on a power train, said double edges of each said jaw being vertically spaced apart and defining limits of cutting;
- Cutting said tree between said jaws and within said cutting limits with a chain saw pivoting to cut on a common pivot with said jaws opening and closing;
- Holding said tree between said jaws in original position during cutting, said double edges respectively engaging the stump and the trunk of said tree with the cut therebetween;
- Felling said tree trunk by tilting said jaws in a desired direction of fall, the sharp edges engaging said stump chipping free therefrom, and the sharp edges engaging said tree trunk remaining engaged therewith; and

e. Bunching said tree trunk by moving said power train and releasing said jaws and their sharp edges engaging said trunk.

4,053,006

ARRANGEMENT FOR MULTISTAGE VACUUM MOLECULAR DISTILLING

Alexander Tkac, and Jan Cveengros, both of Bratislava, Czechoslovakia, assignors to Rektorat Slovenskej vysokej školy technickej, Bratislava, Czechoslovakia

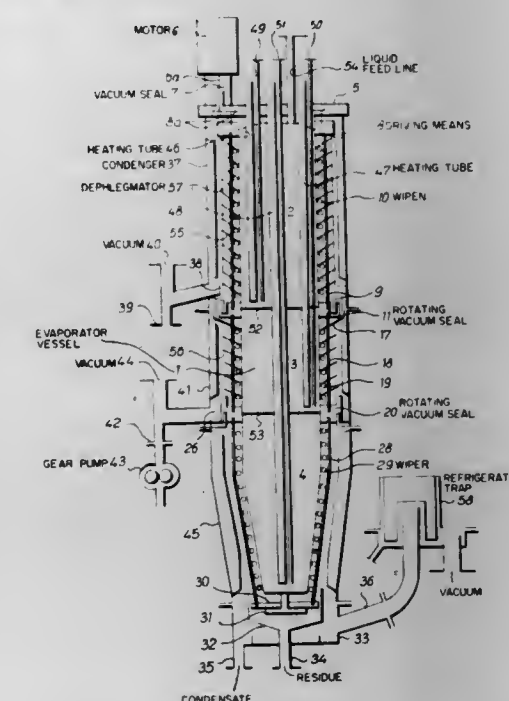
Filed Oct. 31, 1975, Ser. No. 627,551

Claims priority, application Czechoslovakia, Apr. 10, 1974, 2573/74

Int. Cl.² B01D 1/22

U.S. Cl. 159—6 W

6 Claims



1. In an arrangement for establishing a multi-stage vacuum and molecular distillation process using a wiped-off film, an elongated, vertically disposed evaporator vessel supported for rotation about a first longitudinal axis thereof and having a convex outer surface; means including condenser means surrounding first, second and third successively lower regions of the convex outer surface of the evaporator vessel to define therebetween first, second and third vacuum distillation stages; first and second annular elements individually affixed to the outer surface of the evaporator element to define

interfaces between the first and second vacuum stages and the second and third vacuum stages, respectively; first, second and third elongated wiping means extending longitudinally along the outer surface of the evaporator means in the respective first, second and third vacuum stages, the first, second and third wiping means respectively including first, second and third entraining rods, the first and second rods having respective lower and upper ends secured to the first annular element, the second and third rods having respective lower and upper ends secured to the second annular element, whereby the evaporator vessel, the annular elements and the entraining means form a unitary first assembly rotatable about the first axis; means disposed in each of the first and second annular elements for effecting a controlled flow of a fluid there-through from the lower end of the next-higher vacuum stage to the upper end of the next-lower vacuum stage so that the controlled flow of such fluid during a rotation of the first assembly about the first axis provides a rotary vacuum seal between the associated vacuum stages; means for introducing a first liquid to be distilled to the upper end of the first wiping means to be entrained thereby, whereby portions of the first liquid flow downwardly and alternately through the entraining rods and the effecting means of the annular elements; means for rotating the first assembly about the first axis so that the controlled move-

ment of the first liquid through the effecting means of the annular elements provides liquid rotary vacuum seals among the first, second and third vacuum stages; and means coupled to the condensing means for individually evacuating the first, second and third vacuum stages to successively higher degrees.

4,053,007

ANIMAL ACCESS DOOR FOR SCREEN DOORS

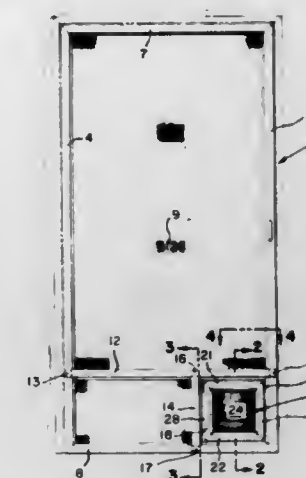
Raymond E. Griffith, 2333 Hopeton Ave., San Jose, Calif. 95122

Filed Jan. 9, 1975, Ser. No. 539,700

Int. Cl.² E06B 7/28

U.S. Cl. 160—180

1 Claim



1. A combination animal access door and screen door for a human habitat, comprising:

- a primary screen door including top and bottom transversely extending horizontal rails connected at opposite ends by first and second longitudinally extending vertical side rails, said top, bottom and side rails defining an opening covered by a screen material; and
- an auxiliary screen door assembly in said primary screen door and comprising an elongated transversely extending horizontal top mounting rail having opposite ends attached to said first and second side rails of said primary screen door intermediate said top and bottom rails, a vertical rail disposed intermediate said side rails of said primary screen door, said vertical rail having its upper end attached to said top mounting rail and having its lower end attached to said bottom rail of said primary screen door, said top rail and said vertical rail cooperating with portions of said first side rail and said bottom rail of said primary screen door to define an animal access opening in said primary screen door, an animal access door comprising a generally quadrilateral frame covered by a screen material, pivot means for mounting said access door in said access opening, said pivot means comprising rod means mounted at the top of said quadrilateral frame and journaled in said vertical rail and said first side rails to define a horizontal pivot axis for said access door, whereby said access door normally is suspended from said pivot means in the plane of said primary screen door to close said access opening, said pivot means permitting pivotal motion of said access door out of its normal plane in opposite directions to permit the passage of an animal therethrough in either direction.

4,053,008

SUPPORT MOLDING FOR FABRIC WALL COVERINGS

Floyd M. Baslow, 100 Lafayette St., New Bethlehem, Pa. 16242

Division of Ser. No. 680,703, April 27, 1976, Pat. No. 4,018,260.

This application Sept. 30, 1976, Ser. No. 728,285

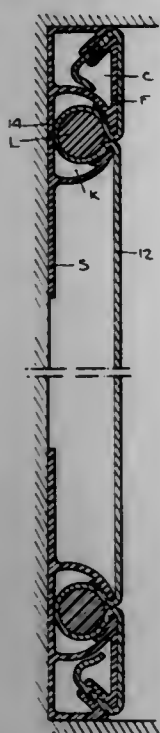
Int. Cl.² A47H 23/00, 13/00

U.S. Cl. 160—327

13 Claims

1. An assembly of border pieces for creating a framework

attachable to a wall or other flat surface for mounting a fabric sheet which is cut to dimensions at least sufficient to cover the surface, said assembly comprising linear border pieces and right-angle corner border pieces, the linear pieces being abutted in end-to-end relation with the corner pieces to define a framework whose outer edge follows the perimeter of the area to be covered, each piece of said framework including a raised face, a storage channel having a narrow inlet running adjacent the outer edge of the piece and communicating with said face,



and a keyway extending in parallel relation to the storage channel and having an inlet communicating with said face, whereby a zone along the selvage of the fabric sheet is trapped within the keyway and the remaining tail of the selvage which includes fabric material in excess of that necessary to cover said surface is stuffed within the channel so that the exposed selvage of the sheet which lies against said face presents a smooth appearance which extends to the inlet of the storage channel and is directly adjacent said perimeter.

4,053,009

SUSPENSION AND HEADING STIFFENER FOR CURTAINS, DRAPES OR THE LIKE

William Joel Reginald Edlin, P.O. Box 90, Katikati, New Zealand

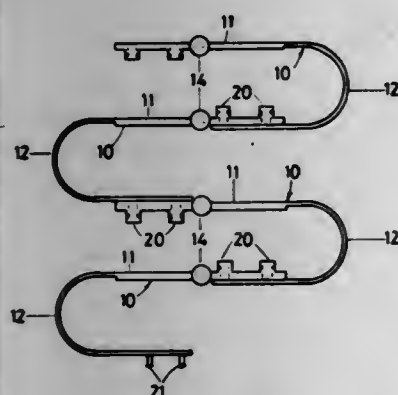
Filed Apr. 2, 1976, Ser. No. 673,133

Claims priority, application New Zealand, Apr. 7, 1975, 177140

Int. Cl.² A47H 13/14

U.S. Cl. 160—348

6 Claims



1. A combination suspension and heading stiffener for a drape, curtain or like article comprising: an elongate member of substantially uniform width throughout its length and having one end portion thicker than the other end portion so that said one end portion is substantially rigid whereas said other

end portion is flexible; means disposed at a longitudinal edge portion of said elongate member for suspending it during use from suspension guide means; and means at one end of said elongate member for connecting with cooperating means at the other end of another similar elongate member to enable connection together of a plurality of such elongate members in end to end relationship.

4,053,010

PROCESS AND APPARATUS FOR THE CONTINUOUS CASTING OF METAL PRODUCTS

Raymond Boccon-Gibod, Paris, France, assignor to Societe de vente de l'Aluminium Pechiney, Paris, France

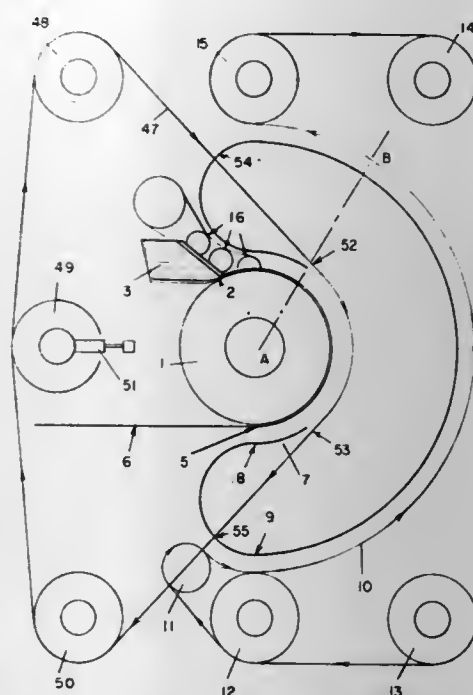
Filed June 21, 1976, Ser. No. 698,183

Claims priority, application France, July 8, 1975, 75.22021; July 23, 1975, 75.24452

Int. Cl.² B22D 11/06

U.S. Cl. 164—86

25 Claims



1. A process for the continuous casting of products of metal alloys such as strips, sheets, bars, blanks for wire rods, ingots and special products, comprising the casting of liquid metal between two surfaces, at least one of which is convex, applying a high pressure to the metal during solidification via these surfaces, the final thickness of the product may be appreciably reduced with respect to the initial thickness presented to the liquid metal, and keeping the cast product on the sides during its reduction in thickness by means of cooled tilting or retracting lateral sectors, the casting of liquid metal between two surfaces involving feeding the liquid metal near the upper generatrix of a cooled rotating casting drum, applying a series of shutters, which are also cooled and are almost joined, around the effective part of the drum and turning the series of shutters at the same rate as the drum, exerting a high pressure on the metal throughout the solidification via the shutters, the pressure of the shutters on the metal being exerted via one or more endless chains or cables acting on the side of the shutters opposite the cast metal and forcibly urging the shutters against the cast metal, and turning at a velocity synchronized with that of the drum, releasing the shutters from the action of the cables or chains, in the vicinity of the outlet for the cast product, the said shutters falling under their own weight, guiding the shutters by a rolling pathway, and moving and raising the shutters by belts to the vicinity of the liquid metal feed point where drive rollers bring them into a quasi-joined arrangement, spacing members being disposed on the said shutters, cooling of the shutters by circulating cooling fluid from the casting drum, and effecting an alignment of connection openings of the cooling fluid circuits of the drum and the shutters around the effective part of the drum by the spacing members of the shutters.

4,053,011

PROCESS FOR REINFORCING ALUMINUM ALLOY

Paul Gordon Riewald; William Henry Krueger, and Ashok Kumar Dhinra, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 615,356, Sept. 22, 1975, Pat. No. 4,012,204, which is a continuation-in-part of Ser. No. 522,881, Nov. 11, 1974, abandoned. This application Sept. 17, 1976, Ser. No. 724,249

Int. Cl.² B22D 19/02

U.S. Cl. 164—97

11 Claims

1. A process comprising the steps of placing polycrystalline alumina fibers in a mold, forming a composite reinforced with 10–80 volume percent of said fibers and having a porosity of less than about 10% by infiltrating the fibers in the mold with a molten aluminum alloy containing about 1–8% by weight of lithium for a time sufficient to form a reaction sheath on the fibers which has a thickness of less than 15% of the total fiber diameter and cooling the composite.

4,053,012

BATTERY STRAP MOLD AND ANTI-D RIP POURING MEANS

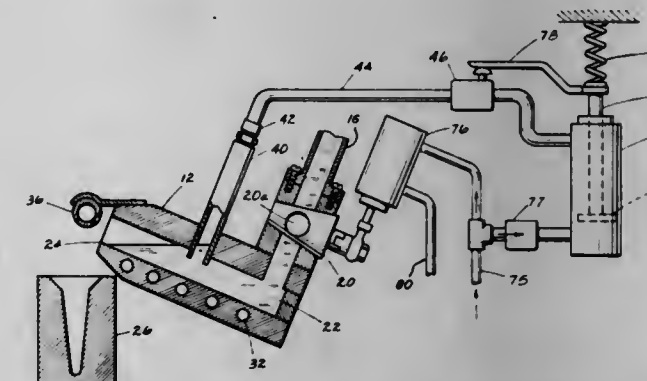
John Edgar Farmer, 12034 S. Emerald Ave., Chicago, Ill. 60628

Filed Aug. 25, 1975, Ser. No. 607,288

Int. Cl.² B22D 35/04

U.S. Cl. 164—254

7 Claims



1. An apparatus for delivering molten metal to a mold cavity which comprises a molten metal delivery head including an upwardly inclined molten metal reservoir terminating in a nozzle mouth with a lower lip for pouring molten metal from the reservoir into the mold cavity, means for supplying molten metal to said reservoir, valve means movable between open and closed positions for controlling delivery of molten metal into said reservoir and through said nozzle providing intermittent delivery from the nozzle for intermittent pours into the mold cavity and suction means including a fluid tap extending below the nozzle lower lip and into direct fluid communication with said reservoir and containing a fluid for direct surface contact with molten metal in the reservoir for withdrawing molten metal from the reservoir by said suction means communicating with said tap to apply suction upon said fluid in said tap at the end of each pour so as to prevent dripping of molten metal from the end of the nozzle between pours.

4,053,013

MULTI-PURPOSE APPARATUS FOR HEATING OR COOLING FLUIDS

Peter Gaba, 786 Malibu Lane, Indianantic, Fla. 32903

Filed May 6, 1975, Ser. No. 574,917

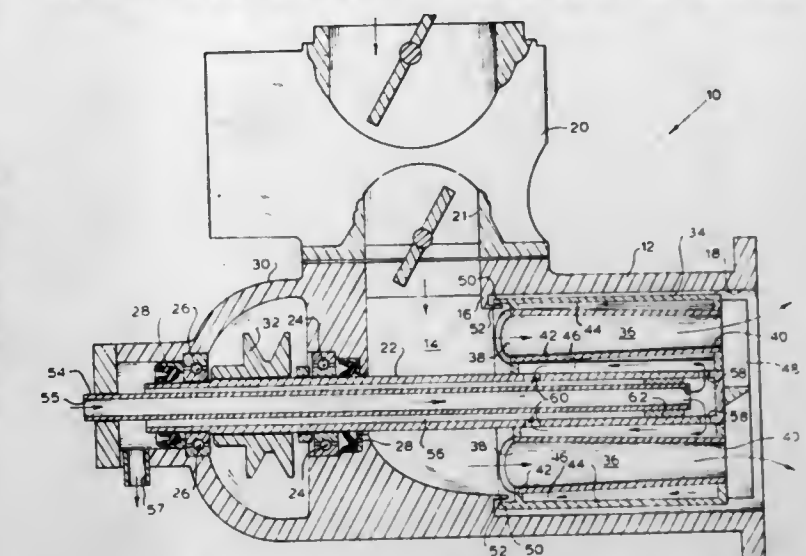
Int. Cl.² F28D 11/02

U.S. Cl. 165—86

22 Claims

1. Apparatus for heating or cooling a first fluid comprising: a housing having a chamber, said housing having an inlet and an outlet therethrough with a flow path for said first fluid defined therebetween, said inlet communicating between said chamber and a source of said first fluid; a rotor rotatably positioned within said chamber, said rotor having at least one tubular member defining a passageway

extending within said rotor and in said flow path between said inlet and said outlet; means for rotating said rotor such that said tubular member communicates between said inlet and said outlet constantly during each cycle of rotation such that there is a



constant flow of said first fluid between the inlet and outlet during rotation of said rotor; and means for heating or cooling the periphery of said tubular member to effect a change in the temperature of said first fluid passing therethrough.

4,053,014

FINNED TUBE COIL

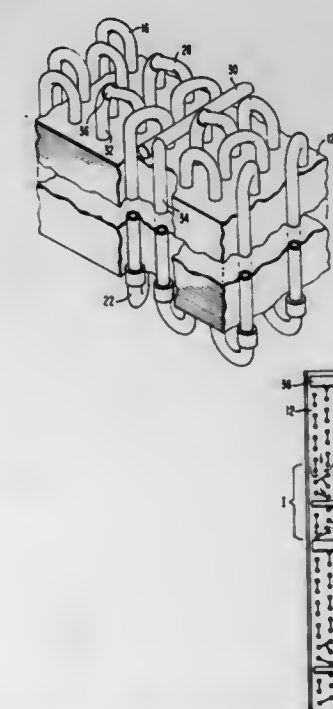
Edward C. Neff, Norman, and Howard F. Spicer, Oklahoma City, both of Okla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 23, 1975, Ser. No. 580,506

Int. Cl.² F28F 1/18, 1/32

U.S. Cl. 165—150

2 Claims



1. A multi-row, finned tube coil having opposite ends, comprising: a number of apertured fins stacked and spaced apart in parallel relation between the opposite ends of the coil, the apertures in said fins being in aligned relation; a number of aluminum hairpin tubes, each having a bight portion and two leg portions, said leg portions extending through said apertures in a direction locating all of said bight portions at one end of said coil; at least some of said hairpin tubes being oriented, relative to the planes of the rows of the tubes, to interconnect at least some of the rows of tubes at selective locations at said one end;

4,053,020

SOIL WORKING TINES

Cornelis van der Lely, 7, Bruchseurain, Zug, Switzerland

Filed Feb. 6, 1975, Ser. No. 547,726

Claims priority, application Netherlands, Feb. 8, 1974, 7401725

Int. Cl.² A01B 23/02

U.S. Cl. 172-713

13 Claims



1. An elongated tine for a rotary harrow comprising a substantially straight upper fastening portion and a substantially straight lower soil working portion that terminates in a lower tip, said fastening portion having a lower first tapering part and an adjoining upper second tapering part, each of said parts tapering inwardly and upwardly towards a screw threaded portion located at an upper free end of the fastening portion, said first part adjoining an integral junction with said soil working portion and said second part being located between said first part and said screw threaded portion, said first part more steeply tapering inwardly than said second part and each said part having substantially conical configuration, said second part extending for substantially at least half of the length of said fastening portion.

4,053,021

SIDE-BY-SIDE TRACTOR COMBINATION

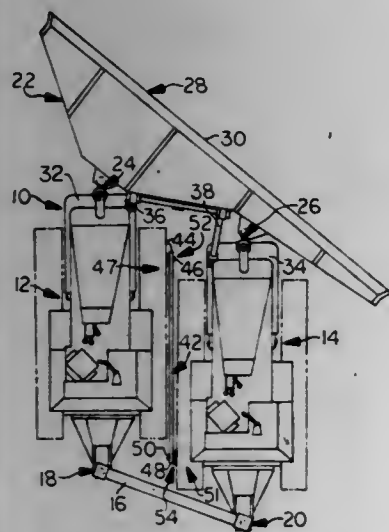
James R. Sturges, Washington, and Willis R. Daft, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1976, Ser. No. 675,027

Int. Cl.² E02F 3/76

U.S. Cl. 172-501

4 Claims



1. A multi-tractor assembly comprising first and second tractors in generally side-by-side and parallel relation, a first coupler element interconnecting the respective rearward ends of the tractors through pivotal joints, a second coupler element comprising a working implement comprising a blade defining a working surface, mounting means for pivotally mounting the second coupler element to the respective forward end of the tractors, and fixed length rigid link means connectable to said first and second tractors to be coupled to one of said tractors at a point forwardly of the coupling to the other tractor to determine with said first and second coupler elements a first relative

position of the first and second tractors with the first tractor forward of the second tractor to in turn determine a first position of the working implement relative to the longitudinal axis of the tractors, and said rigid link also being connectable to said first and second tractors to be coupled to the other of said tractors at a point forwardly of the coupling to the one tractor to determine with said first and second coupler elements a second relative position of the first and second tractors with the second tractor forward of the first tractor to in turn determine a second position of the working implement relative to the longitudinal axis of the tractors, the mounting means being positioned with respect to said working surface such that the working surface is at a predetermined angle relative to a position generally perpendicular to the longitudinal axis of the tractors with the tractors in the first relative position thereof, the working surface being positioned generally perpendicular to the longitudinal axis of the tractor with the tractors in the second relative position thereof.

4,053,022

DEVICE FOR GUIDING A DRILLING STRING DURING UNDERWATER DRILLING

Georges Mercier, Boulogne, France, assignor to Entreprise de Recherches et d'Activites Petrolieres (E.R.A.P.), Paris, France

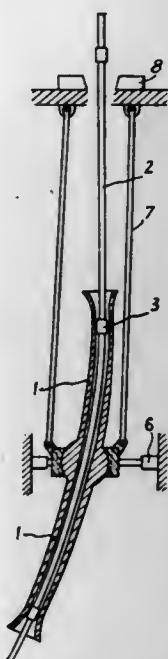
Filed June 25, 1975, Ser. No. 590,100

Claims priority, application France, June 26, 1974, 74.22257

Int. Cl.² E21B 7/12

U.S. Cl. 175-5

13 Claims



1. Device for guiding drilling strings for floating installations of the type comprising a platform and a well in said platform for the passage of tubular material, said device comprising a guide tube which consists of a flexible ring the internal diameter of which is constant over most of its length at a value from 1.1 to 1.4 times the external diameter of the joints of the drilling string, the external diameter of said flexible ring diminishing progressively from its median zone toward its two ends which constitute the flexible parts of the guide tube, the minimum thickness of said flexible ring being at least 4 mm, and the ratio of the thickness of the median zone of the guide tube to said minimum thickness lying between 4 and 25, while the ratio of the thickness in the median zone to the total length L of the tube varies from 0.002 to 0.010, a swivel joint connecting the median zone of said guide tube through lateral connecting means to the wall of said well, said swivel joint having an internal part contacting the outside of the ring and defining a spherical surface engaged in an external part, said external part being connected to the platform by means of longitudinal connecting means.

4,053,023

UNDERWATER WELL COMPLETION METHOD AND APPARATUS

David P. Herd, Houston, Tex., and John H. Fowler, Pittsburgh, Pa., assignors to McEvoy Oilfield Equipment Co., Houston, Tex.

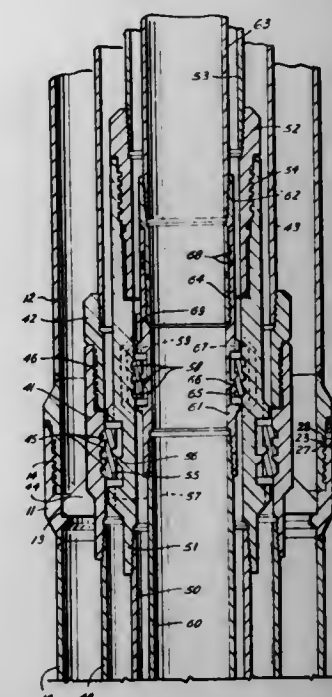
Division of Ser. No. 387,667, Aug. 13, 1973, which is a division of Ser. No. 103,839, Jan. 4, 1971, which is a continuation of Ser. No. 792,912, Jan. 22, 1969, which is a continuation-in-part of Ser. No. 728,081, May 9, 1968, Pat. No. 3,442,536, which is a continuation of Ser. No. 572,511, Aug. 15, 1966. This application

Aug. 22, 1974, Ser. No. 499,467

Int. Cl.² E21B 33/035

U.S. Cl. 175-7

9 Claims



1. A method of installing a string of pipe in the earth, comprising the steps of:
axially inserting a first pipe into a second pipe while preventing relative rotation therebetween until further insertion of said first pipe into said second pipe is prevented by a stop,
rotating said first pipe within said second pipe less than one revolution until tooth-like projections on said first pipe engage tooth-like projections on said second pipe,
driving the pipes into the earth.

4,053,024

LIGHT ITEM PORTABLE SCALE

Myron S. Hoyt, 98 Hawthorne Drive, N.I.-M, New London, Conn. 06320

Filed Aug. 3, 1976, Ser. No. 711,393

Int. Cl.² G01G 3/00, 21/00, 19/56

U.S. Cl. 177-225

5 Claims



1. A portable scale for weighing light items comprising:

a substantially planar flexible strip of material having a proximate end and a distal end,
a scale adjacent said proximate end calibrated in units of weight,
a horizontal slot adjacent said distal end for receiving the proximate end of said strip bent back upon itself there-through including said scale; and
means connected to the distal end of said strip for retaining an item to be weighed,
whereby the distal end of said strip can move under the weight of said item relative to said proximate end and said scale to indicate on said scale the weight of said item.

4,053,025

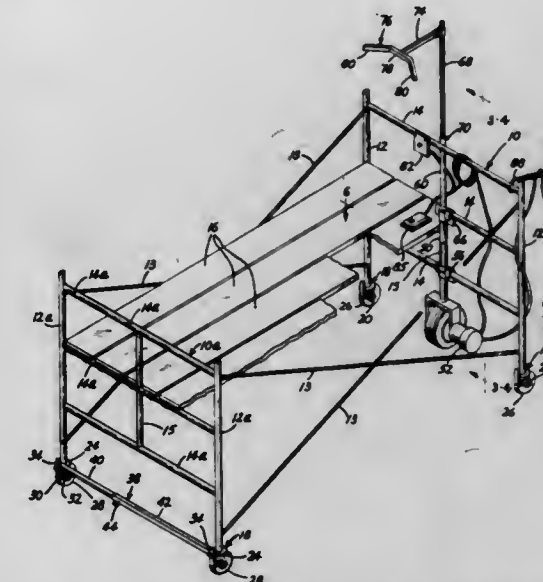
SCAFFOLD INCLUDING REVERSIBLE AND ADJUSTABLE DRIVING AND STEERING UNIT
John A. Slusarenko, 6724 Coleman Creek Road, Medford, Oreg. 97501

Filed July 14, 1976, Ser. No. 705,052

Int. Cl.² B60K 7/00

U.S. Cl. 180-2 R

8 Claims



1. A scaffold including, in combination, a steering and driving unit which scaffold has a front end frame member that includes roller supported corner posts, cross-bars that connect the corner posts, and a vertical intermediate steering and driving bar, and said unit having, in combination,
a. a drive wheel,
b. a wheel and motor supporting frame on which the drive wheel is revolvably mounted,
c. carrying means for the motor supporting frame adapted for attachment to an end frame member of the scaffold,
d. a reversible, variable speed wheel driving motor carried by said motor supporting frame,
e. driving connections between the motor and the drive wheel, and
f. steering means at the forward end of the scaffold conveniently accessible to an occupant of the scaffold for controlling the direction in which the drive wheel points, the drive wheel frame being carried by a drive wheel stem having supporting plural prong hangers which hang on cross-bars of the scaffold end frame member and embrace a vertical bar thereof.

4,053,026

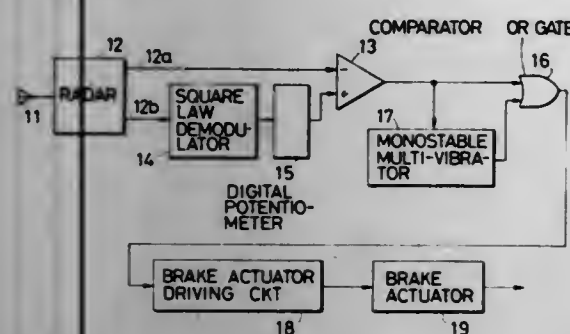
LOGIC CIRCUIT FOR AN AUTOMATIC BRAKING SYSTEM FOR A MOTOR VEHICLE

Norio Fujita, Yokohama, and Hiroshi Endo, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 8, 1976, Ser. No. 748,701

Claims priority, application Japan, Dec. 9, 1975, 50-147248
Int. Cl.² B60T 7/00; G01S 9/02

U.S. Cl. 180—98

5 Claims



1. In an automatic braking system for a motor vehicle having a brake for braking the vehicle which is applicable by the automatic braking system;

an antenna for transmitting and receiving a radar signal; a radar operatively connected to the antenna;

a comparator a first input of which is connected to a first output of the radar to receive a first signal therefrom;

a square law demodulator the input of which is connected to the second output of the radar to receive a second signal therefrom;

a digital potentiometer connected to the square law demodulator to receive a third signal therefrom and arranged to increase the magnitude of the third signal by a coefficient to form a fourth signal, the output of the digital potentiometer being connected to a second input of the comparator to feed the fourth signal thereto, the comparator being arranged to compare the first and fourth signals and generate first and second logic signals;

a brake actuator driving circuit which is arranged to produce a drive signal in response to the first logic signal; and a brake actuator connected to the brake actuator driving circuit to apply the brake of the vehicle when receiving the drive signal; the improvement comprising means connected between the output of the comparator and the input of the brake actuator driving circuit which adds the first logic signal to the input of the brake actuator driving circuit for a time after the first logic signal has disappeared from the output of the comparator.

4,053,027

USE FOR A SEISMIC ENERGY PULSE GENERATOR FOR GENERATING AND SHAPING A SEISMIC ENERGY PULSE

Oswald A. Itria, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 411,598, Oct. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 239,530, March 30, 1972, abandoned. This application Mar. 5, 1975, Ser. No. 555,462

The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.
Int. Cl.² G01V 1/06, 1/38

U.S. Cl. 181—118

6 Claims

1. A new use for a known seismic generator for generating a particular shaped single seismic energy pulse for delineation of sedimentary section below the surface of a body of water comprising:

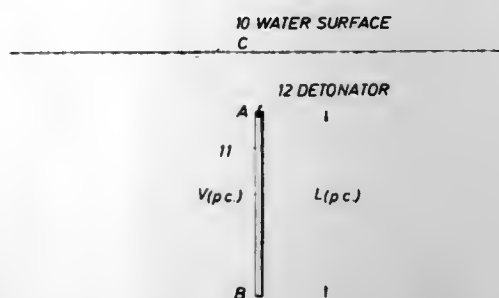
a. forming a vertical straight explosive material of a predetermined length,

b. positioning the vertical straight explosive material at a predetermined substantial depth below the surface of the water,

c. generating a single compressional first portion of said

seismic energy pulse of a predetermined precise length downwardly to the lower end of the vertical straight explosive material, and

d. generating a single rarefactional aft portion of said seismic energy pulse of a second predetermined precise length first upwardly to the surface and then downwardly to the position of the lower end of the vertical straight explosive material,



variation in the length of the vertical straight integral explosive material and variation in the depth of the vertical straight integral explosive material provides variation in both of said seismic energy pulse signal compressional forward portion and said seismic energy pulse signal rarefactional aft portion to predetermine the shaping of the single seismic energy pulse.

4,053,028

APPARATUS SUITABLE FOR USE AS STAIRWAYS, STEPLADDERS AND THE LIKE

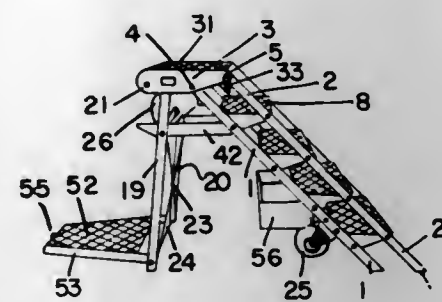
Gilbert Loix, Chasseee Bruchant 22, 4462 Wihogne, Belgium
Filed May 25, 1976, Ser. No. 689,823

Claims priority, application Belgium, May 26, 1975, 829490; Apr. 15, 1976, 0166178

Int. Cl.² E06C 1/393, 1/397

U.S. Cl. 182—1

8 Claims



1. Apparatus for use as stairs, steps and the like, comprising: lower and upper pairs of parallel rectilinear stringers, each stringer of the lower pair being disposed below and parallel to the respective stringer of the upper pair;

a pair of horizontal, parallel arms whereto first ends of the stringers are articulated about respective arms pivot axes extending between the arms, one of said axes supporting the lower stringers and being spaced downwardly from another one of the arm pivot axes, said other one supporting the upper stringers;

a plurality of treads mounted on and between the stringers, each tread having lower tread pivot means connecting it to the lower stringers at and about a lower tread pivot axis, and each tread having upper tread pivot means connecting it to the upper stringers at and about an upper tread pivot axis, the tread pivot axes being spaced apart longitudinally of the stringers by distances approximately equal to the widths of the treads and

being spaced apart vertically by a distance approximately equal to said predetermined vertical distance between the arm pivot axes; and

two elongate support elements articulated between the hori-

zontal arms, each such element having a post perpendicular thereto and having post pivot means pivoted to one of the horizontal arms so that the support elements can be turned from a support position below the horizontal arms to a rest position above the horizontal arms; whereby the stringers and the support elements can be turned relative to the horizontal arms, while the treads are and remain horizontal.

4,053,029

SPRING DRIVE MECHANISM, PARTICULARLY FOR MOBILE TOYS

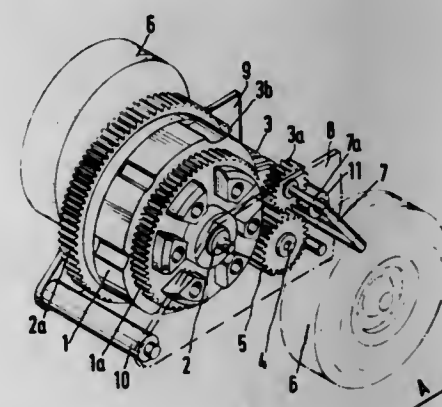
Helmut Darda, Im Tal, D-7712 Blumberg, Germany
Filed Dec. 18, 1975, Ser. No. 642,172

Claims priority, application Germany, Dec. 24, 1974, 2461456; Dec. 27, 1974, 2461625

Int. Cl.² F03G 1/00

U.S. Cl. 185—39

18 Claims



1. In a spring drive mechanism, particularly for toy vehicles; a drive spring; a plurality of gear wheels of different diameters being arranged on an axle, said drive spring having the ends thereof connected to said gear wheels; a drive and spring wind-up shaft located in parallel with said axle; two pinions having different diameters being located on said shaft; directional escapement means having oppositely effective rotational directions adapted to interconnect said pinions with said gear wheels, the smaller diameter pinion being in engagement with the spring gear wheel having the larger diameter and the larger diameter pinion being in engagement with the spring gear wheel having the smaller diameter; a reversing pinion having two gear tooth rims, one said gear tooth rim being in constant engagement with the first of said pinions, the other said gear tooth rim adapted to be brought into operative connection with the spring gear wheel, which is not in engagement with said first pinion; spring drive mechanism plates for supporting the axle of said reversing pinion; a bearing support formed as an elongate aperture for producing the drive connection; and a spring being acted upon by the portion of the axle of said reversing pinion for disengagement of the drive connection, the improvement comprising: said reversing pinion axle being a portion of a spring wire retained in said plates, a part of said spring wire located on the side of said elongate aperture being a support member for effecting displacement of the reversing pinion axle so as to provide said drive connection.

4,053,030

PISTON SEAL AND RETURN SPRING

Dean R. Baird, Clover, S.C., and Martin E. Benjamin, Gastonia, N.C., assignors to Garlock Inc., Rochester, N.Y.

Filed Sept. 7, 1976, Ser. No. 720,696

Int. Cl.² F16D 65/54

U.S. Cl. 188—71.8

16 Claims

1. An annular piston seal and return spring for a disc brake piston/caliper assembly comprising:

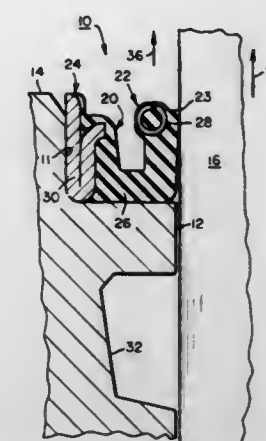
a. an annular elastomeric body having a sealing lip portion including a sealing lip, a seal retaining portion spaced radially outwardly from said sealing lip portion, and an

intermediate flex portion extending between said sealing lip portion and said seal retaining portion,

b. a first reinforcing element incorporated in said sealing lip portion,

c. a second reinforcing element incorporated in said seal retaining portion, and

d. said sealing lip portion being axially moveable, with re-



spect to said seal retaining portion, from its rest position to an extended position by the flexing of said flex portion, and said flex portion exerting a retracting force on said sealing lip portion when in its extended position tending to retract said sealing lip portion back to said rest position, whereby said sealing lip portion can move axially with a piston sealed thereby and can both seal and retract said piston.

4,053,031

PISTON ACTUATED DISC BRAKE WITH MEANS FOR PUSHING THE PISTON

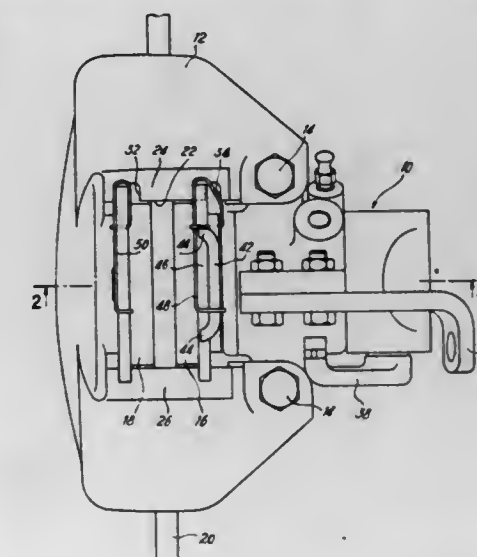
Alain Thioux, Chennevières, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Nov. 17, 1976, Ser. No. 742,960

Claims priority, application France, Dec. 3, 1975, 75.36946
Int. Cl.² F16D 55/02

U.S. Cl. 188—71.9

8 Claims



1. A disc brake comprising brake applying means associated with a carrying member so as to urge two friction pads towards the respective faces of a rotary disc, the brake applying means comprising at least one piston mounted in a cylinder and movable towards the disc from an idle position to urge one of the pads towards the corresponding face of the disc when the brake is operated, the carrying member comprising an aperture defining two circumferentially spaced edges, each of which comprises at least one sliding surface with which the one pad cooperates in accordance with the wear on its lining, at least one of the edges also comprising a slot offset towards the piston relative to the corresponding sliding surface, means being provided to push the piston back away from the disc

towards said idle position, so that the pad can be brought opposite the slot, whose dimensions permit radial extraction of the pad through the aperture, wherein automatic adjusting means are associated with the piston, the means for pushing back the piston in opposition to the adjusting means being operated by introduction of a tool between the one pad and the piston after removal of a wedge forming element normally inserted therebetween.

4,053,032

SELF-ACTUATING BRAKE LINKAGE

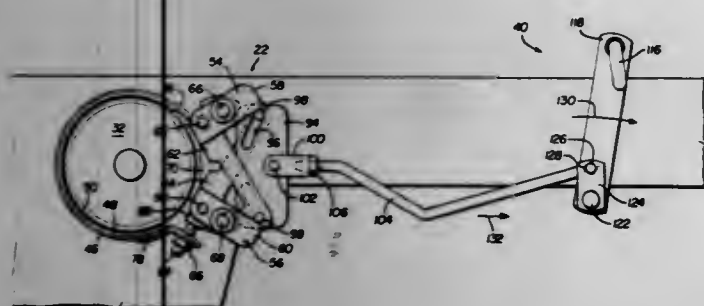
Raymond F. McDonald, Winneconne, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 15, 1976, Ser. No. 732,677

Int. Cl.² F16D 49/00

U.S. Cl. 188—77 R

10 Claims



1. An improved self-actuating brake for vehicles, including a flexible brake band having a center portion for receipt around a rotatable drum, a pair of brake actuating levers, each of said levers having a first pivotal connection to one of said brake band free ends, a fixed pivot adjacent said first pivotal connection and a second pivotal connection to a cam member, said first pivotal connection and said fixed pivot defining the shorter leg of an L-shaped lever with said first and second pivotal connections defining the longer legs, said longer legs of said lever extending away from said brake band and crossing, said cam member located generally between said second pivotal connections of said levers, said cam member having a pair of angularly related slots extending generally away from said brake band and slidably receiving said second pivotal connections of said levers and a brake linkage means pivotally connected to said cam member between said second pivotal connections adapted to tension said cam member, rotating said levers about said fixed pivots to actuate said brake, release of said brake linkage means resulting in movement of said cam plate toward said brake band, whereby said cam plate spreads said lever second pivotal connections within said angularly related slot, releasing said brake band.

4,053,033

PRESSURE LIMITER MEANS FOR CONTROLLING THE OPERATION OF A SOLENOID VALVE

Albert E. Simon, and Henry Dorsett, both of LaPorte, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed July 1, 1976, Ser. No. 701,827

Int. Cl.² B60T 7/20

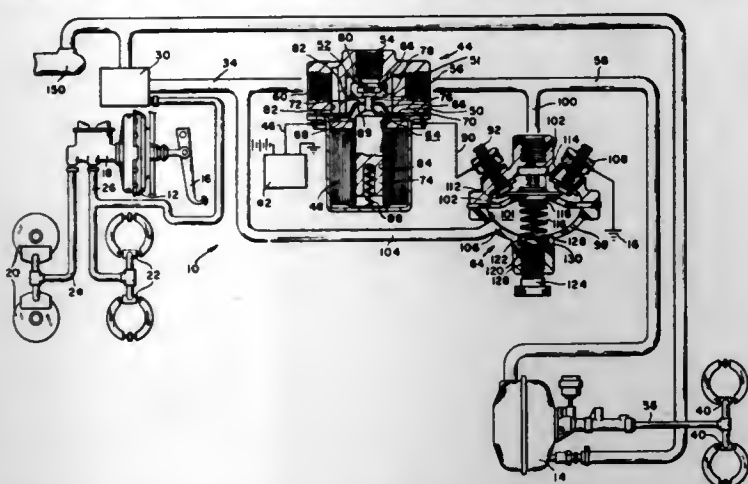
U.S. Cl. 188—112

6 Claims

1. In combination with a solenoid valve, a sway sensor and a servomotor, switch means for limiting the communication of a brake activation signal from said solenoid valve which operates said servomotor in response to a sway control signal developed in said sway sensor, said switch means comprising:

- a housing having a cavity therein;
- wall means located in said cavity, said cavity being adapted to receive said brake activation signal;
- a first contact connected to said solenoid valve;
- a second contact attached to said wall means for connecting said first contact with an electrical ground to allow said sway signal to energize said solenoid valve and produce said brake activation signal, said wall means responding to a predetermined brake activation signal by moving said

second contact away from said first contact to interrupt the energization of said solenoid valve and thereby modulate the development of said brake activation signal; and



resilient means connected in said wall means for urging said second contact into engagement with said first contact, said brake activation signal overcoming said resilient means in moving said second contact away from said first contact.

4,053,034

MOUNT FOR A RAILWAY VEHICLE DISC BRAKE

Ernst Katzer, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

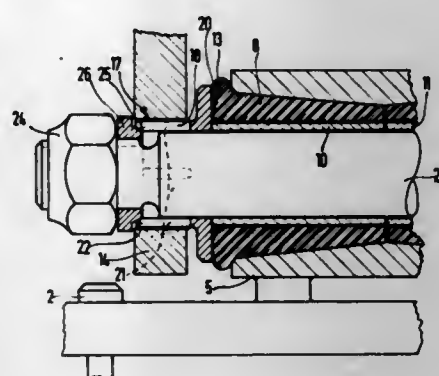
Filed Feb. 5, 1976, Ser. No. 655,566

Claims priority, application Germany, Feb. 5, 1975, 2504804

Int. Cl.² F16D 65/14; F16C 27/06

U.S. Cl. 188—206 R

3 Claims



1. In a disc brake for a railway vehicle, a resilient pivot mount for a cross member upon the ends of which are pivotally mounted brake levers having brake shoes thereon engageable with a brake disc on one of the wheel or axle of the railway vehicle, comprising a pair of spaced trunion bearings mounted on the frame of the vehicle, a bushing attached to the cross piece, said bushing having a bore therethrough, a pair of compressible rubber sleeves inserted into said bushing from each end thereof, each of said rubber sleeves having a cylindrical bore therethrough and an external annular flange on the outer end thereof, a threaded bolt passing through said trunion bearings and rubber sleeves to support said bushing and cross piece from the frame, a pair of clamping sleeves each having a cylindrical portion in each trunion bearing and a flange at one end of said cylindrical portion engageable with the outer flange end of respective rubber sleeves, said cylindrical portion having an outer end and a plurality of axial slots extending from said outer end substantially the length of said cylindrical portion away from said flange, said outer end having an inwardly beveled surface engageable with correspondingly shaped surfaces on fastener means on said bolt, the tightening of said fastener means on said bolt spreading apart the slotted portions of said cylindrical portion against said trunion bearing.

4,053,035

CURRENT COLLECTING SYSTEM FOR SELF-PROPELLED CARRIAGE OF AERIAL TRAMWAY

Hiromichi Uchiyama, and Yukiyo Hatori, both of Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Japan

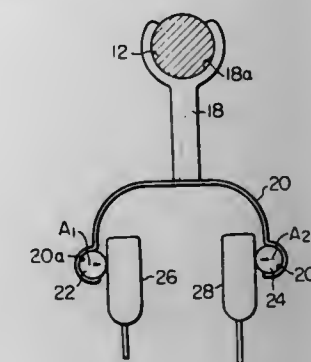
Continuation of Ser. No. 503,932, Sept. 6, 1974, abandoned. This application Apr. 1, 1976, Ser. No. 672,772

Claims priority, application Japan, Sept. 28, 1973, 48-112998

Int. Cl.² B60L 5/08

U.S. Cl. 191—45 A

2 Claims



1. In an aerial tramway system having a self-propelled, travelling suspended cable car, a suspension cable for said cable car, a current-collecting system comprising two laterally disposed electrically conductive, current-collecting shoes spaced apart a fixed distance on said cable car and travelling therewith, two electrically conductive, current-carrying cables, a holder depending from said suspension cable and being spaced apart along the conductive cables, the holder having elastic means for elastically holding the conductive cables in a parallel spaced apart relationship a distance less than a distance between contact surfaces on the shoes which in turn make sliding contact with said cables, and said elastic means elastically biasing the conductive cables toward each other and toward respective ones of said contact surfaces for continuously making contact with the shoes as the cable car travels, and said shoes being disposed between the cables spaced downwardly from said elastic means.

4,053,036

WHEEL BRAKE ASSEMBLY

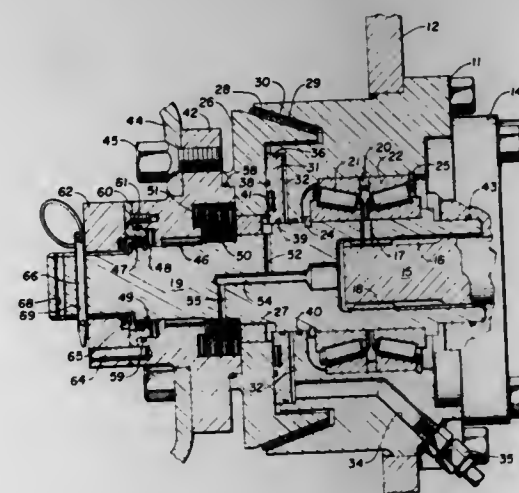
William C. Branham, Minnetonka; Venkat R. Garlapaty, Brooklyn Center, and David W. Berg, Minneapolis, all of Minn., assignors to Tol-O-Matic, Inc., Minneapolis, Minn.

Filed Aug. 25, 1975, Ser. No. 607,294

Int. Cl.² F16D 67/02

U.S. Cl. 192—13 R

12 Claims



1. A combination wheel brake assembly for connection with a rotatable vehicle wheel comprising:

- a rotatable axle;
- a spring applied, hydraulically released brake assembly including a rotatable brake element rotatable with said axle and a non-rotatable brake element, one of said brake ele-

ments being axially movable longitudinally along said axle into frictional engagement with the other to effect braking of said axle;

a wheel hub adjacent to and operatively engaged with said brake assembly and adapted for connection to said wheel and rotatably supported by said axle independently of said brake assembly; and

means for selectively engaging and disengaging said axle and said wheel hub such that when engaged, said wheel hub rotates with said axle, and when disengaged, said wheel hub is freely rotatable relative to said axle and relative to said rotatable brake element.

4,053,037

REVERSING RATCHET

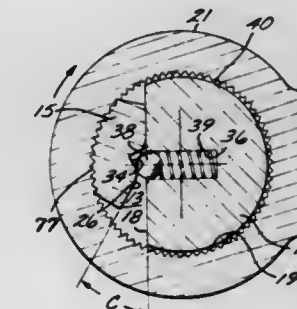
Donald F. Solomon, Newport Beach, Calif., assignor to Jo-Line Tools, Inc., Anaheim, Calif.

Filed June 10, 1976, Ser. No. 694,775

Int. Cl.² F16D 41/16

U.S. Cl. 192—43.1

7 Claims



1. A ratcheting tool for applying torque to a workpiece comprising:

- a. a torque transmitting member rotatable about its own axis and having parallel surfaces for engaging a workpiece and arranged in an axially extending configuration of prismatic cross section and further including a coaxial guide element defined in the shape of a portion of a cylinder that is longitudinally dissected by an axially extending planar bearing wall and wherein a channel is defined extending transversely through said guide,
- b. a work handle terminating in an annular ring positioned adjacent to said torque transmitting member and having an interior surface equipped with radial interiorly directed ratchet teeth, wherein said annular ring and said guide element are positioned in mutual coaxial arrangement to define a cavity between the interior surface of said ring and said bearing wall,
- c. a pawl located within said cavity and having an arcuate surface equipped with ratchet teeth for positioning in engagement with said ratchet teeth of said annular ring, and having an opposing bearing surface of overall convex configuration, and having axially extending engagement pins,
- d. a direction indexing member positioned in annular disposition about said guide element and defining two opposing sets of radially extending detent depressions adjacent to and coplanar with said transverse channel of said guide element and having a boss extending toward said pawl and laterally engageable by either of said engagement pins to act through said pins to roll the convex surface of said pawl laterally across said bearing plane to selectively position said pawl within said cavity, and
- e. detent means located within said channel and biased radially outward from said guide element to selectively engage either of said sets of detent depression in said indexing member.

4,053,038

SELF-SYNCHRONIZING CLUTCH

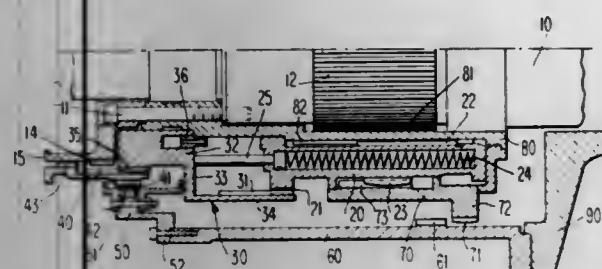
Roland Clyde Herrick, Ambler, Pa., assignor to Philadelphia Gear Corporation, King of Prussia, Pa.

Filed Aug. 12, 1976, Ser. No. 713,646

Int. Cl.² F16D 23/10

U.S. Cl. 192-67 A

19 Claims



1. In a self-synchronizing clutch mechanism for automatically coupling rotatable input means to rotating output means in response to said input means attaining a rotational speed equal to that of said output means, and for automatically decoupling said input means from said output means in response to the rotational speed of said input means falling below that of said output means:

- a. an annular carrier mounted coaxially with said input means and coupled to said input means through a first set of helical splines;
- b. an annular coupler mounted coaxially with said carrier and carried by said carrier by means of a second set of helical splines;
- c. sensing means responsive to said input means attaining a rotational speed equal to that of said output means;
- d. carrier constraining means activated by said sensing means for guiding the combined rotational and axial movement of the carrier relative to the said output means, thereby to cause said carrier to move axially and angularly on said first set of helical splines in response to input torque;
- e. said coupler, when carried axially by said carrier, being adapted to abut against said output means and in response to said abutment to be moved angularly on said second set of helical splines and into engagement with said output means.

4,053,039

CONVEYOR SUPPORT

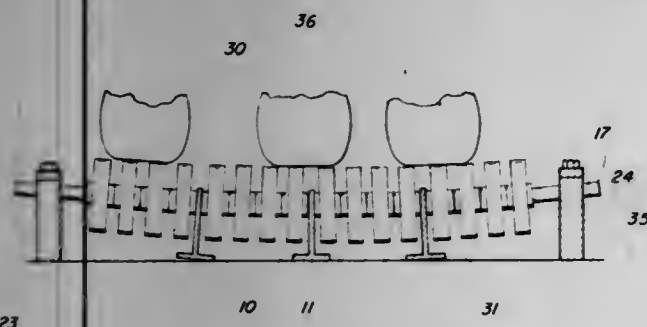
Howard P. Shuttleworth, Warren, Ind., assignor to Shuttleworth Inc., Huntington, Ind.

Filed Mar. 23, 1976, Ser. No. 669,509

Int. Cl.² B65G 13/00

U.S. Cl. 193-35 R

10 Claims



1. In a conveyor for moving objects, the conveyor including a shaft supported at first and second locations on said shaft, a plurality of rollers mounted on said shaft between said first and second locations in side-by-side relation, said rollers projecting upwardly from said shaft and being unobstructed to define a discontinuous surface area extending other than vertically between said first and second locations, said objects being held against said discontinuous surface area by gravity, the improvement comprising:

support means for supporting said shaft intermediate of said

first and second locations, said support means including a support member having an upright connected to said shaft between two of said plurality of rollers, said support member extending upwardly less than said rollers mounted on said shaft; and

connecting means for releasably connecting said support member to said shaft while said rollers remain on said shaft, said connecting means including a slot defined by said upright within which said shaft is received, said connecting means further comprising a surface positionable against the top of said shaft when said shaft is received within the slot to support said support member upon said shaft;

said support means further comprising a support surface spaced apart from said support member and positioned to prevent downward displacement of said support member beyond a preselected distance, said support member having a base surface extending outwardly from the upright and positioned to engage said support surface upon downward displacement of said support member the preselected distance, the base surface of said support member being of sufficient area to provide stability upon engagement with said support surface, whereby said base surface engages said support surface when the shaft of the conveyor bends downwardly due to the weight of objects being supported upon the rollers mounted on the shaft, said support member thereby supporting said shaft and said objects and preventing further bending of said shaft.

4,053,040

SERIAL WIRE MATRIX PRINTER

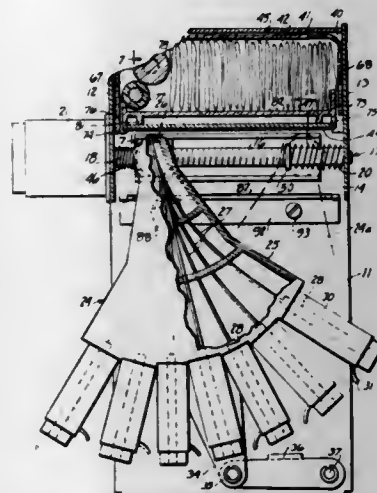
Thomas K. McGourty, 1640 Cox Road, Aptos, Calif. 95003

Filed Oct. 20, 1975, Ser. No. 623,967

Int. Cl.² B41J 1/24

U.S. Cl. 197-1 R

8 Claims



1. A printing device comprising means for supporting a record medium in a printing plane, a print head having printing means adjacent said printing plane, a rotatable screw shaft extending parallel to said printing plane, said shaft having a screw threaded section and an unthreaded section, a nut connected to said head for moving said head along said printing plane, said nut being in threaded engagement with said threaded section of said shaft, spring means, said nut causing said spring means to flex upon movement of said nut onto said unthreaded section upon rotation of said shaft in one direction, said spring being effective to return said nut into threaded engagement with said threaded section upon rotation of said shaft in the opposite direction, and means for rotating said shaft.

4,053,041

LABELING DEVICE

Francisco Barceloni Corte, Corrientes 2021, Buenos Aires, Argentina

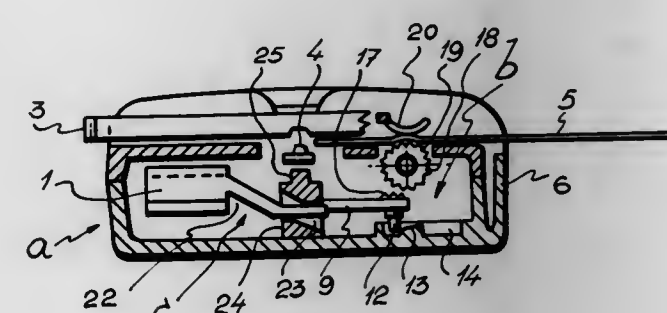
Filed Sept. 8, 1975, Ser. No. 611,007

Claims priority, application Argentina, Sept. 10, 1974, 255536

Int. Cl.² B41J 1/30

U.S. Cl. 197-6.7

2 Claims U.S. Cl. 197-168



1. In a labeling device of the type that includes a body, a pair of rotatable spaced wheels on said body, a path of travel defined between said wheels and in a first plane through which tape to be imprinted is passed, means for feeding said tape along said path of travel, one of said wheels including elastically deformable arms movable in a direction transverse to said tape, each of said arms carrying a printing element, the other of said wheels including corresponding printing elements; each printing element on each arm cooperating with one of said corresponding printing elements on said other wheel for imprinting a desired character on said tape upon said transverse movement of one of said arms, means for applying pressure to said deformable arms for causing transverse movement thereof for imprinting characters on said tape, a lever pivotally mounted on said body for movement about a first axis for operating said tape feeding means and said pressure applying means, said first axis being transverse to said first plane, and biasing means for pivotally returning said lever to an inoperative position, the improvement comprising, in combination, an arm member pivotally mounted on said lever about a second axis laterally spaced from said first axis, said arm member extending laterally outwardly of said lever, a free end portion being defined on said arm member and having a guide element thereon, said arm being movable in a direction transverse to said first plane, a closed track defined in said body having an initial portion, a latter portion, and a return portion which connects with said initial portion, said track being constructed and arranged to guidably receive said guide element therein both for movement about said second axis and for said transverse movement, said tape feeding means including a sprocket wheel rotatably carried by said body and being constructed and arranged to drivably engage and move said tape in said path of travel, means carried on said end portion of said arm member for drivably engaging and rotating said sprocket wheel for moving said tape as said guide element is moved in said initial portion only of said track in response to pivoting movement about said first axis, said pressure applying means being guidably and movably carried on said lever for movement towards and away from said one printing element on one of said arms for imprinting a desired character on said tape as the guide element is moved in said latter portion only of said track in response to continued pivoting compression of said lever, said guide element moving in said return portion upon movement of said lever to the inoperative position by said biasing means.

4,053,042

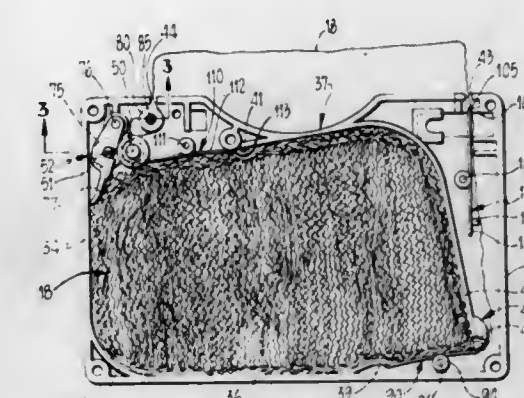
ENDLESS RIBBON CARTRIDGE

Ernst P. Hess, Castro Valley, Calif., assignor to Qume Corporation, Hayward, Calif.

Continuation of Ser. No. 530,120, Dec. 6, 1974, abandoned. This application May 19, 1976, Ser. No. 687,716

Int. Cl.² B41J 33/10

11 Claims



1. A cartridge for supplying an endless inked ribbon to a printing station external to said cartridge in an associated printing apparatus, said cartridge comprising:

a housing including a cover member having an inner surface with a downwardly depending arcuate projection and a main body portion having a ribbon entrance slot, a ribbon exit slot and interior boundary walls partially defining an interior ribbon chamber for said endless inked ribbon, said chamber having an exit portion and an entrance portion, the portion of said interior boundary wall partially defining said exit portion including a relieved channel extending transversely along the top surface thereof, said arcuate projection being received within said relieved channel and adjacent said exit portion when said cover member and said main body portion are assembled;

an endless inked ribbon received within said ribbon chamber and arranged in random folds, said ribbon having an upper edge facing said inner surface of said cover member a portion of said ribbon extending from said exit portion through said exit slot and said entrance slot to said entrance portion to form a closed ribbon path;

ribbon transport means for providing a force for translating said ribbon from said exit portion to said entrance portion via said exit slot and said entrance slot, said ribbon transport means including a capstan member rotatably mounted in said housing, said capstan member having a pair of axially spaced flanges and a curved surface portion therebetween; said surface portion having a serrated wall surface;

means adjacent said exit portion for providing a substantially constant drag force on said ribbon; and

means adjacent said entrance portion and said ribbon transport means for deflecting entering ribbon into said chamber, said drag force means and said deflecting means defining the remainder of said interior ribbon chamber, said drag force means and said deflecting means each comprising a hub portion and a resilient blade portion secured to said hub portion, said blade portion being mounted in a flexed position, one end of said blade portion of said deflecting means being arranged in surface contact with said surface portion of said capstan member so that entering ribbon is deflected thereby, one end of said blade portion of said drag force means being arranged to bias said ribbon against said exit portion of said interior boundary wall,

said arcuate projection having a portion thereof extending along said inner surface beyond said relieved channel and adapted to contact said upper edge of said ribbon for preventing migration of said ribbon from said exit portion in a direction transverse to said ribbon path.

4,053,043

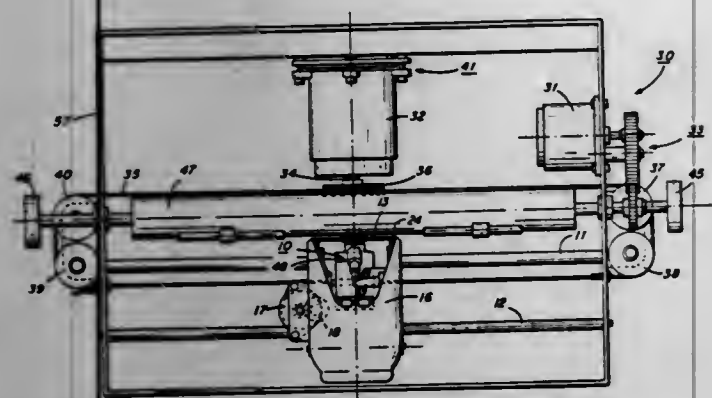
MEANS AND METHOD FOR ENHANCING RIBBON LIFT

David R. Deetz, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1975, Ser. No. 644,391
Int. Cl.² B41J 35/20, 1/24

U.S. Cl. 197-53

5 Claims



5. A method for reducing the effect of any interference between a print element and a ribbon in a printer during ribbon lift, said method comprising the steps of: initiating ribbon lift to position the ribbon from a first position to a second position, providing for linear movement of the ribbon in one direction past a print station, initiating rotation of the print element past the print station in a first direction in preparation for printing a first character subsequent to each initiation of ribbon lift, said first direction being opposite to the direction of linear movement of the ribbon past the print station even if said first direction requires a rotation of greater than 180° to move said first character to said print station; and initiating rotation of the print element past the print station in a direction providing the least amount of rotation from the character previously printed to the next character to be printed, while the ribbon remains in the second position.

4,053,044

SYSTEM FOR CONTINUOUS ENTRAINMENT AT VARIABLE SPEED

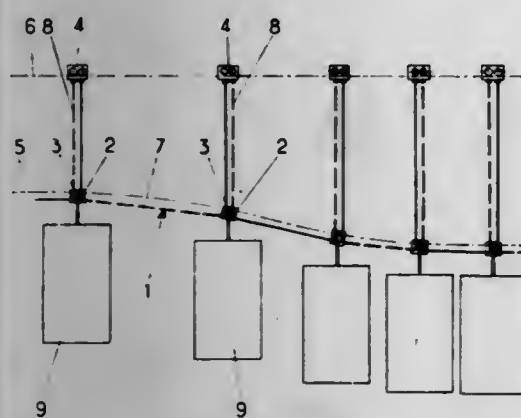
Pierre Pata, 9 rue Nicolas Houel, 75005 Paris, France
Continuation of Ser. No. 585,519, June 10, 1975, abandoned.

This application Oct. 27, 1976, Ser. No. 736,230

Claims priority, application France, June 14, 1974, 74.20681
Int. Cl.² B61B 13/14

U.S. Cl. 198-334

5 Claims



1. A system for continuous entrainment at variable speed along a path of travel, comprising principal movable elements mounted for displacement on a first rolling track and coupled together in pairs by a flexible link of constant length, auxiliary movable elements mounted for displacement on a second rolling track, the spacing between said first and second rolling

tracks being variable along at least a part of the path of travel, each said flexible link passing over two deflecting members each one mounted integrally with one of said principal movable elements so that a central portion of each flexible link is always positioned substantially in the direction of displacement, and wherein the two extreme portions of each link are respectively secured to two separate auxiliary movable elements without rigid part between a principal and an auxiliary elements.

4,053,045

RESILIENTLY MOUNTED CONVEYOR BELT CLEANER

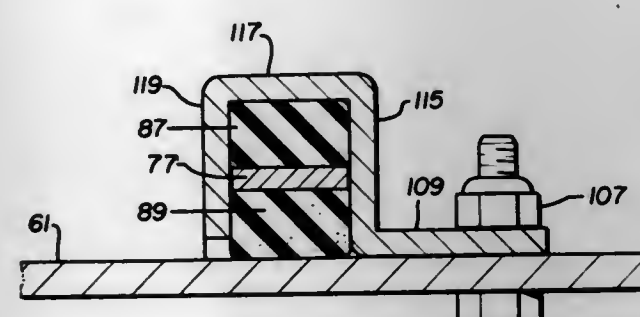
Robert C. Reiter, Aurora, Ill., assignor to Material Control, Inc., Aurora, Ill.

Continuation of Ser. No. 651,462, Jan. 22, 1976, abandoned. This application Feb. 17, 1977, Ser. No. 769,493

Int. Cl.² B65G 45/00

U.S. Cl. 198-499

5 Claims



1. In a conveyor belt cleaner for a conveyor having a rotatable drum and an endless belt trained about said drum for defining delivery and return runs, a support fixedly positionable transversely of and adjacent to one of said runs, a plurality of scraper blades disposed transversely of said one run and a plurality of elongated arms equal in number of said scraper blades and disposed substantially lengthwise of said one run, each arm having one of said scraper blades secured to one end thereof and each arm having a support-engaging means at the opposite end thereof, each of said support-engaging means being individual to its arm and being positioned along the length of the support such that each of said arms is rockable relative to said support and to each of the others of said plurality of arms for moving said blades toward and away from said one run, the improvement characterized in that support-engaging means includes a block of resilient material attachable to the opposite end of said arm for absorbing the shock of said rocking motion and for biasing said arm to urge said scraper blade toward said one run after it has been moved away from the normal plane of said run, and clamping means attachable to said support for resiliently securing said block and the opposite end of said arm to said support for rockable movement with respect thereto without requiring apertures in said block and in the opposite end of said arm, said clamping means including a first substantially rectangular, relatively flat portion having apertures therein, the plane of said first portion defining a reference plane, fastening means engageable with said apertures and corresponding apertures in said support for fixedly attaching said first apertured portion to said support, an integral L-shaped clamping portion having a side portion integral with said first portion and generally perpendicular to said reference plane and a cap portion generally perpendicular to said side portion and extending from the top thereof in a direction opposite to the direction in which said first portion extends, said side portion and said cap portion being dimensionally similar to one another and a tab member integral with said cap portion and depending perpendicularly from the outer longitudinal dimension thereof, said tab member being substantially parallel to said side portion but dimensionally smaller than said side and cap portions, the interior surfaces of said side portion, said cap portions, and said tab member defining an

interior clamping portion whose bottom is a portion of said support, said block and the opposite end of said arm being received within said interior clamping portion which resiliently mounts said block and arm for rockable movement with respect to said support, the combined size of said block and said opposite end of said arm being dimensionally greater than the size of said interior clamping portion to insure at least partial compressing of said block within said interior clamping portion, at least one of said faces engaging said opposite end of said arm, said block having a pair of side surfaces, with one side surface engaging the size portion of said L-shaped clamping portion, said second side surface having a notched portion, said tab member being received in said notched portion for retaining said block within said interior clamping portion.

4,053,046

PLASTIC FILM WRAPPER

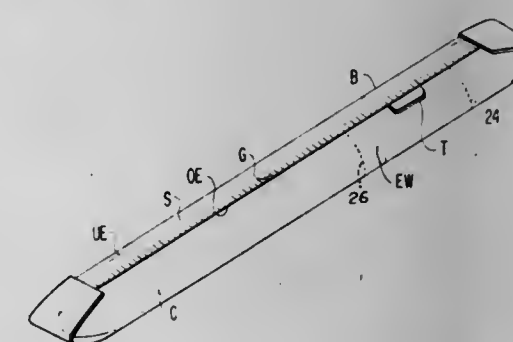
Eugene Roark, Waycross, Ga., assignor to Jno H. Swisher & Son, Inc., Jacksonville, Fla.

Filed July 29, 1976, Ser. No. 709,920

Int. Cl.² B65D 3/26

U.S. Cl. 206-274

7 Claims



1. A plastic wrapper for commodities said wrapper being formed of grainless plastic film having underlapping and overlapping edge portions and a heat seal joining said edge portions together along the length thereof so as to form a double-thickness seam, means for initiating a tear across the overlapping edge portion at one part of the length of the seam, and means spaced along the length of said seam for preventing blocking of the continuation of the tear across the other part of the length of the seam.

4,053,047

COMBINATION DISPLAY COVER, HANDLE, AND TILT STAND FOR PORTABLE INSTRUMENT

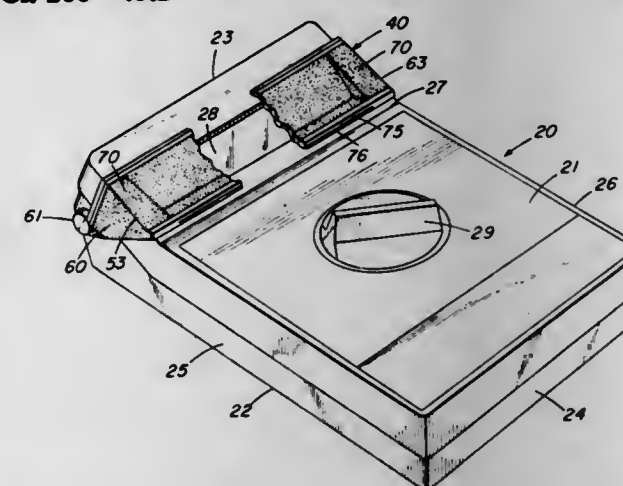
Joseph R. Andreaggi, Short Hills, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

Filed Apr. 9, 1976, Ser. No. 675,674

Int. Cl.² B65D 25/24, 85/38

U.S. Cl. 206-45.2

12 Claims



1. For use in conjunction with a portable instrument which includes a housing of generally parallelepiped configuration having relatively large area front and rear opposing surfaces

and relatively small area top, bottom and opposing side surfaces, said housing having a display window extending across said front surface relatively near the top edge thereof and substantially parallel to said top edge; a combination display window cover, handle, and tilt stand unit, comprising:

first and second generally triangular members, each pivotally mounted at about one of its corners on opposite side surfaces of said housing and relatively near the top surface of said housing; and a generally rectangular panel joining the edges of said triangular members which are opposite said one corners of said triangular members; said triangular members being proportioned such that when said unit is pivoted to its limit over said front surface, said panel overlays said display window and when said unit is pivoted to a position over said rear surface, one edge of said panel is spaced from said rear surface whereby said instrument can be seated on a working surface at a stable tilt position resting on its rear bottom edge and said one edge of the panel.

4,053,048

MATCHBOOKS

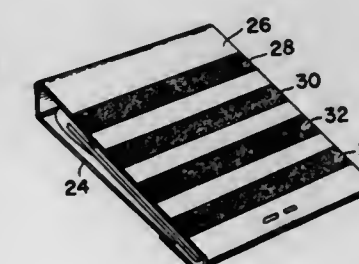
Charles C. Cohn, Colonial Alloys Company, 4041 Ridge Ave. - Bldg. No. 11, Philadelphia, Pa. 19129

Filed June 4, 1976, Ser. No. 692,854

Int. Cl.² A24F 27/00

U.S. Cl. 206-106

4 Claims



1. A matchbook comprising: a comb of matches having a base, a plurality of stems extending therefrom and a head on each of said stems; a cover having a first portion overlying said base, a first fold forming a first pocket receiving said base, a back portion extending from said first fold to the vicinity of the heads, a second fold forming a second pocket receiving said heads, and a flap portion extending from said second fold along the stems of said matches and into said first pocket between said first portion and said base; an elongated effective striking surface disposed on the exterior of said cover; and means for camouflaging said effective striking surface, thereby reducing the probability of the successful striking of a match on said surface by a young child; characterized by the fact that said effective striking surface is disposed on said back portion of the cover, and also by the fact that said means for camouflaging said effective striking surface comprises an additional elongated surface disposed on said first portion, said additional elongated surface having the appearance of said effective striking surface, but being ineffective to ignite said matches.

4,053,049

PACKAGING OF SEMICYLINDRICAL SLEEVE BEARINGS

Albert L. Beauvais, Birmingham, Mich., assignor to Federal-Mogul Corporation, Detroit, Mich.

Filed Feb. 19, 1976, Ser. No. 659,383

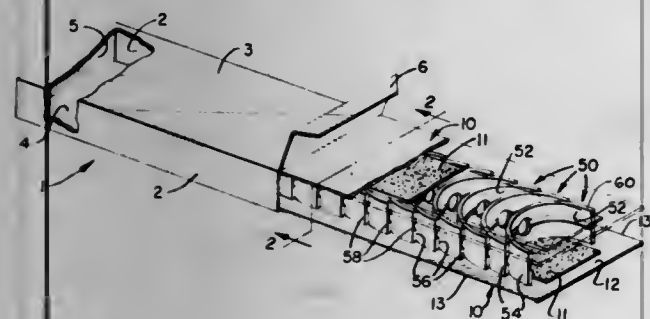
Int. Cl.² B65D 85/30

U.S. Cl. 206-318

6 Claims

1. A packaging arrangement comprising a plurality of uni-

formly shaped, partially cylindrical parts, each of said parts having a concave front wall and a convex back wall, and being arranged in a planar row in nested relationship such that the leading end portion of the front wall of each said part lightly contacts the back wall of an adjacent leading one of said parts without distorting either of said parts in contact with one another, each of said parts being of uniform height measuring from the top of said walls to the bottom of said walls throughout and being equal in height to each of said other parts, said plurality of parts as nested together forming the compressive member of a cantilever beam defined by the entire said row of parts,



non-stretchable adhesive means disposed on and adhering to the top of said walls and to the bottom of said walls of said parts and encompassing each of said end portions forming the area of contact between said parts and forming along the top and bottom of said walls an upper and a lower tensile member, respectively, of the aforementioned cantilever beam and thereby constituting a unitary package whereby each of said nested parts is absolutely without freedom of movement relative to each other when subjected to normal shipping handling.

4,053,050

DISPLAY PACKAGE

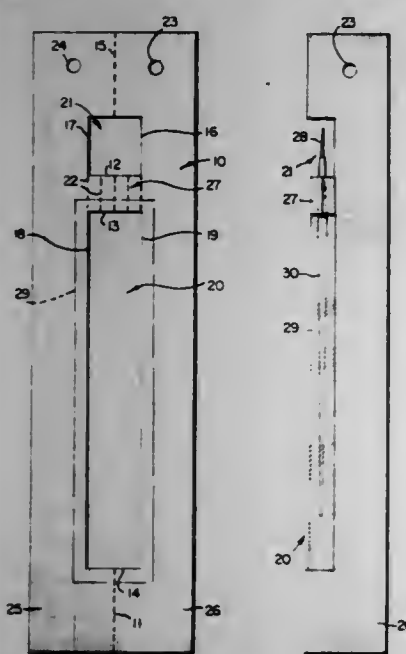
Hampton E. Forbes, Jr., Wilmington, and John M. Nock, New Castle, both of Del., assignors to Westvaco Corporation, New York, N.Y.

Filed Aug. 26, 1976, Ser. No. 718,073

Int. Cl.² B65D 75/04, 85/20

U.S. Cl. 206—361

8 Claims



1. A substantially flat display package for elongated products prepared from a one-piece blank of paperboard or the like and formed from a blank of material having a longitudinal dimension greater than its width dimension, said blank including a centrally located score line along its longitudinal dimension which bisects the blank into two equally sized portions and about which the two equally sized portions are folded into face-to-face contact to enclose a product, the improvement comprising a pair of spaced apart apertures wherein at least one of said apertures is covered with a piece of transparent film

material to form a window in said blank and an intermediate means formed from said blank material which separates the window from said remaining aperture for enclosing and retaining a portion of said product, said intermediate means comprising:

- a symmetrical panel formed by a first pair of cut lines in said blank, said cut lines being spaced apart along the longitudinal dimension of said blank to define the length of said panel;
- a plurality of secondary score lines in said panel along the longitudinal dimension of said blank wherein said secondary score lines include at least one pair which connect the ends of said first pair of cut lines and a plurality of additional score lines between said pair that are spaced from one another; and,
- a second pair of cut lines in said blank spaced outboard of said first pair of cut lines and which connect with the ends of said first pair of cut lines to define with said first cut lines the spaced apart window and remaining aperture in said blank said remaining aperture exposing a first part of a packaged product for physical examination by a consumer while the window exposes another part of the packaged product to the view of a consumer.

4,053,051

EARPLUG PACKAGE AND METHOD OF MAKING IT

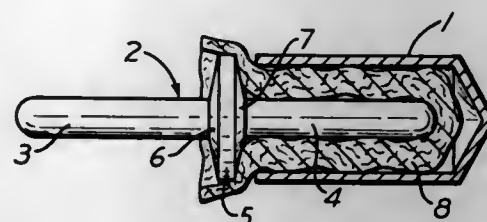
Carl H. Brinkhoff, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Sept. 10, 1976, Ser. No. 721,948

Int. Cl.² A61F 11/02

U.S. Cl. 206—438

8 Claims



1. An earplug package comprising a cylindrical container open at at least one end, an earplug inserter having a stem extending axially into said open end of the container and spaced from the side wall of the container, the inserter having an enlarged portion outside of the container forming a shoulder extending laterally away from said stem and spaced from said open end of the container, and a thin sound-attenuating mat of fibers enclosing said stem and disposed between it and the encircling side wall of the container with the free end of said stem pressed against the central portion of the mat, the marginal portion of said mat extending out of the container and flaring outwardly across said shoulder, the mat forming an earplug removable with said inserter from the container to permit insertion of the earplug in an ear by means of the inserter.

4,053,052

PACKAGED ADDITIVE CAP

Mark Friedel Jasper, Laguna Hills, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 9, 1977, Ser. No. 766,859

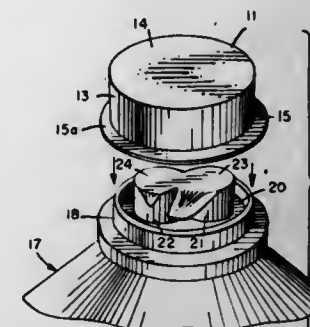
Int. Cl.² B65D 85/70

U.S. Cl. 206—439

7 Claims

1. An additive cap package consisting essentially of a cap having a continuous side wall, a top wall, and a perimeter flange projecting outwardly and continuously about the lower

extremity of said side wall; said cap having sterile interior surfaces; and a backing sheet removably secured to the under-



surface of said flange to seal the interior of said cap and to maintain said interior surfaces in sterile condition.

4,053,053

VENIPUNCTURE AID DEVICE

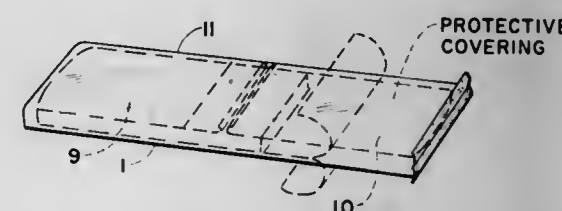
Fidel G. Tumangday, Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 26, 1976, Ser. No. 680,282

Int. Cl.² B65D 85/00; A61F 15/00

U.S. Cl. 206—441

1 Claim



1. A venipuncture aid device, comprising a bandage strip having a central area and two side areas each on a corresponding side of the central area and each having pressure adhesive thereon, said bandage strip having a cotton pad affixed to the central area and extending beyond the plane of the bandage strip; a pair of strips of protective material each removably affixed to a corresponding one of the adhesive covered sides and extending over half the cotton pad; an alcohol swab on one of the strips of protective material; a cotton pad on the other of the strips of protective material; and additional protective material releasably antiseptically enclosing the bandage strip, alcohol swab and cotton pad.

4,053,054

PACKAGE HAVING INDIVIDUAL ISOLATED CELLS

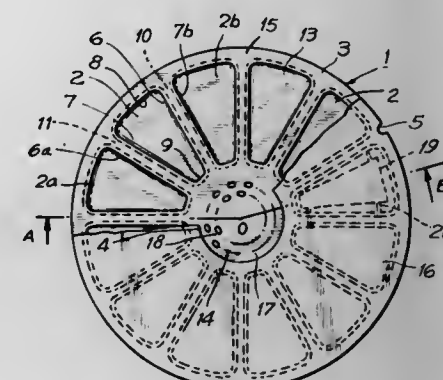
Bernard Lucas, Rouen, France, assignor to Padeg A.G., Moehlin, Switzerland

Filed Oct. 7, 1975, Ser. No. 620,498

Int. Cl.² B65D 85/56

U.S. Cl. 206—534

9 Claims



1. A package comprising a single piece of material constituting a plurality of distinct cells and a support to which the cells are connected in a manner disposed around a common center, each cell comprising a bottom wall and side walls and having

an opening opposite the bottom wall, the openings of the cells lying in a common plane, all the cells being integrally connected one to the other by said support which is common to all cells and is situated in the plane of the openings, the cells and support constituting a substantially cylindrical body having a central axis with the cells disposed around said axis and extending radially and axially thereof and with an internal zone and a peripheral zone defined on said support, a ring shaped cover fixed on said cells for sealing same, said support having at least one first reference mark capable of determining the disposition of the cells in a determined order in one or more sequences as well as at least one second mark capable of determining the position of the cells with respect to a fixed point, at least one cell comprising at least two compartments, said compartments being constituted by the cell itself on the one hand and at least one sealed chamber placed in said one cell on the other hand, said sealed chamber within said cell containing a sealed product for subsequent utilization.

4,053,055

DISPENSING PACKAGE

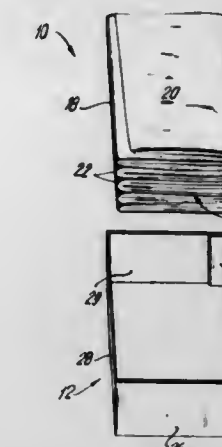
Edward Albert Tarbox, Naperville, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 4, 1977, Ser. No. 756,682

Int. Cl.² B65D 31/00, 85/54

U.S. Cl. 206—554

12 Claims



1. A package comprising in combination: an array of flat articles arranged in a stack having four vertical faces and two horizontal faces; a substantially rectangular support frame surrounding said four vertical faces; and a plastic film enclosure surrounding said frame and said array of articles in a substantially flush relationship, and having a seam lying along at least one of the vertical corners lying between two adjacent vertical faces.

4,053,056

CIGARETTE PACKAGE INSPECTION APPARATUS

John Herbert Day, Middlethian, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed July 19, 1976, Ser. No. 706,428

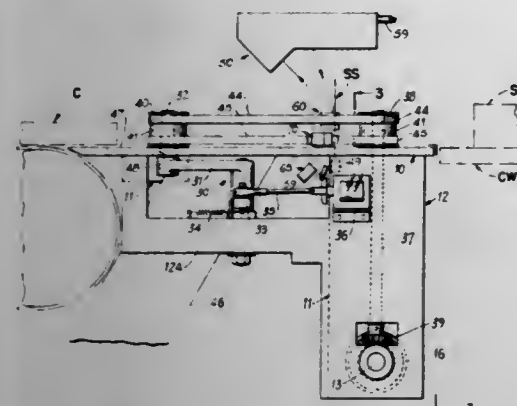
Int. Cl.² B07C 5/342

U.S. Cl. 209—73

10 Claims

1. Cigarette pack inspection and conveying apparatus comprising endless belt conveyor means having pack receiving and delivering ends; an inspection station and a rejection station disposed in series between said receiving and delivering ends; said conveyor means engaging the top and bottom ends of cigarette packs and conveying such packs from said receiving end through said inspection station and past said rejection station to said delivering end; electro-optical scanning means synchronized with incremental pack movement selectively scanning at least a portion

of each pack conveyed through said inspection station and providing signals representing detected pack condition; logic and signal processing means with a programmable memory connected to said scanning means for receiving therefrom and providing a reject signal when the signals from said scanning means represent a defective package condition; and



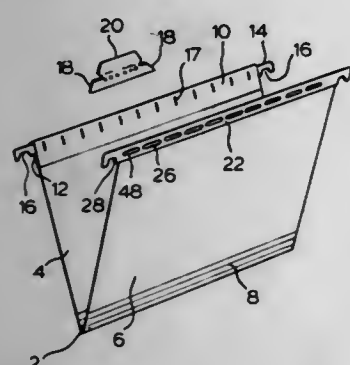
reject means connected to said logic and signal processing means for receiving reject signals, and to said conveyor means and causing said conveyor means to release a detected defective pack at said rejection station when a reject signal is received.

4,053,057 SUSPENDED FILING FOLDERS

Wesley Raymond Snowden, Irlington, Canada, assignor to Oxford Penderflex Canada Limited, Toronto, Canada
Filed May 4, 1976, Ser. No. 682,976
Int. Cl.² A47B 63/00

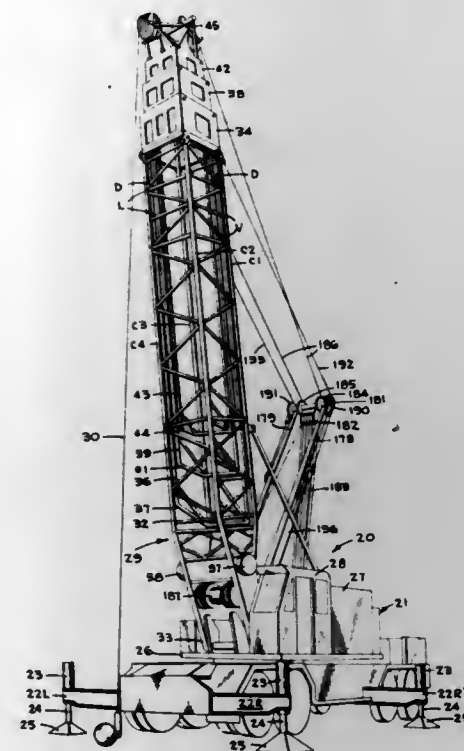
U.S. Cl. 211-126

3 Claims



1. A suspended filing folder comprising a sheet of flexible material folded along a medial line to form opposed walls joined at their lower edges, and first and second suspension bars secured to the upper edges of the walls and having projecting end portions extending beyond the ends of the walls, the end portions being formed with notches to engage rails in a file, the first suspension bar being bonded within a tubular channel formed by the upper edge portion of one of said walls folded upon and secured to itself to form with said bar a first laminar structure, said structure adapted for engagement with tabs sprung into engagement with said laminar structure, and a folded over upper edge portion of the other of said walls enclosing and bonded to a second suspension bar to form a second laminar structure, all the layers of at least one of said laminar structures being embossed with a longitudinal row of indentations extending longitudinally with respect to the suspension bar and forming detents adapted for engagement with tabs sprung into engagement with said laminar structure.

4,053,058
SUSPENDED EXTENSIBLE BOOM
Lyle B. Jensen, and C. Wayne Powers, both of Cedar Rapids, Iowa, assignors to FMC Corporation, San Jose, Calif.
Filed May 27, 1976, Ser. No. 691,045
Int. Cl.² B66C 23/00
U.S. Cl. 212-8 R
10 Claims



1. In a crane or the like, the combination comprising an extensible boom having at least two sections that include a fixed base section and a movable tip section, means for extending the tip section relative to the base section, means for pinning said boom sections together to resist bending transversely of the longitudinal axis of the boom in a generally vertical plane and to resist compression axially of the boom, a boom pendant connected to the distal end of the tip section, means for maintaining slack in the boom pendant while the tip section is being extended, means for tensioning the boom pendant to support the distal end of the boom when the boom sections are pinned together for supporting loads with the boom, said boom pendant slack maintaining means including a pendant storage drum about which a portion of the boom pendant is wrapped and a hydraulic motor that pays out the boom pendant only in response to a given pressure, said pendant storage drum being located at the proximate end of the base section, and a live mast assembly being connected to the proximate end of the base section for pivotal movement upwardly of the boom about a horizontal axis, said live mast assembly supporting the boom pendant between the distal end of the tip section and the pendant storage drum.

4,053,059 PORTABLE OVERHEAD CRANE AND METHOD OF INSTALLING IT

Winfield M. Haas; Howard E. Nichols, and James L. Pack, all of Owensboro, Ky., assignors to Southwire Company, Carrollton, Ga. and National Steel Corporation, Pittsburgh, Pa.
Division of Ser. No. 559,484, March 18, 1975, Pat. No. 3,973,679. This application Feb. 23, 1976, Ser. No. 660,755
Int. Cl.² B66C 17/06, 19/02

U.S. Cl. 212-18

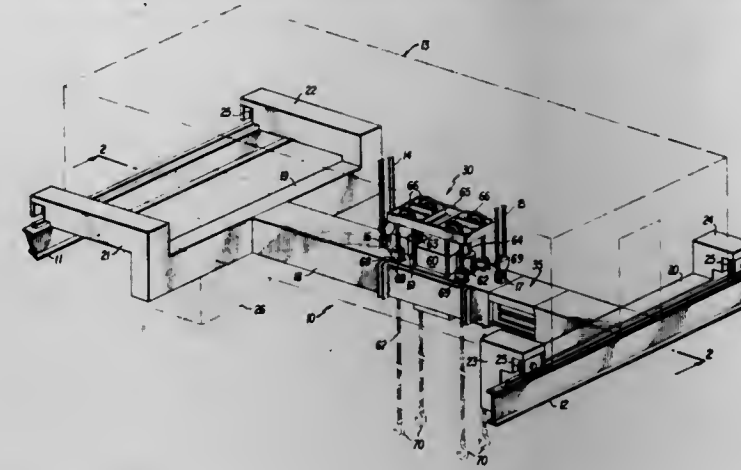
9 Claims

1. A portable lifting beam for being transported to a worksite and lifted by an existing bridge crane to an operative position spanning two parallel rails, said portable lifting beam that support a movable lifting means and including a horizontally extending main beam having means at the ends thereof carrying wheels for rollingly supporting said portable lifting beam on said rails, said main beam including a telescoping section, means for controllably retracting said telescoping section to reduce the longitudinal extent of said main beam to a dimension less than the distance between said parallel rails whereby said portable lifting beam may be raised and lowered between said rails while being disposed perpendicular thereto, means for controllably extending said telescoping section from its retracted position to increase the longitudinal extent of said main beam to a dimension equivalent to the distance between said parallel rails for positioning said wheels thereon, and means for locking said telescoping section in its fully extended position.

sion less than the distance between said parallel rails whereby said portable lifting beam may be raised and lowered between said rails while being disposed perpendicular thereto, means for controllably extending said telescoping section from its retracted position to increase the longitudinal extent of said main beam to a dimension equivalent to the distance between said parallel rails for positioning said wheels thereon, and means for locking said telescoping section in its fully extended position.

8. A method of operatively positioning a longitudinally extensible portable lifting beam in overhead relation to a load, comprising the steps of:

a. disposing the portable lifting beam beneath an overhead



bridge crane carried by overhead parallel rails with the portable lifting beam aligned transverse to the rails and longitudinally extending a distance less than the distance between said rails;

b. lifting the portable lifting beam with the bridge crane to a position above the rails;
c. extending the portable lifting beam longitudinally to position the extremities thereof over the rails;
d. locking said portable lifting beam in an extended position;
e. lowering the portable lifting beam onto the rails such that it is supported both by the rails and by the bridge crane; and
f. moving both the bridge crane and the portable lifting beam as a unit along the rails to a position above a load.

4,053,060 CRANE

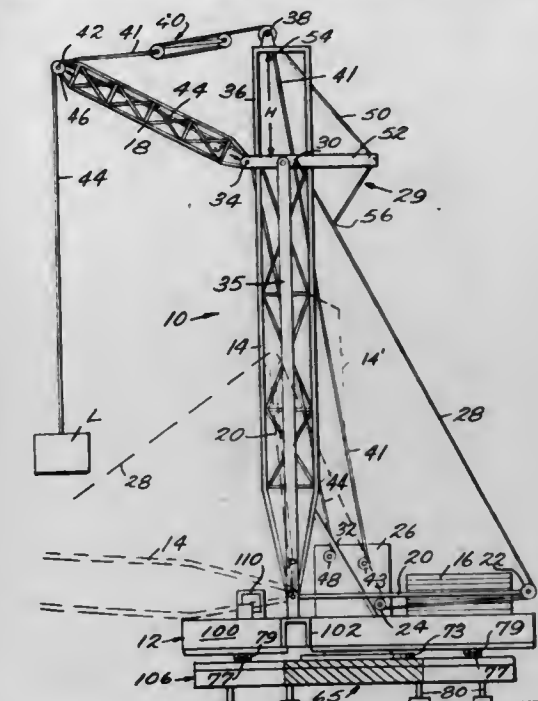
Virgil D. Wilson, 8720 Selger Drive, Springfield, Va. 22153
Filed Feb. 13, 1976, Ser. No. 658,043
Int. Cl.² B66C 23/36

U.S. Cl. 212-48

28 Claims

1. A mobile rotary crane comprising
a. a mobile vehicular support,
b. a crane base,
c. means for rotating said crane base with respect to said vehicular support with said vehicular support in a stationary position,
d. a main boom pivotally mounted with respect to said crane base for pivotal movement in a vertical plane about a first horizontal axis from a generally horizontal position to a generally vertical position, said main boom having a free end,
e. means for mounting counterweight on said base on one side of said main boom, said main boom extending away from said counterweight when in said generally horizontal position thereof,
f. a jib boom pivotally mounted to said main boom at a portion thereof near the free end thereof for rotation about a second horizontal axis and located on the load side of said main boom, opposite the counterweight side thereof, said jib boom having a free end,

g. a tower extending from said main boom free end and providing a substantial continuation of said main boom,
h. a first cable connected to the free end of said jib boom, extending over said tower, and to a drive assembly on said crane base, said drive assembly for letting out and pulling in said cable to pivot said jib boom with respect to said tower and said main boom,
i. a lever arm pivotally mounted to said crane base for pivotal movement in a vertical plane about said first axis, said lever arm extending generally perpendicularly to said



main boom toward the counterweight side, and operatively attached to said main boom, and having a free end with a pulley attached thereto, and
j. a second cable extending from a portion of said main boom adjacent the free end thereof around said pulley and to a drive assembly, said drive assembly for letting out and pulling in said second cable to pivot said main boom and said lever arm about said first axis to any position between said generally horizontal and generally vertical position of said main boom.

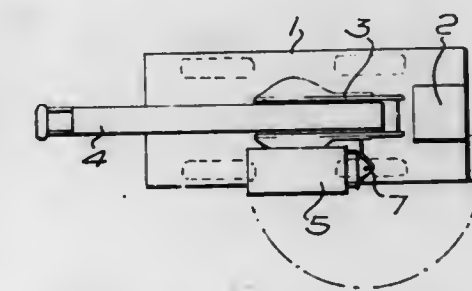
4,053,061 MOBILE CRANE

Robert James Lester, Cleaton near Sunderland, England, assignor to Coles Cranes Limited, Sunderland, England
Filed Oct. 2, 1975, Ser. No. 618,859
Claims priority, application United Kingdom, Oct. 5, 1974, 43296/74

U.S. Cl. 212-58 R

Int. Cl.² B62D 27/00

1 Claim



1. A mobile crane comprising a wheel supported vehicle chassis having a front end and a rear end, an engine compartment mounted on said chassis at said front end, a boom support structure, pivot means for mounting said boom support structure on said chassis for rotation about a vertical axis located on the longitudinal axis at the mid section of said chassis, an extensible boom having a first end and a second end with a load hoist mechanism mounted at said second end, pivot means mounting said first end to said boom support structure for movement

about a horizontal axis, means extending between said extensible boom and said boom support structure for pivoting said extensible boom about said horizontal axis, an operator's control cab, vertical pivot means mounting said control cab at one end thereof to said boom support structure at one side of the latter such that said control cab is pivotable about said vertical pivot means from a craning position in which said control cab is disposed parallel to said extensible boom and facing said load hoist mechanism to a mobile crane travel position in which said control cab is located adjacent said engine compartment and faces in a direction that is 180° from said craning position and access means on said control cab so as to provide entry thereto from a single side of the vehicle when said control cab is in either said craning or travel position.

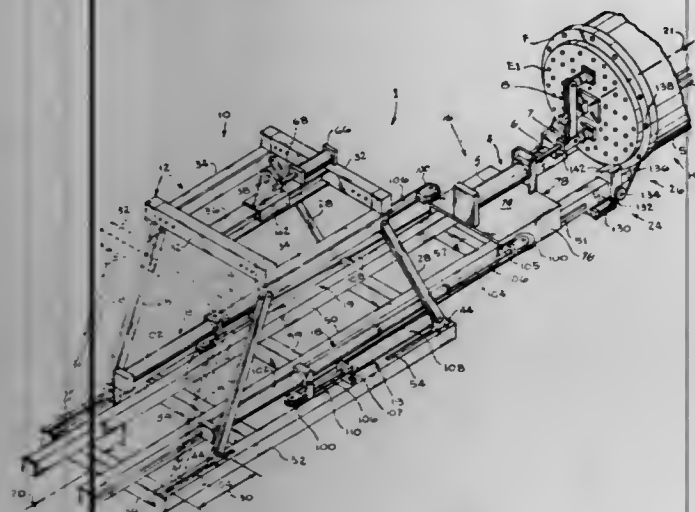
4,053,062

TUBE BUNDLE EXTRACTOR FOR USE WITH HEAT EXCHANGERS

Bobby J. Travis, 345 Mayhaw St., Vidor, Tex. 77662
Filed Sept. 26, 1975, Ser. No. 617,076
Int. Cl.² B66F 1/00

U.S. Cl. 214-1 P

9 Claims



8. In a tube bundle extractor of the type having an elongated framework adapted to be suspended from a crane hook and to be secured at one end to the shell of a heat exchanger containing a bundle of tubes attached to an end sheet, the framework supporting a pair of rails adapted to be horizontally and vertically aligned with the heat exchanger to receive the tube bundle, and a car movable along said rails and parallel thereto, said car being adapted for connection to said end sheet, the improvement comprising a number of oppositely acting, parallel linear hydraulic actuators each having its cylinder secured to the framework and its piston extensible parallel to said rails, said linear hydraulic actuators simultaneously acting on the car through sheave and cable means to cause motion of the car.

4,053,063

APPARATUS FOR HANDLING PIPE AT WELL SITE

Roland George Harper, Jr., Lafayette, La., assignor to Weatherford/Lamb, Inc., Houston, Tex.
Filed Apr. 19, 1976, Ser. No. 677,956
Int. Cl.² E21B 19/00

U.S. Cl. 214-2.5

5 Claims



1. Apparatus for transporting an elongate member between an elevated area and a lower area comprising,

- a. dual side-by-side support cables forming an inclined track extending between the elevated area and the lower area,
- b. a lowermost bucket movable along the track (a) for holding and supporting the lower end of the elongate member, said bucket including,
 - i. a frame having a concave topside cross-sectional configuration and a stop plate at the rear for abutting the end of the elongate member, and
 - ii. support sheaves mounted on the frame (i) to movably support said frame on the track (a),
- c. cable means for controlling the movement of the lowermost bucket (b) along the track (a),
- d. a series of a plurality of interconnected buckets movable along the track (a) from an adjacent relationship into a spaced relationship for supporting the remainder of the elongate member as it is being transported between the elevated area and the lower area, each said bucket including,
 - i. a frame having a concave topside cross-sectional configuration,
 - ii. support sheaves mounted on the frame (i) to movably support said frame on the track (a), and
 - iii. a roller disposed centrally of the frame (i) and transverse to the track (a) to permit the elongate member to freely slide over the frame, and
- e. drawworks means for slackening the dual cables of the track (a).

4,053,064

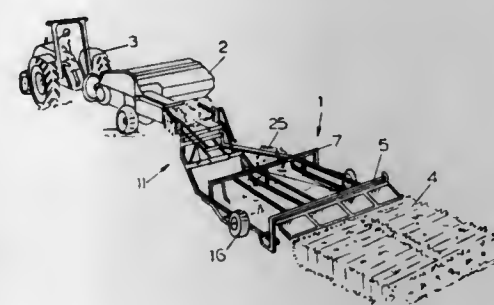
HAY BALE COLLECTOR

Garth David Stewart, Nightingale St., Wyndham, New Zealand
Filed June 3, 1976, Ser. No. 692,426
Claims priority, application New Zealand, June 4, 1975, 177703

Int. Cl.² A01D 87/12; B65G 57/32

U.S. Cl. 214-6 B

6 Claims



1. A hay bale collector comprising a bale confining frame, ground support means to support said frame for movement over the ground, towing means to allow the frame to be towed over the ground, a rear frame and release gate across the rear of said bale confining frame, a central division in combination with said bale confining frame, defining two adjacent open front bale holding compartments, bale diverting means projecting from the forward end of said central division to divert bales coming into engagement therewith alternatively into one compartment and then the other compartment until both compartments are full, a compression bar longitudinally located in each bale holding compartment to exert a downward force on said bale, said compression bar being centrally located with an upwardly directed forward end and a rearward end adjacent the back of the bale compartment guidable to be lifted against the action of a biasing means to exert a downward pressure on top of the bales in said compartment and opening means to open said release gate, releasing together in a group the bales from the filled compartments.

4,053,065

SEQUENCER

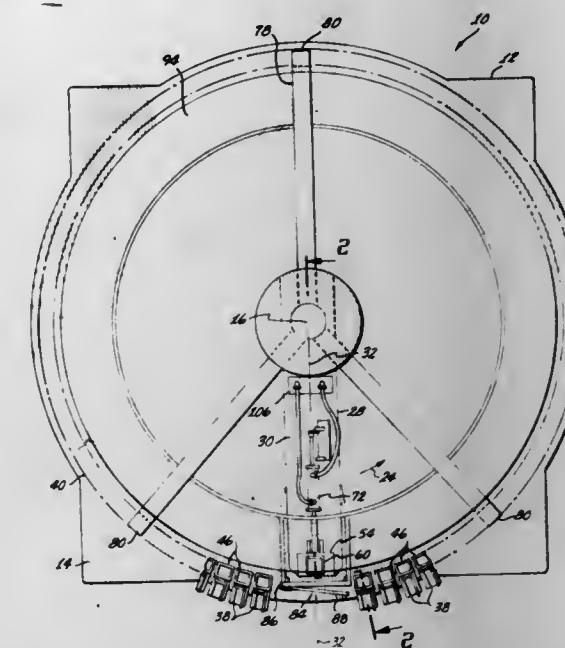
John Lawrence Kowalski, Phoenix, and Kenneth Boyd Tippetts, Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Aug. 9, 1976, Ser. No. 712,563

Int. Cl.² B65G 57/30

U.S. Cl. 214-6 M

18 Claims



1. A sequencer for assembling in a transferee magazine a plurality of objects of substantially the same size and shape from a plurality of transferor magazines; said sequencer comprising:

- a support member,
- a plurality of transferor bases mounted on said support member, each of said transferor bases adapted to removably hold a transferor magazine;
- a plurality of transferor magazines adapted to hold a plurality of said objects, one transferor magazine being mounted on each transferor base;
- positioning means mounted on said support member;
- a transferee base mounted on said positioning means, said transferee base adapted to removably hold a transferee magazine;
- a transferee magazine mounted on said transferee base;
- means mounted on said positioning means for transferring an object from a transferor magazine mounted on a transferor base to the transferee magazine mounted on the transferee base when the transferee magazine is positioned by the positioning means in object transfer relationship with a transferor magazine; and
- control means for causing said positioning means to sequentially place the transferee magazine in object transfer relationship with predetermined ones of said transferor magazines and to cause the means for transferring an object, to transfer into the transferee magazine a predetermined number of objects from said predetermined transferor magazines.

4,053,066

ARTICLE STACKING AND LOADING APPARATUS

Joseph A. Lynch, Westwood, N.J., assignor to Nabisco, Inc., East Hanover, N.J.

Filed Dec. 3, 1976, Ser. No. 747,240

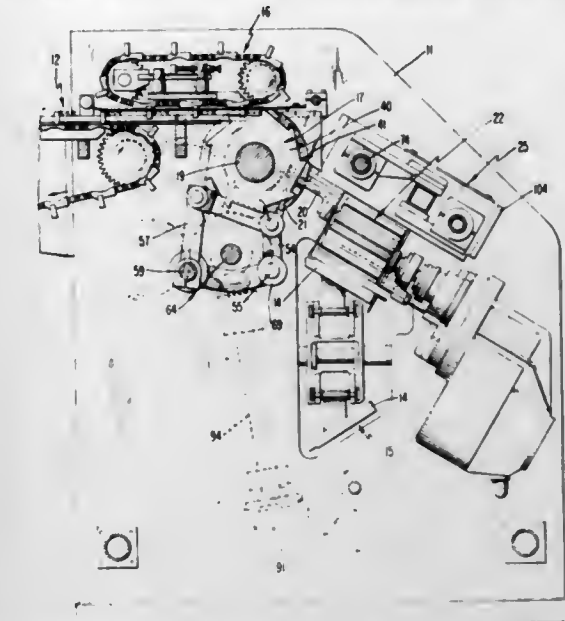
Int. Cl.² B65G 57/00

U.S. Cl. 214-7

8 Claims

1. Article stacking and loading apparatus comprising a pair of inclined rails, a wheel device for placing flat articles on edge on said rails, said wheel device having elements spaced around the periphery thereof for carrying flat articles oriented generally perpendicular to radii of the wheel device, nozzle means for directing a jet of air generally parallel to said rails against each article as that article is transferred from the wheel to the

rails, air nozzle means provided along said rails for sliding the articles along the rails and maintaining them in an upright condition, a turret rotatable about an axis parallel to said rail means having a plurality of recesses for receiving columns of articles, a finger mounted for movement along said rails to said



turret for engaging the first article in a column being formed to support the column, and conveyor means adjacent said turret having projecting members equally spaced at a distance comparable to the length of the turret for supporting each column and moving the columns into the turret recesses.

4,053,067

FUEL TRANSFER SYSTEM FOR A NUCLEAR REACTOR

Leonard R. Katz; James R. Marshall, both of Pittsburgh, and Walter E. Desmarchais, Monroeville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

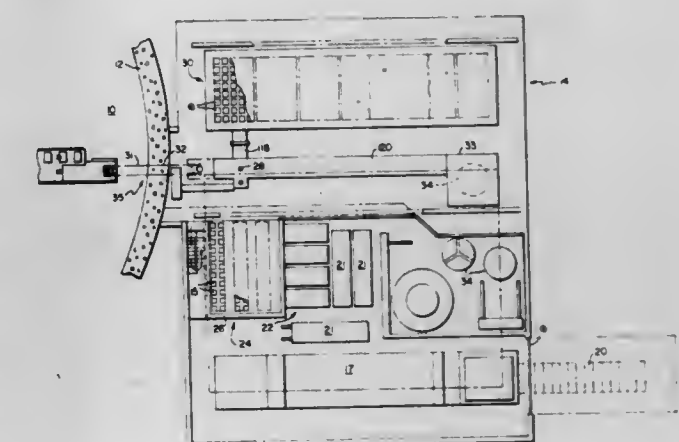
Filed June 25, 1973, Ser. No. 373,344

Disclosure was also published under second Trial Voluntary Potest Program on Feb. 3, 1976

Int. Cl.² F23K 3/00

U.S. Cl. 214-18 N

5 Claims



1. A system for transferring fuel assemblies between a fuel handling building and a nuclear reactor wherein the fuel handling building includes new and spent fuel pits and an operating deck on the top surface of walls forming said pits, a reactor containment area separated from said building by a containment wall, and a canal adapted to be filled with water extending from said pits to the reactor containment area to permit submerged movement of the fuel assemblies between the building and the nuclear reactor comprising:

- said canal being arranged to extend through said wall and a valve mounted therein for selectively establishing communication between said building and containment area;
- a base supporting rails which extend from the building through the canal into the containment area;
- a car on said rails and means connected with the car for

providing car linear movement between the fuel handling building and containment area;
 a fuel assembly handling container rotatably mounted at its midpoint on said car;
 first and second power actuating means respectively mounted on the base in the fuel handling building and the containment area, each of said actuating means including a reciprocable arm associated with the container for rotating it between vertical and horizontal positions;
 thereby permitting loading and unloading of a fuel assembly therein and facilitating movement of the car through the canal;
 car position indicating means for determining the position of said car in the fuel building and in said containment area, said position indicating means including car position indicators on said operating deck connected with switches mounted on said base and at locations where said car is to be stopped at its extreme ends of travel; and
 an actuator on said car which cooperates with said switches connected to said car position indicators to thereby show on the operating deck the position of said car; said car position indicating means further includes actuators on said container and switches on said base adapted by said actuators to show the vertical and horizontal orientation of said container.

4,053,068

APPARATUS FOR TRANSFERRING HOT COKE INTO A COKE QUENCHING CAR

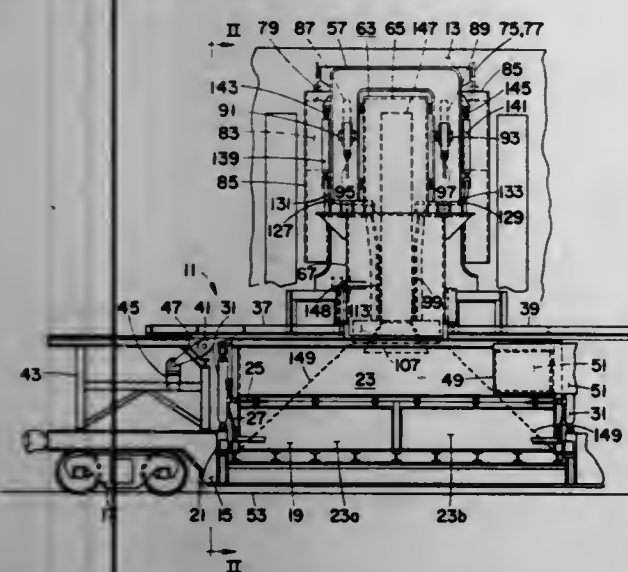
Ward Francis Gidick, West Newton, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 30, 1976, Ser. No. 718,595

Int. Cl.² C10B 39/14

U.S. Cl. 214—18 R

9 Claims



1. Apparatus for transferring coke pushed from a coke oven chamber into a receptacle alongside said chamber, wherein the improvement comprises:

- a guide extension means which linearly directs said coke into the center of said receptacle as said coke is pushed through said guide extension means;
- pivotal means by which said guide extension means is pivoted vertically upwards and downwards in relation to said coke oven chamber;
- plow means, fixed to said guide extension means, which spreads said coke within said receptacle when said guide extension means is pivoted vertically upwards; and
- gravitation means cooperating with the vertical pivotation of said guide extension means, which allows residual coke remaining in said guide extension means to be deposited into said receptacle as said guide extension means is pivoted vertically upwards.

4,053,069

APPARATUS FOR LIFTING LARGE BALES OF MATERIAL

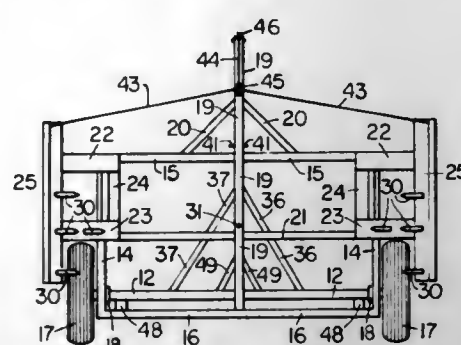
Phillip Wynell Love, P.O. Box 323, Smithville, Tenn. 37166

Filed May 24, 1976, Ser. No. 688,973

Int. Cl.² B60P 1/28

U.S. Cl. 214—147 G

12 Claims



1. Apparatus for picking up and moving a large bale of material, such as a bale of hay, comprising, a mobile chassis mounted on at least one set of wheels; a generally vertically extending tilt frame extending transversely across the chassis at an end thereof and being mounted at one end to the end of the chassis for pivotal movement about an essentially horizontal axis extending transversely of the chassis, so that the tilt frame can be tilted from a position extending essentially vertically upward from the end of the chassis to a position in which the tilt frame leans forward towards the front of the chassis; a pair of rearwardly extending bale clamping members pivotally attached intermediate the tilt frame in mutually spaced relationship and swingable toward and away from each other; means for tilting the tilt frame forward towards the front of the chassis and for swinging the bale clamping members toward each other to clamp a bale, said means for tilting the tilt frame and for swinging the bale clamping members comprising an elongate, flexible member having its ends connected to the free ends of the rearwardly extending bale clamping members a second, elongate, flexible member having one end thereof attached to the first flexible member at a point intermediate its length, said second flexible member passing over means secured to the top of the tilt frame and being connected to winch means at the front of the chassis for pulling said second, flexible member towards the front of the chassis.

4,053,070

RETRIEVING VEHICLE

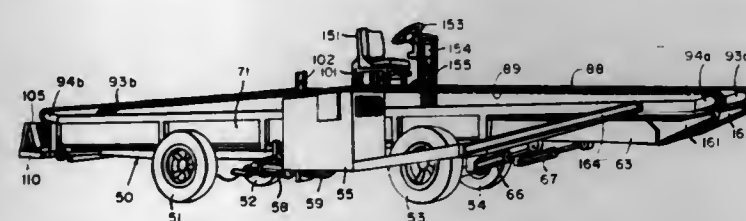
Tunis Junior Rozeboom, 10329 Springwood Drive, Holland, Mich. 49423

Filed Dec. 3, 1975, Ser. No. 637,151

Int. Cl.² B60P 1/28

U.S. Cl. 214—505

8 Claims



1. A retrieving and collecting vehicle having a frame and means forming a load-receiving surface mounted on said frame, wherein the improvement comprises:

- integral U-shaped means having the opposite ends thereof mounted for movement with respect to said frame along a path substantially parallel to said load-receiving surface, said bail ends also being pivotally mounted on a horizontal axis transverse to said path;
- positioning means operative to locate the central transverse portion of said bail in spaced relationship above said load-receiving surface, said means forming a load-receiving

surface having a loading end portion at least disposable adjacent ground level; and
 drive means operable to induce movement of said bail along said path.

4,053,071

METHOD AND APPARATUS FOR TRANSPORTING AND PROCESSING MULTIPLE ROUND BALES

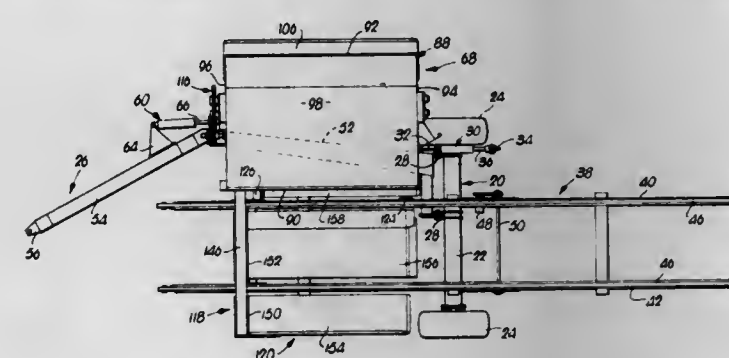
Thomas Gene Schrag; Merle Keith Burkhardt, both of Newton, and Arnold Elmer Goertz, Buhler, all of Kans., assignors to Heaton Corporation, Heaton, Kans.

Filed Apr. 7, 1976, Ser. No. 674,496

Int. Cl.² A01D 90/00; B60P 1/36

U.S. Cl. 214—506

37 Claims



1. In a machine for transporting and disintegrating a body of crop material while on the move:

- a mobile bed for carrying the body off the ground during transport;
- crop disintegrating structure for said body; and apparatus for transferring the body laterally from a wholly intact position on the bed to a wholly disintegrated position outboard of the normal path of travel of the bed, all of said structure being disposed outboard of said path of travel of the bed and in disposition to receive the body from said transfer apparatus, said structure having an outlet for discharging the disintegrated crop material in a stream laterally outboard of the bed.

30. In a method of handling a body of crop material, the steps of:

- loading a body onto a mobile bed;
- transporting the body on said bed as the latter advances along a path of travel;
- transferring the body laterally as advancement of the bed continues;
- maintaining the body wholly intact prior to said lateral transfer;
- progressively disintegrating the body at a position laterally outboard of the bed as said transfer is effected; and
- dropping the disintegrated material from said outboard position in a continuous stream as the bed continues to advance along said path of travel.

4,053,072

CONTAINER TRANSPORT SYSTEM AND APPARATUS

Douglas Ross, 3043 122 Pl. NE., Bellevue, Wash. 98005, and Keith Blackburn, 1316 Florence St., Enumclaw, Wash. 98022

Filed Jan. 21, 1977, Ser. No. 765,341

Int. Cl.² B60P 1/64

U.S. Cl. 214—512

10 Claims



1. A container transport system comprising,

a pallet frame having corner ground support legs and a center longitudinal guide rail,
 a steerable transport vehicle having a rear pallet support frame narrower than the lateral spacing of said legs, guide means on the vehicle near the rear and lateral center of said pallet support frame adapted to register with said guide rail,
 primary wheels and caster wheels mounted on said vehicle near the rear of the pallet support frame,
 first level changing means on said vehicle for selectively raising and lowering the forward end of said pallet support frame relative to the ground level between a lowered pallet clearing position and a raised pallet engaging position; and
 second level changing means on said vehicle for selectively raising and lowering the primary wheels relative to the caster wheels and pallet support frame to responsively move the rear of the pallet support frame between a lowered pallet clearing position whereat only the caster wheels support the rear of the pallet support frame, and a raised pallet engaging position whereat only the primary wheels supports the rear of the pallet support frame, whereby when the pallet support frame is in lowered pallet clearing position, the vehicle can be backed to register the guide means with the guide rail and thereby guide the rear of the pallet support frame beneath the pallet frame as the vehicle is backed further to locate the pallet support frame beneath the length of the pallet frame, and whereby the pallet support frame can then be raised into pallet engaging position to lift the pallet legs free of ground contact so that the pallet frame with its load can be transported by the vehicle.

4,053,073

LEVEL LIFTING SYSTEM FOR TRUCK BODIES OR CONTAINERS

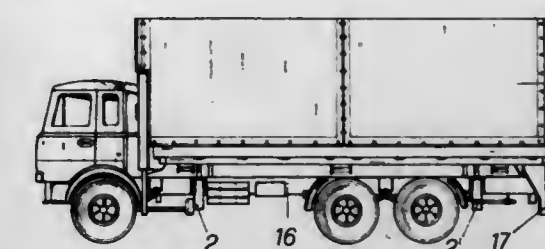
Franco Franchia, Treviso, Italy, assignor to Officine Franchia di Giuliano Franchia & C. S.p.A., Italy

Filed Dec. 15, 1975, Ser. No. 640,977

Int. Cl.² B60P 1/54

U.S. Cl. 214—515

4 Claims



1. A lifting system for truck bodies and the like comprising four double-acting cylinder-piston units arranged in a rectangular array, each cylinder-piston unit in said array having an upper and a lower chamber on opposite sides of the piston of such unit, conduit means serially connecting the lower chambers of one pair of units in the array with the upper chambers of the pair of units which are diagonally opposite in said array, conduit means connected with the upper chambers of said one pair of units and feeding pressurized fluid to said upper chambers in parallel, return conduit means connected with the lower chambers of the second-named pair of units in said rectangular array and returning fluid from said lower chambers in parallel to a source of fluid, a fluid pumping means connected with said source of fluid, and a fluid distributor connected with the pumping means and with the second-named and return conduit means, said double-acting cylinder-piston units having extensible and retractable members which are ground-engagable, and said cylinder-piston units being adapted for attachment to a container body.

4,053,074

DEVICE FOR HANDLING A VEHICLE-CARRIED CONTAINER

Pierre Lemaire, 5 Avenue des Freres Vaux le Penil, 77000 Melan, France

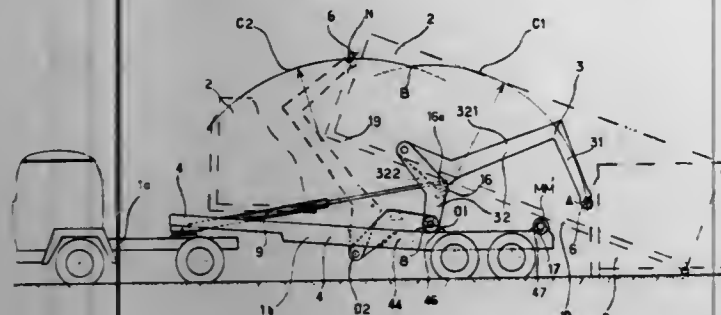
Filed Oct. 14, 1975, Ser. No. 621,748

Claims priority, application France, Oct. 15, 1974, 74.34553; Feb. 18, 1975, 75.05017

Int. Cl.² B60P 1/64

U.S. Cl. 214-515

4 Claims



1. A device mounted on a generally horizontal supporting structure of a vehicle for loading and unloading a container on and off said vehicle, said device comprising:

- a transverse horizontal shaft mounted on said structure substantially intermediate the length of the vehicle and perpendicular to the longitudinal axis of the vehicle;
- a lifting bracket having a rigid upper arm and an articulated lower arm secured thereto, the free end of said upper arm having prehension means for engaging a forward end of a container, said lower arm comprising (i) a rigid unitary upper member having a major portion perpendicular to said upper arm, one end of said upper member adjacent said major portion being rigidly affixed to the other end of said upper arm, and (ii) a lower member having first and second portions angled with respect to each other, a first end adjacent said first portion and pivotally connected to the other end of said upper member adjacent a minor portion of said member, said major and minor portions of said upper member being angled with respect to each other, said lower member having a second end adjacent said second portion thereof and connected to said shaft for pivotal movement of said lower member with respect to said supporting structure,
- said bracket being situated in the median plane of said vehicle, and having a rest position and an extended position with respect to said structure;
- at least one control jack connected between said supporting structure and a point on said upper member adjacent the boundary between said major and minor portions thereof, for moving said bracket between said rest and extended positions,

said bracket being disposed in said rest position with said major portion of said upper member and said second portion of said lower member substantially horizontal, and said minor portion of said upper member and said first portion of said lower member angled downward; and said second portion of said lower member being substantially vertical in the extended position of said bracket.

4,053,075

HIGH LIFT MOUNTING MEANS FOR LOADER BUCKETS

Robert N. Steinhilber, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 30, 1976, Ser. No. 718,732

Int. Cl.² E02F 3/74

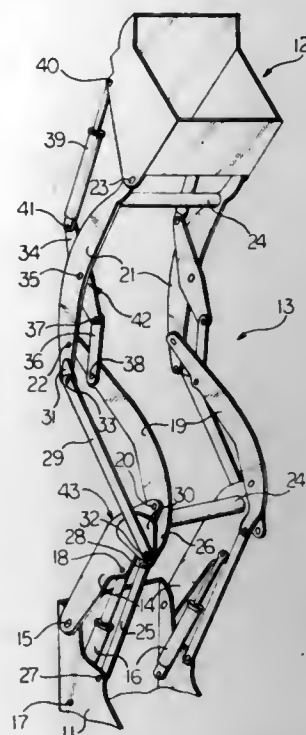
U.S. Cl. 214-770

9 Claims

1. A construction vehicle comprising a frame, a work tool, and mounting means mounting said work tool on said frame for

selectively moving said work tool substantially vertically between lowered and raised positions on said vehicle comprising

first lift arm means having a first end thereof pivotally mounted on said frame, extensible and retractable actuating means interconnected between said frame and said first lift arm means for selectively raising and lowering said first lift arm means, second lift arm means having a first end thereof pivotally connected to a second end of said first lift arm means, third lift arm means having a first end thereof pivotally connected to a second end of said second lift arm means



and having a second end thereof connected to said work tool, and

linkage means pivotally interconnected between said frame and said first, second and third lift arm means for expanding said mounting means from a collapsed condition on said vehicle in response to extension of said actuating means to raise said first lift arm means, said third lift arm means resting directly upon said first lift arm means when said mounting means is in its collapsed condition and wherein said linkage means begins separating said first and third lift arm means from each other when said first lift arm means is disposed approximately horizontally upon raising thereof by said actuating means.

4,053,076

COATINGS FOR SHATTERPROOFING GLASS BOTTLES

Richard W. Vogel, Vernon Hills; Nick N. Suci, IV, Lake Bluff; Milton A. Glaser, Glenview, and John A. Szewdo, Waukegan, all of Ill., assignors to The Dexter Corporation, Windsor Locks, Conn.

Filed June 3, 1976, Ser. No. 692,469

Int. Cl.² B65D 11/16; B32B 9/00

U.S. Cl. 215-12 R

28 Claims

1. A glass bottle coated with a multilayer covering protective film on its surface and characterized by preventing or retarding broken glass fragments of said bottle from scattering around when the bottle is broken, and further characterized by being capable of providing, if desired, the use of a bottle having a thinner glass wall, said bottle comprising:

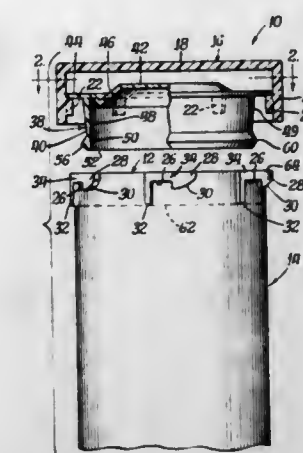
- a. a glass bottle;
- b. a base coating applied to and having good adhesion to the exterior of said bottle and characterized by being a soft elastic polyurethane polymer which is compatible with a top coating, said base coating comprising a polyurethane resin produced from a liquid aromatic diisocyanate and a polyol mixture, said polyol mixture having an average

hydroxy functionality between 2 and 3 with an average molecular weight between about 300 and 1000, said polyurethane having an NCO:OH ratio of not less than about 1.1:1.0 and up to 4% by weight of an organo-functional trialkoxy silane based on the weight of said polyurethane; and

- c. a top coating applied to said bottle over said base coat and characterized by being a hard tough polyurethane polymer which is compatible with said base coating, substantially abrasion resistant and resistant to washing, said top coating comprising a polyurethane resin produced from a liquid aromatic polyisocyanate and a polyol, said polyol being approximately trihydroxy-functional and having a molecular weight between about 300 and 800, the amount of isocyanate and polyol being regulated to give an NCO:OH ratio of at least about 1.1:1.0;

the multi-layer covering protective film provided by (b) and (c) providing a coated glass bottle having a composite coating characterized by preventing or retarding broken glass fragments of said bottle from scattering around when the bottle is broken, and further characterized by being capable of providing, if desired, the use of a bottle having a thinner glass wall.

container, said locking members defining locking lug and locking recess interconnection between the container and closure, biasing means within said encircling skirt wall for engaging said container and for being compressed and flexed to bias the locking members on said closure into locking relationship with the locking members on the container until said closure is forced downwardly and rotated relative to the container to release said closure, said closure having an annular



4,053,077

CHILD SAFETY CAP

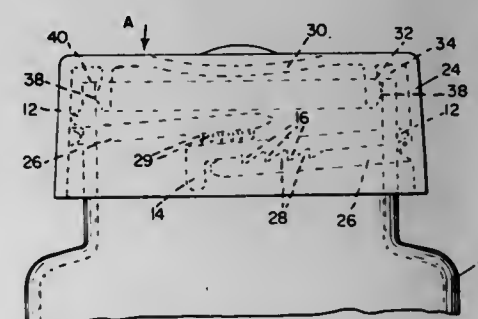
Amedeo DeFelice, c/o Banner Mold & Die Co., Inc., 251 Florence St., Leominster, Mass. 01453

Filed Oct. 19, 1976, Ser. No. 733,869

Int. Cl.² B65D 55/02, 85/56

U.S. Cl. 215-217

8 Claims



1. The combination of a container and a child safety cap for the container, an exterior screw thread on the container and a corresponding interior screw thread on the cap, interengaging teeth on said screw threads locking the cap in position on the container in closed condition thereof, resilient means holding the cap in position with the teeth engaged, said resilient means being deformable upon pressing in of the cap with relation of the container to disengage the teeth allowing separation of the cap from the container by rotating the same in the appropriate direction, said resilient means comprising fingers on the screw threads on the cap located substantially in the area of the teeth of the screw thread on the container.

4,053,078

CHILD SAFETY CLOSURE

James E. Herr, East Petersburg, Pa., assignor to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.

Filed Aug. 18, 1976, Ser. No. 715,238

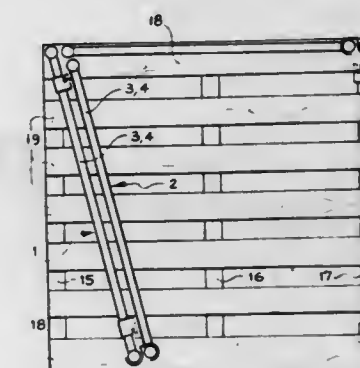
Int. Cl.² B65D 55/02, 85/56

U.S. Cl. 215-222

18 Claims

1. A safety closure for moisture tight sealing engagement with a container having an open mouth over which said closure is received, said closure having a top wall adapted to extend across the open mouth of the container and having a depending skirt wall attached to and encircling said top wall, a plurality of locking members formed on the inner surface of said depending skirt wall for cooperation with locking members on the container to selectively retain said closure on said

1. For a goods pallet comprising at least two parallel bearers with battens fixed to opposite top and bottom edges of the bearers and lying transverse to the bearers, the battens fixed to the bottom bearer edges being pallet support battens and the battens fixed to the top bearer edges being load support battens with two of the load support battens constituting parallel cage securing battens; a pallet cage locking panel comprising a pair of uprights joined by top and bottom rails, to define a substantially rectangular frame, a pair of clips on the bottom rail each clip comprising a leg with a hooked end, the clip legs extend in the same direction away from the panel and the hooked ends extend in opposite directions from outer edges of the legs; the spacing between the hooked end of the clips and the rail bottom in a direction parallel to the plane of the panel being not



depending wall encircled by said skirt wall for insertion into the open mouth of the container to project downwardly therein a predetermined distance axially below said locking members, and a circumferential radially outward sealing surface located on and adjacent the lower end of said annular depending wall axially below said locking members for sealing engagement with the interior surface of said container generally axially below the lower ends of said locking members on said container.

4,053,079

PALLET CAGES

Ladislav Stephan Karpisek, 86 Woodfield Blvd., Caringbah, N.S.W., Australia

Filed Dec. 8, 1976, Ser. No. 748,552

Claims priority, application Australia, Dec. 10, 1975, 4240/75; Mar. 22, 1976, 5291/76; Apr. 28, 1976, 5724/76; Nov. 3, 1976, 8006/76

Int. Cl.² B65D 9/12, 7/00, 7/20

U.S. Cl. 217-43 A

8 Claims

less than the thickness of the cage securing batten; the distance between the outer edges of the legs being not greater than the distance between the cage securing battens; the overall distance between the ends of the hooked ends of the clips exceeding the distance between the cage securing battens but not exceeding the diagonal distance between the intersections of the cage securing battens with adjacent bearers.

4,053,080

PROTECTIVE DEVICE AGAINST RUPTURE OF LARGE CYLINDRICAL VESSELS AND METHOD OF MANUFACTURING SAME

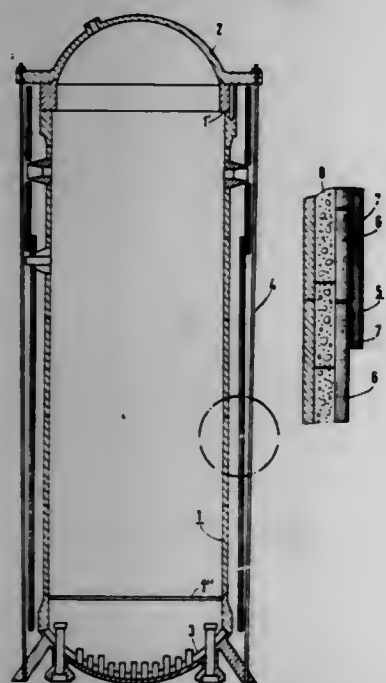
Peter Danilchik, Frankfurt am Main, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim (Ruhr), Germany

Filed Sept. 27, 1974, Ser. No. 509,920

Claims priority, application Germany, Oct. 2, 1973, 2349518 Int. Cl.² B65D 7/44

U.S. Cl. 220-3

3 Claims



1. Protective device against rupture of a large cylindrical vessel having a first cover and a first bottom wall and, superimposed respectively thereon, a second cover and a second bottom wall, and further having tensioning members mutually connecting the second cover and the second bottom wall, comprising mutually superimposed rings formed of respective sheet-metal wrappings, each having a plurality of turns wound about the cylindrical part of the vessel between the second cover and second bottom wall thereof, said sheet-metal wrappings have an inner diameter greater than the outer diameter of the large cylindrical vessel, the rupture of which is being protected against, the space between said sheet-metal wrappings and the large cylindrical vessel being filled with light concrete segments.

4,053,081

REINFORCED FILAMENT-WOUND CUT-PORF PRESSURE VESSEL AND METHOD OF MAKING SAME

Charles M. Niska, Cumberland, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 20, 1976, Ser. No. 716,461

Int. Cl.² B65H 81/06

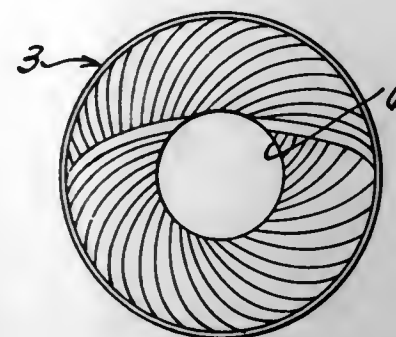
U.S. Cl. 220-3

7 Claims

1. A method of making a filament wound pressure vessel having a desired constant helical winding angle and having finally sized polar end openings one of which is larger than the other, comprising:

windably forming an initial pressure vessel structure having a symmetrical curvative formed by an elongate cylindrical body portion and ovaloid end portions having identically-

sized polar end openings of a diameter no greater than the smaller of said finally sized openings, said vessel being formed by winding the filament of each layer at a constant helical angle across the length of said body portion and said end portions and said helical angle being one that constantly maintains a winding path that follows a geodesic line of the symmetrically-arcuate surfaces being formed,



reinforcing said polar ends of said initial vessel by interspersing a wafer-like mat between each of said filament layers, and matching at least one of said initial polar ends to enlarge its opening to the desired final size, said mats reinforceably encircling the edge portions of said finally-sized openings and being formed of material that is dimensionally stable under pressure vessel operating conditions.

4,053,082

ELECTRICAL OUTLET BOX ASSEMBLY

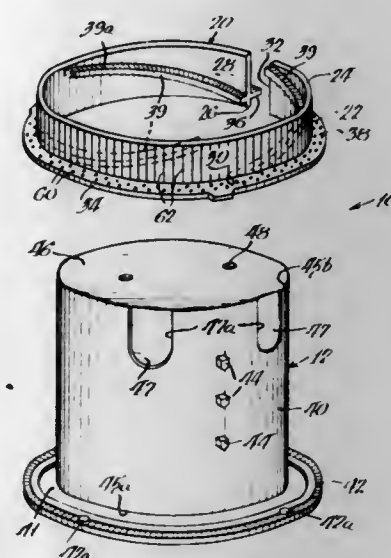
Frederick E. Ullman, Glencoe, Ill., assignor to Unarco Industries, Inc., Del.

Filed Mar. 1, 1976, Ser. No. 662,569

Int. Cl.² H02G 3/12; F16F 15/00

U.S. Cl. 220-3.6

24 Claims



1. An electric box assembly for mounting an outlet box within an opening extending between opposite surfaces of a panel, comprising: a ring member formed of a material with an inherently elastic memory and having a generally cylindrical-shaped sidewall having inner and outer surfaces and adapted to be inserted into and seated within said opening, a flange extending outwardly from the outer surface of said sidewall and adapted to bear against one surface of said panel, and means on the inner surface of said sidewall defining cam track means inclined away from the inserted end of said ring member, said sidewall being discontinuous and defining a gap to permit said ring member sidewall to be spread apart from a relaxed position, wherein the diameter of said outer surface is greater than the diameter of said opening, to a spread position wherein the gap is greater than the thickness of the panel whereby the ring member may be inserted through said panel

opening by (1) placing one portion of the sidewall adjacent the gap outside the panel, and (2) rotating the ring member relative to the panel to position the entire ring member outside the panel and in the relaxed position said ring member then being insertable in said opening by (1) compressing the ring member from said relaxed position to a compressed position wherein the diameter of said outer surface is smaller than the diameter of said opening, (2) telescopically inserting said ring member in said opening until the flange thereon engages said one panel surface, and (3) releasing the force compressing said ring member whereby the inherent elastic memory of said ring member urges said sidewall toward said relaxed position to position the outer surface of said sidewall in frictional retentive engagement with the wall of said opening; and an outlet box member having a sidewall adapted to be positioned within the sidewall of said ring member, a flange extending outwardly from the sidewall of said outlet box member and adapted to bear against the surface of said panel opposite from the surface engaged by the flange on said ring member, and cam follower means on the sidewall of said outlet box member and adapted to engage said cam track means when said outlet box member is rotated relative to said ring member, whereby said cam track means and cam follower means cooperate to move the flanges on said ring member and outlet box member toward one another and into clamping engagement with said panel.

20. A ring member for an electric box assembly for mounting an outlet box within an opening extending between opposite surfaces of a panel, comprising a generally cylindrical sidewall adapted to be seated within said opening, said sidewall having inner and outer surfaces and opposite ends, a flange integral with said sidewall and extending outwardly from said outer surface, said flange having first and second opposed surfaces extending perpendicular to the axis of said generally cylindrical sidewall, said first surface of said flange being spaced a greater distance from one end of said sidewall than said second surface is spaced from the opposite end of said sidewall, said sidewall and flange being formed of a material with an inherent elastic memory and being discontinuous to define a gap permitting said ring member sidewall to be spread apart and compressed from a relaxed position, and a plurality of circumferentially spaced cam tracks integral with said sidewall and extending inwardly from said inner surface, each of cam tracks comprising a thin rib having opposed parallel surfaces inclined with respect to a plane extending parallel to said first and second surfaces of said flange, said ribs having opposite ends respectively located on planes extending parallel to said plane so that either of said first and second surfaces can be positioned to engage a surface of said panel to accommodate panels of different thickness.

4,053,083

MOTOR VEHICLE FUEL TANK CAP

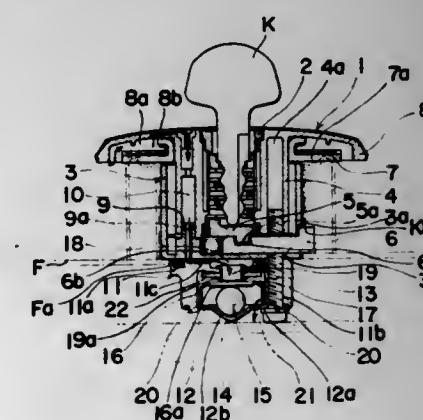
Masakazu Hukuta, Tsushima, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Oct. 4, 1976, Ser. No. 729,239

Int. Cl.² B65D 51/16

U.S. Cl. 220-202

4 Claims



1. In a motor vehicle fuel tank cap comprising a lock means portion permitting said fuel tank cap to be held in locked

attachment to the inlet of the fuel tank of a motor vehicle and defining at least one passage through which external air may pass in order to enter said fuel tank, a motor vehicle fuel tank cap comprising an attitude-sensor valve unit which is provided on said air passage, which is open when said motor vehicle is in a normal, generally upright attitude, and which closes said air passage when said motor vehicle is inclined more than a certain amount from an upright attitude, said attitude-sensor valve unit comprising:

a main housing having an upper portion including means defining an upper opening constituting a portion of said air passage, a lower wall portion defining a central, downwardly curved concave portion, and said main housing having at least one lower opening constituting a portion of said air passage and leading to said fuel tank;

a weight ball element which is normally seated in a lowermost portion in said lower wall central portion and which may freely roll from said lowermost portion when said motor vehicle and fuel tank cap are inclined away from said normal, generally upright position;

a mantle element fitted loosely in the lower portion of the valve unit and positioned over and around said weight ball element, the upper surface portion of said mantle element normally being below the level of said upper opening and said mantle element being movable upwards and towards said upper opening by said weight ball element when said weight ball element moves from said lowermost position; and

sealing means defined by at least said upper opening at the lower surface of the upper portion of said main housing and which cooperates with the upper surface portion of said mantle element to seal said upper opening when said motor vehicle is inclined more than a certain amount from said normal, generally upright attitude and said mantle element is moved upwards more than a certain amount by said weight ball element.

4,053,084

FILLER PLUG

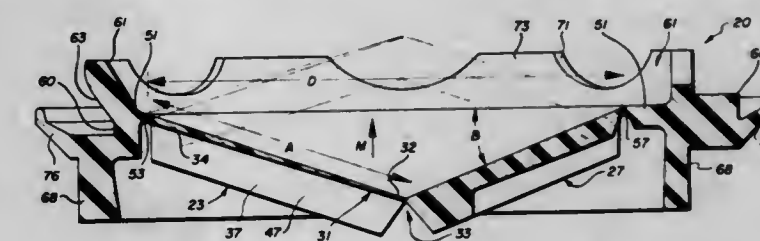
Bruce W. Anderson, Rosemont, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 1, 1976, Ser. No. 662,868

Int. Cl.² B65D 49/02; F16K 21/04

U.S. Cl. 220-229

18 Claims



1. A one-piece plastic closure plug for use with an aperture formed in a wall, the plug including a plurality of petal flaps conically arrayed with hinged connections to said plug, and said flaps including structure so that they are originally pointing outwardly in one direction away from the plane of said wall, each petal including a peripheral rib formed along those petal flap edges located adjacent other petal flap edges to provide petal flap edges of extended thickness, said edges of extended thickness being bevelled to provide a predetermined included angle between said adjacent edges, said petal flaps further including means arranged and shaped to form an inverted cone pointing inwardly in a direction opposite to said one direction and toward the opposite side of the plane of said wall after plug use with said adjacent bevelled extended thickness flap edges being in intimate, substantially planar contact to abuttingly support one another and inhibit outward flow of material through the closure plug, and fastener means for mounting the plug in and on the wall aperture.

4,053,085

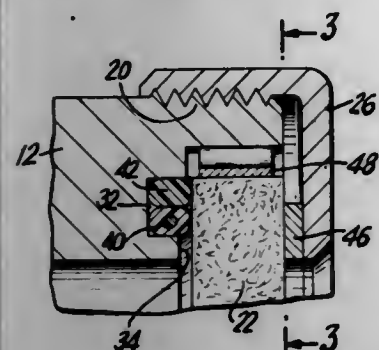
DISSIMILAR MATERIALS SEAL FOR HIGH PRESSURE, HIGH TEMPERATURE AND CHEMICALLY REACTIVE ENVIRONMENTS

David Brown, Cambridge, and Reginald Tobias, Watertown, both of Mass., assignors to Block Engineering, Inc., Cambridge, Mass.

Filed Oct. 10, 1975, Ser. No. 621,403
Int. Cl.² B25D 53/02

U.S. Cl. 222-378

4 Claims



1. A device for demountably sealing a gas tight cover about the periphery of an aperture in a metallic container, the juxtaposed cover and the container being of dissimilar materials, the novel combination comprising of a metallic container having an aperture therein, a cover, the cover being shaped to conform to and close the aperture when juxtaposed thereto, a first and a second gasket seal, the first seal being of chemically resistant material and mounted concentrically with and interiorly to the second seal, the second seal being of load bearing elastomer material, the cover and the container being juxtaposed with the gasket seals there between about the periphery of the aperture in the container, and a generally annular metallic thermal conductor, the thermal conductor being mounted coaxial with and exterior to the second gasket seal and through means in thermal contact with both the cover and the metallic container, whereby the cover may be tightly sealed to the container, the load bearing elastomer seal being protected from reactive chemicals within the container by the presence of the interiorly mounted chemical resistive seal, and the container and its cover being maintained in thermal equilibrium by means of the annular thermal conductor mounted about the periphery of the cover.

4,053,086

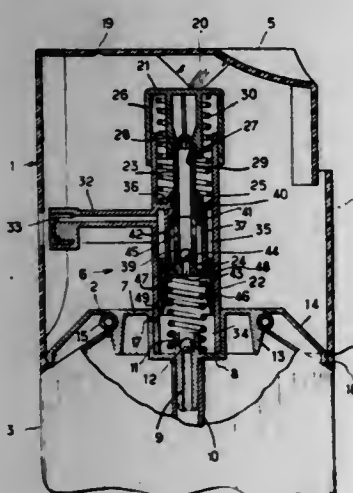
PUMPS FOR HAND-HELD DISPENSERS

Andre Delbard, Buc, France, assignor to Aerosol Inventions & Development S.A. Atd SA, Switzerland

Filed Mar. 31, 1976, Ser. No. 672,320
Int. Cl.² B67D 83/14

U.S. Cl. 222-182

9 Claims



1. A manually-operated reciprocating pump for liquids comprising a pump body with a piston slidable therein, resilient

return means operatively connected to the piston for moving the piston in one direction, an actuating member connected to the piston through resiliently-releasable means during movement of said piston in the said one direction, and releasing means mounted on the pump body engagable by said resiliently-releasable means adjacent the end of the travel of the actuating member in the said one direction, to release the resiliently-releasable means, thereby disengaging the piston from the actuating member, and allowing the return of the piston under the action of said resilient-return means.

4,053,087

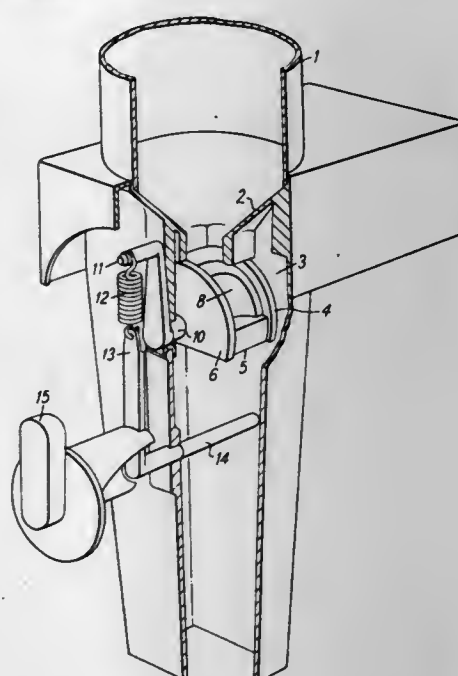
DISPENSER FOR GRANULAR MATERIAL

Bryan Edward Charles Lack, and Alec Thomas Newman, both of Banbury, England, assignors to General Foods Limited, Banbury, England

Filed Nov. 28, 1975, Ser. No. 635,840
Int. Cl.² G01F 11/10

U.S. Cl. 222-278

3 Claims



1. A dispenser for dispensing predetermined amounts of particulate or granular material, which comprises a funnel-shaped inlet leading downwardly into a dispensing zone, a two-compartment bucket valve comprising a base with two side walls and a central vertical partition, said bucket valve mounted on a central spindle within the dispensing zone and operating means for tipping the bucket valve from a position wherein the granular material is prevented from being dispensed to a first dispensing position wherein a first compartment of the bucket valve dispenses the granular material, while simultaneously allowing a second compartment of the bucket valve to be filled with granular material from a container located above the inlet, and returning the valve to a second dispensing position wherein the second compartment dispenses granular material, while simultaneously allowing the first compartment to be filled with granular material from the container, in said first and second dispensing positions after said first and second compartments respectively dispense granular material further granular material is prevented from being dispensed, and a latch mechanism attached to the operating means and adapted to be released by a coin-operated mechanism and locked upon returning the bucket valve to the second dispensing position.

4,053,088

ROTARY DISPENSER WITH DELIVERY REGULATING VALVE AND SCRAPER

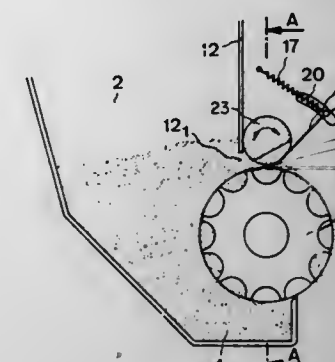
Xavier Roger Grataloup, Montreuil (Seine et Marne), France, assignor to Nodet Gougis, France

Filed Jan. 5, 1976, Ser. No. 646,439

Claims priority, application France, Jan. 10, 1975, 75.00777
Int. Cl.² G01F 11/10; B65D 83/06

U.S. Cl. 222-312

10 Claims



1. A regulating dispenser comprising a hopper having a dispensing opening of a predetermined height and length, a dispensing member positioned within said dispensing opening for the full width thereof and at a height less than the height of said opening and in combination with said hopper defining a slot through which material within said hopper may be moved out of said hopper above said dispensing member, said dispensing member having a movable dispensing surface positioned for movement from within said hopper to outside of said hopper, said movable dispensing surface including at least one delivery area and at least one non-delivery area spaced along the width of said opening, a regulating valve positioned between said moving surface and said hopper above said opening for controllably partially closing said slot, and a scraper mounted independently of said regulating valve and bearing on said movable dispensing surface close to said regulating valve, said scraper bearing elastically on said movable dispensing surface at least in said non-delivery area to ensure sealing of said non-delivery area against delivery of material from said hopper through said slot.

4,053,089

PUMP FOR DISPENSING LIQUIDS

Rustom Kooverji Gamadia, London, England, assignor to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 604,744, Aug. 14, 1975, abandoned, which is a continuation of Ser. No. 528,642, Dec. 2, 1974, abandoned. This application June 3, 1976, Ser. No. 692,515

Claims priority, application United Kingdom, Aug. 1, 1975, 32268/75; Aug. 1, 1975, 32269/75; Mar. 3, 1976, 8495/76; Mar. 23, 1976, 11641/76

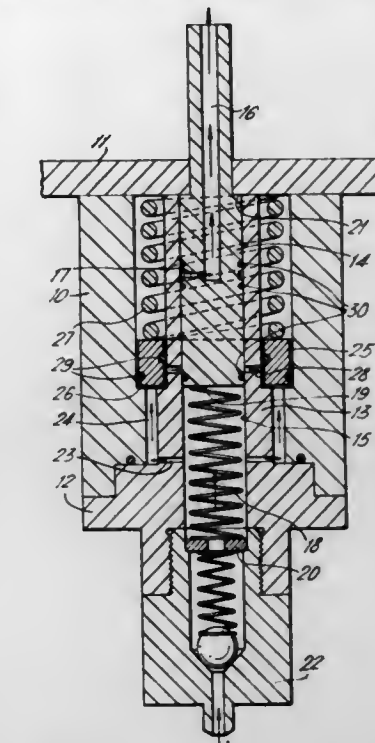
Int. Cl.² G01F 11/32

U.S. Cl. 222-321

17 Claims

1. A finger operable pump for dispensing liquids comprising:
a. an axially arranged feed chamber having a finger displaceable end wall, axial movement of which will vary the volume of said feed chamber;
b. a pressure actuable valve to permit entry of a liquid product from an external supply to the feed chamber, said valve and said feed chamber being so positioned that downward axial movement of the finger displaceable end wall toward said valve reduces the volume of the feed chamber and increases hydraulic pressure therewithin, and upward axial movement of the finger displaceable end wall away from said valve increases the volume of the feed chamber and reduces hydraulic pressure therewithin;
c. an axial discharge chamber in communication with said feed chamber;
d. a resilient means positioned co-operably with the discharge chamber for storing energy generated by the in-

creased hydraulic pressure which results from downward movement of the finger displaceable end wall with respect to the feed chamber;
e. a discharge conduit communicating the discharge chamber with the atmosphere exterior to the pump;
f. valve means for releasing the energy stored in the resilient means and for conducting the liquid product from the



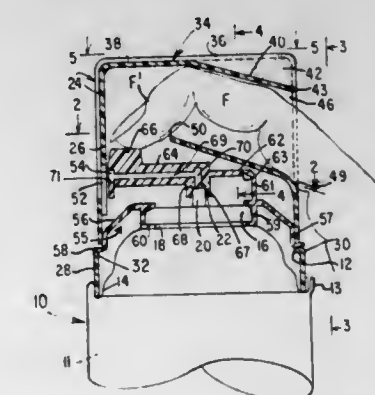
discharge chamber to the discharge conduit, said valve means being operable to release the energy and provide a conduit for the liquid product only after the finger displaceable end wall has moved downwardly with respect to the feed chamber by a predetermined distance, the finger displaceable end wall forming a liquid tight seal with a side wall of the chamber at least until after said valve means is operated.

4,053,090

CAP AND VALVE ACTUATOR FOR SPRAY DISPENSERS
Ronald L. Kelly, Elk Grove, and Efrem M. Ostrowsky, Highland Park, both of Ill., assignors to VCA Corporation, Baton Rouge, La.Filed Aug. 22, 1974, Ser. No. 499,462
Int. Cl.² B65L 83/14

U.S. Cl. 222-402.13

4 Claims



1. A two-piece cap and valve actuator for use in connection with an aerosol spray dispenser which is part of an aerosol container, comprising: a cap and a separate valve actuator member positioned therewithin, one of said cap and said valve actuator member having spaced openings around its lower portion to receive spaced ears provided on the other of said cap and said valve actuator member to secure said cap to said actuator, said cap positioned over the top of the aerosol container.

tainer and with the valve actuator member cooperating with the depressible discharge part of the spray dispenser, said cap having a cap body with a circumference substantially that of the aerosol container so as not to extend substantially outwardly thereof to permit containers with caps to be positioned contiguous to each other, said cap having an outlet opening at the front side thereof, said cap having a finger receiving socket extending inside said cap and accessible through a side rear opening of the cap body, said actuator having means for engagement with the valve stem of the aerosol container and a forwardly extending portion extending substantially to the front side outlet opening of the cap, said forwardly extending portion of the actuator having a duct communicating with the means engaging the valve stem of the aerosol container, said forwardly extending portion of the actuator having means at the forward end which is manually engageable by the forepart of the finger of the hand for manual depression to thereby operate said aerosol valve stem and permit the discharge through the forwardly extending portion of said actuator and through the outlet opening of said cap, said finger receiving socket having a rigid, fixed bottom wall which extends at least over and past said valve stem and terminates short of said means engageable by the forepart of the finger at the forward end of said forwardly extending portion of said actuator.

4,053,091

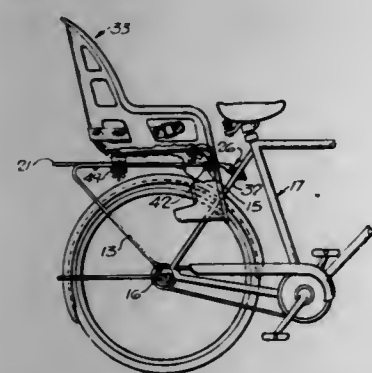
COMBINATION REAR LUGGAGE CARRIER AND CHILD SEAT FOR BICYCLE

Ronald G. Martelet, River Forest, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Filed May 28, 1976, Ser. No. 690,889
Int. Cl.² B62J 11/00

U.S. Cl. 124-32 A

1 Claim



1. An attachment for bicycles and the like comprising a luggage carrier formed of rod-like members and having means for mounting on the rear frame of a bicycle, and a child carrier removably secured on said luggage carrier, said luggage carrier including a first U-shaped member having parallel longitudinal legs connected by a first bight portion, a second U-shaped member having parallel longitudinal legs connected by a second bight portion, said bight portions being oppositely arranged, a tie bar connected to each of said legs intermediate said bight portions, the legs of said first U-shaped member being connected to the bight portion of the second U-shaped member and having forward diverging extensions and carrying clamping means for securement to a rear frame member of said bicycle, the legs of said second U-shaped member having depending extensions embracing a rear cycle wheel and having perforated extremities for attachment to another portion of said rear frame member in close proximity to the axle of the rear cycle wheel, said child carrier being formed of molded plastic and having a seat portion, a back, side walls, and depending leg receiving portions straddling the rear cycle wheel, a sheet metal bracket secured to the underside of said seat portion, said bracket including a vertical leg disposed between the depending leg receiving portions of the child carrier, said vertical leg having a struck-out lug constituting a downwardly opening socket engageable with said second bight portion, said vertical leg having a lateral notch at each side edge with the parallel legs of said first U-shaped member being engageable in

said notches and removably secured therein, and locking elements carried on the underside of said seat portion for clamping engagement with the legs of said U-shaped members.

4,053,092

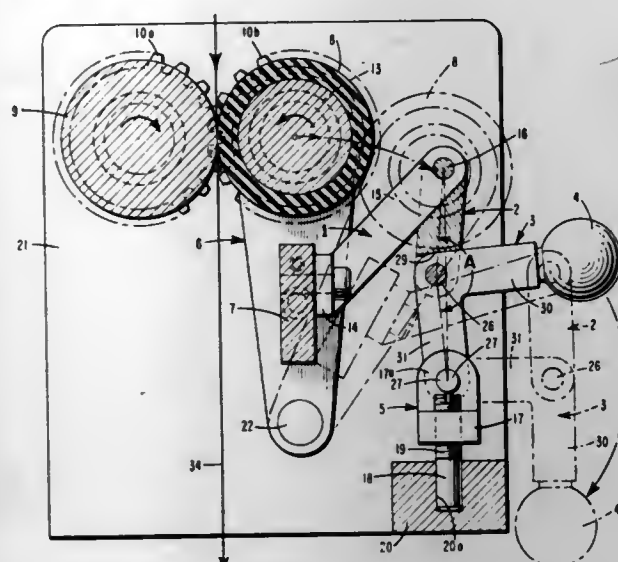
DISENGAGEABLE ROLL POSITIONING APPARATUS

Arthur Wayne Edwards, Rte. No. 2, Box 257A, Mechanicsville, Va. 23111

Filed Feb. 25, 1976, Ser. No. 661,321
Int. Cl.² B65H 17/22

U.S. Cl. 226-90

2 Claims



1. A roll positioning apparatus for urging a passive roll into engagement with a drive roll comprising a self-aligning yoke assembly cooperatively joined to a locking lever mechanism comprised of three interacting members pivotally connected at three sites and communicating between an adjustable anchor base and said yoke assembly, said three interacting members comprising: (1) a yoke anchor attached at one extremity to said yoke assembly and attached by means of an upper pivot pin at its opposite extremity to (2) a moving clevis which is attached by means of a middle pivot pin at its opposite extremity to (3) a lever which at its opposite extremity is attached by means of a lower pivot pin to an adjustable anchor base.

4,053,093

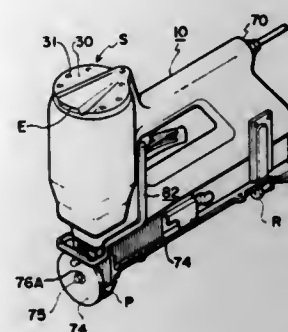
AIR-ACTUATED STAPLING GUN IMPROVEMENT

Stephen E. Thueringer, P.O. Box 284, North Bend, Wash. 98045
Continuation-in-part of Ser. No. 636,025, Nov. 28, 1975, abandoned. This application Aug. 19, 1976, Ser. No. 716,020

Int. Cl.² B25C 5/06

U.S. Cl. 227-5

4 Claims



1. In an air-operated stapling gun having a staple driver, a housing provided with a cylinder, a piston operatively disposed in said cylinder and connected to said staple driver, staple magazine means coupled to said housing and operatively aligned with said staple driver for sequential, single-staple ejection, the combination of said housing and said staple magazine means providing a staple-ejection nose accommodating said staple ejection, said housing being provided with an air-pressure inlet and also air-exhaust vent means, trigger means operatively coupled to said housing and comprising outer and

inner trigger elements, and valving means intercoupling said piston and air-pressure inlet and said air-exhaust vent means for enabling air-pressure reciprocation of said piston in successive cycles, said valving means having a valve control means for initiating each of such cycles, said trigger means being cooperatively disposed with respect to said valve control means: an improvement comprising a spring-biased slide member slidably carried by said housing, a work-surface engaging friction wheel pivotally mounted to said slide member and having actuator means and a peripheral surface disposed proximate said ejection nose, and operative means coupled to said inner trigger element, carried by said stapling gun, and proximate to and periodically engaged by said actuator means for actuating said inner trigger element to in turn actuate said valve control element when said outer trigger element is manually depressed.

4,053,094

CARTRIDGE CONTAINING CONTINUOUS WIRE COIL AND PORTABLE DEVICE FOR CUTTING SUCCESSIVE LENGTHS FROM THE WIRE AND DRIVING THE SAME

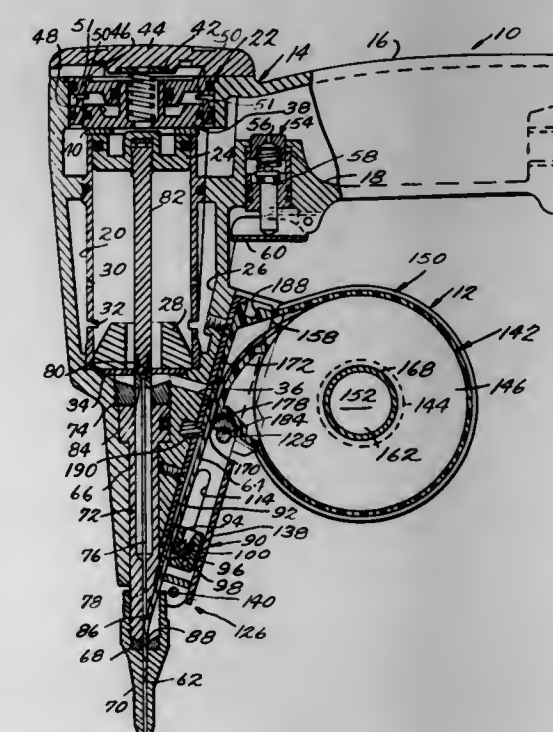
Robert E. Males, Cranston, R.I., assignor to Textron, Inc., Providence, R.I.

Filed May 6, 1976, Ser. No. 683,816

Int. Cl.² B25C 1/04; B65H 17/52, 49/02

U.S. Cl. 227-93

27 Claims



1. A portable power-operated device for use with a continuous strand of fastener material for cutting off successive short lengths from the free end portion of said strand and driving the same into a workpiece comprising:

a housing structure including (a) a handle portion adapted to be manually grasped by a user for purposes of handling the device, (b) means defining a drive track of a cross-sectional size generally similar to the cross-sectional size of the strand, said drive track including a discharge end and an opposite end and (c) means defining a feed opening intersecting said drive track intermediate the ends thereof including a surface facing toward the opposite end of the drive track which intersects a drive track defining surface to form a strand cutting edge, feed means mounted on said housing structure for effecting a movement of the strand in a direction toward the free end thereof during a feed movement of said feed means, a fastener driving element having a strand cutting end, said element being slidably mounted in said drive track for movement through drive and return strokes between (a) a strand receiving position wherein said cutting end is spaced from said cutting edge in a direction toward the opposite end of said track whereby a free end portion of said strand may be moved through said feed opening angularly past said cutting edge and into said drive track

toward the discharge end thereof into an operative position in response to a feed movement of said feed means, and (b) a fastener driving position wherein said cutting end is adjacent the discharge end of said drive track, power operated means carried by said housing structure for effecting successive cycles of movement of said feed means and said fastener driving element, of which each cycle includes (a) a feed movement of said feed means to move a free end portion of said strand into said operative position, (b) a drive stroke of said fastener driving element to cut off a short length from the free end of said strand by a cooperative shearing action between the cutting end of said fastener driving element and said cutting edge and to drive the cut-off length outwardly of the discharge end of said drive track into a workpiece, and (c) a return stroke of said fastener driving means, and manually actuated means including a trigger carried by said housing structure adjacent said handle portion for digital actuation by a user manually gripping said handle portion for actuating said power operated means.

4,053,095

SUPPORT FOR ATTACHING HEELS TO SHOES

Trevor Norman Coleman, Oadby, England, assignor to USM Corporation, Boston, Mass.

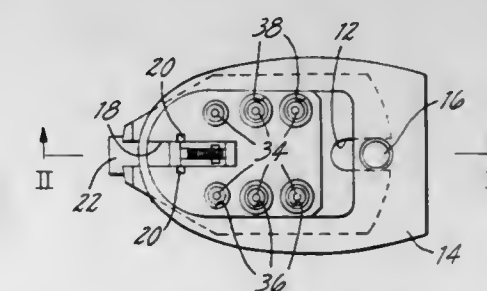
Filed May 3, 1976, Ser. No. 682,639

Claims priority, application United Kingdom, Jan. 21, 1976, 2279/76

Int. Cl.² B27F 7/00

U.S. Cl. 227-135

1 Claim



1. A shoe support for use in a machine for attaching sharply tapering heels to shoes comprising, in combination, a member having a plurality of nail guides in each of which a nail can be located to be driven into forward portions of the heel seat and heel of a shoe, a gauge means mounted on the member for locating the heel seat of the shoe thereon, a staple guide formed in the member and disposed rearwardly thereof so that a staple can be located to be driven forwardly into the tapered rearward portion of the heel seat and heel of the shoe, said staple guide being positioned rearwardly of the nail guides and inclined relative thereto to direct legs of the staple in said staple guide toward a central region of the heel being attached, and driving means including a portion aligned with the nail and staple guides, respectively, to drive the nails and the staple in said guides.

4,053,096

THERMOCOMPRESS WELDING DEVICE

Richard Heim, Moosburg, Germany, assignor to Texas Instruments Deutschland GmbH, Freising, Germany

Filed June 25, 1976, Ser. No. 699,915

Claims priority, application Germany, June 27, 1975, 2528806

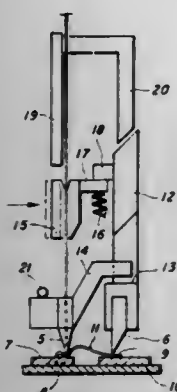
Int. Cl.² H01L 21/603

U.S. Cl. 228-4.5

17 Claims

1. Thermocompression welding apparatus for welding areas between a contact area of a semiconductor body and a corresponding contact area of a housing for said semiconductor body, including a welding capillary from the mouth of which the contacting wire emerges for application by said capillary to

one of said contact areas to effect a weld between said one contact area and said connecting wire, the improvement comprising a separate welding tool laterally displaced from said welding capillary by a distance corresponding to the separation of said contact areas and means for moving said welding



capillary and said welding tool through a path movement toward and away from said contact areas for applying said welding capillary and said welding tool simultaneously to engage said connecting wire against the two respective contact areas and to weld said connecting wire to said contact areas.

4,053,097

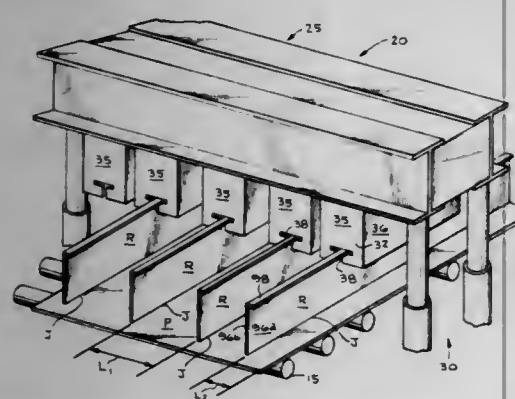
ARRANGEMENT FOR PLACING AND MAINTAINING REINFORCING MEMBERS IN PREDETERMINED RELATIONSHIP RELATIVE TO A WELDMENT COMPONENT

Richard L. Linam, League City, Tex., assignor to Kelso Marine, Inc., Galveston, Tex.

Filed July 15, 1976, Ser. No. 705,450

Int. Cl.² B23K 1/14

U.S. Cl. 228—44.1 R



1. An arrangement for supporting reinforcing members as they are welded to a plate including:
 - a. support means including a pair of I beams extending longitudinally and parallel to each other in spaced relation;
 - b. a plurality of spaced members to guide and support the reinforcing members as they are welded to the plate;
 - c. means connecting said members to said support means;
 - d. means for simultaneously moving said spaced members on said connecting means longitudinally of said support means including:
 1. motor means;
 2. a pair of lead screws extending longitudinally of said support means and in spaced, parallel relation to each other;
 3. shaft means connected for rotation by said motor means extending transversely of said lead screws;
 4. spaced worm gear means mounted on said shaft means and engaged with said lead screws;
 5. additional shaft means extending transversely of said lead screws and rotatably mounted in each of said spaced members;
 6. additional spaced worm gear means mounted on said

additional shaft means and engaged with said lead screws;

7. control means carried by each of said spaced members to control rotation of said additional shaft means whereby rotation of said shaft means rotates said lead screws and simultaneously moves said spaced members therealong; and
- e. additional means moving said spaced members independently of each other longitudinally of said support means.

4,053,098

SHIPPING CARTON

Brian Kent Baptist, San Jose, Calif., assignor to International Paper Company, New York, N.Y.

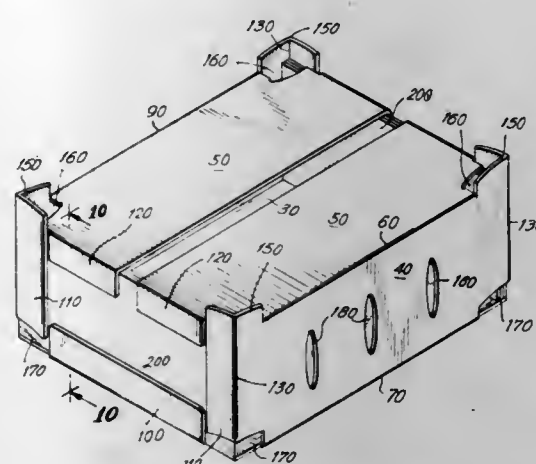
Continuation-in-part of Ser. No. 576,717, May 12, 1975,

abandoned. This application Aug. 10, 1976, Ser. No. 713,195

Int. Cl.² B65D 13/04, 5/02

U.S. Cl. 229—23 R

2 Claims



1. A shipping carton adapted for storage and transport of produce under cold and humid conditions comprising a body wrap and a pair of separate substantially rigid end panels, said body wrap comprising:

- a rectangular bottom panel,
- a pair of side panels each comprising a wall integrally connected with one of the opposite sides of the bottom panel by a fold line along which said wall is folded to extend vertically upward from said bottom panel,
- a pair of top closure panels each integrally connected with one of said side panels by a fold line defining the upper margin of said side panel and along which said top panel is folded when said carton is closed,
- said substantially rigid end panels each comprising:
 - a rectangular multi-wall adhesively laminated corrugated board made up of at least two corrugated mediums enclosed by facing boards, each end panel having top, bottom and end edges, and at least said mediums and the interior facing boards being impregnated with a moisture resistant rigidifying agent,

- a pair of bottom panel flaps integral with said body wrap and each integrally connected with one end margin of said bottom panel by a fold line along which said flap is folded upwardly to lie upon the outer surface of one of said separate end panels thus to secure said bottom panel to both of said end panels with said end panels extending vertically upwardly from said bottom panel with the bottom edges thereof resting on said bottom panel,
- four side panel flaps each integrally connected with one vertically extending side margin of each of said side panels of said body wrap by a fold line along which said flap is folded to lie upon the outer surface of one of said separate end panels with the inner surface of the adjacent side panel extending firmly in contact with the adjacent end edge of said end panel,
- each of said four side panel flaps extending vertically in secured contact with said outer surface of the adjacent end of one of said end panels from substantially the level of said bottom panel to the top margin of said end panel,

stacking tabs extending upwardly from the top margins at least of each of said side panels and through openings formed in said top panels.

each of said stacking tabs being bolstered for rigidity as a result of said contact of said inner walls of said side panels with the opposite end edges of said separate end panels, and the end walls of each of said side panels having cut-out areas corresponding with said stacking tabs and positioned at the bottom corners of said body wrap whereby the stacking tabs of said carton will mate with similar cut-out areas in a second similar carton to be stacked thereupon to essentially prevent said second carton from shifting relative to the body wrap of said carton.

4,053,099

ARTICLE TRAY

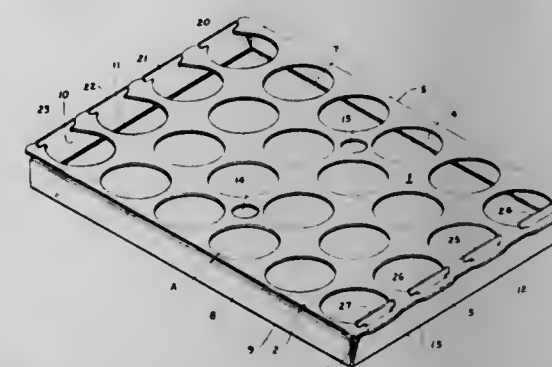
Joseph H. Lock, Mableton, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 4, 1976, Ser. No. 729,357

Int. Cl.² B65D 5/30

U.S. Cl. 229—28 R

14 Claims



1. An article tray comprising a bottom wall, a top wall disposed parallel to said bottom wall, a pair of spaced side walls disposed perpendicular to said top and bottom walls, a pair of end panels foldably joined respectively to the end edges of said bottom wall, at least one aperture formed in said top wall and having a locking surface disposed on the periphery of said aperture generally adjacent and parallel to the end edge of said top wall at one end of the tray, a stabilizing tab formed on the upper edge of the end panel at said one end of the tray adjacent said aperture and disposed in abutting engagement with the underside of said top wall, a locking tab formed on the upper edge of said end panel at said one end of the tray and disposed within said aperture and in abutting engagement with said locking surface, and a first shoulder formed on said locking tab and disposed in overlapping abutting relationship with the topside of said top wall, the lower edge of said shoulder at the point of contact with said top wall being disposed generally in the same horizontal plane as the upper edge of said stabilizing tab to cause a tension force across at least a portion of said end edge of said top wall at said one end of the tray.

4,053,100

SHIPPING CARTON

Brian Kent Baptist, San Jose, Calif., assignor to International Paper Company, New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,410

Int. Cl.² B65D 5/22, 5/30

U.S. Cl. 229—43

5 Claims

1. A shipping carton adapted for storage and transport of produce under cold and humid conditions comprising a tray and a separate cover adapted to fit over the top of the tray to close the carton,

said tray comprising:

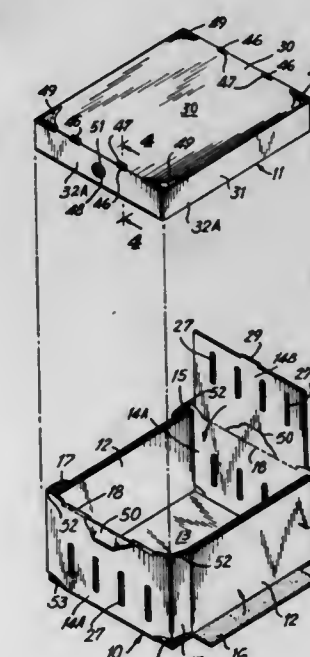
- a rectangular bottom panel,
- a pair of double-wall end panels each comprising an outer wall integrally connected with one of the opposite ends of the bottom panel by a fold line along which said outer wall is folded to extend vertically upward from

said bottom panel and an inner wall connected with said outer wall by a fold line defining the upper margin of said end panel and along which said inner wall is folded inwardly of said tray to lie substantially in face-to-face contact with the inner surface of said outer wall,

a pair of substantially rigid side panels separate from the bottom and end panels and each comprising a plurality of adhesively united corrugated mediums and facing boards,

a pair of bottom panel flaps each integrally connected with one side margin of said bottom panel by a fold line along which said flap is folded upwardly to lie upon the outer surface of one of said separate side panels thus to secure said bottom panel to both of said side panels with said side panels extending vertically upwardly from said bottom panel,

four end panel flaps each integrally connected with one vertically extending side margin of each of said outer walls of said double-wall end panels by a fold line along which said flap is folded to lie upon the outer surface of one of said separate side panels with the inner surface of the inner wall of the adjacent double-wall end panel extending in contact with the adjacent end margin of said side panel thus to secure said outer walls of each of said double-wall end panels to opposite ends of both of said side panels,



- each of said four end panel flaps extending vertically in secured contact with the adjacent end of one of said side panels from substantially the level of said bottom panel to the top margin of said side panel,
- and stacking tabs extending upwardly from at least two diagonally opposite top corners of said tray each of said stacking tabs being formed integrally with and extending jointly upwardly from an end panel flap and an adjacent portion of an outer wall of said double-wall end panels,
- each of said stacking tabs being V-shaped and being bolstered for rigidity by the inner walls of said end panels and by the opposite ends of said separate side panels, the outer walls only of each of said double-wall end panels and each of said four end panel flaps connected therewith having cut-out areas corresponding with said stacking tabs and positioned at the bottom corners of said tray whereby the stacking tabs of said tray will mate with similar cut-out areas in a second similar tray to be stacked thereupon, and
- said cover comprising:
 - portions defining openings through which said stacking tabs extend when the carton is closed whereby the bottom panel of a second similar carton stacked on the closed carton rests upon the top of said cover of said

closed carton and lies between said diagonally opposed stacking tabs of said closed carton to essentially prevent said second carton from shifting relative to the tray of said closed carton.

4,053,101

COMBINATION SHIPPING CONTAINER AND DISPLAY BOX

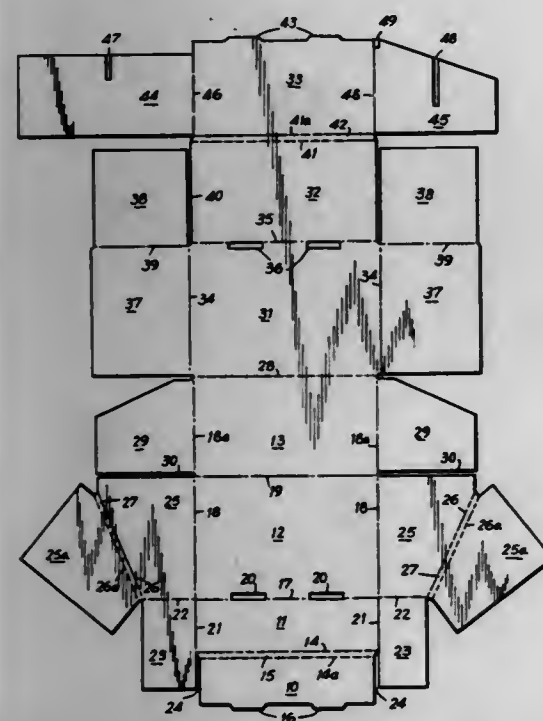
John J. Hart, Jr., Geneva, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,637

Int. Cl.² B65D 5/22, 5/46

U.S. Cl. 229—36

7 Claims



1. A combination shipping container and display box formed from a single-piece blank of corrugated board, comprising:
 - a. A compartmented display box portion defined by a substantially rectangular bottom panel having two opposed side walls, a front wall, and a rear wall, said side walls and said front wall being comprised of a plurality of layers of said corrugated board;
 - b. a separable cover section being defined by a substantially rectangular top panel having two opposed side walls, a cover section front wall, and a back wall including hinged connecting means for connection thereof and separation therefrom of said cover section from said rear wall of said display box portion, said side walls and said cover section front wall being comprised of a plurality of layers of said corrugated board, said cover section front wall overlapping said front wall of said display portion;
 - c. intersecting divider walls which form a plurality of compartments in said display box portion, said divider walls being integral with an obtained from said back wall of said cover section to which it is detachably connected in said single-piece blank of corrugated board; and
 - d. hinged connecting means including a fold line sufficiently weakened to enable separation of said cover section from said display box portion.

4,053,102

REINFORCED PAPERBOARD CAN

Martin H. Stark, Saginaw, Mich., assignor to Arrow Paper Products Company, Saginaw, Mich.

Filed Sept. 17, 1976, Ser. No. 724,465

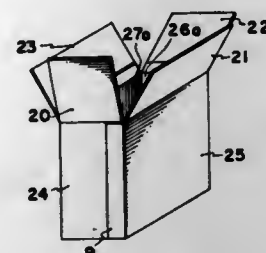
Int. Cl.² B65D 5/02

U.S. Cl. 229—37 E

11 Claims

1. Structure for forming a reinforced paperboard can comprising a first rectangular paperboard blank scored transversely to form a plurality of side-by-side panels and scored longitudinally to form a plurality of coextensive flaps at least

along one edge of said panels, each of said flaps being separated from the adjacent flap by a slit; a second rectangular paperboard blank having a length corresponding to the length of said first blank and a width less than that of said first blank, said blanks being of substantially uniform thickness, said second blank being scored transversely to form a plurality of side-by-side panels corresponding in number and area to the number



and area of the panels of said first blank and being scored longitudinally to form a plurality of coextensive tabs at least along one edge of the panels of said second blank, each of said tabs being separated from the adjacent tab, said first and second blanks being superposed with their respective panels, flaps and tabs in overlying relation and the panels in register with one another; and means securing said blanks to one another.

4,053,103

HERMETICALLY SEALED CARTON

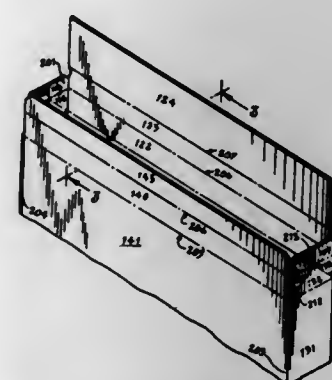
Paul Gaudish, Mundelein, Ill., assignor to International Paper Company, New York, N.Y.

Filed Sept. 22, 1976, Ser. No. 725,897

Int. Cl.² B65D 5/02

U.S. Cl. 229—37 R

6 Claims



1. A container closure, including:
 - a. a body portion comprising first, second, third and fourth foldably connected body panels, and a sealing flap foldably connected to said fourth body panel, the outer surface of said sealing flap being sealed to the inner surface of said first body panel;
 - b. said closure having first and second triangular end panels foldably connected to said first and third body panels as extensions thereof, and first and second roof panels foldably connected to said second and fourth body panels as extensions thereof;
 - c. said first triangular end panel connected to said first and second roof panels by a first pair of triangular fold-out panels extending therefrom;
 - d. said second triangular end panel connected to said first and second roof panels by a second pair of triangular fold-out panels extending therefrom;
 - e. said closure also having a side roof flap foldably connected to said sealing flap, the outer surface of said side roof flap being sealed to the inner surfaces of the extensions of said first body panel;

- f. said first pair of triangular fold-out panels having first and second rib panels foldably connected thereto;
 - g. said first roof panel having a third rib panel foldably connected thereto;
 - h. said second pair of triangular fold-out panels having fourth and fifth rib panels foldably connected thereto;
 - i. said second roof panel having a sixth rib panel foldably connected thereto;
 - j. said side roof flap having a seventh rib panel foldably connected thereto;
 - k. consecutively numbered rib panels being foldably connected to one another, and the outer surface of said seventh rib panel being sealed to the inner surface of said first rib panel;
 - l. said roof panels extending across an end of said body portion;
 - m. said triangular end panels extending outward beyond said body to form projecting wings;
 - n. said triangular fold-out panels overlying said triangular end panels;
 - o. the inner surfaces of said second, third and fourth rib panels being sealed to the inner surfaces of said seventh, sixth, and fifth rib panels, respectively;
- whereby a continuous and uninterrupted hermetic closure extending the width of the container is formed.

4,053,105

THERMOSTATIC VALVE DEVICE HAVING NON-LINEAR FLOW CHARACTERISTICS

Backman Wong, Wayland, and Earl L. Wilson, Wellesley, both of Mass., assignors to Standard-Thomson Corporation, Waltham, Mass.

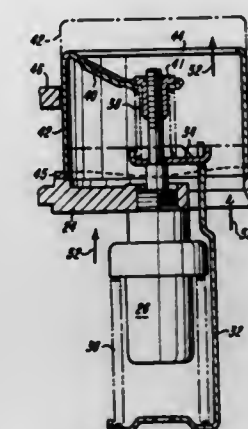
Continuation-in-part of Ser. No. 384,519, Aug. 1, 1973, Pat. No. 3,893,618. This application June 18, 1975, Ser. No. 587,915

The portion of the term of this patent subsequent to July 8, 1992, has been disclaimed.

Int. Cl.² G05D 23/02

U.S. Cl. 236—100

7 Claims



1. A thermally responsive fluid flow control valve device for elimination of temperature fluctuations in the fluid during initial opening operation comprising:
 - a stationary valve member having an annular valve seat portion forming a fluid port,
 - a movable valve member having a closure portion engageable with the annular valve seat portion to close the fluid port, the movable valve member being movable to move the closure portion toward and away from the valve seat portion of the stationary valve member,
 - the stationary valve member having an annular flange encompassing the valve seat portion and forming a recess within which the annular valve seat portion is located and within which the closure portion of the movable valve member is movable, the annular flange having a sloping part, initial movement of the movable valve member with respect to the stationary valve member thus creating a small fluid flow passage between the flange and the movable valve member, and increased movement of the closure portion of the movable valve member adjacent the annular flange being non-linear in magnitude with respect to the area of the fluid flow passage created between the annular flange and the movable valve member,
 - thermally responsive actuator means,
 - means joining the thermally responsive actuator means to the movable valve member for movement thereof.
7. A thermally responsive fluid flow control valve device for elimination of temperature fluctuation in the fluid during initial opening operation comprising:
 - a stationary valve member having an annular valve seat portion forming a fluid port,
 - a movable valve member having a closure portion engageable with the valve seat portion to close the fluid port, said portions of the valve members being in overlapping relationship, said portion of one of said valve members having an inclined wall surface which extends from the annular valve seat portion, initial movement of the movable valve member in a direction away from the stationary valve member thus creating a small fluid flow passage between said portions of the valve members and increased movement of the movable valve member in a direction from the stationary valve member being non-linear in magnitude with respect to the magnitude of the fluid flow passage created between the said portions of the valve members,
 - thermally responsive actuator means,

4,053,104

SELF COOLING TABLE TOP CENTRIFUGE

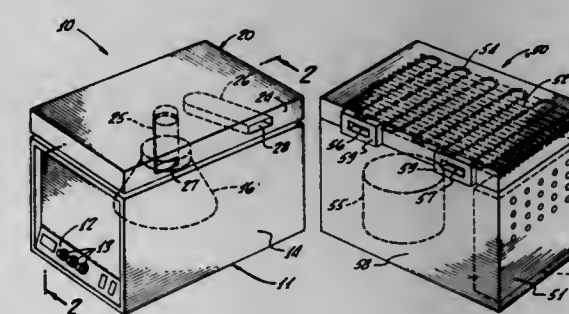
Harry Aron Penhasi, Cupertino, and John Francis Whiting Robbins, Los Altos, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 23, 1976, Ser. No. 660,446

Int. Cl.² B04B 7/02, 15/02

U.S. Cl. 233—11

13 Claims



1. In a centrifuge including a rotor and a housing defining a chamber of said rotor, the improvement comprising:
 - a refrigeration unit having a cold air outlet and a warm air inlet to the evaporator of said unit;
 - first and second passageways extending through said centrifuge housing, first ends of said first and second passageways terminating external to said chamber and being adapted to be connected to said cold air outlet and warm air inlet, respectively, of said refrigeration unit, the second end of said first passageway terminating internally of said chamber, adjacent the axis of rotation of said rotor, the second end of said second passageway terminating internally of said chamber, adjacent the periphery thereof, said rotor conducting air from said first passageway to said second passageway via said chamber.

means joining the thermally responsive actuator means to the movable valve member for movement thereof.

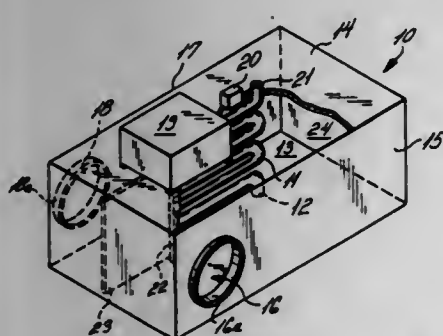
4,053,106

SYSTEM FOR UTILIZING HEAT CONTAINED IN FLUE GAS

Robert Karl, 97-22 Metropolitan Ave., Forest Hills, N.Y. 11375
Filed Nov. 2, 1976, Ser. No. 737,938

Int. Cl.² F24D 3/00

U.S. Cl. 237-8 R



1. In combination with a heating system comprising a boiler, combustion means for heating water contained in the boiler and a flue for conducting away hot gases resulting from the combustion, the invention comprising a system for recovering heat contained in the flue gas comprising a housing having a flue gas inlet and a flue gas outlet in direct opposition to the flue gas inlet, a first path from the flue gas inlet to the flue gas outlet being defined by the shortest distance between the flue gas inlet and the flue gas outlet, contained in the housing laterally offset from and immediately adjacent said first path a coil having a water inlet and a water outlet, a second, longer path from the flue gas inlet to the flue gas outlet intersecting said coil, laterally offset from and immediately adjacent said coil an unobstructed space in said housing, a third, longest path from the flue gas inlet to the flue gas outlet including said unobstructed space, sole means for directing the flow of flue gas, said flue gas directing means comprising a directing plate pivotally mounted for movement between a first position in which it blocks the first path and a second position in which it blocks the second path, means for sensing the temperature of water heated in the coil by the flue gas, a motor operatively connected to said directing plate for pivoting said directing plate back and forth between said first and second positions and means for actuating the motor in response to the temperature sensed by the sensing means, whereby the directing plate is pivoted into the first position when the temperature of the water in the coil is below a desired level and the flue gas is thereby directed into the second path to further heat the water in the coil, the directing plate is pivoted into the second position when the temperature of the water in the coil is above a desired level and the flue gas is thereby directed into the first path to permit the water in the coil to cool and the third path permits the flue gas to flow from the flue gas inlet to the flue gas outlet in the event that the directing plate is in the first position and the second path becomes obstructed such as by the accumulation of soot in the interstices of the coil.

4,053,107 DEVICE FOR FASTENING A RAIL TO A SLEEPER, HOLDER AND CLIP FOR THE APPLICATION OF SUCH A FASTENING DEVICE

Lodewijk Goderbauer, van Lommessenweg 1, Schaesberg, Netherlands

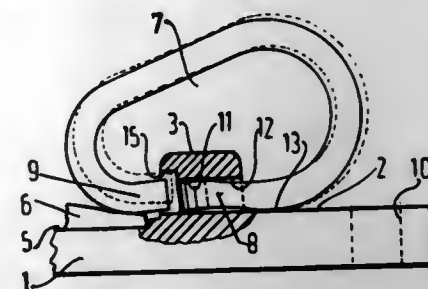
Filed Mar. 17, 1976, Ser. No. 667,698

Claims priority, application Netherlands, Mar. 24, 1975, 7503503

Int. Cl.² E01B 9/30, 9/34, 9/48

U.S. Cl. 238-349

18 Claims



1 Claim
1. A device for fastening a rail to a cross tie, comprising in combination:

a holder adapted to be secured to a cross tie, said holder having a portion for underlying a rail foot and an upstanding portion adjacent the rail foot, said upstanding portion defining a recess facing the rail and a recess facing away from the rail; and

a spring clip cooperating with said holder to press downwardly on the rail foot, said clip comprising first and second C-shaped portions disposed in spaced, side-by-side upstanding relation, and a bight portion joining such C-shaped portions at one of their ends so as to leave the opposite ends of said C-shaped portions free, said free ends of the C-shaped portions being directed toward but spaced from said bight portion with such spacing being less than the width of the upstanding portion of said holder, and said free ends being received in that recess adjacent the rail foot and extending outwardly therefrom to bear downwardly upon the rail foot while said bight portion is received in the other recess, said recess adjacent the rail foot being of a height which provides clearance over said free ends whereby said free ends may be deformed upwardly only to a limited extent.

4,053,108

DEVICE FOR LATERAL LIMITING TRAFFIC MARKING LINES

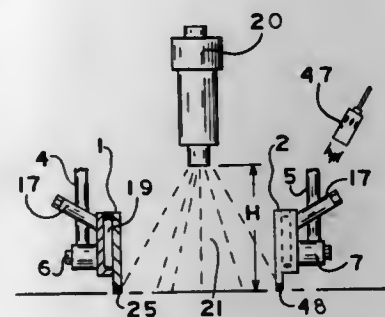
Walter Hofmann, An der Flottbek, Hamburg, Germany (2000)
Filed Oct. 7, 1976, Ser. No. 730,569

Claims priority, application Germany, Oct. 4, 1975, 2544478

Int. Cl.² B05B 1/28; B28B 19/00

U.S. Cl. 239-150

10 Claims



1. Apparatus for applying road marking lines onto a roadway and limiting the lateral extent thereof and thereby control the width and edge finish of the lines, comprising:

a frame;
an adjustable spray gun operatively associated with said

frame for applying spray road marking indicia material onto the roadway;
a pair of oppositely disposed sliding plates coupled to said frame, said plates being positioned on opposite sides of said spray gun and laterally separated in distance in accordance with the width of the lines to be marked on the roadway, said plates being adjustable laterally to vary the lateral spacing therebetween to vary the width of the lines to be marked, said plates being slidable on the roadway in contact therewith to assure obtention of a fine edge for the road marking; and
gas supply devices connected with said sliding plates for supplying blowing gas for blowing the spray road marking indicia material away from said sliding plates and onto the roadway between said sliding plates and onto the marking lines.

4,053,109

WATER CONDUCTING AND EMITTING DEVICE

Gideon Gilead, 5 Nicaragua Street, Jerusalem, Israel
Filed Feb. 5, 1976, Ser. No. 655,487

Claims priority, application Israel, Feb. 25, 1975, 46706

Int. Cl.² B05B 15/00

U.S. Cl. 239-542

11 Claims



1. An irrigation device comprising:
an inner elongated continuous hollow hose element for conveying fluid through the interior thereof;
an outer elongated continuous hose element coaxial with and external of said inner hose element; and
a fluid conduit formed in the space between the outer surface of said inner hose element and the inner surface of said outer hose element, said conduit having a non-helical pattern in said irrigation device and extending in a generally longitudinal fashion, said conduit being formed by pressing undulations into the wall of one of said inner and outer hose elements thereby placing said hose walls in contact at various locations depending upon the pattern of said undulations;
said inner hose element wall having a plurality of openings therethrough spaced along the length of said irrigation device to provide fluid communication between the interior thereof and said conduit;
said outer hose element wall having a plurality of openings therethrough spaced along the length of said irrigation device to provide fluid communication from said conduit to the exterior of said irrigation device;
whereby fluid flow through said conduit is non-laminar and trickles or drips from said openings along the length of said outer hose element.

4,053,110

SHOCK PRESS

Samuel Schalkowsky, Chevy Chase, Md., and Louis L. Clipp, McLean, Va., assignors to Exotech, Incorporated, Gaithersburg, Md.

Filed Apr. 1, 1976, Ser. No. 672,713

Int. Cl.² B02C 19/18

U.S. Cl. 241-1

10 Claims

1. An instrument for applying controlled high pressures to a sample with little temperature rise in the sample comprising barrel means containing a bore, a free-moving piston arranged in said bore, said bore forming an acceleration path for said piston, sample holding means attached to one end of said barrel and having a sample holding bore adapted to contain said

sample aligned with said bore in the barrel and forming a part of the piston acceleration path such that said piston can strike the sample at one end of its travel along said acceleration path, nozzle means attached to said sample holding means and having a nozzle connected with said sample holding bore, end cap means spaced from the exit of said nozzle and forming a cham-



ber at the exit of said nozzle, means for accelerating said piston along said acceleration path to strike the sample and create a shock wave in said sample to force a portion of the sample through the nozzle as a high velocity jet into said chamber, and collecting means for collecting said portion of the sample in said chamber.

4,053,111

APPARATUS AND METHOD FOR PRODUCING DISTRIBUTED STATOR WINDINGS

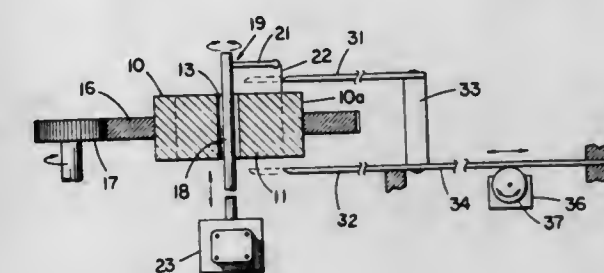
Robert J. Eminger, Fort Wayne, Ind., assignor to Windmatic Systems, Inc., Fort Wayne, Ind.

Filed Dec. 6, 1976, Ser. No. 747,885

Int. Cl.² B65H 81/06; H01F 7/06

U.S. Cl. 242-1.1 R

11 Claims



1. A stator winding apparatus for placing a winding of varying depth along the length of radially inwardly extending teeth or pole cores of a stator, the stator having a cylindrical configuration with radial teeth extending inwardly to define a central bore, said apparatus comprising a winding head actuated through said central bore and having a wire-dispensing member moved in a path sequentially parallel to and transverse to the axis of the stator bore and encircling the base of the stator tooth receiving the winding, winding turn distributing elements movably supported outboard of the stator adjacent the end faces thereof, said distributing elements being movable radially inward between said path of the wire-dispensing member and the stator tooth receiving the winding, and means for moving said distributing elements radially inward with respect to the stator in a series of reciprocating strokes of decreasing length as said head moves through its winding path to thereby distribute the windings in increasing depth toward the base of the tooth receiving the winding.

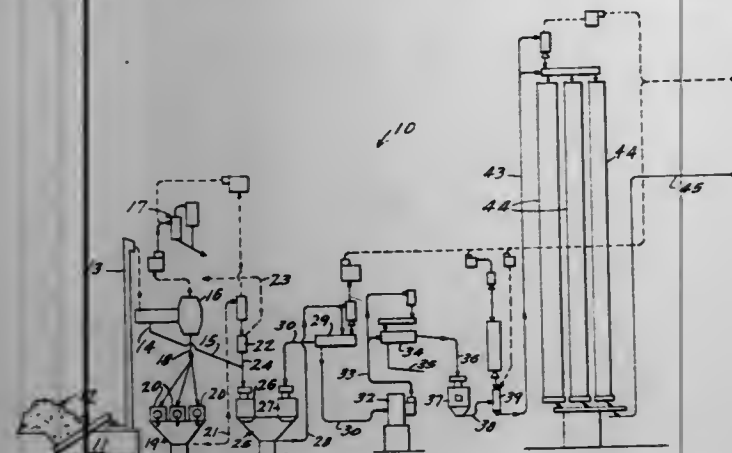
4,053,112

CORN COB PROCESSING APPARATUS AND METHOD
David I. B. Vander Hooven, Maumee; Jacobus Johan Van der Zwan, Holland; James L. Logston, Perrysburg, and Carl E. Pennington, Swanton, all of Ohio, assignors to The Andersons, Maumee, Ohio

Filed Dec. 13, 1973, Ser. No. 424,369
Int. Cl.² B02C 7/00, 17/02, 13/00; B02B 5/02

U.S. Cl. 241-24

12 Claims



1. Apparatus for processing shelled corn cobs comprising, in combination, first grader means for grading the shelled corn cobs and removing lighter components, first aspirating means in communication with said first grader means for removing husks from the corn cobs, crusher means communicating with said first aspirating means for reducing the size of the corn cobs to between $\frac{1}{4}$ inch and 3 inches in length, said crusher means comprising a revolving cylinder crusher, second aspirating means in communication with said crusher means for removing any remaining husks from the corn cobs, hammer mill means in communication with said second aspirating means for reducing the corn cobs into $\frac{1}{4}$ inch to $\frac{1}{2}$ inch pieces, second grader means in communication with said hammer mill means for grading said pieces to a first predetermined size, wherein pieces over such size are returned to said hammer mill means, cob drier means for receiving corn cob pieces under such first predetermined size and drying such pieces to a predetermined moisture content, third grader means for removing corn cob pieces under a second predetermined size, attrition mill means for receiving corn cob pieces over such second predetermined size and reducing such pieces to a third predetermined size, third aspirating means in communication with said attrition mill means for further removal of lighter components and dust from such pieces, shearing means in communication with said third aspirating means for reducing the size of such pieces to a fourth predetermined size, attrition mill means in communication with said shearing means for rounding the pieces to a granular shape, and fourth grader means for grading such pieces into final product sizes.

4,053,113

DRY GRINDING PROCESS FOR REDUCING ORE TO PELLETIZABLE PARTICLES

Friedrich Rosenstock; Walter Hastik, both of Frankfurt am Main, and Reinhold Becker, Bad Homburg, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 24, 1976, Ser. No. 726,486

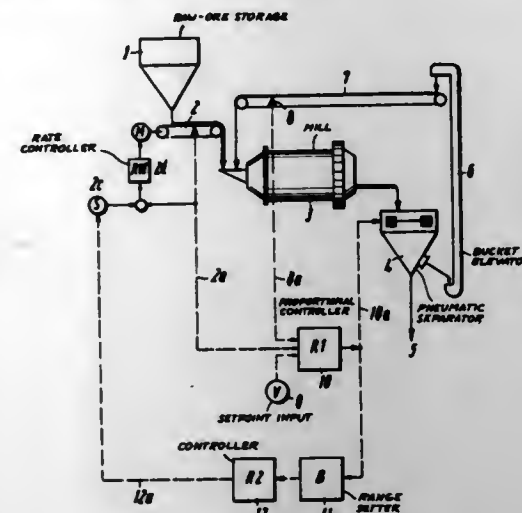
Claims priority, application Germany, Oct. 10, 1975, 2545424
Int. Cl.² B02C 23/12

U.S. Cl. 241-30

4 Claims

1. A process for dry grinding ore to produce pelletizable particles which comprises the steps of:
a. grinding ore in a size-reducing unit;
b. classifying the ground ore in a centrifugal pneumatic separator into a coarse fraction and a fine fraction, said centrifugal pneumatic separator having a controllable operating parameter;
c. recycling the coarse fraction into the size-reducing unit;

d. discharging the fine fraction as a finished product; and
e. maintaining a substantially constant total rate of ore feed and recycled coarse fraction feed to said size-reducing unit by maintaining the ratio of the ore-feed rate to the coarse fraction recycled rate substantially constant.



automatically controlling the centrifugal pneumatic separator to make said coarse fraction available with a varying particle size fraction at a substantially constant rate, and
varying the ore-feed rate when and only when, said controllable variable of the pneumatic separator has a deviation in excess of a predetermined permissible deviation.

4,053,114

METHOD AND APPARATUS FOR COUNTING YARN-SPICING OPERATIONS OF SPINDLES IN AUTOMATIC WINDING MACHINE

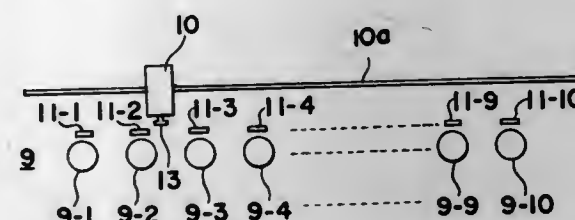
Takao Miyake, Neyagawa, and Katsue Koashi, Toyonaka, both of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

Filed Oct. 18, 1976, Ser. No. 733,190

Claims priority, application Japan, Oct. 20, 1975, 50-126592
Int. Cl.² B65H 63/00, 69/02, 69/04

U.S. Cl. 242-36

3 Claims



1. A method for counting yarn splicing operations for each of the spindles in an automatic winding machine provided with a plurality of winding spindles and an automatic knotting machine and in which relative motion of said spindles and said knotting machine causes the knotting machine and successive spindles to be adjacent each other for carrying out a yarn splicing operation when necessary, said method comprising generating a pulse signal each time the knotting machine and a spindle are adjacent each other during the relative motion of the knotting machine and the spindles, the pulse being of relatively short duration when said knotting machine is adjacent a spindle for a time insufficient to carry out a splicing operation and being of relatively long duration when said knotting machine is adjacent a spindle for a time sufficient to carry out a splicing operation, discriminating between said long and short duration pulses for each spindle, and counting the long duration pulses for each spindle as an indication of the occurrences of a splicing operation for that spindle.

4,053,115

FABRIC PROTECTING MEANS

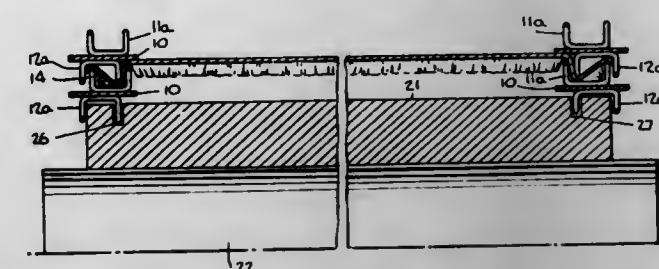
Herbert Schmitz, Kitchener, Canada, assignor to Uniroyal Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 506,081, Sept. 16, 1974, abandoned. This application Apr. 15, 1976, Ser. No. 677,201
Claims priority, application Canada, Aug. 15, 1974, 207103

Int. Cl.² B65H 75/02, 75/28

U.S. Cl. 242-77.1

30 Claims



1. A fabric protecting means for collecting, shipping and storing fabric, comprising an elongate, flexible carrier strip, upwardly disposed means integral with said carrier strip for gripping and engaging said fabric, and downwardly disposed means integral with said carrier strip for gripping and engaging said fabric, the height of each of said upwardly and downwardly disposed means being at least equal to the thickness of said fabric, and said carrier strip being sufficiently long and said upwardly and downwardly disposed means for gripping and engaging said fabric being closely spaced adjacent to each other such that said upwardly disposed means mechanically grips and engages said fabric with said downwardly disposed means upon being placed into contact with said fabric in a rolled, wrapped configuration in all successive wraps of said fabric.

4,053,116

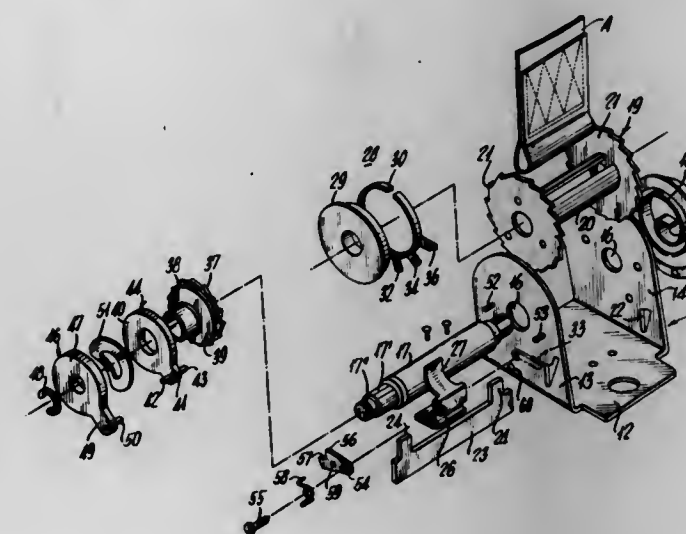
RETRACTION LOCKING SAFETY BELT RETRACTOR
Juichiro Takada, Tokyo, Japan, assignor to Takata Kogyo Co., Ltd., Tokyo, Japan

Filed May 21, 1976, Ser. No. 688,661

Int. Cl.² A62B 35/00; B65H 75/48

U.S. Cl. 242-107.7

6 Claims



1. A belt retractor device comprising a reel rotatable in opposite belt retraction and extraction directions, a belt coupled to said reel and windable thereon with the belt retraction rotation thereof, a ratchet wheel rotatable with said reel, a pawl member swingable between an advance position engaging said ratchet wheel and locking said reel against retraction rotation and a retracted position disengaging said ratchet wheel and having a lock shoulder and a cam edge, spring means biasing said pawl member toward its advance position, an actuator member rotatable through a restricted angle about the axis of said reel and slip drive coupled thereto, a follower element defining projection projecting transversely

from and eccentrically located on said actuator member and movable in engagement with said cam surface to retract said pawl member with the extraction rotation of said reel, a locking member rotatable through a restricted angle about the axis of said reel and drive coupled thereto, a locking element defining projection located eccentrically on and projecting transversely from said locking member and movable into registry with said pawl member shoulder with the retraction rotation of said reel and a release element defining projection eccentrically located on and projecting from said actuator member and movable into engagement with said locking member with the extraction rotation of said reel to retract said locking element from said pawl lock shoulder to permit the spring advance of said pawl into engagement with said ratchet wheel.

4,053,117

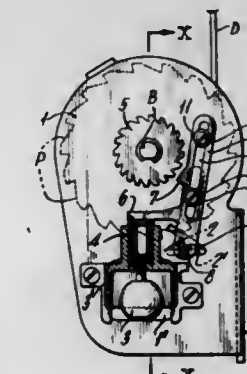
AUTOMATIC LOCKING SAFETY BELT RETRACTOR
Juichiro Takada, Tokyo, Japan, assignor to Takata Kogyo Co., Ltd., Tokyo, Japan

Filed May 13, 1976, Ser. No. 685,967

Claims priority, application Japan, May 17, 1975, 50-057929
Int. Cl.² A62B 35/02; B65H 75/48

U.S. Cl. 242-107.4 A

9 Claims



1. A safety belt retractor device comprising a belt take-up reel rotatable in opposite belt extraction and belt retraction directions and spring biased to rotate in a belt retraction direction, a first ratchet wheel coaxially rotatable with said reel, a first pawl member movable between a retracted position disengaging from said first ratchet wheel and an advanced position engaging said first ratchet wheel, a peripherally toothed drive wheel coaxially rotatable with said reel, an actuating member including a drive wheel engaging coupling element, means mounting said actuating member for sliding movement along a path proximate the periphery of said drive wheel between a retracted position with said coupling element out of engagement with said drive wheel, an intermediate position with said coupling element engaging said drive wheel and an advanced position, means for moving said first pawl to its advanced position with the movement of said actuating member toward its advanced position and means for moving said actuator member to its intermediate position in response to a predetermined acceleration of said retractor.

4,053,118

REVERSIBLE REEL UNIT

Warren A. Aikins, Longview, Wash., assignor to Swing-Shift Mfg. Co., Rainier, Oreg.

Filed May 21, 1976, Ser. No. 688,782

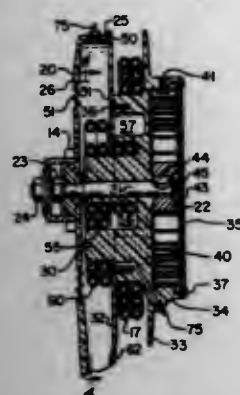
Int. Cl.² B65H 75/38, 75/48

U.S. Cl. 242-107.11

11 Claims

1. A reel unit for a flexible line such as a hose line or electric cord line, comprising a stationary housing having a closed side and an open side, a stationary shaft mounted at one end in said closed side of said housing and having an opposite and extending out of said open side, and a rotary member mounted for rotation on said shaft; said rotary member comprising a reel having a reel hub outside of said housing, a first radial reel flange on said hub adjacent said open side of said housing, and

a second radial reel flange on said hub spaced away from said housing; an axial circular flange outstanding from the outside surface of said second reel flange, said second reel flange and axial circular flange defining a spring housing, a flat spiral power spring in said spring housing having an inner end connected to said shaft and an outer end connected to said spring



housing; a counterwind hub extension on said reel hub extending into said stationary housing, and grooves in said hub and hub extension for leading said line from said hub extension to a winding surface on said hub; said stationary housing having a peripheral sealing lip in sliding engagement with said first radial reel flange to provide a sealed counterwind chamber for said line in said housing.

4,053,119

WINDING DEVICE PARTICULARLY USEFUL IN CONNECTION WITH VEHICLE SAFETY BELTS

Bernard J. Doin, Saint Medard en Jalles, and Jean-Francois Tillac, Bordeaux Cauderan, both of France, assignors to Societe Nationale des Poudres et Explosifs, France

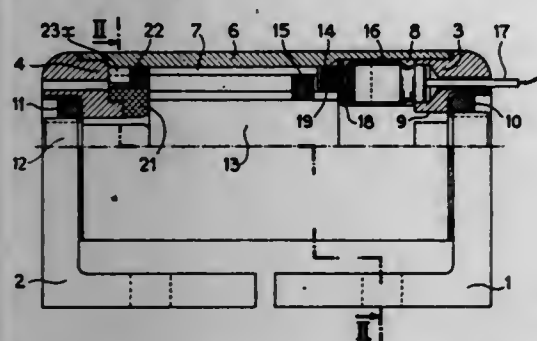
Filed Dec. 3, 1976, Ser. No. 747,402

Claims priority, application France, Dec. 31, 1975, 75,40206

Int. Cl.² B65H 75/48

U.S. Cl. 242—107.4 R

10 Claims



1. In a device for winding up an elongate flexible element, such as a vehicle safety belt, comprising a casing, an axle mounted in said casing and rotationally fast therewith, a hollow winding-drum rotatably mounted in said casing coaxial with and surrounding said axle, an annular piston positioned between said drum and axle and axially movable relative thereto between initial and final positions, an annular pressure chamber defined within said drum by said piston in said initial position thereof, a pyrotechnic charge for pressurizing said pressure chamber with combustion gases therefrom to propel said piston axially along said drum and axle from said initial position, to said final position, first cooperable guide means on said piston and said drum, and second cooperable guide means on said piston and said axle, said first and second guide means being so arranged that said piston is rotationally fast with one of said drum and axle, and is movable along a helicoidal path relative to the other of said drum and axle, whereby axial displacement of the piston by the combustion gases causes said drum to be rotated for winding said flexible element on to said drum, the improvement which comprises the annular piston being formed by two annular half-pistons, one of said half-pistons cooperating through said first guide means with the drum, the other of said half-pistons cooperating through said second

guide means with said shaft, and said half-pistons having means for interconnecting said half-pistons to move together.

4,053,120

WIRE REEL

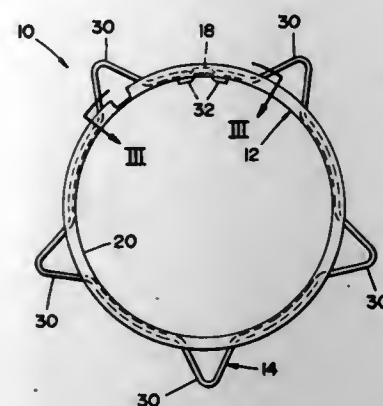
John G. Frantzreb, Sr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 16, 1976, Ser. No. 649,873

Int. Cl.² B65H 75/22

U.S. Cl. 242—115

4 Claims



1. A wire reel comprising: an elongated member including lock means unitarily formed at the ends thereof for coupling said ends of said elongated member one to the other to form an annular core, said elongated member having unitarily formed along each elongated side a U-shaped channel; first and second side pieces each removably received in the U-shaped channel with said elongated member formed in an annular core to form a reel therewith, each side piece defining a plurality of projections, extending radially outwardly from said elongated member while said elongated member is formed in an annular core; keeper means demountably affixed to said elongated member while formed in an annular core, said keeper means acting in cooperation with said side pieces for retaining said side pieces in a fixed relation relative said core.

4,053,121

TAPE GUIDING AND TENSION CONTROLLING CASSETTE ASSEMBLY

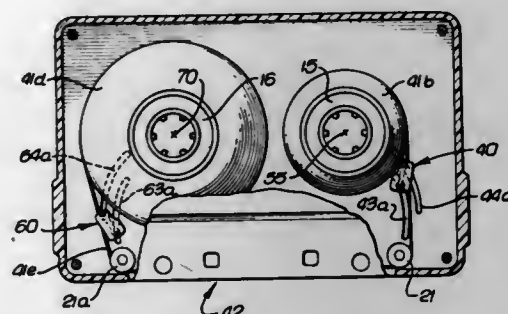
Happy H. Unfried, Long Beach, Calif., assignor to Audio Magnetics Corporation, Irvine, Calif.

Filed June 21, 1976, Ser. No. 698,282

Int. Cl.² G11B 23/10

U.S. Cl. 242—199

15 Claims



15. In a tape cassette assembly having a case and a first rotatable tape reel within the case, the reel having an axis of rotation and the tape adapted to form a pack on the reel, a. a first tape follower bodily movable within the case to guide the tape approaching the tape pack on the reel, b. a non-rotatable tape director carried by the case to turn the tape and direct it toward the follower, and c. guide means including a pair of arcuate guide tracks carried by the case to interfit the follower, and along which the follower is movable to bodily rotate in response to such movement,

d. the case having opposite side walls, and said pair of tracks located on one of said walls.

4,053,122

FLAPPING WING AIRCRAFT

Konrad Gar, Haus Nr. 30, 8078 Nettelhofen, Germany

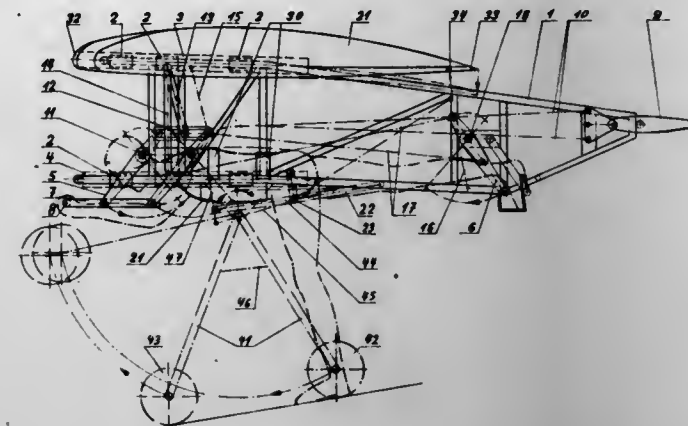
Filed Jan. 22, 1976, Ser. No. 651,528

Claims priority, application Germany, Jan. 27, 1975, 2503177

Int. Cl.² B64C 33/02

U.S. Cl. 244—11

15 Claims



1. A flapping wing aircraft comprising an aircraft fuselage, two superposed pairs of flapping wings extending laterally from substantially in flight direction orientated bearing spars and a lever system for actuating the wings in opposite respective directions and comprising means for locking the wings in a horizontal volplane position, the lever system further comprises two mutually independent toggle lever systems for the mutually independent actuation of the wings on the right-hand and left-hand sides respectively, the wings being at least partially elastic and of a broad shape.

4,053,123

METHOD AND APPARATUS TO DETERMINE NEED FOR ROTOR BLADE PITCH ADJUSTMENT AND/OR BLADE SUBSTITUTION

James R. Chadwick, Bradbury, Calif., assignor to Chadwick-Helmuth Company, Inc., Monrovia, Calif.

Filed Apr. 16, 1976, Ser. No. 677,561

Int. Cl.² B64C 27/72; G01M 1/22

U.S. Cl. 244—17.11

9 Claims

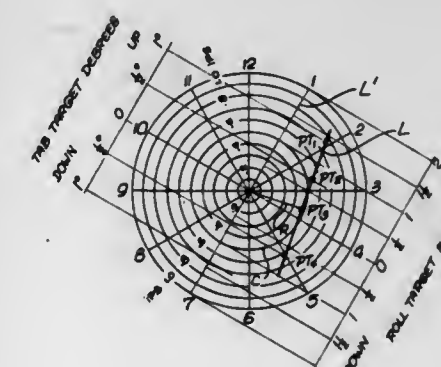
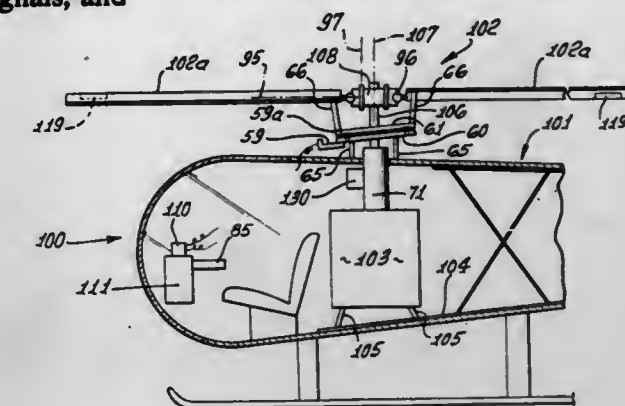
1. In the method of testing a bladed rotor having multiple blades defining an axis of rotation, said rotor comprising a helicopter lift rotor and wherein helicopter structure associated with the rotor is subject to vibratory motion due to an out-of-track condition of the rotor blades, the method employing vibration pick-up means, the steps that include

- mounting the pick-up means on the helicopter structure with longitudinal spacing from the lift rotor,
- rotating the rotor and operating the pick-up means to produce first vibratory signals corresponding to vibratory motion of the structure generally parallel to said axis, said first signals having an associated amplitude and clock angle about said axis,
- adjusting the effective pitch of at least one of said blades in an effort to reduce the amplitude of said vibratory signals and maintaining the adjustment constant as the rotor rotates, and
- repeating at least said (b) step to produce second vibratory signals corresponding to vibratory motion of the structure generally parallel to said axis, said second signals having an associated amplitude and clock angle about said axis, and
- determining from said first and second signals amplitudes and from said clock angles a minimum or near minimum value for said vibratory signal amplitude, and which is less than each of said first and second signal amplitudes, and
- substituting a new blade or blades for at least one of said rotor blades if said minimum or near minimum value is

unacceptably large, thereby to reduce said out-of-track condition of the rotor blades.

9. In the method of testing a bladed rotor having multiple blades defining an axis of rotation, and wherein structure associated with the rotor is subject to vibratory motion due to an out-of-track condition of the rotor blades, the method employing vibration pick-up means, carried by said structure, the steps including

- rotating the rotor and operating the pick-up means to produce first vibratory signals corresponding to vibratory motion of the structure generally parallel to said axis,
- adjusting the effective pitch of at least one of said blades in an effort to reduce the amplitude of said vibratory signals, and



- repeating said (a) and (b) steps in an effort to further reduce the amplitude of said vibratory signals, said repetition being carried out to determine a minimum or near minimum value for said vibratory signal amplitude,
- said rotor comprising a helicopter main lift rotor, and said pitch adjustment being effected by adjusting (i) the effective length of at least one pitch link connected to at least one blade, or (ii) the angularity of at least one trim tab associated with at least one blade, the selection of (i) or (ii) being determined by stroboscopically observing, for increasing forward speeds of the helicopter, the rate of rise of a cross bar target on the underside of a blade sweeping forwardly at one side of the rotor, adjustment (i) being indicated when the cross bar rises relative to a vertical bar target to another blade.

4,053,124

VARIABLE CAMBER AIRFOIL

James B. Cole, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 607,004, Aug. 22, 1975, Pat. No. 3,994,452, which is a division of Ser. No. 455,837, March 28, 1974, Pat. No. 3,994,451. This application July 26, 1976, Ser. No. 708,671

Int. Cl.² B64C 3/48

U.S. Cl. 244—219

16 Claims

10. A variable camber apparatus for the trailing edge portion of an airfoil, comprising: a trailing edge structure; an aerodynamically continuous upper surface having an inner-end connected to relatively rigid structure of the airfoil and an outer-

end fixedly connected to the trailing edge structure; a rib member pivotally mounted about its inner-end to an axis fixed with respect to rigid structure of the airfoil; linkage means interconnecting the trailing edge structure with the rib member such that the rib member supports the outer-end of the upper surface independently of the structural continuity of said



upper surface; actuating means for rotating the rib member about its inner end pivotal support; and means for slaving the movement of the linkage means to the rotational movement of the rib member for torsionally rotating the trailing edge structure about a relatively spanwise axis, to flexuously bend and produce an external curvilinear contour thereto.

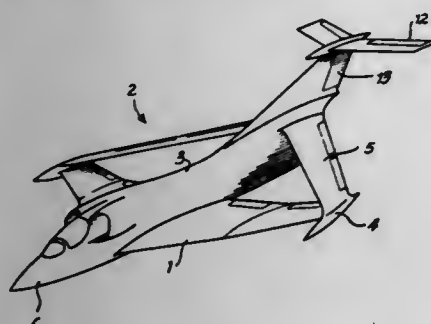
4,053,125

STAGGERED CHANNEL WING-TYPE AIRCRAFT

Alexander Ratony, 3264 Royal Ave., Simi Valley, Calif. 93065
Continuation-in-part of Ser. No. 393,220, Aug. 30, 1973, Pat. No. 3,981,460. This application July 6, 1976, Ser. No. 702,740
Int. Cl.² B64C 3/06, 3/40

U.S. Cl. 244-46

10 Claims



1. A staggered channel wing-type aircraft comprising: a fuselage with a nose, a passenger section, and an aft section;
- a propulsion means coupled to said fuselage;
- a pair of substantially horizontal forward wings having leading and trailing edges, said forward wings and said leading and trailing edges, thereof being swept backward from said fuselage;
- a pair of sloping rearward wings having leading and trailing edges, each of said rearward wings being attached to its tip to a corresponding tip of said forward wings, said rearward wings and said leading and trailing edges thereof being swept slopingly backward to join said fuselage, each of said rearward wings, forward wings, and fuselage forming a substantially triangular-like configuration, said trailing edge of said forward wing being spaced apart forward of said leading edge of said rearward wing, except adjacent their tips;
- a tail extending vertically from said aft section; and control surfaces on said tail and on said pair of substantially horizontal forward wings.

4,053,126
HELICOPTER CABIN AND METHOD OF MAKING SAME

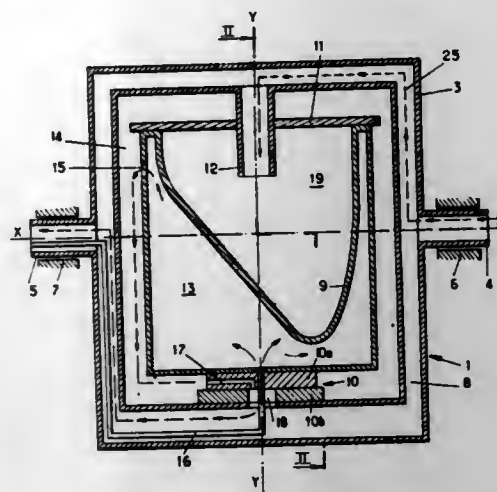
Maurice Louis Duret, Aix-en-Provence, and Pierre Barnoin, Egulles, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Nov. 19, 1975, Ser. No. 633,439

Claims priority, application France, Nov. 26, 1974, 74.38661
Int. Cl.² B64C 1/00; B29D 3/00; B29C 5/04

U.S. Cl. 244-119

9 Claims



1. A method for making a helicopter cabin, in the form of a thin-walled hollow structure, with apertures corresponding to doors and a canopy, and having an internal floor incorporated into the structure, which comprises forming frames composed of elongated metal elements corresponding respectively to the frames of the doors and canopy and to a junction line between said floor and said structure, said frames being made of U-shaped, open channels; positioning said frames within a rotatable mold with said frames adjacent the wall thereof, disposing open sides of said U-shaped open channels toward molding surfaces of said mold; introducing a molding material into said mold, and heating and rotating said mold to cause said material to form a relatively thin shell following the contours of said mold, interconnecting said frames, and embedding at least portions of said channels in said molding material adjacent said open ends along substantially the entire length of said shell and closing said open ends of said channels with said material.

4,053,127

APPARATUS FOR INDICATING RATE OF ICE ACCRETION

Geoffrey Edgington, Godalming, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 9, 1976, Ser. No. 740,180

Claims priority, application United Kingdom, Nov. 19, 1975, 47592/75

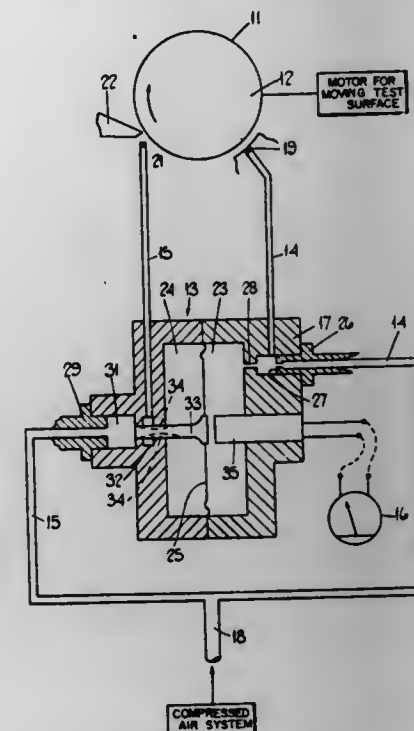
Int. Cl.² G01B 13/04

U.S. Cl. 244-134 F

5 Claims

1. Apparatus for indicating rate of ice accretion on a surface, comprising a hollow housing, a resilient diaphragm dividing the housing internally into first and second chambers, a first conduit communicating at one end in use with a gas supply and terminating at its other end in a first orifice, a first restrictor intermediate the ends of the first conduit, and said first chamber communicating with said first conduit intermediate the first orifice and the first restrictor, a test surface upon which ice can form in use, means for moving the test surface past the first orifice at a known speed and at a constant spacing therefrom, a second conduit communicating at one end in use with said gas supply and terminating at its other end in a second orifice, a second restrictor intermediate the ends of the second conduit, the second restrictor being a variable restrictor the setting of which is determined by the position of the diaphragm relative to the housing, said second chamber communicating with said second conduit intermediate said second restrictor and said

second orifice, and, means for supplying a signal representative of the position of the diaphragm relative to the housing to an indicator, said second restrictor being arranged to effect a decrease in restriction in said second conduit as the diaphragm moves in a direction to reduce the volume of the second chamber, whereby when there is no ice on said test surface the diaphragm assumes a rest position from which it is moved in a direction to reduce the volume of the second chamber when



the first orifice is restricted by ice forming on the test surface, the movement of the diaphragm reducing the restriction imparted in the second conduit by the second restrictor and so increasing the pressure in the second chamber so as to establish a new equilibrium position of the diaphragm, the change in position of the diaphragm being shown by the indicator on the test surface so that the indicator can be considered as indicating rate of ice accretion.

4,053,128

JOINTLESS HIGH FREQUENCY TRACK CIRCUIT SYSTEMS FOR RAILROADS

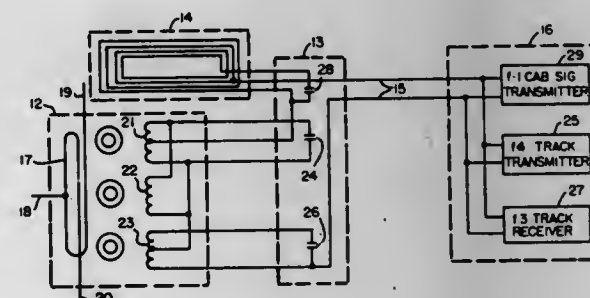
Klaus H. Frielinghaus, and Clinton S. Wilcox, both of Rochester, N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Dec. 6, 1976, Ser. No. 748,024

Int. Cl.² B61L 23/22

U.S. Cl. 246-34 R

2 Claims



1. A jointless high frequency track circuit system, for communication of signals through track rails of a stretch of railway track, having a high frequency track circuit transmitter and receiver and a cab signal transmitter coupled across the track rails at each of several locations marking the ends of track sections along a stretch of railway track wherein improved means for coupling the transmitters and receiver to the track rails at one location comprises;

a. impedance bond means having a low resistance primary

- winding shunting the track rails and providing a propulsion current return connection at its midpoint,
- b. the impedance bond means having a plurality of toroid coil means inductively coupled to the primary winding for coupling a distinctive frequency transmitter and a distinctive frequency receiver to the track rails,
 - c. tuning means for tuning each of the toroid coil means to substantially parallel resonance for maximum impedance across the track rails,
 - d. loop circuit means disposed between the track rails and inductively coupled thereto along a portion extending near the impedance bond means but not inductively coupled thereto for coupling the cab signal transmitter at a distinctive frequency to the track rails,
 - e. an apparatus housing at a remote point relative to the bond means, loop means, and tuning means for housing the track circuit code transmitter, the receiver and the cab signal transmitter of at least said one location, and
 - f. circuit means including a line circuit having only two line wires for connecting the track circuit code transmitter and receiver and the cab signal transmitter for said one location to one end of the line circuit in multiple, the other end of the line circuit being connected to the toroid windings and the loop circuit means in series.

4,053,129

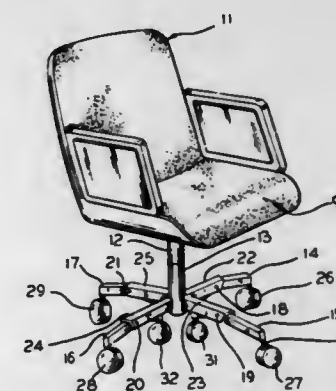
GLIDING CHAIR SYSTEM

Vernon D. Graff, P.O. Box 1410, Edmond, Okla. 73034
Filed Nov. 29, 1976, Ser. No. 745,616

Int. Cl.² F16M 11/20

U.S. Cl. 248-188.7

13 Claims



1. An improved gliding chair system comprising: elevated sitting means for receiving a user's body; chair support means attached to and cooperating with the lower end of said sitting means for providing support and means for mobility to said gliding chair system, said chair support means comprising a plurality of extended leg members, said chair support means further comprising one or more double-action lever means rotatably connected for movement in a vertical plane at a fulcrum point located a desired distance along one or more of said plurality of extended leg members respectively, each of said lever means maintained in a fixed protruding position relative to said leg member so as to be in substantial alignment with said respective leg member whereby rotative movement of said lever means relative to said respective leg member in a substantially horizontal plane is precluded, each of said one or more double-action lever means having outer gliding means attached by glide attachment means proximate to a first end of said lever means and inner gliding means cooperating with a second end of said lever means, and each of said one or more double-action lever means rotating about said fulcrum connection in said extended leg member so as to distribute the weight of said user's body and said chair system through both said inner and outer gliding means, thereby reducing the force exerted by said user

and chair at any one point on a surface and facilitating the gliding of said chair over said surface.

4,053,130

ATTACHMENT ARRANGEMENT FOR ELECTRONIC APPARATUS TO A SUPPORT WALL

Udo Birkner, Heide, Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Germany

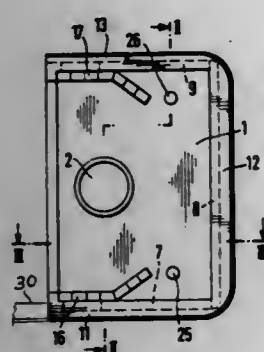
Filed July 6, 1976, Ser. No. 702,985

Claims priority, application Germany, July 5, 1976, 2530199

Int. Cl.² H01R 13/60, 9/16

U.S. Cl. 244—27.3

12 Claims



1. Attachment arrangement for electronic apparatus (4) to a support wall (10) in which the support wall is formed with an opening to introduce the apparatus therethrough, wherein the electronic apparatus (4) is formed with cylindrical threaded sleeves (3), comprising a fitting element determining the position of the apparatus (4) in the opening and supporting the apparatus having a front wall (1) formed with an opening (2) therein; means (4, 5, 6) secured to the front wall (1) locating and supporting the apparatus on the fitting element; wall portions (7, 8, 9) extending from the front wall in the direction away from the apparatus when located in position said wall portions being formed with turned-over edges (11, 12, 13) adapted to fit over the edges of the opening in the support wall (10); means clamping said fitting element including at least one tapered holding element formed on the wall (1) of the fitting element having a tapered or inclined surface extending at an inclination with respect to the major plane of the front wall; and movable housing means (20, 21) secured to the front wall (10) and having a length to extend beyond the edges (14) of the opening in the support wall and engageable with said tapered, inclined surface of the tapered holding element (16, 17), the holding means being movable within the outline of the opening to permit insertion of the fitting element and the electronic apparatus secured thereto into the opening of the support wall and then move said holding means in engagement with the rear surface of the support wall (10) and engage said holding means against the inclined surface of the tapered holding element (16, 17) to secure the fitting element against the front surface of the support wall (10) by engagement of said turned over edges (11, 12, 13) and engagement of the holding means (20, 21) against the rear surface of the support wall, the holding means being positioned by the inclination or taper of the respective tapered holding element, said holding means comprising wire-shaped elements having an eye at one end thereof, and the holding elements being secured to the fitting element such that the axes of the eye, and of the threaded sleeve (3) are coincident and the threaded sleeve axis forms a rotating axis for the holding element.

4,053,131

PAINT CAN HOLDER

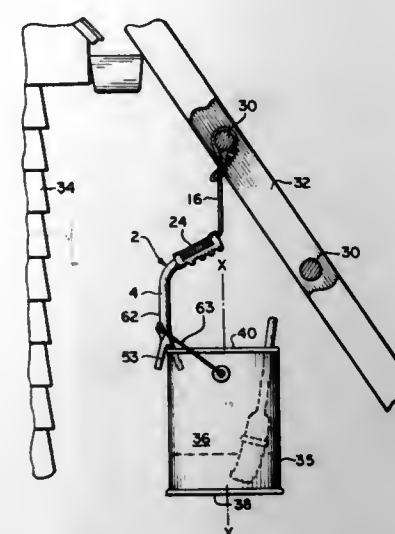
James R. Francis, 8450 W. 95th St., Hickory Hills, Ill. 60457

Filed Mar. 29, 1976, Ser. No. 671,313

Int. Cl.² E06C 7/14

U.S. Cl. 248—211

12 Claims



1. A quick-attach and detach hanger for a paint container and the like having a lip defining an open top and having a carrying bail, said hanger comprising a member having an upright with an intumed handle at its upper end for positioning above the container and having a furcated lower end including inner and outer portions for receiving the lip of the can therein and having means on the furcations for interlocking with the inner and outer edges of the lip, and fulcrum means on the upright intermediate its ends for engagement with the bail, said handle upon application of a lifting force thereto operative to fulcrum said hanger about said fulcrum means and loading said bail in tension and biasing said outer portion of the furcation toward said outer edge of the lip for locking engagement therewith.

4,053,132

SHELF SUPPORT

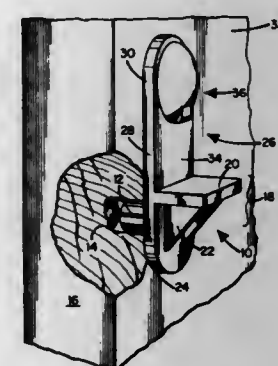
James Anthony Del Pozzo, 155 Colonel Bell Drive, Brockton, Mass. 02403

Filed Aug. 5, 1976, Ser. No. 711,773

Int. Cl.² A47B 96/06

U.S. Cl. 248—235

12 Claims



1. A shelf support device for supporting a shelf on a cabinet wall, the device comprising: a support portion having a surface for receiving a shelf edge portion; an upright portion including a first surface for engagement with a cabinet wall, a second surface opposite said first surface, and a shelf retainer comprising a generally smoothly curved deformable web of resilient material that projects from said second surface at a location spaced apart from said support portion; and means for mounting the device on a cabinet wall.

4,053,133

PORTABLE WRITING MEANS

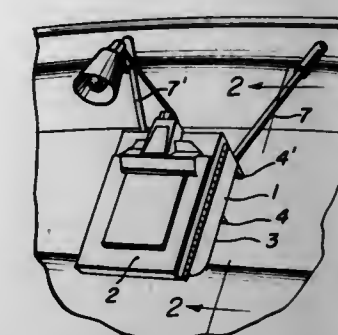
Robert Carl Kauffman, 342 Windemere Ave., Lansdowne, Pa. 19050

Filed May 21, 1976, Ser. No. 688,766

Int. Cl.² A47B 3/10

U.S. Cl. 248—452

1 Claim



1. A portable writing device consisting of a box like member having a removable writing member, two parallel spaced members attached in spaced position and carried upon the back of the main member and having ovate openings in the upstanding portion thereof, and two elongated leg members round in cross section received in the ovate openings and provided with a pair of ring shaped elastomeric elements adapted to functionally engage the leg members and about the ovate opening thereby forming an adjusting means whereby the device can be used in motor cars by using the front seat and instrument panel as supports.

4,053,134

PIPE MOLD HAVING INSERT SUPPORT MEANS

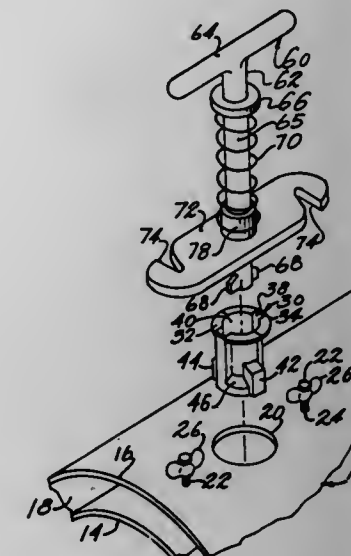
Bobbie D. Peacock, 702 Hippocket Road, Peachtree City, Ga. 30269

Continuation of Ser. No. 530,983, Dec. 9, 1974, abandoned. This application June 14, 1976, Ser. No. 695,914

Int. Cl.² B28B 23/00

U.S. Cl. 249—94

13 Claims



1. In an apparatus for providing lifting insert cavities in molded concrete pipe made from concrete which is poured into a pipe mold comprising rigid, inner and outer spaced shells and prior to the curing of the concrete poured therein: an inner shell and an outer shell fixed in spaced relation to each other to provide a mold in which poured concrete is placed in the space between said inner and outer shells to cure and form a rigid concrete pipe, said outer shell having at least one thru opening therein leading into the space between said inner and outer shells and receiving a cavity forming insert therethrough the cavity forming insert construction from plastic or a similar material comprising an insert body of a size smaller than the opening in the outer shell whereby said cavity forming insert is inserted thru said opening from outside after said inner and outer shells are assembled to support said insert on said outer

shell and in alignment with the opening therein, said cavity forming insert having an opening in the top thereof which when in position is exposed thru the opening in said outer shell and said insert opening leading into the interior and to a closed bottom in said insert, a retaining means detachably attached to said outer shell, means on said outer shell removably attaching said retaining means to said outer shell, means on said retaining means for positioning same in said insert body prior to insertion in said opening in said outer shell for a temporary but firm engagement therewith to attach same thereto for subsequent removal therefrom after the concrete pipe is cured, and to hold same in position between said inner and outer shells whereby said insert remains inside said concrete to receive a lifting insert therein.

4,053,135

HOSE CLAMP

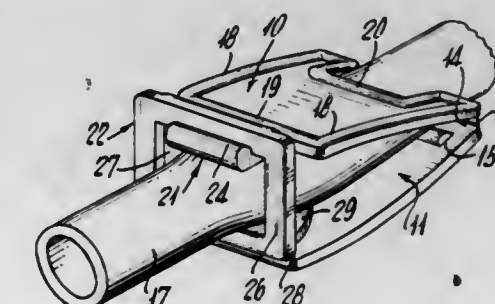
George P. Saliaris, Worthing, Ohio, assignor to Sigma Scientific Development, Inc., Columbus, Ohio

Filed Sept. 20, 1976, Ser. No. 724,755

Int. Cl.² F16K 7/06

U.S. Cl. 251—10

10 Claims



1. A unitary single-piece hose clamp of relatively stiffly compliant material, comprising first and second panels centrally interconnected at a locally relatively weak transverse hinge-axis region, said panels having a hose-admitting opening at their respective transversely central regions; one of said panels having at its opposite end an outwardly projecting auxiliary panel with a locking aperture framed by the outer confines of said auxiliary panel, said one panel being connected to said auxiliary panel at a second locally relatively weak transverse hinge-axis region, and said auxiliary panel aperture being of hose-admitting proportions, an integral bracket member relatively rigidly united to said auxiliary panel adjacent said auxiliary panel hinge-axis region and extending normal to the general plane of said framed aperture; the other of said panels having at its opposite end an outwardly projecting locking tab of width enterable in said locking aperture and relatively rigidly united to said other panel, said tab extending from said central hinge-axis region a distance greater than the distance of the near side of said locking aperture and less than the distance of the remote side of said locking aperture, said last two distances being taken from said central hinge-axis region when said frame is relatively flat with respect to said other panel; whereby a flexible hose inserted through said opening and aperture and arched over said bracket will by the nature of its stiffness tend to upwardly bend said auxiliary panel about the second hinge axis to a moderately elevated position; and whereby upon flexing said panels about the central hinge axis, the confines of the central opening will compress the hose with substantial mechanical advantage as said locking tab approaches the locking aperture; and further whereby upon subsequent hose-compressing pressure applied by squeezing together the locking ends of said panel, the hose will bear against said bracket to further angularly elevate said locking panel into resiliently loaded end abutment with said locking tab until said locking tab clears the adjacent edge of the locking aperture to permit the final resiliently loaded angular displacement of said auxiliary panel into locked retaining engagement with said tab.

4,053,136

CONTROL CIRCUIT AND ADJUSTABLE VALVE FOR A GAS APPLIANCE

Richard L. Part, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

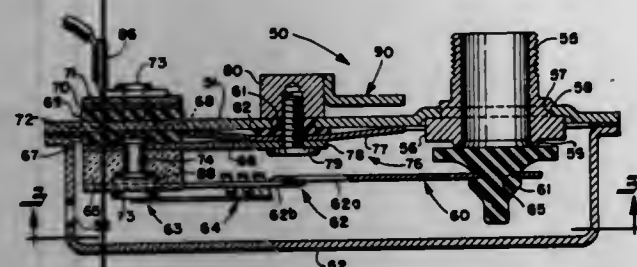
Division of Ser. No. 583,985, June 5, 1975, Pat. No. 3,981,674.

This application Jan. 29, 1976, Ser. No. 653,478

Int. Cl.² F16K 31/04

U.S. Cl. 251-11

22 Claims



1. A fluid valve, comprising a fluid-tight housing having an inlet and an outlet, a valve element in said housing movable between respective positions to open and to close said outlet, a valve actuator normally maintaining said valve element in one of said positions and energizable to move said valve element to the other of said positions, mounting structure extending through an opening in said housing, said mounting structure including resilient seal means providing for limited pivotal movement of said mounting structure within such opening, said valve actuator being supported by said mounting structure for pivotal movement therewith, and adjustment means operable exteriorly of said housing for effecting such pivotal movement of said mounting structure and valve actuator supported thereby.

4,053,137

ELECTROMECHANICALLY OPERATED VALVE

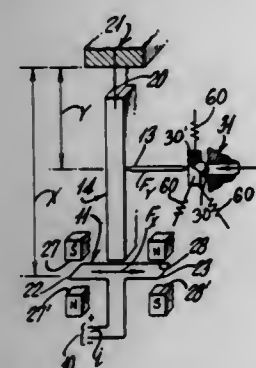
Robert E. Raymond, Zanesville, Ohio, assignor to De Laval Turbine Inc., Princeton, N.J.

Filed Jan. 16, 1976, Ser. No. 649,657

Int. Cl.² F16K 31/08, 31/10

U.S. Cl. 251-65

13 Claims



1. Electromechanically operated valve structure, comprising a valve body having a passage for pressure fluid flow, a movable ball-poppet valve member for controlling said flow, a valve-member suspension comprising at least three like radially extending coil springs angularly spaced about the axis of valve-member movement, the inner ends of said springs being connected to said valve member and the outer ends of said springs being fixed, and actuating means for said valve member; said actuating means comprising magnetic-core means establishing two spaced substantially parallel gaps which are directionally polarized in opposite directions, an electrically conductive coil having a course defining two substantially parallel legs that are spaced substantially in accordance with the spacing of said gaps, means including a compliantly suspended beam movably mounting and orienting said coil with respect to said core means such that each of said legs is positioned with clearance within and substantially parallel to a different one of said gaps, said mounting means constraining

and guiding said coil for movement which is substantially in the plane of said legs and normal to the orientation of said legs, said valve member being so connected to said mounting means that said flow is controlled in response to excitation of said coil.

4,053,138

METHOD OF LIFTING OR LOWERING AN OBJECT BY MEANS OF A PLURALITY OF SO-CALLED CLIMBING JACKS

Arne J. Mattson, Vasteras, Sweden, assignor to Paul Anderson Industrier AB, Vasteras, Sweden

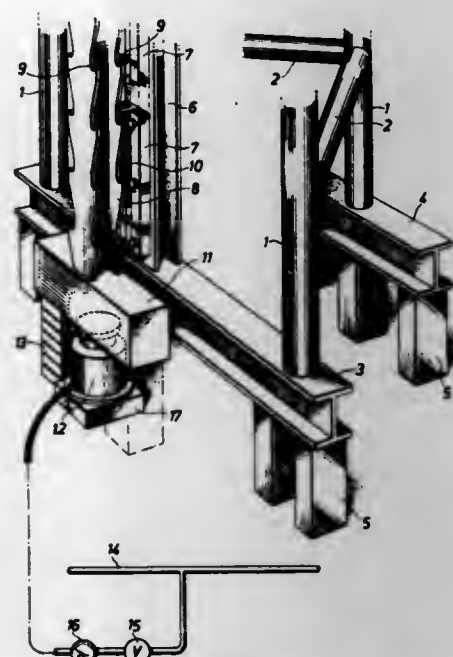
Filed May 24, 1976, Ser. No. 689,630

Claims priority, application Sweden, May 29, 1975, 7506170

Int. Cl.² B66F 1/00

U.S. Cl. 254-105

3 Claims



1. A method of lifting or lowering an object on a mast structure by means of a plurality of climbing jacks capable of climbing each along a climb rod, comprising the steps of: mounting the rods to the mast on associated support structures to allow relative movement between the rod and the mast, arranging each rod on a jack associated with each rod, each jack separated from each other from a load point of view, and adjusting the height position of the climb rods in relation to each other by means of a respective associated jack in order to minimize the stresses in the object caused by the lifting operation.

4,053,139

BOOM POINT SHEAVE ASSEMBLY

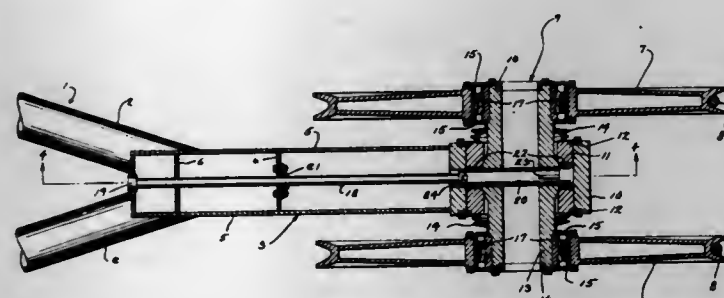
M. J. Lovass, Crystal Lake, Ill., and Roger J. Voeks, South Milwaukee, Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed May 21, 1975, Ser. No. 579,649

Int. Cl.² B66D 1/36

U.S. Cl. 254-190 R

4 Claims



1. In a boom point sheave assembly for the outer end of a material handling boom, the combination comprising: a bearing seat mounted directly to the end of the boom and

having an opening running crosswise to the boom length in a generally horizontal direction; a sheave shaft extending through said opening with a central curved bearing surface rockably received within said bearing seat, and having opposite ends extending sideward from the central bearing surface to overhang from the sides of the boom; and a pair of hoist sheaves each rotatably mounted directly on an end of said sheave shaft and disposed on said sheave shaft outboard of the boom, said sheaves tilting sidewise in unison with a rocking motion of said shaft to reduce torsional stress on the boom during hoist rope offload.

4,053,140

FIBER REINFORCED PLASTIC HANDRAIL SYSTEM

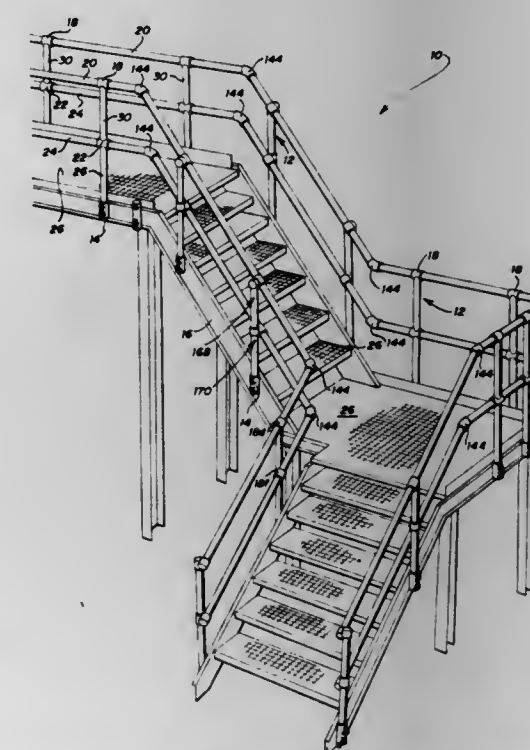
Donald L. Clemens, 1826 Willow Road, Carrollton, Tex. 75006, and Steven A. Edmiston, 14215 Tanglewood Drive, Dallas, Tex. 75234

Filed Apr. 29, 1976, Ser. No. 681,696

Int. Cl.² E04H 17/00

U.S. Cl. 256-19

20 Claims



1. An improved fiber reinforced plastic handrail system comprising:

- a fiber reinforced, hollow, plastic post members;
- base mount means for securely affixing each of said post members at its lower end portion to a super structure element of a structure utilizing said handrail system, said base mount means securing each of said post members in a substantially upright, parallel position;
- fiber reinforced plastic end joint fitting means formed of two halves said end joint fitting means having a collar means at one end thereof defining a passageway therein for receiving a handrail member and leg means at the other end thereof for connecting said fitting means to said post member;
- a fiber reinforced, hollow, handrail member connected to said collar means of said end joint fitting means to interconnect a plurality of said post members, said handrail being securely affixed in each of said collar means by an adhesive;
- fiber reinforced plastic inner joint fitting means formed of two halves, said inner joint fitting means having a collar means defining a passageway therethrough for connecting same to said post members at a position intermediate the ends of said posts, said inner joint fitting means further being provided with a pair of leg means extending outwardly in opposite directions from said collar means so as to have a common axis which is substantially perpendicular to the axis of the passageway of said collar means; and,
- fiber reinforced hollow midrail members, one end portion

of one of said midrail members being secured to one of said leg means of said inner joint fitting means and the other end of said midrail member being secured to a leg means of an inner joint fitting means positioned on an adjacent post member, said midrail member being secured to said leg means by an adhesive.

4,053,141

STATIC MIXER FOR FLOWING MEDIA

Horst Gassefeld, Uttenreuth, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

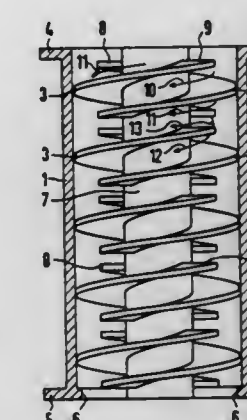
Filed July 17, 1975, Ser. No. 596,838

Claims priority, application Germany, Aug. 2, 1974, 2437359

Int. Cl.² B01F 5/24

U.S. Cl. 366-339

5 Claims



1. A static mixer for use with flowing media comprising: a tubular enclosure; and a number of guide surfaces arranged within said enclosure, said guide surfaces being in the form of multiple-thread screw surfaces which overlap each other, have the same sense of rotation, and are concentric with the axis of and extend up to said enclosure, said multiple-thread screw surfaces also being alternately interrupted so that an interruption in each one of said surfaces is followed in the axial direction by an uninterrupted portion of another of said surfaces, whereby mixing takes place through recycling the media being mixed while direct flow through said mixer is prevented.

4,053,142

NONMECHANICAL SHEARING MIXER

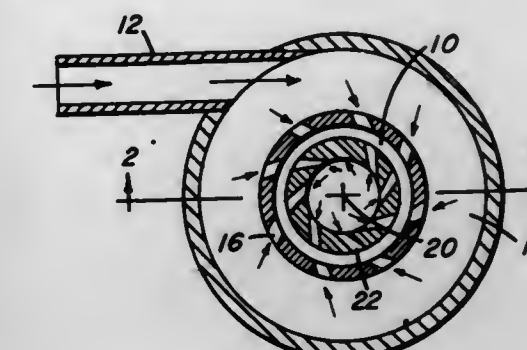
Walter Johannes, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 11, 1976, Ser. No. 695,272

Int. Cl.² B01F 15/02

U.S. Cl. 366-165

3 Claims



1. Apparatus for mixing first and second fluid components, said apparatus comprising:

- means defining an outer chamber into which the first fluid is supplied under pressure;
- means defining an inner chamber into which the second fluid is supplied under pressure;
- means defining an annular mixing chamber interposed

between said inner and outer chambers, said annular mixing chamber having a first and second series of ports therein to said outer and inner chambers respectively, said first series of ports so oriented that the first fluid flowing therethrough from said outer chamber to said annular mixing chamber assumes a generally rotational fluid flow pattern in said annular mixing chamber, said second series of ports so oriented that the second fluid flowing therethrough from said inner chamber to said annular mixing chamber assumes a generally rotational fluid flow pattern in said annular mixing chamber but in a direction generally opposite that of said first fluid rotational fluid flow pattern; and

d. means for discharging fluid from said annular mixing chamber.

4,053,143

SCREW FOR USE IN AN EXTRUDER

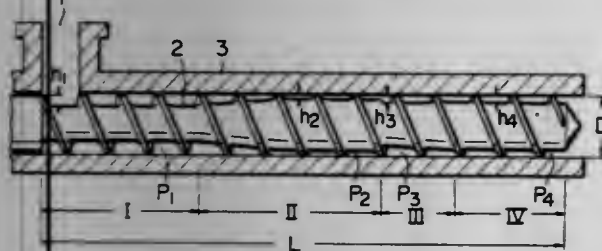
Akira Hosokawa, Otsu; Yukifusa Miyazaki, Kusatsu; Yoshio Yada, Otsu; Yasuo Kitamura, Otsu, and Masashi Takeda, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Sept. 3, 1975, Ser. No. 610,077

Claims priority, application Japan, Nov. 14, 1974, 49-130475
Int. Cl.² B30B 11/24

U.S. Cl. 366-89

1 Claim



1. A screw for use in a non-vent type extruder and having a diameter D, comprising: a feed section having a channel depth h_1 at a rear end thereof; a melting section subsequent to said feed section, having a channel depth gradually decreasing along a forward direction from said value h_1 to a value h_2 ; a decompression section subsequent to said melting section, having a channel depth increasing from said value h_2 to a value h_3 and gradually decreasing to a value h_4 ; and a metering section subsequent to said decompression section, where the channel depth has a constant value of h_4 ; where $h_1 > h_3 > h_4 > h_2$;

$$\frac{h_3}{h_2} \frac{(D - h_3)}{(D - h_2)} > 0.5 \frac{h_1}{h_2} \frac{(D - h_1)}{(D - h_2)}$$

and where $1.5 > (h_3/h_2) > 1.15$.

4,053,144

DELTA ROTOR THROUGH FEED MIXER

Henry Ellwood, Rochdale, England, assignor to USM Corporation, Boston, Mass.

Filed May 27, 1976, Ser. No. 690,730

Claims priority, application United Kingdom, May 29, 1975, 23408/75; Apr. 22, 1976, 16292/76

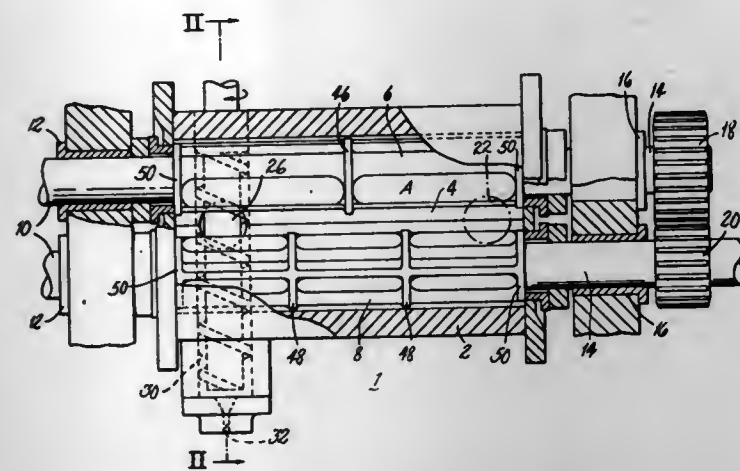
Int. Cl.² B29B 1/06

U.S. Cl. 366-97

5 Claims

1. A through feed mixer comprising: at least two rotors mounted for rotation in opposite directions about generally parallel axes in a mixing chamber, each of said rotors comprising an elongated polyhedron extending axially in said mixing chamber, each of said elongated polyhedrons having apexes extending generally axially and being generally parallel with one another, a feeding device adapted to supply material to be mixed to an

inlet and portion of said mixing chamber under a substantially constant pressure, each of said rotors having a cross-section at right angles to its axis of rotation which is derived from a regular n-sided polygon having similar peripheral portions, each peripheral portion including: a first, narrow section substantially circular about the axis of rotation of said rotor comprising the radially outermost portion of each of said apexes;



a second leading section which leads into the first section to provide an acute angle between the second section and a circle defining the outer periphery of said rotor at that cross-section; a third section which is in part, at least, of one of the sides of the polygon; and a fourth relief section extending from the third section towards the first section of the next peripheral portion.

4,053,145

CUTTING TORCH GUIDE

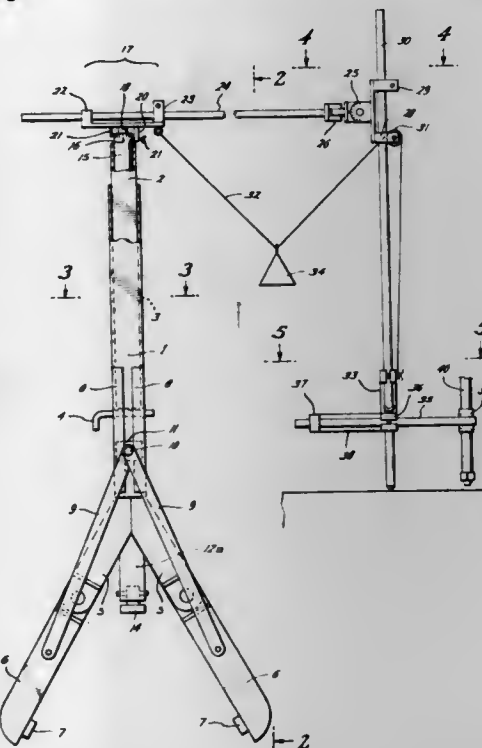
Richard J. Steele, 2202 Harwell, Houston, Tex. 77026

Filed Mar. 12, 1975, Ser. No. 557,809

Int. Cl.² B23K 7/04, 7/10

U.S. Cl. 266-58

6 Claims



1. A cutting torch guide having telescoping vertical housings, means on one of said housings for anchoring said housing to the work, and means on the other housing, horizontally adjustable, and having a shaft holder on one end, vertically transverse and horizontally transverse pivotal adjustment means on said shaft holder, a vertical shaft in said shaft holder, and a horizontally adjustable torch holding shaft mounted on

said vertical shaft and freely movable vertically thereon and a cutting torch holder on one end of said torch holding shaft. of a series of pairs of oppositely oriented dished spring washers, in which the dished spring columns abut a metal disc with

4,053,146

CONTINUOUS STREAM TREATMENT OF DUCTILE IRON

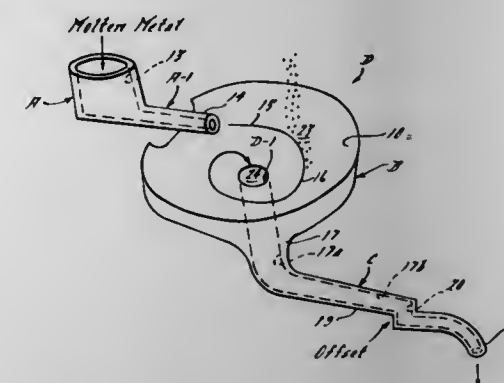
Herschel B. Smartt, and Bela V. Kovacs, both of Dearborn Heights, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 665,019, March 8, 1976. This application
Nov. 15, 1976, Ser. No. 742,025

Int. Cl.² C21C 1/00

U.S. Cl. 266-216

3 Claims



1. An apparatus for treating molten metal with a highly reactive treating agent, comprising: a bowl having an opening at the bottom thereof, through which molten metal exists therefrom in a vertical direction, the bowl having an interior shaped as a funnel with an upper interior surface arranged to make an angle of about 5° with a vertical line and the lower region surface arranged to make an angle of about 70° with a vertical line; b. a pouring cup having a receiving chamber and a conduit effective to direct a jet of molten treatable metal in a direction tangent to the upper interior of said bowl whereby a stream of molten metal is caused to flow in a vortical pattern within said bowl, c. an outlet passage fluidly connected to the exit opening of said bowl, said passage having a curved interior passage effective to direct the flow from said bowl to a generally horizontal direction, and d. means for introducing a stream of particulate treating agent into said bowl to engage in molten metal flowing in a vortical pattern therein, said particulate stream contacting the outer peripheral region of said flow.

4,053,147

DEVICE FOR INTRODUCTION OF GASES INTO REACTION VESSELS CONTAINING FLUIDS

Robert Moser, Steg; Alfred Steinegger, Venthone; Fritz Dolder, Wallisellen, and Horst Feddern, Schaffhausen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jan. 14, 1976, Ser. No. 649,137

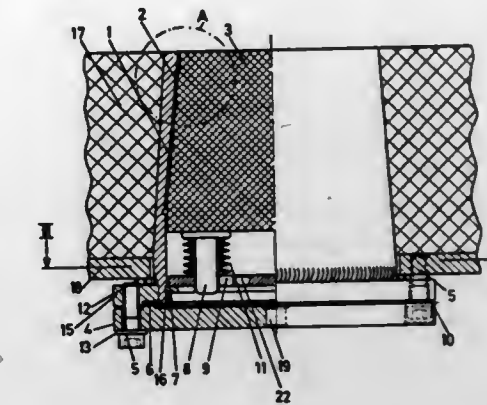
Claims priority, application Switzerland, Apr. 24, 1975, 5289/75

Int. Cl.² C21C 5/48

U.S. Cl. 266-220

2 Claims

1. A vessel which, when in use, is subject to thermal stress, and which includes a device for introduction of gas through the wall of the vessel, the vessel including an enclosing wall through which there is an opening, and the device comprising a metal sleeve fitting in the opening, means comprising screws and spring washers anchoring the sleeve to the outer face of the wall in an adjustable and easily exchangeable manner, a gas-permeable body of fire-resistant material fitting in the sleeve, and means exerting spring pressure on the body and thereby locating the body in the sleeve in an adjustable and easily exchangeable manner, in which the means exerting spring pressure is at least one dished spring column consisting



4,053,148

RUBBER SPRING AND VEHICLE SUSPENSION INCORPORATING SAID SPRING

Wallace G. Chalmers, 310 Victoria Ave., Montreal, Quebec, Canada (H3Z 2M9)

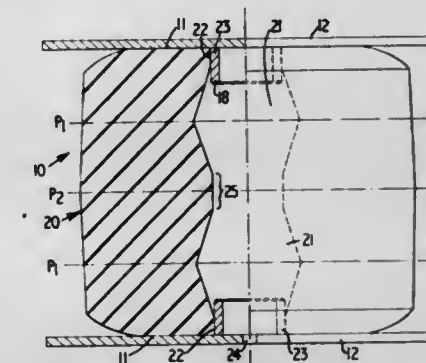
Continuation-in-part of Ser. No. 368,729, June 11, 1973. This application Dec. 30, 1974, Ser. No. 537,330

Claims priority, application United Kingdom, June 12, 1972, 2728/72

Int. Cl.² B60G 11/22

U.S. Cl. 267-63 R

8 Claims



1. A suspension system for vehicle including a sprung chassis member and an unsprung suspension member movable vertically underneath said chassis member, said members being separated by a spring, said suspension member being located by torque rod means so that distortion of the spring occurs principally by axial compression, said spring comprising an integral body of elastic material such as rubber, said body having opposed end faces, and in which the body has freely exposed sides extending between said end faces and having substantially smooth contours uninterrupted by depressions, the body having an axial cavity extending between said faces, said cavity being of divergent/convergent form and having a relatively small cross-sectional area at the end faces and at a central plane between the end faces and having a maximum cross-sectional area at two transverse planes intermediate the respective end faces and said central plane whereby the cross-sectional area of the material in the body is minimized at said transverse planes and the cross-sectional area of said material is maximized at the central plane between the end faces, the maximum transverse dimension of said cavity at each of said two transverse planes being less than one half the transverse dimension between the sides of the body at the same plane; said spring being characterized by bulging less, radially outwardly under full axial compressive load, than would be the case were the same spring to have an exterior waist at said central transverse plane and have its largest trans-

verse cross-sectional areas where said cavity is of largest internal diameter.

4,053,149

DEVICE FOR SHORTAGE MONITORING INSIDE A SHEET COLLATOR

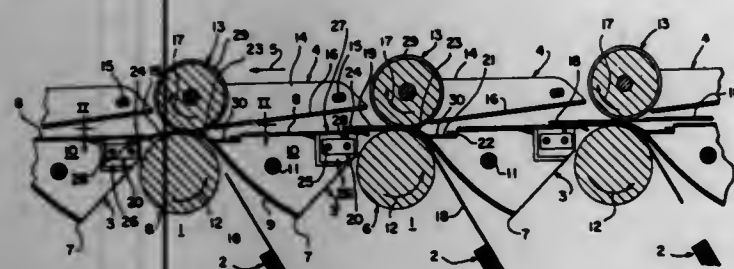
Jean Jules Henri Paulus, Brussels, Belgium, assignor to C. P. Bourg, Ottignies, Belgium

Filed Oct. 30, 1975, Ser. No. 627,296

Claims priority, application Belgium, Sept. 24, 1975, 160325 Int. Cl.² B65H 39/04

U.S. Cl. 270-58

12 Claims



1. Device for shortage monitoring inside a sheet collator having a plurality of bins for holding sheet stacks, said bins being arranged underneath lower and upper guiding and conveying members forming therebetween a substantially horizontal path for the sheets discharged from said bins, said shortage monitoring device comprising for each bin an elongated flexible leaf having a portion thereof positioned in said horizontal path, an electric microswitch, and a displaceable switch actuating means positioned between a movable end of leaf and the microswitch, said flexible leaf end normally contacting the switch actuating means which responds to such contact to be displaced in one direction to actuate the microswitch into one condition, said leaf end and switch actuating means being so positioned on opposite sides of said horizontal path that the presence of a sheet separates said leaf end from contact with said switch actuating means, said switch actuating means being responsive to such separation to be displaced in the direction opposite to said one direction to actuate the microswitch into another condition.

4,053,150

FOLDER APPARATUS

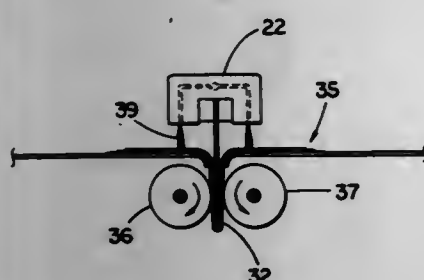
Leslie A. Lutz, Indianapolis, Ind., assignor to Cornelius Printing Co., Indianapolis, Ind.

Filed Mar. 8, 1976, Ser. No. 664,622

Int. Cl.² B65H 45/18

U.S. Cl. 270-67

5 Claims



1. In a folder apparatus having a movable folding blade and having a platform including a surface and defining a blade-receiving slot generally aligned with the path of said blade, the blade having a folding edge positioned outwardly of the platform surface on one side of the platform when the blade is not received within the slot, the improvement which comprises: the folding blade including air flow means receiving compressed air at an inlet for directing a flow of air at the platform surface adjacent the slot when the blade is moved near the slot; the air flow means comprising a manifold member receiving

compressed air at an inlet, the folding blade being elongated and having a first side and second side, the manifold member having a first portion extending beyond the first side of the folding blade and a second portion extending beyond the second side of the folding blade, each said manifold portion defining a passageway for air flow in communication with said inlet, each said passageway terminating in an opening in the manifold directed toward the folding edge of said folding blade, whereby a flow of air is directed adjacent each side of the blade in the direction of the slot and adjacent to the platform surface when the blade is moved near the slot.

4,053,151

HIGH SPEED FABRIC FOLDER

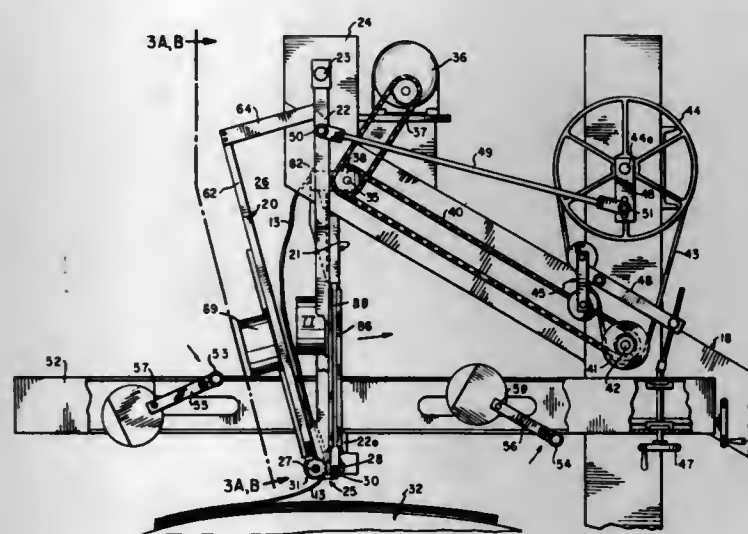
Robert Frezza, Carle Place, N.Y., assignor to Samco Holding Corporation, Woodside, N.Y.

Filed Apr. 26, 1976, Ser. No. 679,889

Int. Cl.² B65H 45/20

U.S. Cl. 270-79

7 Claims



1. Apparatus for folding fabric at high speed, which comprises

- a. a receiving platform,
- b. a fabric folding guide mounted for back and forth oscillating movement above said platform,
- c. said folding guide comprising a pair of opposed, downwardly extending guide panels for directing the fabric in a back and forth direction during the oscillation of the following guide,
- d. opposing faces of said guide panels being of air permeable construction across their entire working widths,
- e. means for directing fabric web downward between the opposed guide panels, and
- f. means for maintaining a continuous flow of air through the permeable guide panels and toward the opposite surfaces of the fabric web.

4,053,152

SHEET FEEDING DEVICE

Osamu Matsumoto, Ebina, Japan, assignor to Rank Xerox, Ltd., London, England

Filed July 27, 1976, Ser. No. 709,157

Claims priority, application Japan, Oct. 16, 1975, 50-140026[U]

Int. Cl.² B65H 1/02

U.S. Cl. 271-9

5 Claims

1. A sheet feeding apparatus for feeding a sheet from a stack thereof comprising: means for feeding a sheet from said stack in an upwardly direction, said feeding means being arranged for movement between a first feeding position wherein it engages a first portion of said stack and is adapted to feed a sheet

4,053,154

HOMICIDE BOARD GAME

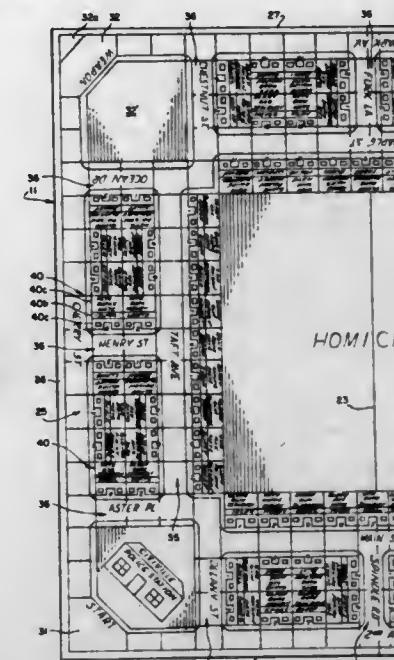
Henry P. Niemann, 305 W. 18th St., Apt. 2-A, New York, N.Y. 10011

Filed May 24, 1976, Ser. No. 689,639

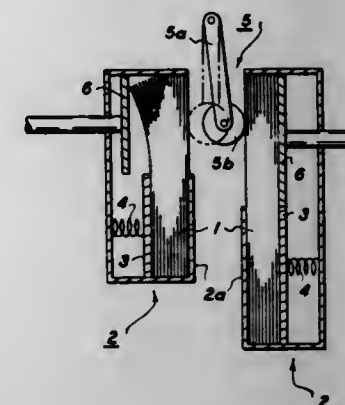
Int. Cl.² A63F 3/00

U.S. Cl. 273-134 B

1 Claim



from said stack, and a second position spaced from said stack; means for supporting said stack of sheets, in a generally vertical orientation so that said feeding means can feed said sheet from said stack in said upwardly direction; said support means including means for fanning out said first portion of said stack; said fanning out means including a first means arranged for movement between first and second support positions, said first means being operable in its first position to supportably engage said first portion of said stack against a



contact force of said feeding means, and said first means in its second position being disengaged from said stack to allow said stack to fan out; said support means further including means for restraining a second portion of said stack different from said first portion, said restraining means being operable when said first means is in its first or second positions, said first portion of said stack being arranged upwardly of said second portion thereof; whereby when said feeding means is in its second position and said first means is in its second position, said stack is fanned out to allow air to easily enter between the sheets.

4,053,153

BILLIARD-BRIDGE AND STROKE TRAINER

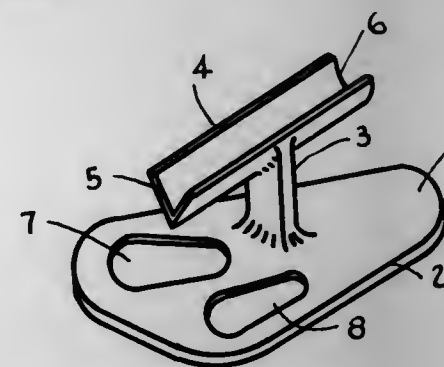
Frederick G. Josephans, 14020 Netherfield Drive, Midlothian, Va. 23113

Filed Apr. 29, 1976, Ser. No. 681,553

Int. Cl.² A63D 15/10

U.S. Cl. 273-23

3 Claims



1. A bridge and stroke training device comprising a rigid base, a support post of convenient height extending upwardly from said base, an elongated cue guide of convenient length attached to the upper end of said support post and positioned in a plane essentially horizontal to said base, said guide being an open trough having a V-shaped forward end and a back end having a semi-circular configuration, said support post being capable of limited bending movement only in a plane perpendicular to the plane of said base and coextensive with the longitudinal axis of said guide.

1. A homicide board game for playing by a plurality of players each assuming the roles of detectives, the players each following a multitude of clues to determine the murderer of a named murdered victim, the game comprising, in combination: a first deck of information cards identified as Clue cards, the deck consisting of five identically shaped and configured rectangular flat cards each having a back side and a face side, the back side of each card being identical to prevent distinguishment of the cards from each other when placed with the face side down, the face side of each card each containing a different name of a clue imprinted thereon, the different clues being "GLOVE", "KEYS", "SCARF", "BLOOD" and "CAR"; a second deck of information cards identified as Weapon cards, the deck consisting of five identically shaped and configured rectangular flat cards each having a back side and a face side, the back side of each card being identical to prevent distinguishment of the cards from each other when placed with the face side down, the face side of each card each containing a different name of a weapon imprinted thereon, the different weapons being "KNIFE", "GUN", "AXE", "ROPE" and "POISON", the weapon cards being identical in configuration as the clue cards; a third deck of information cards identified as Motive cards, the deck consisting of four identically shaped and configured rectangular flat cards each having a back side and a face side, the back side of each card being identical to prevent distinguishment of the cards from each other when placed with their face side down, the face side of each card each containing a different name of a motive imprinted thereon, the different motives being "JEALOUSY", "BLACKMAIL", "HATE" and "MONEY", the motive cards being identical in configuration as the clue cards and the weapon cards; a plurality of Murderer Sheets each being of an identical flat rectangular configuration having a flat face surface and a flat back surface; a flat, rectangularly shaped game board having a flat playing surface imprinted on a flat face surface thereof, a flat back surface, a top edge, a bottom edge, and opposed side edges, the game board divided into equal half portions and hinged along its central axis permitting the half portions to fold onto each other in face-to-face relationship for ease of storage and transportation of the game board, a first roadway extending continuously about the outermost periph-

ery of the playing surface adjacent to the edges thereof and formed of a series of consecutive side-by-side rectangles defining playing spaces therealong, a second roadway substantially concentric with the first roadway and spaced inwardly therefrom and defining a general rectangular shape and formed of a series of consecutive side-by-side rectangles defining playing spaces which are substantially identical to the first mentioned playing spaces, a plurality of spaced apart third roadways disposed between the first and second roadways and interconnecting portions of the first roadway to portions of the second roadway at spaced intervals completely about the playing surface, the third roadways each formed of a series of consecutive side-by-side rectangles defining playing spaces therealong which are substantially identical to the first and second mentioned playing spaces, there being disposed at intervals along the first, second and third roadways a multitude of squares designated as individual houses with each square having imprinted thereon an individual's name and a set of three "leads" selected one from each of the groups of clues, weapons and motives as found on the decks of cards defining each group, the combination of three "leads" being different for each of the named individuals such that none of the individuals' squares on the playing surface contain the same three "leads" thus making each square unique from each other individuals' square, three of the four corners of the playing surface of the game board being respectively identified by the marking imprinted thereon of "WEAPON", "MOTIVE" and "CLUE" with portions of the game board adjacent thereto being designated as positions on which the respective decks of Clue cards, Weapon cards, and Motive cards are intended to be stacked in a face-down manner for individual selection thereof by the players of the game during the play of the game;

a plurality of distinctive markers, one for each player of the game, for use by each player of the game to mark the player's position on the game board as the play of the game proceeds from player to player, each marker of a configuration to be readily received in any roadway rectangle or individuals' square to mark the players position thereon;

a chance device in the form of a conventional die for use in turn by each of the players in determining the length and position of each of the player's movements along the roadways of the game board playing surface as the player progresses thereabout;

a player gaining access to an individual's square to interrogate the individual named thereon by landing on a roadway rectangle immediately adjacent such individual's square and on which the square faces;

a miniature figure in the form of a dead body for use in marking on the game board the name of the murdered victim for all players to clearly see and for which the murderer must be detected by the players, the player successfully detecting the name of the individual who murdered the victim being determined the winner of the game;

a police file container adapted to sit freely in the middle of the game board for ready access by each of the game players, the container having a flat horizontal top surface, a flat horizontal bottom surface, a vertical bottom end, opposed vertical side ends, and an open top end providing access therethrough to an open topped compartment formed interiorly of the container between the surfaces thereof, the compartment adapted to receive therein a plurality of the Murderer Sheets in a stacked relationship with the face surface of the topmost sheet facing upwardly, the top surface of the container is provided with a multitude of squares marked thereon with each of the squares having imprinted thereon an individual's name and street address corresponding to the individual's square on the game board, a slot shaped opening is formed in each of the squares opening through the container top surface in communication with the sheet compartment to

provide visibility of a portion of the Murderer Sheet disposed in the compartment immediately adjacent the container top surface, a flap defining door member disposed in each of the slots and operative between a normally closed position closing the slot and preventing visibility of the murderer sheet therebelow and an open position providing selective viewability of the murderer sheet through the slot, a Murderer opening formed in the container top surface separate from the squares imprinted thereon and positioned to register with the name of the murderer found on the murderer sheet positioned beneath the container top surface, a flap defining door member disposed in the murderer opening and operative between a normally closed position closing the opening and preventing viewing of the name of the murderer and an open position disclosing the name of the murderer through the opening, a signal defining aperture formed in the container top surface and adapted to register with a portion of the murderer sheet disposed in the compartment immediately therebelow to provide a visual indication that the murderer sheet is properly inserted in the container compartment beneath the top surface preparatory to and during the play of the game;

the murderer sheets being plural in number with their being a murderer sheet prepared for each of the individuals named on the individual game board squares, the name of the individual on each sheet being imprinted on the face surface thereof in a position to register with the murderer opening in the container top surface upon the sheet being placed in the container compartment, marking indicia imprinted on each of the murderer sheet face surfaces in a position to register with the signal aperture of the container top surface to indicate the proper positioning of the murderer sheet in the container compartment when the sheet is inserted therein, a plurality of markings disposed about the face surface of each of the murderer sheets adapted to register with some of the slotted openings in the container top surface for viewability through such slots upon the opening of the flap door associated with such slot, the markings indicating those individuals which are suspect from those individuals which are innocent to thus provide clues for the players for the determination of the name of the murderer;

a plurality of detective notebook sheets each of a flat rectangular sheet of paper having a plurality of vertical and horizontal lines imprinted on a face surface thereof defining columns and rows of such columns, the sheets being for use in conjunction with appropriate indicia on the game board with one sheet assigned to each game player for listing thereon by the player the names of individuals interrogated by the player in an attempt to determine the name of the murderer with the use of information provided by successive use of the clue, weapon, and motive cards selected by the players for the purpose of logical development of the game purpose, each of the notebook sheets are of an identical shape and configuration having the face surface divided into three vertical columns identified, from left to right, as "CHECK LIST", "NAMES" and "NAMES", the "CHECK LIST" column is divided into six vertical sub-columns each of which is, in turn, divided by horizontal lines into at least 26 vertically arranged squares, the first sub-column on the left having the letters of the alphabet "A" through "Z" written in the squares thereof, the remaining five sub-columns each being identified at the head thereof by the numbers 1 through 5 respectively, each of the "NAMES" columns being identical and each divided into six vertical sub-columns with each sub-column divided by the same horizontal lines passing through the "CHECK LIST" column to provide at least 26 separate vertical squares for each column, the "NAMES" sub-column being identified, starting from the left, by the numbers 1-5 respectively for the first five columns with the sixth sub-column being

identified by the letter "S", the name of each individual named on the game board has exactly five letters in the name such that an individual's name chosen to be interrogated by a player is written into the first five sub-columns of a "NAMES" column with the marking "S" placed in the "S" sub-column if such interrogated individual's name indicates on the police file container as being a suspect as indicated by a marking on the murderers sheet disposed in the container compartment and exposed through one of the openings in the top member of the police file;

there being a like number of separate individuals' squares on the game board as there are individuals listed on the police file container top surface as there are murderers' sheets each corresponding to one of the named individuals; each individual has uniquely associated therewith on the individual square of the game board three "leads" with one of the leads corresponding to a Clue card, one of the leads corresponding to a Weapon card, and one of the leads corresponding to a Motive card; and

whereby a murderer sheet is picked at random with the murderer name hidden, the sheet placed in the container compartment beneath the top surface thereof with the indicia on the sheet in registration with the openings in the container, a detective sheet is assigned to each player for the players use along with one of the markers, and the die is tossed by each player in turn as they progress along the roadways and interrogate individuals on the game board as they progress thereabout to determine the name of the murderer, the first player to do so being determined the winner.

4,053,155

MULTIPLE-GAME GAME BOARD WITH GOLF PUTTING SELECTING MEANS

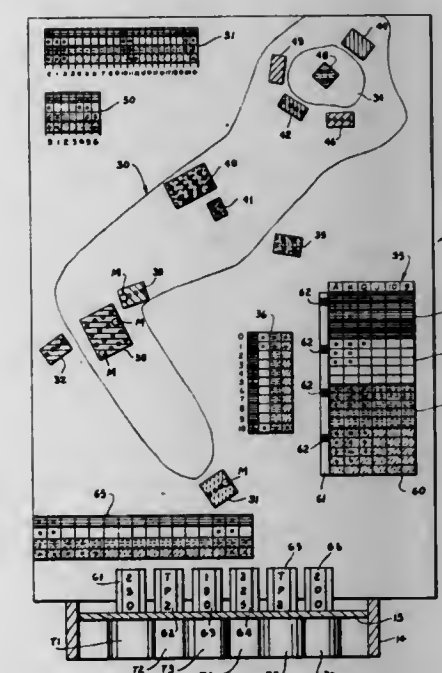
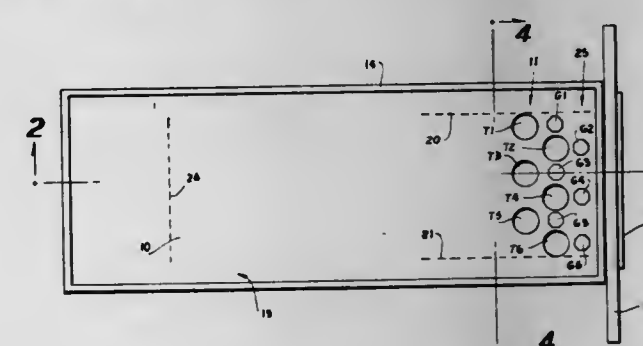
Ralph S. Williams, 1355 Briarwood Road NE., Apt. N-5, Atlanta, Ga. 30319

Filed Apr. 28, 1976, Ser. No. 681,345

Int. Cl.² A63F 7/06

U.S. Cl. 273-87 C

7 Claims



1. A game comprising a game board including a plurality of

locations, at least one marker selectively movable to each of said plurality of locations, and selecting means for determining which of said plurality of locations said marker is to be next moved to, said selecting means including a playing surface, fixed target means on said playing surface comprising a plurality of targets, and variable programming means comprising a plurality of value indicia for each target, a plurality of first indicia on said game board distinguishing each said plurality of locations from each other and a plurality of second indicia on said variable programming means, one for each of said value indicia, each of said plurality of first indicia having a characteristic identical to a characteristic of at least one of said second indicia for relating one of said value indicia of said variable programming means with each target in accordance with the location of said marker.

4,053,156

BALL FOR TARGET DART GAME

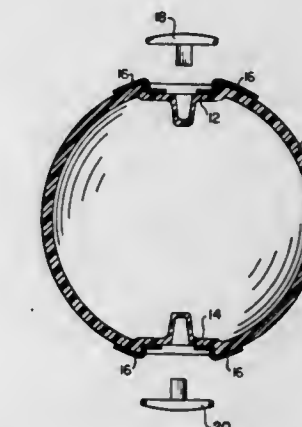
Henry S. Bai, 421-14 Picadilly Place, San Bruno, Calif. 94066

Filed Aug. 25, 1976, Ser. No. 717,640

Int. Cl.² A63B 65/00

U.S. Cl. 273-106 R

5 Claims



1. A ball for use in a target game, which game includes a target formed of a sheet of fabric having upstanding filamentary elements adapted to engage and hold the ball against that portion of the target struck by the ball as the ball is thrown against the target, the ball comprising: a light-weight spherical-shaped body; a pair of diametrically opposite bushings mounted on said spherical-shaped body; a plurality of strips of Velcro material mounted on said spherical-shaped body with the respective ends of each such strip extending partially across respective ones of said bushings; and a plurality of plugs respectively mounted in said bushings, each of said plugs having a head extending across the corresponding ends of said Velcro strips to maintain said ends in engagement with the surface of said spherical-shaped body.

4,053,157

BOARD GAME APPARATUS

Gary J. Cowan, 6952 Bruckner, Detroit, Mich. 48210

Filed Nov. 1, 1976, Ser. No. 737,066

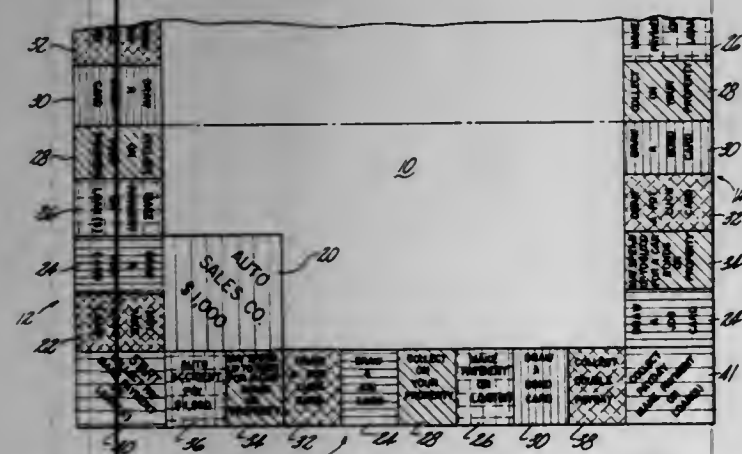
Int. Cl.² A63F 3/00

U.S. Cl. 273-134 AT

8 Claims

1. A game apparatus, which comprises in combination: a plurality of first movable game pieces, each of said first movable game pieces being of a different color; a plurality of second movable game pieces, equal in number to said first movable game pieces, and each being of the same color as a different one of said first movable game pieces; a substantially square game board having a first side, second side, third side and fourth side; a plurality of squares located along said first side, said second side, said third side and said fourth side of said game

board for accommodating said first and second movable game pieces;
 directional information printed in each of said squares;
 a first corner square located at the intersection of said squares along said first side and said squares along said fourth side of said game board;
 directional information printed in said first corner square;
 a second corner square located at the intersection of said squares along said first side and said squares along said second side of said game board;
 directional information printed in said second corner square;
 a third corner square located at the intersection of said squares along said second side and said squares along said third side of said game board;
 directional information printed in said third corner square;
 a fourth corner square located at the intersection of said squares along said third side and said squares along said fourth side of said game board;
 directional information printed in said fourth corner square;
 a first block disposed generally at one corner of said game board adjacent the intersection of said squares located along two of said sides of said game board;
 information printed in said first block;
 a plurality of first information members containing printed information pertaining to directional information printed in a predetermined number of said squares and relating to the loss of money;
 a plurality of second information members containing



printed information pertaining to directional information printed in a predetermined number of said squares and relating to various jobs;
 a plurality of third information members containing printed information pertaining to directional information printed in a predetermined number of said squares and relating to property;
 a plurality of fourth information members containing printed information pertaining to directional information printed in a predetermined number of said squares and relating to bonds;
 a plurality of play directing fifth information members containing directional information pertaining to directional information printed in a predetermined number of said squares and further pertaining to information contained on said fourth information members, which directional information relates to the payment and receipt of money related to the value of bonds;
 a plurality of play directing sixth information members containing directional information printed in a predetermined number of said squares and further pertaining to information contained on said second information members, said third information members and said fourth information members, which directional information relates to the payment and collection of money and the advancement of the game pieces;
 a predetermined amount of artificial money of various face value amounts to be distributed to the players of the game apparatus as a loan to be repaid; and
 a pair of dice to be thrown one die at a time or together by

the players of the game to determine the movement of said first game piece and said second game piece, respectively.

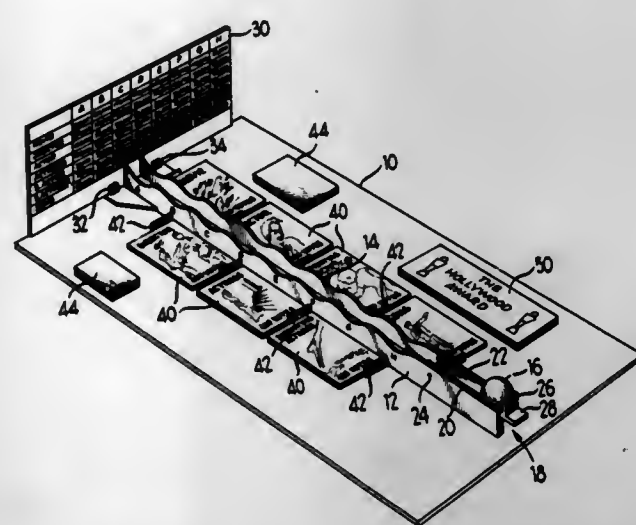
4,053,158 SKILL-TYPE BOARD GAME

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 26, 1976, Ser. No. 652,430
 Int. Cl.² A63F 3/00

U.S. Cl. 273-135 R

3 Claims

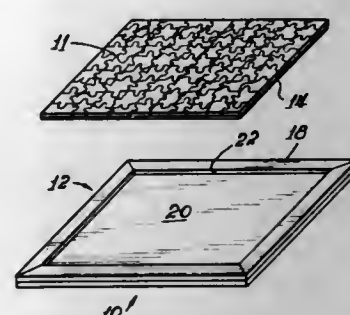


1. A game of skill and chance comprising a game board for play by a plurality of players, a set of master play directing cards each having indicating means instructing a player as to a playing move to be made by the player, a skill device mounted on said board manually operable by a player to obtain a skill oriented score upon receipt of instructions to the player by a play directing card to operate the skill device, said skill device comprising an undulated surface having a plurality of valleys spaced therealong representing different score values, a plurality of different sets of category cards positionable on said game board in structural alignment with said valleys of said undulated surface to define different award categories therefor, and a playing piece manually launchable along said surface and capable of coming to rest in any one of said valleys.

4,053,159
 METHOD FOR FRAMING A JIG-SAW PUZZLE
 Walter J. Kalak, 5808 N. Winthrop, Chicago, Ill. 60660
 Filed May 6, 1976, Ser. No. 683,871
 Int. Cl.² A63F 9/10

U.S. Cl. 273-157 R

6 Claims



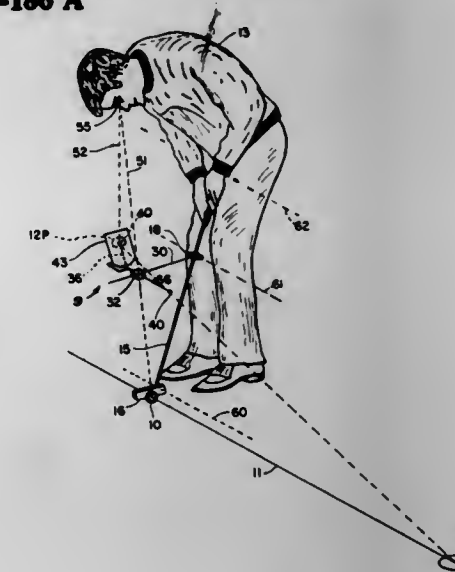
5. A method of framing a completed jig-saw puzzle, comprising:
 providing a combination work assembly board and frame having a raised peripheral rim defining a well therewithin for receiving the completed jig-saw puzzle;
 providing a backing sheet and placing it in overlying engagement with said frame within said well;
 assembling the jig-saw puzzle in said frame on said sheet;

coating the front face of the completed jig-saw puzzle in said frame with an adhesive;
 permitting the coated puzzle to cure;
 lifting the backing sheet out of said well to remove the coated puzzle therefrom; and
 attaching the rear face of the puzzle to said frame within said well.

4,053,160
 GOLF CLUB SWING TRAINING DEVICE
 Joseph M. Salata, 4716 Behrwald Ave., Cleveland, Ohio 44144
 Filed Mar. 12, 1976, Ser. No. 666,187
 Int. Cl.² A63B 69/36

U.S. Cl. 273-186 A

10 Claims



1. A golf device for aiming a ball toward a target by a player with a golf club having a shaft and a face, comprising in combination:

an alignment member;
 a reflector element;
 first means mounting said reflector element relative to said alignment member;
 second mounting means for mounting said alignment member to the club shaft with said alignment member being disposed in a plane containing a line substantially normal to the plane of the club face;
 said first and second mounting means establishing concurrently first and second three point alignment paths, with said first three point alignment path being the player's eye, the ball and the alignment member therebetween superimposed on the ball as viewed by the player;
 and said second three point alignment path being the target, the player's eye and the alignment member therebetween and pointing toward the target with this path being bent at about a right angle by said reflector element.

4,053,161
 STYLUS ARM LIFTING/LOWERING APPARATUS FOR A VIDEO DISC PLAYER

John Clifford Bleazey, Trenton, and Marvin Allan Leedom, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1976, Ser. No. 667,309

Claims priority, application United Kingdom, Sept. 15, 1975, 37847/75

Int. Cl.² G11B 3/10

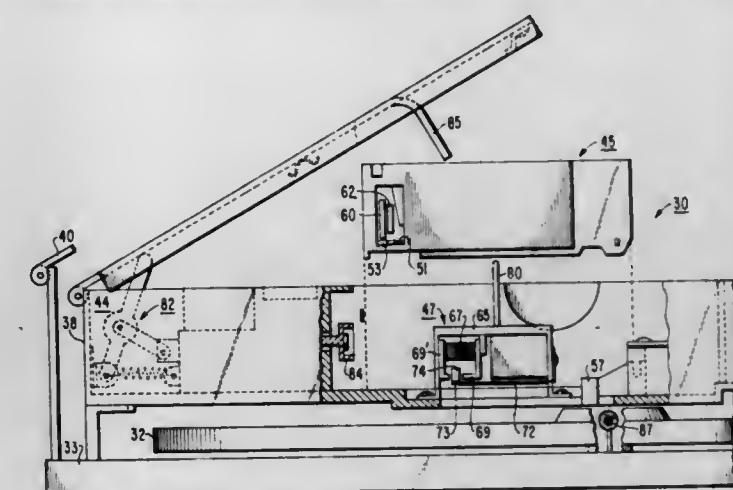
U.S. Cl. 274-23 R

8 Claims

1. In a playback system for recovering prerecorded information from a spirally grooved record disposed on a turntable rotatably mounted with respect to a base of said system; said system including a stylus arm carriage mounted for lateral motion with respect to said base between and off record rest position and an above-record play position; a groove riding stylus secured to one end of a stylus arm; the end of said stylus arm remote from said one end being secured to a support

member mounted within said carriage via a compliant coupler; said securing of said compliant coupler to said support member being such that the axes of said compliant coupler and said stylus arm are aligned when said stylus arm is occupying a lowered position; said compliant coupler being in a substantially unstressed condition when the axes of said compliant coupler and said stylus arm are aligned; said lowered position of said stylus arm establishing stylus/record contact for playback when said carriage is in said above-record play position; an apparatus comprising:

1. a stylus arm rest mounted in said carriage for motion between an elevated position and a depressed position; said stylus arm rest in said elevated position supporting said stylus arm in a raised position; said raised position of said stylus arm being such that said stylus/record contact is precluded when said carriage is in said above-record play position;
 said stylus arm rest in said depressed position permitting said stylus arm to occupy said lowered position;



2. selectively actuated means mounted within said carriage for causing motion of said stylus arm rest between said elevated and depressed positions;
 3. actuating means subject to engagement with said selectively actuated means, and responsive to motion of said carriage from said above-record play position to said off-record rest position, for causing said stylus arm rest to assume said depressed position when said carriage is in said off-record rest position;
 4. selectively energized means mounted within said carriage for causing motion of said stylus arm rest between said elevated and depressed positions;
 5. means for selectively energizing said selectively energized means when said carriage is in said above-record play position to establish said stylus/record contact for playback; and
 6. means for causing said stylus arm rest to occupy said elevated position in the absence of said engagement and said energization.

4,053,162
 DYNAMIC AIR BEARING SEAL - RADIALLY AND AXIALLY STABILIZED

Roger O. Bjerk, Edelstein, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 23, 1976, Ser. No. 660,536

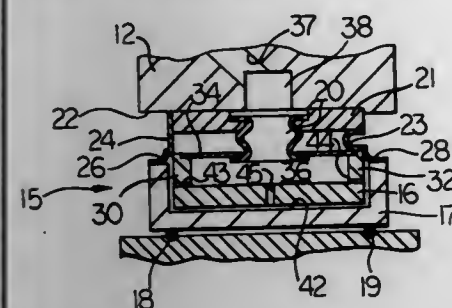
Int. Cl.² F16J 15/40

U.S. Cl. 277-75

9 Claims

1. A pressurized sealing arrangement comprising a rotatable shaft, a generally ring-shaped thrust sleeve mounted on said shaft, an outer, ring-shaped sleeve mounting a flexible mounting member, a ring-shaped inner sleeve intermediate and spaced from said thrust sleeve and said outer sleeve, said inner sleeve being supported by said mounting member and defining an air chamber therein, passage means in said mounting member intercommunicating said outer sleeve with said chamber,

and a plurality of jets in said inner sleeve positioned so as to direct pressurized fluid into said thrust sleeve from said cham-



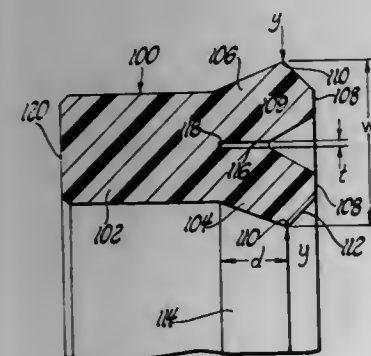
ber and thereby cause said inner sleeve to be centered with respect to said thrust sleeve.

4,053,163 SEAL CONSTRUCTION

George Vegella, 25150 Thomas Drive, Warren, Mich. 48091
Continuation-in-part of Ser. No. 536,681, Dec. 26, 1974,
abandoned. This application June 4, 1976, Ser. No. 692,831
Int. Cl.² F16J 15/18

U.S. Cl. 277-124

3 Claims



1. A one piece seal member of elastomeric material comprising: an endless main body portion; a pair of endless leg portions enclosing the central axis of said body, said leg portions projecting integrally from said main body portion in side by side relation to free end portions; said leg portions each having an outer sealing portion including an outwardly projecting apex portion defined at the intersection of two flat surfaces disposed at an angle with respect to each other, said apex portion defining a sealing tip; and said leg portions each having inner substantially flat inclined surfaces extending from the side of said respective free ends opposite said apex portions; an endless narrow groove formed between said leg portions and enclosing the central axis of said body; said groove having side walls extending from a closed base at the end of said groove remote from the free ends of said leg portions to a normally open end at the juncture between the inner surfaces of said leg portions; said sealing tips each being located in the direction of the central axis of said body between the normally open end of said groove and the free ends of said leg portions; said groove having substantially parallel side walls, said groove being unobstructed throughout its length between the side walls thereof to permit complete closure of said normally open end throughout its length; said leg portions having an unstressed position with respect to each other in which said groove is open such that any movement of said leg portions toward each other from said unstressed position such as by forces applied on said sealing tips flexes said leg portions about the base of said groove to provide relatively low resistance to movement of said sealing tips toward each other because of the relatively long moment arm between said sealing tips and the base of said groove; said leg portions having an installed position with respect to each other in which the open end of said groove is closed such that any further movement of said leg portions toward each other such as by forces applied on said sealing tips can only take place about the closed end of said groove at the

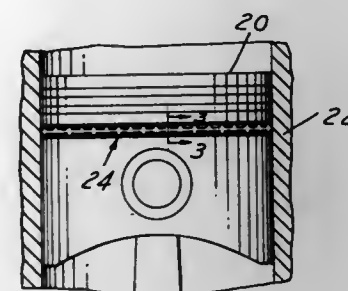
junction between said inner surfaces to provide higher resistance to movement of said sealing tips toward each other because of the shorter moment arm between said sealing tips and the juncture of said inner surfaces at the closed end of said groove such that resistance to movement of said sealing tips toward each other, and hence the sealing pressure exerted thereby, abruptly increases when said leg portions are flexed from the unstressed to the installed positions with respect to each other.

4,053,164 SPACER-EXPANDER FOR A PISTON OIL CONTROL RING

Lee H. Saylor, Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.
Filed Sept. 8, 1976, Ser. No. 720,273
Int. Cl.² F16J 9/20

U.S. Cl. 277-139

8 Claims



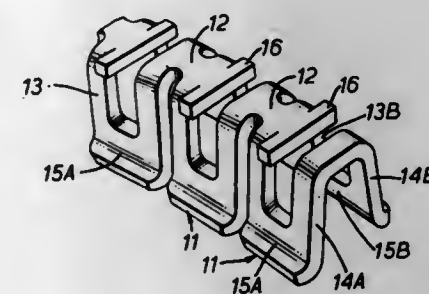
1. In a parted circular spacer-expander adapted for use in combination with a parted rail as a nonbottoming self-expanding piston oil control ring and including a plurality of alternating concentric circumferentially spaced inner and outer crowns integrally interconnected by generally diverging spring legs and a plurality of supporting pads, each said pad having an inner edge integrally connected by a pad leg to a corresponding inner crown and having an outer edge disposed outwardly of said outer crowns, the improvement wherein each said pad leg comprises a reverse bend extending radially inwardly from an inner crown and then radially outwardly to a corresponding pad.

4,053,165 OIL RING DESIGN

Edward Douglas Hartley, Halifax, England, assignor to Hewlett & Grandage Limited, EN
Filed Dec. 17, 1975, Ser. No. 641,372
Int. Cl.² F16J 9/06

U.S. Cl. 277-140

6 Claims



1. A piston ring assembly including two ring elements and a spacer-expander element which spaces apart the ring elements and resiliently loads them in a radially-outward direction, the spacer-expander element having its free ends in abutment and including a series of interconnected parts, short circumferential connecting means at the radially outer periphery of said spacer-expander element to interconnect adjacent parts, each part comprising two spaced-apart pairs of limbs bent inwardly through nearly a right angle from said connecting means, the limbs of each pair being connected only at their inner ends, the

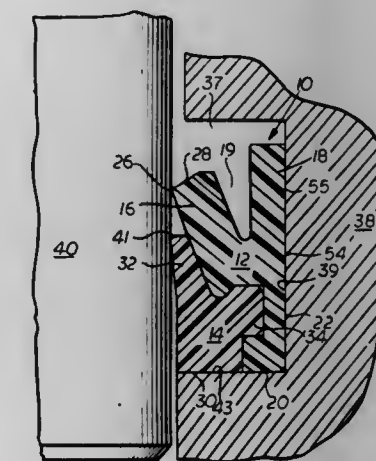
inner ends of said limbs being interconnected by respective spaced-apart portions which extend circumferentially and axially of the element, and the respective spaced-apart portions being in contact with and resiliently outwardly loading the ring elements, the spacer-expander element including at the outer periphery thereof a spacer element between the two pairs of limbs of each said part, said spacer element being connected to the center of said part and extending transversely to space apart said ring elements at the outer periphery of the spacer-expander element.

4,053,166 TWO-PIECE SEAL

Ronald A. Domkowski, Arlington Heights, Ill., assignor to Halogen Insulator & Seal Corporation, Elk Grove, Ill.
Filed Dec. 8, 1975, Ser. No. 638,522
Int. Cl.² F16J 15/32

U.S. Cl. 277-152

3 Claims



1. A composite seal for sealing engagement with a radially extending end wall and an axially extending wall defining an annular cavity in a stationary member and for sealing with a moving member, said seal comprising:

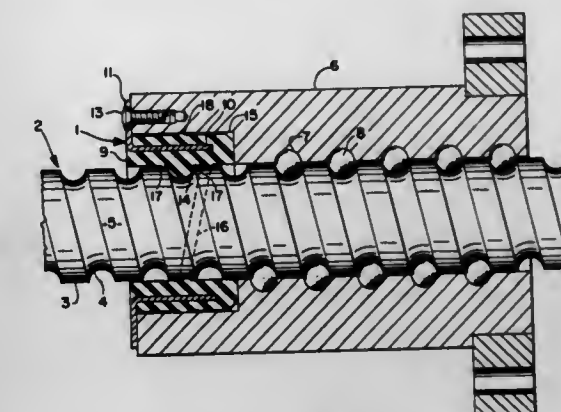
- a first soft flexible annular sealing ring made of elastomeric material having an annular sealing lip edge for sealing engagement with the moving member at first predetermined pressures, said sealing lip having a chamfered edge inclined to be pressed by higher pressure forces to have greater contact area;
- a second lip on said first sealing ring being inclined radially away from said first lip said second lip being spaced from said first lip and defining an annularly extending groove therebetween;
- an axially extending wall on said first sealing ring extending from said second lip and coacting with said second lip for sealing engagement with the axially extending wall defining the annular cavity;
- a second annular sealing ring of material harder than the material of said first sealing ring and having a friction characteristic lower than that of said elastomeric material, said second sealing ring having a radially directed extending sealing lip and having an edge for engaging said moving member at a position spaced axially downward from said annular sealing lip on said first ring, each of said sealing edges on said first and second seals having a diameter for sealing in interference with said moving member at a low pressure loading of said seal, said first and second sealing rings having surfaces abutting one another to deflect the sealing lip on said second ring to deform into greater contact area with said moving member with increased pressure on said first sealing ring,
- a radially extending end wall on said flexible sealing ring disposed behind a portion of said second sealing ring for sealing engagement with the radially extending end wall on said stationary member, said axially extending wall on said first sealing ring extending from said second lip to said end wall, and
- interlocking means on said first and second sealing rings

mated with one another to prevent substantial relative displacement bodily of said first sealing ring relative to said second sealing ring and thereby reducing a likelihood of bypass leakage between said first and second sealing rings.

4,053,167
SEAL FOR BALL BEARING SCREWS AND THE LIKE
Jerry George Jelinek, LaHabra, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Oct. 18, 1976, Ser. No. 733,710
Int. Cl.² F16J 15/16; F16H 55/22

U.S. Cl. 277-165

10 Claims

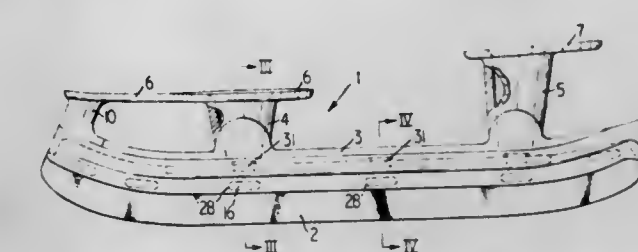


1. A nut and screw assembly wherein interengaged threads of said nut and screw effect relative axial movement thereof in response to relative rotation thereof, the combination thereof with of a ring of elastomeric material axially and angularly fixedly secured to said nut; said ring having an internal one-turn helical rib in sliding sealed engagement with the crest of the thread of said screw and terminating in end portions having sliding sealed engagement with said crest to its junctions with the thread groove therebetween; said ring having a radially inwardly extending projection between said end portions having sliding sealed engagement with said thread groove from crest to crest thereof.

4,053,168
SKATE AND METHOD OF PRODUCING SAME
Ludovicus J. Goverde, Whitby, Canada, assignor to Ontario Tool Design Inc., Canada
Filed Feb. 26, 1976, Ser. No. 661,793
Claims priority, application Canada, Oct. 10, 1975, 241486
Int. Cl.² A63C 1/22

U.S. Cl. 280-11.12

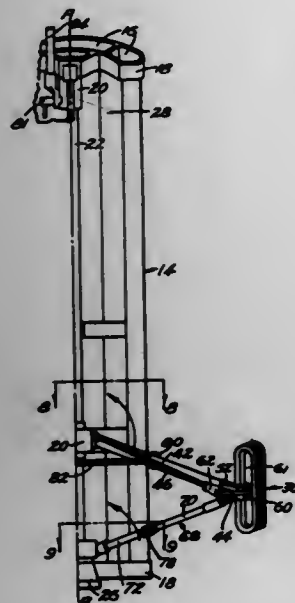
5 Claims



1. An ice skate of the type having a plastic, generally unitary upper portion including a base section and two flange portions for securing the skate to a boot, and a metallic runner embedded in a lower section of said upper portion with a lower section of said runner protruding downwardly along said base section wherein said plastic, generally unitary upper portion comprises two uneven halves, said runner being located between the base sections of said two halves, said two halves being fixedly secured to each other along a joint extending generally longitudinally with respect to said runner, wherein one of said halves is an integral part including at least one complete flange portion and a substantial portion of a support-

ing column section associated with said at least one complete flange portion.

4,053,169
COMBINED GOLF BAG AND CART MECHANISM
 Clarence R. Taylor, 28 Woodside Drive, Peasfield, N.Y. 14526
 Filed Apr. 5, 1976, Ser. No. 673,583
 Int. Cl.² B62B 11/00
 U.S. Cl. 280—37 12 Claims

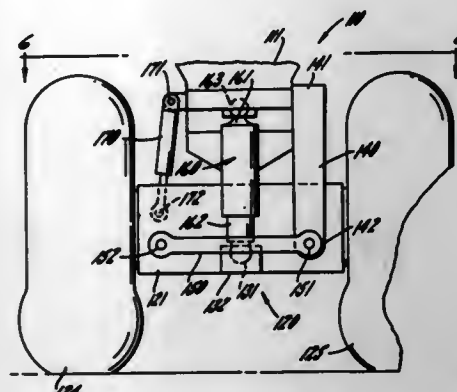


1. A combined golf bag and cart mechanism comprising: a golf bag having an elongated peripheral cavity defining an axis;
- a golf cart permanently secured to said bag and movable between a retracted position in which said cart wholly nests in said cavity, and an extended position in which said cart supports said bag for transport on said wheels, said golf cart further including a pair of wheels and orienting means for pivotally coupling each of said wheels to said bag and for maintaining each of said wheels in parallel planes relative to said axis;
- said orienting means for each of said wheels further comprising a first lever having one end pivotally mounted on a first pivot pin on said bag, and a second lever pivotally connected to the opposite end of said first lever, said second lever having one end coupled to said wheel and the opposite end pivotally coupled to said bag on a second pivot pin spaced from said first pin; and
- rigid detachable support rods interconnecting said first lever of each of said wheels to said bag for supporting said first lever and said wheels in said extended position of said cart.

4,053,170
PANHARD SPRING SUSPENSION ARRANGEMENT FOR OFF-ROAD VEHICLES
 John H. Hyler, and Edward G. Orth, both of Peoria, Ill., assignors to Westinghouse Air Brake Company, Pittsburgh, Pa.
 Filed Apr. 29, 1976, Ser. No. 681,465
 Int. Cl.² B60G 21/00
 U.S. Cl. 280—112 R 10 Claims

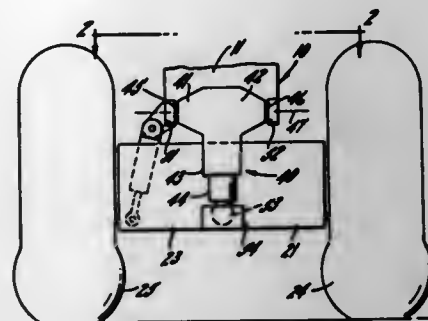
1. In a heavy duty suspension for an off-road vehicle, the combination comprising a chassis, an axle assembly below the chassis, the axle assembly including a transversely extending axle housing having wheels at the lateral ends thereof and a forwardly extending tongue rigid with the axle housing and generally centered thereon, the forward end of said tongue having a front pivot connection with the chassis, the rear portion of the axle assembly providing a rear pivot connection laterally centered on the axle housing, the front and rear pivot connections being of the ball and socket type defining a fore-and-aft extending roll axis, a rigid bracket extending downwardly from the chassis to a point adjacent the axle housing

and substantially offset in the lateral direction from the roll axis, a horizontal transversely extending link having at least first and second spaced pivot points, the first pivot point being pinned to the lower end of the bracket and the second pivot point being pinned to the axle housing so that the axle assembly is restrained by the link from moving laterally with respect to the chassis while accommodating rolling movement of the axle assembly about the roll axis as the vehicle passes over irregular ground contours, and a single damped spring suspension device



vice vertically adjacent the axle housing, the suspension device being connected at its upper end to the chassis and supportingly coupled at its lower end to the axle assembly at the roll axis so that the supportive effect of the suspension device is distributed evenly to both of the wheels, and auxiliary biasing spring means connected between the chassis and the axle assembly at a point eccentric to the roll axis for relatively biasing the axle assembly toward a centered position parallel to the chassis.

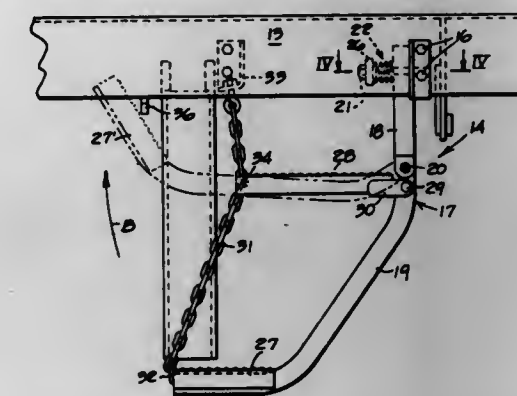
4,053,171
SPRING SUSPENSION ARRANGEMENT FOR OFF-ROAD VEHICLES
 John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Pittsburgh, Pa.
 Filed Apr. 29, 1976, Ser. No. 681,515
 Int. Cl.² B60G 21/00
 U.S. Cl. 280—112 R 8 Claims



1. In a heavy duty suspension for an off-road vehicle, the combination comprising a chassis, an axle assembly below the chassis, the axle assembly including a transversely extending axle housing having wheels at the lateral ends thereof and a forwardly extending tongue rigid with the axle housing and generally centered thereon, the forward end of said tongue having a front ball and socket connection with the chassis, a single damped spring suspension device vertically arranged adjacent the axle housing and centered thereon, the suspension device being connected at its upper end to the chassis and at its lower end to the axle assembly so that the supportive effect of the suspension device is distributed evenly to both of the wheels, the suspension device being of "T" shape with the arms of the "T" including a hinge having a transversely extending axis at one end and having a ball and socket connection at its opposite end, the ball and socket connections together defining a fore-and-aft extending roll axis for accommodation of relative rolling movement while the transversely extending

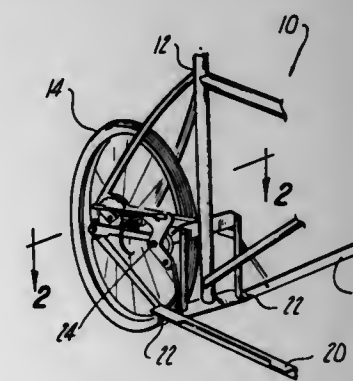
hinge provides rigidity against side forces to keep the suspension device in a generally centered working position, and auxiliary biasing spring means connected between the chassis and the axle assembly at a point eccentric to the roll axis for relatively biasing the axle assembly toward a position parallel to the chassis.

4,053,172
STEP ASSEMBLY FOR CONSTRUCTION VEHICLES
 Randall D. McClure, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
 Filed Nov. 3, 1975, Ser. No. 628,021
 Int. Cl.² B60R 3/02
 U.S. Cl. 280—163 16 Claims



1. A step assembly for construction vehicles and the like comprising a mounting bracket, a support bracket comprising first and second members, first pivot means pivotally mounting an upper end of the first member of said support bracket on said mounting bracket for permitting swinging movement of said first member relative to said mounting bracket, second pivot means pivotally mounting an upper end of said second member on a lower end of said first member for permitting said second member to swing in a plane disposed transversely relative to a plane of swinging movement of said first member relative to said support bracket, a first step mounted on a lower end of said second member, a second step disposed vertically above said first step and attached to said second member, and a releasable detent means for normally holding said support bracket in a vertically disposed position and releasable upon application of a predetermined force imposed on said support bracket for swinging said support bracket relative to said mounting bracket.

4,053,173
BICYCLE
 Douglas Chase, Sr., Rte. No. 3, Box 422, Cheboygan, Mich.
 49721
 Filed Mar. 23, 1976, Ser. No. 669,606
 Int. Cl.² B62M 1/04
 U.S. Cl. 280—253 9 Claims

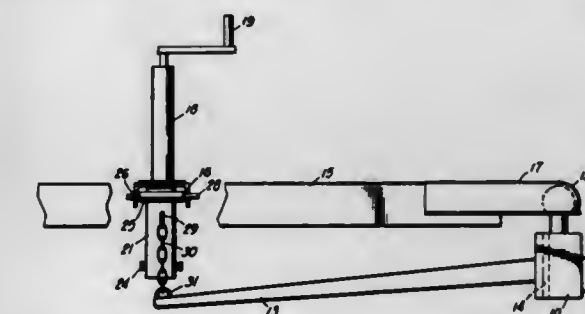


1. In a bicycle of the type having a frame, a front wheel and

rear wheel rotatably secured to said frame, the improvement comprising:

- a right and left elongated foot lever pivotally secured at one end to said frame,
- a pivot rod pivotally connected to said frame and substantially parallel to the axis of rotation of said rear wheel, means for rotating said pivot rod between a first and second rotational position in response to the alternate depression of said foot levers, and
- means for rotatably driving said rear wheel in response to the pivotal action of said pivot rod comprising an axle associated with the rear wheel and the rotation of which rotatably drives the rear wheel, a driven lever secured to and extending radially outward from said axle, a driving lever secured to and extending radially outward from said pivot rod, and a driving link having one end secured to said driving lever and its other end secured to said driven lever whereby rotation of the pivot rod from its first to its second rotational position effects a one half revolution of said axle while rotation of the pivot rod from its second to its first rotational position effects a one half revolution of said axle.

4,053,174
LOAD TRANSFERRING TRAILER HITCH DEVICE
 Lawrence H. Gaetler, Jr., P.O. Box 1695, Montgomery, Ala.
 36108
 Filed Sept. 7, 1976, Ser. No. 720,900
 Int. Cl.² B60D 1/06
 U.S. Cl. 280—406 A 16 Claims

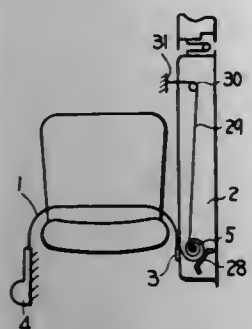


1. In a load transferring trailer hitch having a resilient member which is tensioned to distribute trailer weight through the hitch on all wheels of the towing vehicle, the improvement comprising a jack means on the trailer having an engaging part which engages the resilient member to apply tension to the latter when the jack means is operated in one direction with the trailer and towing vehicle coupled through the hitch, and means interconnecting the resilient member and trailer and relieving the jack means of substantial forces transmitted through said resilient member during towing of the trailer.

4,053,175
PASSIVE SEAT BELT SYSTEM
 Masami Kato, Toyooka; Shigenori Kanazawa, Toyota, and Kiyomitsu Oshikawa, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
 Division of Ser. No. 595,319, July 11, 1975, Pat. No. 4,004,829.
 This application May 12, 1976, Ser. No. 685,709
 Claims priority, application Japan, July 17, 1974, 49-82608; July 29, 1974, 49-86777; July 30, 1974, 49-87852
 Int. Cl.² B60R 21/02
 U.S. Cl. 280—745 6 Claims

1. A passive seat belt system for a motor vehicle comprising: a belt coupled at its one end to a vehicle door and having inner thin space therein extending from said one end to the other end;
- a seat belt retractor secured to a floor of a motor vehicle and having a retracting reel rotatably received therein for windingly retaining said belt and a coil spring coupled to

said retracting reel for normally biasing said reel in a belt retracting direction;
belt reinforcing means of flat strip type inserted at its one end into said inner thin space of said belt through an opening provided thereon;
reel means rotatably mounted in said vehicle door for windingly retaining said belt reinforcing means; and



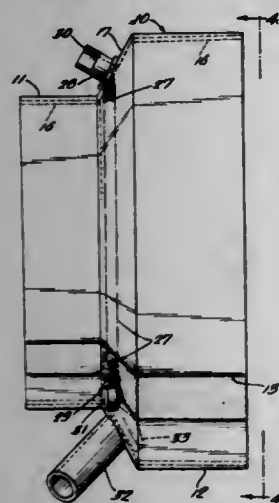
driving means mounted in said vehicle door and coupled to said reel means for extending said belt reinforcing means when said vehicle door is opened, said belt reinforcing means extending through said inner thin space in accordance with the extension thereof driven by said driving means, and
said driving means retracting said belt reinforcing means when said vehicle door is closed, and thereby said belt reinforcing means is retracted from said inner thin space.

4,053,176

COLLAR FOR SEALING PIPE JOINTS
Edward Oscar Hilbush, West Chester, Pa., assignor to West Chester Chemical Co., Inc., West Chester, Pa.
Filed Oct. 15, 1975, Ser. No. 622,696
Int. Cl.² F16L 55/00

U.S. Cl. 285-15

3 Claims



1. A molded flexible collar for sealing bell and spigot joints in pipes, said collar having a large sleeve to enclose the bell, a small sleeve to enclose the spigot, a connecting sleeve joining said large and small sleeves, the sleeves being integrally molded from an elastomeric material, a vent in said connecting sleeve for elimination of voids in the sealant by permitting gases to escape from the collar, a sealant inlet tube in said connecting sleeve circumferentially spaced from said vent, a dam secured to the inside of said connecting sleeve, said dam extending across the inside of said connecting sleeve and extending radially inward therefrom so that the top of said dam is spaced from the pipes to define a flow path between the pipes and said dam for the sealant to flow over said dam so that sealant flows in at least two circumferential directions about the collar with one direction of flow subject to a flow impediment caused by said dam, said inlet tube being circumferentially spaced from said dam and being connected to the collar

so that sealant injected into the collar has a flow direction which is biased toward said dam.

4,053,177

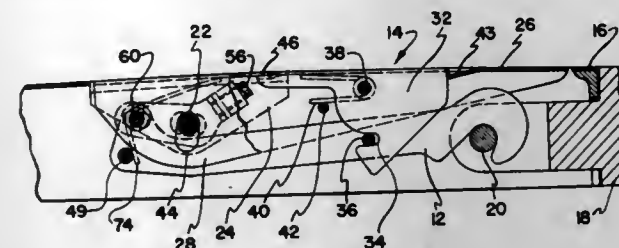
ADJUSTABLE LATCH

John Creighton Stammreich, Buena Park, and Robert Dean Richter, Harbor City, both of Calif., assignors to Tridair Industries, Torrance, Calif.

Filed June 8, 1976, Ser. No. 694,002
Int. Cl.² E05C 19/14

U.S. Cl. 292-113

1 Claim



1. An adjustable overcenter aircraft hook latch having an open and closed position comprising:
 - a. a pivotable handle member mounted about a fulcrum axis at one end thereof;
 - b. a latching member pivotably connected about a pivot axis at said one end of the handle member and extending toward the other end of said handle member when said latch is in its closed position;
 - c. said latching member having means at its extremity for engaging a keeper and slidable relative to said handle member;
 - d. adjusting means for adjusting said pivot axis relative to said fulcrum axis comprising a first yoke member mounted about said pivot axis, a second yoke member mounted about said fulcrum axis and cooperating with said first yoke member, and a driver for moving said yoke members relative to one another;
 - e. said handle member having an access opening in its outer face for the engagement of said driver by a drive tool when said latch is in its closed position;
 - f. said first yoke member being generally U-shaped with extending arms and a closed end portion, said arms mounted about said pivot axis through an opening therein, said fulcrum axis passing through slots in said first yoke member forward of said pivot axis, and the closed end portion of said first yoke member extending upwardly and forwardly above said fulcrum axis and terminating into a flat-bearing surface facing the access opening in said handle when the latch is in its closed position;
 - g. said second yoke member overlaying said first yoke member and being generally U-shaped with extending arms and a closed end portion, said second yoke member mounted about said fulcrum axis through an opening therein, said pivot axis passing through slots in the arms of said second yoke member rearwardly of said fulcrum axis, and the closed end portion of said second yoke member extending upwardly and forwardly above said flat bearing surface of said first yoke member and in alignment with said surface and said access opening in said handle when the latch is in its closed position;
 - h. said slots in said first and second yoke members particularly arranged with respect to each other to guide said pivot axis relative to said fulcrum axis to maintain said latch in an overcenter condition when the latch is in its closed position;
 - i. said driver comprising a screw threaded to the second yoke member and bearing against the flat surface of said first yoke member, and said screw being in alignment with said access opening in said handle when the latch is in its closed position; and
 - j. said first yoke member, pivot axis and latching member

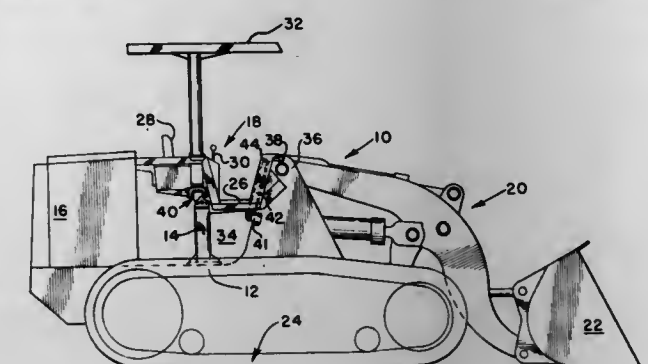
slidable relative to said second yoke member and fulcrum axis when said first yoke member is driven by said driver.

4,053,178

PLATFORM - OPERATOR TILTING RESILIENT MOUNTING FOR EARTHMOVING VEHICLES
Lyle E. York, Peoria, and Dale C. Brinkmann, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 18, 1975, Ser. No. 614,812
Int. Cl.² B62D 27/06

U.S. Cl. 296-28 C

10 Claims



1. In a vehicle having a frame, an operator cab overlying the frame, and vehicle components underlying the cab when the cab is in an operating position relative to the frame, apparatus for moving the operator cab upward away from the frame to a maintenance position wherein the vehicle components are exposed, comprising:
 - means for mounting the cab to the frame for pivotal movement relative thereto about an axis adjacent one side of the cab; and
 - jack means for mechanically altering the pivotal position of the cab relative to the frame when an adjusting force is applied thereto, said jack means including a pair of elongate members connected respectively to the frame and the cab spaced from the axis, said members being aligned in telescoping relation for relative longitudinal movement, and means interconnecting the members for applying a moving force therebetween to move the cab-connected member along the length of the frame-connected member in response to said adjusting force and for applying a frictional locking force between said members to frictionally lock said members against relative longitudinal movement whenever said adjusting force is not being applied, said members being adjustable to pivot the cab to a maintenance position in which the center of gravity thereof is located on a side of the pivot axis whereat the weight of the cab applies a force to move said pair of elongate members apart, and said interconnecting means applies a bearing force which opposes the force of the cab weight.

4,053,179

POSITIONING MEANS FOR A WINDSHIELD WIPER ARM ASSEMBLY

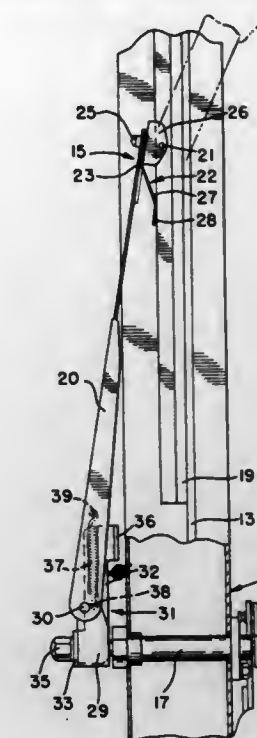
Stanley A. Jorgensen, Oswego, and Kenneth R. Myers, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 5, 1976, Ser. No. 673,504
Int. Cl.² B60S 1/34, 1/40

U.S. Cl. 296-28 C

10 Claims

1. A windshield wiper arm assembly comprising a wiper arm adapted for mounting adjacent to a windshield, and adapted to receive a portion of a rock shaft for causing oscillation of said wiper arm about the axis of said rock shaft
a blade pivotally mounted on an upper end of said wiper arm, said blade being pivotal around a pin means positioned so that the axis thereof is perpendicular to the axis of said rock shaft, and
positioning means comprising spring means having a first end thereof secured to an upper end of said wiper arm and

a second end thereof engaging a lower end of said blade directly for biasing said blade outwardly away from said



wiper arm and toward said windshield and in a direction generally parallel to the axis of said rock shaft to maintain said blade at an acute angle relative thereto.

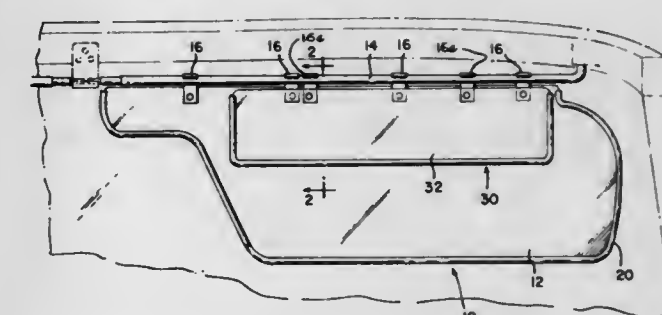
4,053,180

AUTOMOBILE SUN VISOR

Fred C. White, 1210 S. Bailey St., Seattle, Wash. 98108
Filed May 20, 1976, Ser. No. 688,353
Int. Cl.² B60J 3/02

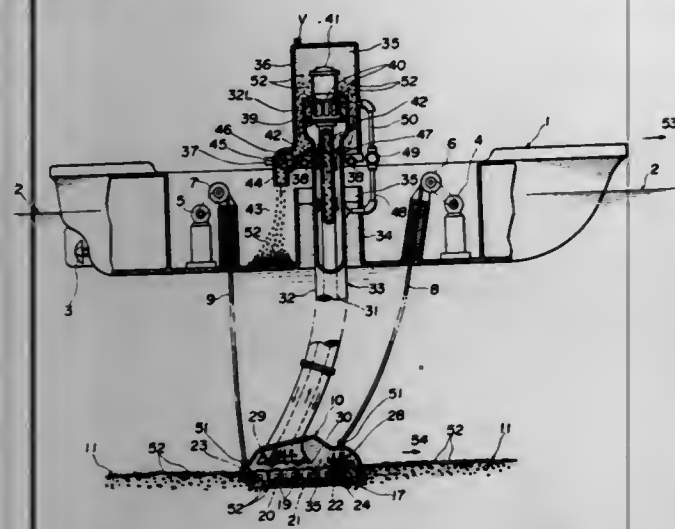
U.S. Cl. 296-97 K

4 Claims



1. An automobile visor for reducing glare, comprising:
 - a horizontally disposed elongated rod mounted above the automobile windshield,
 - a transparent glare-reducing visor,
 - releasable means securing the visor to the rod for providing release of the visor from the rod during a forward impact on the visor,
 - said releasable securing means including a plurality of spaced curved friction clips each having an open end facing rearwardly and pressed over said rod whereby a forward impact on the visor will force open the open ends of the clips to release the visor from the rod,
 - an auxiliary transparent glare reducing plate releasably secured to said rod with the auxiliary glare reducing plate adapted to overlie said visor in parallel relationship, and a plurality of similar clips mounting said glare reducing plate on said rod in a similar manner whereby a forward impact on the auxiliary glare reducing plate will force open the ends of the clips and the release of the plate from said rod.

4,053,181
SEABED MINING UTILIZING CIRCULATING CURRENT
BASED ON WATER LEVEL DIFFERENCES
 Nakaji Saito, 3-1, Higashijuku 6-chome, Kita, Tokyo, Japan
 Filed Oct. 5, 1976, Ser. No. 729,734
 Claims priority, application Japan, Jan. 20, 1976, 51-5583
 Int. Cl.² E02F 3/88
 U.S. Cl. 299-9 9 Claims



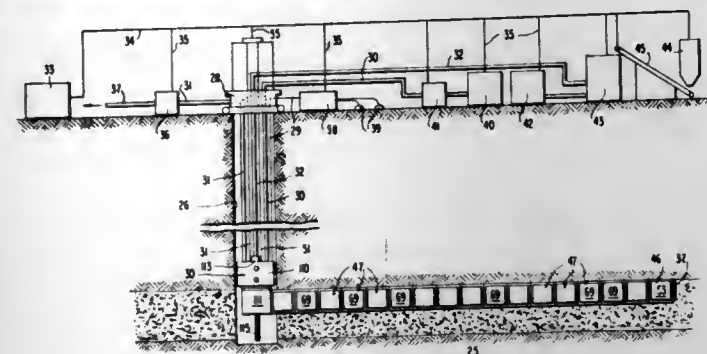
1. Apparatus for sucking and extracting seabed mineral resources utilizing a circulating current based on the difference of water levels comprising:

- a working ship traveling on an ocean and mounted at its upper portion with an external cistern containing seawater at a level higher than the level of seawater on the ocean;
- a hollow box shaped tank having its bottom opened, sunk liftably into the sea bottom by a rope from said working ship, and having a rotatory driving mechanism for causing said tank to be trawled along the sea bottom while stirring it when said working ship travels on the ocean;
- an elongated flexible coaxial pipe with both ends opened which includes an inner pipe and an outer pipe arranged coaxially with the inner pipe, the upper portion of which is disposed within the external cistern of said working ship, and which has an enlarged hopper mouth at its lower end disposed within said tank through the upper wall thereof;
- a suction pump joined within the external cistern to the upper end of said coaxial inner pipe for sucking mineral resources and seawater from within said tank;
- selection means for selecting seabed mineral resources out of seawater sucked up by said pump from said tank through said coaxial inner pipe into the external cistern and gathering the selected mineral resources in said working ship; and
- returning means for bringing the seawater after selecting out the seabed mineral resources by said selection means back into said tank through a space defined by an outer wall of said coaxial inner pipe and an inner wall of said coaxial outer pipe utilizing the difference between the level of seawater contained in the external cistern and the level of seawater on the ocean.

4,053,182
MINING METHOD AND APPARATUS
 Rodney L. Nelson, Falls Creek, Pa., assignor to Ray M. Baughman, Dubois, Pa., a part interest
 Division of Ser. No. 664,191, March 5, 1976. This application Oct. 5, 1976, Ser. No. 729,718
 Int. Cl.² E21C 27/24, 41/00
 U.S. Cl. 299-19 26 Claims

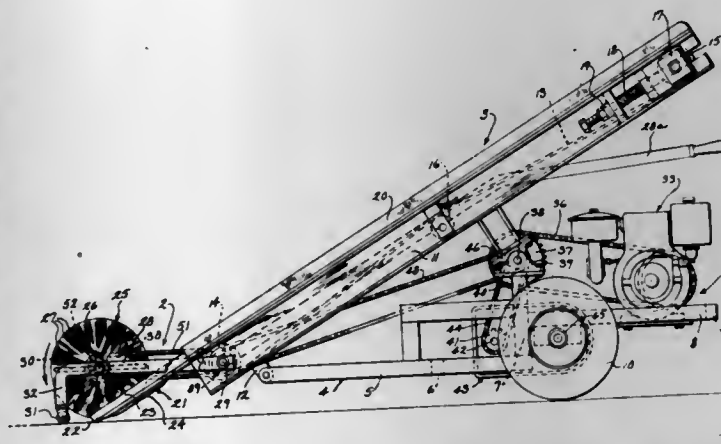
1. Apparatus for mining solids from a subterranean seam containing minable solids through a prepared shaft extending from ground level into said seam comprising plural mining modules adapted to be placed one at a time in coupled relationship in said seam, a module placement and advancing unit

adapted to be lowered through said shaft to said seam with each mining module and to force each module into said seam on a radial path away from said shaft while coupled with a module immediately ahead of it, and a rotational driving unit



for all of the coupled mining modules in said seam adapted to be lowered in said shaft into coupled engagement with the rearmost mining module adjacent said shaft for then driving the modules through said seam on an arcuate path centered on said shaft.

4,053,183
APPARATUS FOR DISLODGING AND COLLECTING MATERIALS
 John F. Probst, Hartland, Wis., assignor to P.A.L. Development Corporation, Butler, Wis.
 Filed July 16, 1976, Ser. No. 705,761
 Int. Cl.² E04D 15/00
 U.S. Cl. 299-36 12 Claims

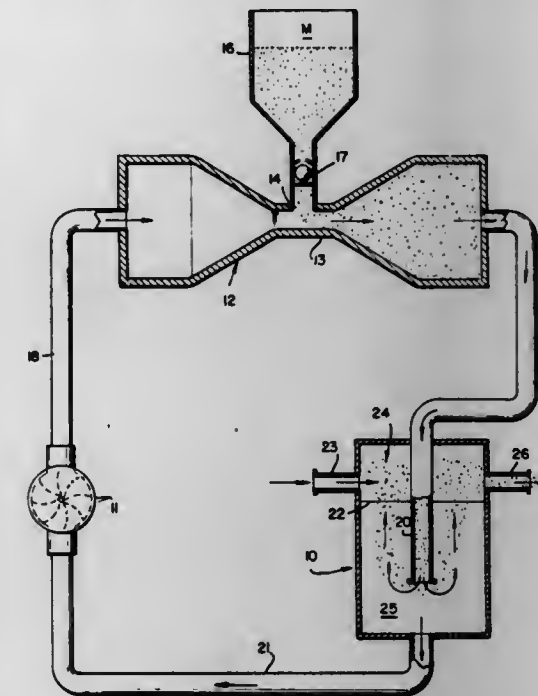


1. A self-propelled apparatus for dislodging material from the surface and conveying the material for collection, comprising a self propelled vehicle including a frame, a scraping member extending transversely of the vehicle and mounted forwardly of the frame, said scraping member comprising a blade having a relatively sharp edge disposed to engage a surface as the vehicle is propelled to dislodge material from the surface, conveying means mounted on the frame and located to the rear of the scraping member in position to receive dislodged material from the scraping member and convey the dislodged material rearwardly to a position for collection, a brush having a plurality of flexible bristles and mounted adjacent to the forward edge of the scraping member, and means for rotating the brush whereby the brush will sweep dislodged material rearwardly across the scraping member to the conveying means.

4,053,184
SOLIDS TRANSFER METHOD
 Raymond W. Hiteshew, Bedford, Pa., assignor to Cities Service Company, Tulsa, Okla.
 Filed July 30, 1975, Ser. No. 600,326
 Int. Cl.² B65G 53/30
 U.S. Cl. 302-46 2 Claims

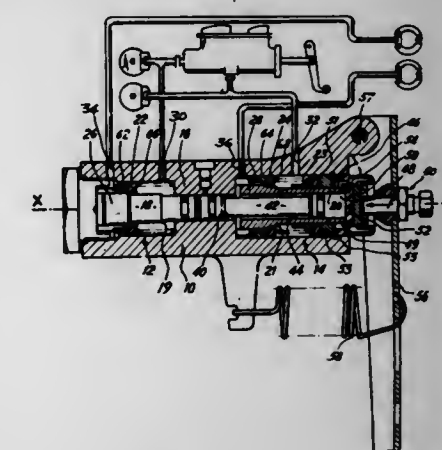
1. A method of introducing finely divided coal into a circulating liquid pressure system where the finely divided coal is

retained at atmospheric pressure and the system is under a pressure of at least 10 atmospheres, comprising the steps of introducing a Venturi tube, said tube having a throat of predetermined cross-section in the liquid system, pressurizing the system with a liquid flow so as to generate a negative pressure in the Venturi tube, providing an inlet port at the Venturi throat, introducing finely divided coal into the throat through said port so that negative pressure at the throat operates to



siphon finely divided coal into the system, wherein the liquid is a dense liquid having a density greater than the density of coal and immiscible relative to the coal maintaining the system at a temperature sufficiently high to keep said dense liquid in a liquid state, transporting the coal and dense liquid to a separation chamber, separating the coal from the dense liquid while in said separation chamber by flotation, sweeping the coal from the separation chamber by a gaseous fluid into a reactor and recirculating said dense liquid.

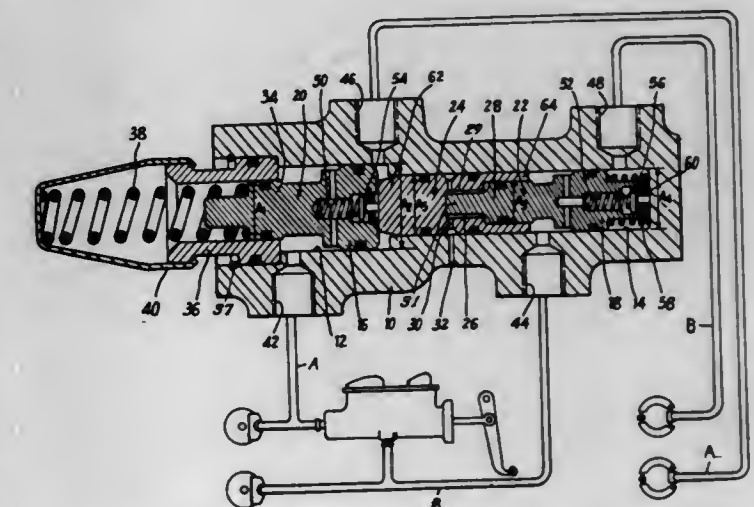
4,053,185
DUAL BRAKING CORRECTION DEVICE
 Jean Jacques Carre, Montreuil, France, assignor to Societe Anonyme D.B.A., Paris, France
 Filed July 12, 1976, Ser. No. 644,690
 Claims priority, application France, Jan. 17, 1975, 75.01423
 Int. Cl.² B60T 8/18, 8/26
 U.S. Cl. 303-6 C 5 Claims



1. A correction device for a vehicle braking system comprising:
 a housing in which are disposed two correcting valves having inlet and outlet ports adapted to be separately connected to two independent sets of vehicle brake actuators respectively, each of said two correcting valves including a control piston slidably mounted in a bore, each of said

control pistons being adapted to control communication between its corresponding inlet and outlet ports;
 resilient means having a tension variable as a function of the load applied on the vehicle wheel axle associated with the vehicle;
 force distributing means being provided for respectively transmitting to each of said control pistons, part of the force generated by said resilient means in the direction of opening of said two correcting valves, said force distributing means having a rigid shell with a cylindrical cavity located therein;
 linkage means connected to said resilient means for transmitting an input force from the resilient means to said force distributing means;
 a block of elastomeric material located within said cavity; and
 a projection extending from each of said control pistons into said cavity and contacting said block, the area of the block face adjacent each of the projections being substantially equal to the sum of the areas of the contacting faces of said ends to hold said block within a deformable enclosure of constant volume and thereby transmit equal operational forces to said control pistons.

4,053,186
PROPORTIONAL VALVE APPARATUS FOR USE IN A REAR BRAKE SYSTEM OF A VEHICLE
 Dieter Jakobi, Brebach-Fechingen, Germany, assignor to The Bendix Corporation, South Bend, Ind.
 Filed Mar. 26, 1976, Ser. No. 671,224
 Claims priority, application Germany, June 4, 1975, 2524842
 Int. Cl.² B60T 8/18, 8/26
 U.S. Cl. 303-6 C 8 Claims



4. Proportioning valve apparatus for a dual circuit brake system, said apparatus comprising:
 a housing having a bore closed at one end;
 a first movable proportioning piston slidably disposed in said bore having a head portion and a rod portion, said rod portion having an area in section smaller than that of said head portion;
 a first output chamber established by the extremity of the head portion of the first piston and the closed end of the bore, said first output chamber being in communication with a first outlet port of the housing;
 an intermediate piston being disposed in said bore; said intermediate piston having a recess for receiving the rod portion of the first piston, said recess being vented to the atmosphere;
 a first inlet chamber communicating with a first inlet portion of the housing being established by the intermediate piston and the head portion of the first piston;
 a second movable proportioning piston slidably disposed in an enlarged diameter portion of said bore, said second movable proportioning piston having a head portion and a rod portion, the rod portion of the second movable por-

portioning piston having an area in cross section smaller than that of the second head portion;
 a second output chamber established by the other end of the intermediate piston and the extremity of the head portion of the second piston in communication with a second outlet port of the housing;
 closing means cooperating with the rod portion of the second piston for sealing said bore;
 a second inlet chamber established by said closing means and the head portion of the second piston in communication with a second inlet port of the housing;
 valve means located in each head portion of the first and second proportioning pistons for respectively controlling the fluid passage between the first and second inlet and outlet chambers;
 first resilient means for urging said second piston toward said first piston; and
 second resilient means having a load lower than said first resilient means being disposed between the closed end of the bore and the head portion of the first piston for urging said first rod portion into engagement with said intermediate piston to provide simultaneous movement of said first and second pistons in response to presentation of first and second fluids to said first and second inlet ports and thereby permit said valve means to simultaneously allow said first and second fluid to be communicated to said first and second outlet ports.

4,053,187

SINGLE GAIN SKID CONTROL VALVE AND SKID CONTROL SYSTEM

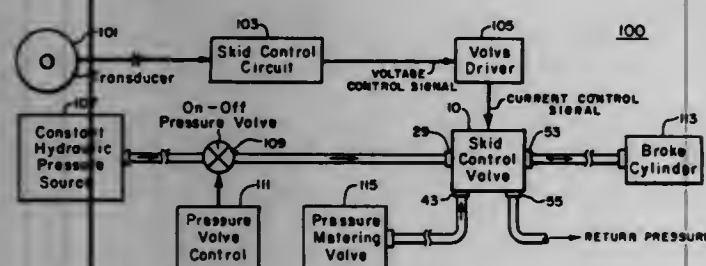
Robert D. Cook, Valencia, Calif., assignor to Crane Co., Chicago, Ill.

Filed Nov. 16, 1976, Ser. No. 742,251

Int. Cl.² B60T 8/02

U.S. Cl. 303—93

22 Claims



13. A skid control valve responsive to a variable skid control signal, comprising:
 control pressure generating means for providing a hydraulic control pressure in response to the skid control signal, said control pressure being exclusively controlled by the skid control signal and having a level which is a predetermined function of the skid control signal; and
 brake pressure valving means for accepting a metered hydraulic fluid pressure and for comparing the metered pressure with said control pressure and for producing a hydraulic brake pressure which is determined by the lower of either said control pressure or said metered pressure.

4,053,188

CIRCUIT ARRANGEMENT FOR ANTILOCKING CONTROL SYSTEM

Wolf-Dieter Jonner, Sandhausen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Dec. 22, 1976, Ser. No. 753,426

Claims priority, application Germany, Dec. 24, 1975, 2558712

Int. Cl.² B60T 8/10

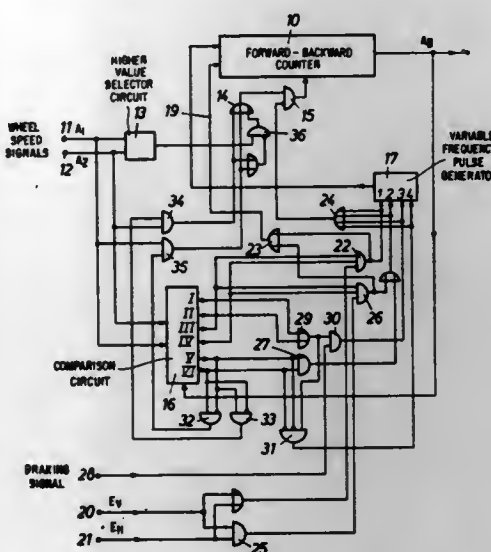
U.S. Cl. 303—96

15 Claims

1. For use in an antilocking control system for the wheel brakes of a vehicle wherein signals dependent on the rotational behavior of the wheels of the vehicle are evaluated to produce control signals, including slip signals, for controlling control

members associated with the wheel brakes of the vehicle to vary the brake pressure, a circuit arrangement for providing a reference value for generating the slip signals comprising in combination:

a memory for storing said reference value;
 first and second signal inputs for receiving respective first and second input signals whose values are dependent on the respective rotational speeds of two different wheels of the vehicle;
 selector circuit means, connected to said first and second signal inputs, for feeding the one of said first and second input signals with the greater value to said memory to cause said memory to store said greater value;
 comparison circuit means, connected to said first and second inputs and to said memory, for comparing the values of said first and second signals with the value of the reference signal stored in said memory and for emitting respective output signals whenever the value of either of said first and second signals exceeds or falls below the value of the reference signal stored in said memory;
 third and fourth signal inputs for receiving respective signals indicating that the control members associated with the wheels from which said first and second signals are derived have responded; and
 logic circuit means, responsive to the output signals from said comparison circuit means and to signals at said third and fourth signal inputs, for controlling said memory to



cause said reference value stored in said memory to be selectively varied according to either a first negative time constant for rapidly decreasing the value in said memory whereby a very rapid matching of a higher reference value to the rotational speed of the wheel will be effected, a second negative time constant for very slowly reducing the value in said memory whereby a very slow reduction in the reference value corresponding to a decrease in the speed of the vehicle on ground having a small coefficient of friction will be effected, or a third positive time constant for relatively rapidly increasing the value in said memory whereby a relatively rapid matching of the reference value with a greater rotational speed of a wheel will be provided; said logic circuit means including switching means for causing said reference value stored in said memory to be varied according to

a. said first time constant when said comparison circuit means produces output signals indicating that the value of both of said first and second signals is less than said reference value;
 b. said second time constant when said comparison circuit means produces output signals indicating that the value of both of said first and second signals is less than said reference value and signals are present at said third and fourth signal inputs indicating that both control members have responded; and
 c. said third time constant when said comparison circuit means produces output signals indicating that the value of

at least one of said first and second signals is greater than said reference value.

4,053,189

TURBINE CONSTRUCTION

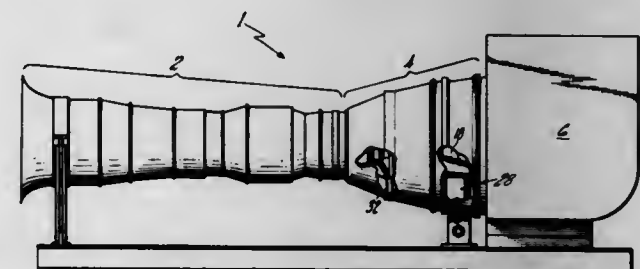
Rudolph J. Novotny, Stuart, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed June 17, 1976, Ser. No. 697,096

Int. Cl.² F16C 35/00

U.S. Cl. 308—26

10 Claims



1. A turbine power assembly comprising a case, a rotor assembly mounted for rotation therein, said rotor assembly having a forwardly extending shaft means, a bearing assembly for supporting said shaft means, means mounting said bearing assembly comprising a diaphragm positioned therearound, said diaphragm having an inner periphery and an outer periphery, the inner periphery of said diaphragm being fixed to said bearing assembly, an annular passageway located between said bearing assembly and case, vanes in said passageway, the outer periphery of said diaphragm being connected to the inner ends of said vanes, a cylindrical member, said cylindrical member having one end connected to the case, said vanes having their outer ends fixed to said cylindrical member.

4,053,190

SELF-ALIGNING BEARING WITH A SPLIT INNER MEMBER

Albert R. McCloskey, Fairfield, Conn., assignor to The Heim Universal Corporation, Fairfield, Conn.

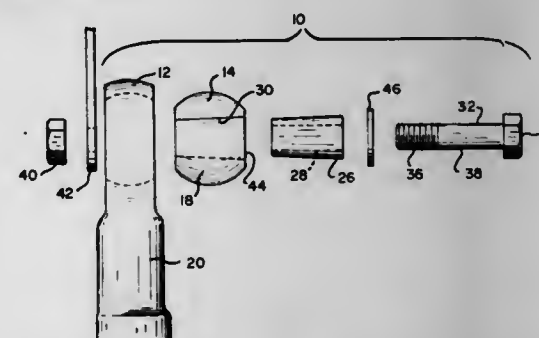
Division of Ser. No. 589,201, June 23, 1975, Pat. No. 4,024,616.

This application Sept. 22, 1975, Ser. No. 615,624

Int. Cl.² F16C 23/08

U.S. Cl. 308—72

15 Claims



1. A self-aligning bearing assembly comprising an outer member having a concave inner surface and an inner member operationally carried within said outer member and having a convex outer surface generally complementary to said concave inner surface, said inner member being split to provide a tapered hole therethrough, said tapered hole being tangential to a central hole provided in said inner member.

4,053,191

ROLLING CONTACT SPRING BEARINGS

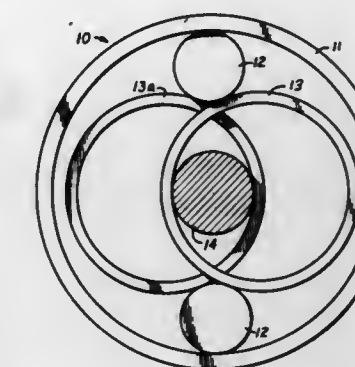
Earl W. Traut, 8040 Palm Lake Drive, Orlando, Fla. 32811

Filed Nov. 3, 1975, Ser. No. 628,350

Int. Cl.² F16C 19/20, 19/40, 19/56

U.S. Cl. 308—206

9 Claims



1. A rolling contact bearing comprising:
 an outer race,
 an inner race,
 rotating roller means,
 said rotating roller means being located between said outer race and said inner race and including a plurality of rollers,
 rotating ring means,
 said rotating ring means being located between said outer race and said inner race and including a plurality of rings,
 said rotating ring means being in rolling contact with at least one of said races, so as to transfer at least part of the bearing load therethrough,
 said rollers and said rings being alternately interposed between and holding each other in position.

4,053,192

MODULAR FURNITURE

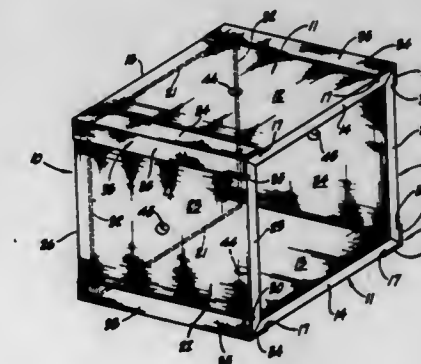
Norman Spetner, 7108 Delmar Blvd., St. Louis, Mo. 63130

Filed Jan. 9, 1976, Ser. No. 647,940

Int. Cl.² A47B 87/00

U.S. Cl. 312—107

3 Claims



1. A modular furniture combination comprising:
 a. a plurality of stacked components each including:
 1. a plurality of stacked components each including:
 I. a substantially flat outer face having a pair of parallel side margins and associated parallel grooves disposed adjacent said margins said face being planar on each side of said grooves, and
 II. a substantially flat inner face having a pair of parallel chamfered side edges and a perpendicular groove extending therebetween said chamfered edges being engageable with the chamfered side edges of an adjacent panel,
 2. a plurality of identical elongate rails interconnecting adjacent panels, each rail including:
 I. angularly related outstanding legs having transversely related, lengthwise extending lips receivable

within associated outer face grooves of adjacent panels to form a corner between said panels, and

II. each of said legs having an inner face engageable with an associated panel planar outer face and an outer face disposed in a plane spaced from the plane of said panel outer face to provide an outstanding bearing seat engageable by the corresponding outstanding rail bearing seat of a like component for stacking purposes to space corresponding panel outer faces between said rails apart.

3. stiffener means receivable within said inner face grooves of the panels,
- b. at least one panel of one stacked component including at least one fastener opening disposed in the panel area between the rails substantially alignable with a corresponding fastener opening of a spaced panel of an adjacent stacked component, and
- c. fastener means receivable within said fastener openings and extending between the spaced apart outer surfaces of said corresponding panels of like stacked components tending to urge said spaced panels toward each other and connect said stacked components.

4,053,193

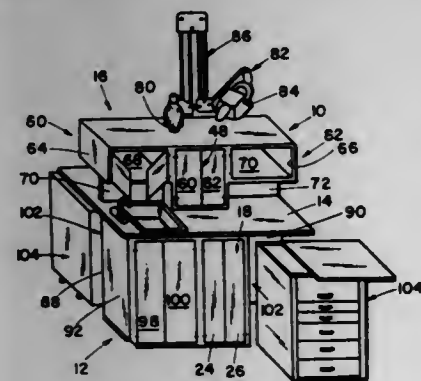
ROOM DIVIDER AND CABINET STRUCTURE FOR DENTAL EQUIPMENT

Richard E. Grover, and Robert H. Larsen, both of Box 254, Grandville, Mich. 49418

Filed Mar. 29, 1976, Ser. No. 671,677
Int. Cl.² A61C 19/02; A47B 77/08

U.S. Cl. 312-209

8 Claims



1. A dental room divider permitting access to and use of a variety of dental equipment from opposite sides of the divider and thereby eliminating equipment duplication, said divider comprising:

- a central enclosure including an elongated horizontally extending countertop and a pair of spaced vertically extending sidewalls supporting said countertop, said countertop extending outwardly beyond each of said sidewalls;
- a first access means positioned below said countertop for permitting access to said central enclosure from one side thereof;
- a second access means positioned below said countertop opposite said first access means for permitting access to said central enclosure from the other side thereof;
- an upper, generally T-shaped enclosure including a pair of spaced vertically extending sidewalls and a pair of outwardly extending wing enclosures supported by said countertop and dividing said countertop into two mirror image, dental operator work areas on opposite sides of said upper enclosure and extending longitudinally of said countertop, each side of said upper enclosure further including access means secured thereto for permitting access to the interior of said enclosure from opposite sides thereof;
- a pair of vertical divider walls positioned on said countertop adjacent the longitudinally centerline thereof and extending outwardly from and perpendicular to the sidewalls of

said upper enclosure to a point adjacent the ends of said countertop thereby isolating said dental work areas; and means disposed within one of said enclosures for slidably mounting a piece of dental equipment for movement to either side of said enclosure whereby said equipment may be used by a dentist positioned on either side of said dental room divider.

4,053,194

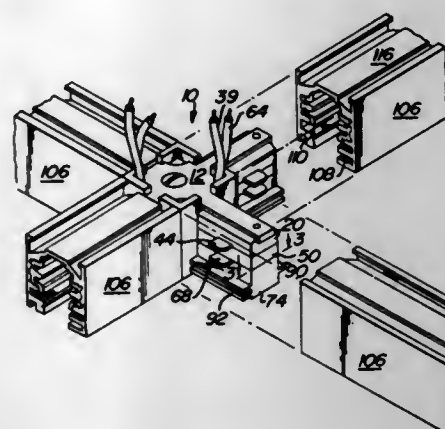
ELECTRICAL JUNCTION ASSEMBLY

Lester Gilman, Southampton, Pa., assignor to Kidde Consumer Durables Corporation, Bala Cynwyd, Pa.

Filed May 3, 1976, Ser. No. 682,938
Int. Cl.² H01R 9/00

U.S. Cl. 339-21 R

12 Claims



1. An electrical junction assembly for electrically coupling mating bus bars of two adjacent tracks comprising a non-conductive body portion having at least two integral legs, a ground overlying a part of said body portion, at least two mating distributor members of electrically conductive material, each distributor member having a body and at least two flanges generally perpendicular to a plane of the body, each flange having at least one leg, each flange leg being integral in one piece with and extending from one end of its associated flange, each flange leg having a tab lying generally perpendicular to its leg and generally parallel to its associated body, said two distributor members being arranged in a set with a non-conductive spacer therebetween so that the tabs of a pair of legs extending outwardly away from each other beyond opposite side faces of each of said body portion legs, and means coupling said components into an assembled relationship.

4,053,195

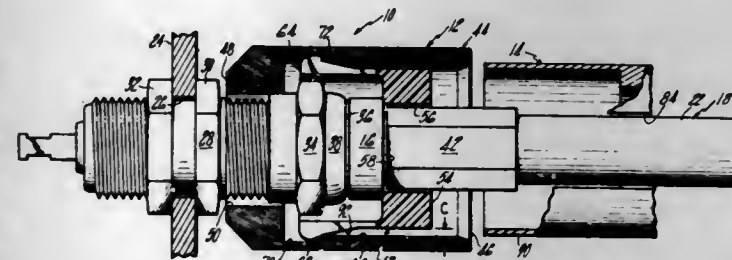
THEFTPROOF CONNECTOR ASSEMBLY

Eric W. Laverick, South Nashua, N.H., and Allen I. Horowitz, Windsor Locks, Conn., assignors to Hi-G Incorporated, Windsor Locks, Conn.

Filed Oct. 14, 1975, Ser. No. 621,372
Int. Cl.² H01R 13/54

U.S. Cl. 339-37

16 Claims



1. For protecting a coaxial cable connection to a use device, a theftproof assembly comprising a connector including a coupling for connecting a coaxial cable to the use device, a housing for the coupling, the housing having an open end for receiving the coupling, an end cap for enclosing the open end

of the housing and protectively shielding the coupling within the housing, the cap having an end wall with an opening of enlarged size relative to the cable but of reduced size relative to the coupling permitting the cap to be fitted over the cable and inserted into the housing by manually sliding the cap over the cable into the open end of the housing, the housing and cap having recess means and complementary projection means movable into interlocking engagement, upon inserting the cap into the housing, for securing the housing and cap in locked assembly with the coupling protectively isolated within the surrounding confines of the assembly.

4,053,196

SUBMERSIBLE ELECTRIC MOTOR AND ELECTRICAL CONNECTOR ASSEMBLY

Louis R. Dunaway, Gettysburg, Ohio, assignor to Century Electric Motor Co., Gettysburg, Ohio

Continuation of Ser. No. 578,532, May 19, 1975, Pat. No. 3,997,232. This application Sept. 9, 1976, Ser. No. 721,827
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.² H01R 13/52

U.S. Cl. 339-94 R

10 Claims



1. In a submersible electric motor including a housing enclosing a stator and a rotor having a shaft supported by bearing means, an improved electrical connector assembly for coupling to said motor a power supply lead wire having an end portion projecting from surrounding insulation, said connector assembly comprising means connected to said housing and defining a bore, an electrically conducting socket member, electrical insulator means within said bore for supporting said socket member, a resilient gland member disposed within said bore and having means defining an opening for receiving said insulation on said power supply lead wire, said socket member having means defining an opening for receiving the exposed end portion of said power supply lead wire, means for electrically connecting said socket member to a stator wire within said housing, means for compressing said gland member in an axial direction to produce a fluid-tight seal between said insulation of said power supply lead wire and said motor housing, and means responsive to compression of said gland member for exerting a generally radial inward compression force on said socket member to produce a positive gripping action by said socket member.

4,053,197

ELECTRICAL CONNECTOR

Vladimiro Teagno, Turin, Italy, assignor to AMP Incorporated, Harrisburg, Pa.

Filed July 30, 1976, Ser. No. 709,980
Claims priority, application United Kingdom, Aug. 2, 1975, 32385/75

Int. Cl.² H01R 11/20

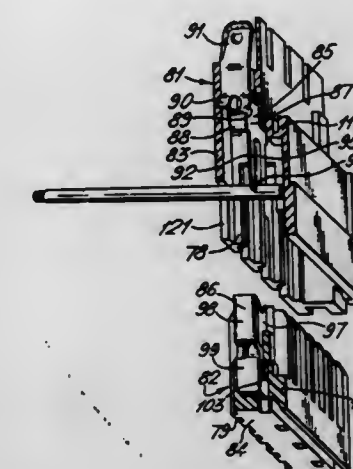
U.S. Cl. 339-99 R

4 Claims

1. An electrical connector assembly comprising:
a. a first housing of insulating material having a plurality of side walls forming at least one passageway opening into a

forward mating end, said mating end having at least one inwardly projecting elongated rib on one interior side wall surface, and at least one wire-receiving slot in a side wall in general alignment with the passageway;

- b. at least one conductive male terminal positioned in the passageway in the first housing, said terminal having a body section with a wire-connecting portion at one end extending into the forward mating end of the housing, said wire-connecting portion comprising a generally planar tab having a wire-receiving groove extending from its free end rearwardly toward the body section;
- c. a second housing of insulating material having one end adapted to be telescopically received into the forward mating end of the first housing, said one end having on the exterior surface of one wall at least one channel positioned to slidably receive the elongated rib positioned in the



forward mating end so as to guide the housings together, further, said second housing having at least one passageway therethrough, said passageway in said second housing being in alignment with the passageway in the first housing; and

- d. at least one conductive female terminal positioned in the passageway of the second housing, said female terminal having on one end a wire-connecting portion comprising a web with arms extending laterally along either side to provide a tab receiving cavity, so that as the first and second housing are mated together, the wire-connecting portion on the male terminal is telescopically received in the wire-connecting portion on the female terminal and a wire which may be inserted into the wire-connecting slot in the first housing in front of the male terminal is bent by the tab and web and crimped longitudinally in between the groove and the web.

4,053,198

ELECTRICAL CONNECTOR MEANS

Richard C. Doyle, Greenlawn, and James E. Meehan, Levittown, both of N.Y., assignors to Slater Electric Inc., Glen Cove, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,785
Int. Cl.² H01R 13/58

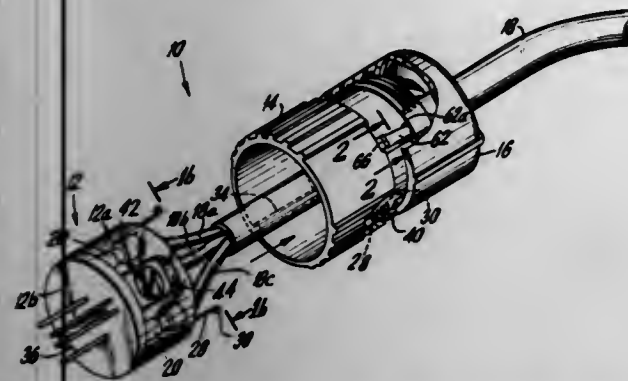
U.S. Cl. 339-103 R

32 Claims

1. Connector means adapted to be coupled to the end of a cable, which comprises:

- a generally cylindrical connector housing member, said housing member being generally hollow and adapted to receive said cable and a connector body, and having thread means formed substantially at one end;
- a generally cylindrical collar member, said collar member being generally hollow to receive said cable and having reciprocating thread means for threadably engaging said thread means on said connector housing;
- grasping means positioned between said housing and collar members when said members are threadably engaged, said grasping means adapted to securely engage said cable as

said collar and housing members are threadably engaged by relative rotation therebetween; detent means formed on one of said housing and collar members, said detent means adapted to project towards the other of said housing and collar members;



buttressing means formed on said other member, said buttressing means and said detent means proportioned to allow threadable coupling of said housing and collar members by relative rotation of said housing and collar members in one direction, but substantially prevent decoupling by simply reversing said relative rotation.

4,053,199

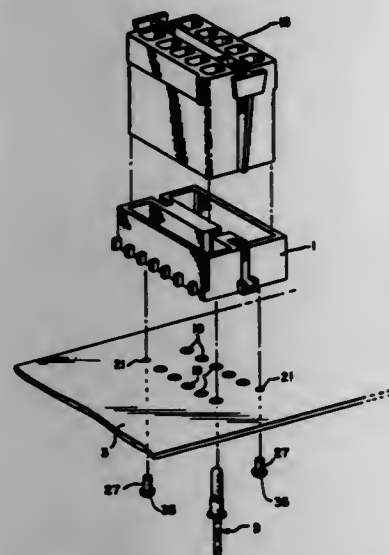
CABLE CONNECTABLE BULKHEAD FILTER ARRAY
Robert David Hollyday, and William Jeffrey Hudson, Jr., both of Hershey, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 555,657, March 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 423,944, Dec. 12, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 641,196

Int. Cl.² H01R 25/02

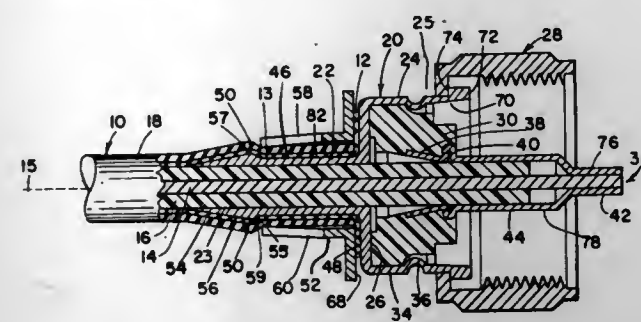
U.S. Cl. 339—147 R

1 Claim



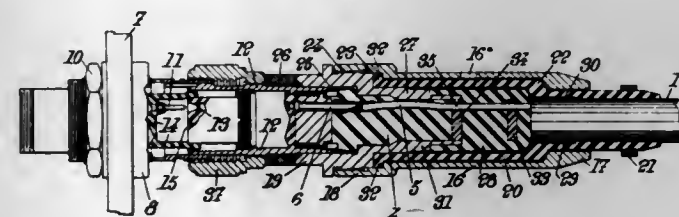
1. A filter array comprising a printed circuit board, a pin, a filter sleeve joined electrically over said pin, said pin and said filter being retained in said printed circuit board, said pin having a portion projecting outwardly of said printed circuit board, a first housing mounted on said printed circuit board and encircling said filter and said pin, a second housing coupling with said first housing and capable of being uncoupled therefrom, an electrical receptacle contained in said second housing and removably coupled to the projecting portion of said pin, a bottom wall of said first housing in spaced relationship from said printed circuit board, and an aperture in said bottom wall encircling said filter and said pin, said aperture being larger than said filter and said pin, said bottom wall thereby being spaced from said filter and said pin to prevent transmission of stresses to said filter and said pin upon coupling or uncoupling said first and second housings.

4,053,200
CABLE CONNECTOR
Stephen William Pagner, Bethel, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Nov. 13, 1975, Ser. No. 631,453
Int. Cl.² H01R 17/04
U.S. Cl. 339—177 R 39 Claims



1. An electrical connector assembly for connection to a coaxial cable including outer cable material having an outer conductor with an inner surface portion, an inner conductor, and an insulating member separating said outer and inner conductors, comprising a connector housing including a rear tubular conductive member extending along a longitudinal axis and having an outer peripheral surface portion dimensioned for engagement with the inner surface portion of the outer conductor and an inner passageway dimensioned for receiving the inner conductor and insulating member, contact means mounted in said housing, first and second shoulders on said rear tubular conductive member spaced apart longitudinally and separated by and extending radially from said outer peripheral surface portion, and an elongate sleeve member for disposition about the cable at a position over said outer peripheral surface portion and including a rigid closed section and inwardly resilient section dimensioned for normally pressing against the outer material of the cable to urge said outer conductor against said outer peripheral surface portion and outwardly expandable to move axially over one of said shoulders to reach said position over said surface portion, the ends of said sleeve and said shoulders cooperable through the intervening cable material to hold said sleeve in axial retention and prevent retrograde movement of the cable.

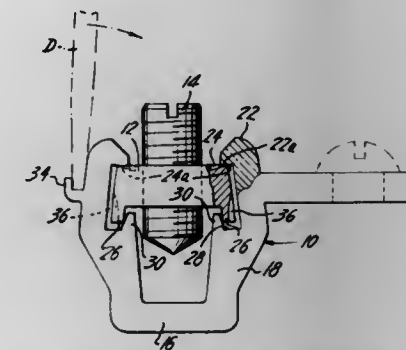
4,053,201
ELECTRIC CABLE CONNECTION ADAPTED FOR HIGH EXTERNAL PRESSURES
Rene Gabriel Grappe, Paris, France, assignor to Societe Souriau et Cie, France
Filed Feb. 6, 1976, Ser. No. 656,128
Claims priority, application France, Feb. 14, 1975, 75.04680
Int. Cl.² H01R 13/40
U.S. Cl. 339—218 R 16 Claims



1. In an electrical cable connector assembly which is particularly adapted for electrical cables subjected to very high external pressures, which is disposed between a connector member and the terminal end of the electrical cable, and which includes an insulator that fills an inner connector chamber wherein sheathed conductors of the cable are connected with electrical contacts of the connector member, the improvement wherein said insulator comprises a deformable, resilient material which

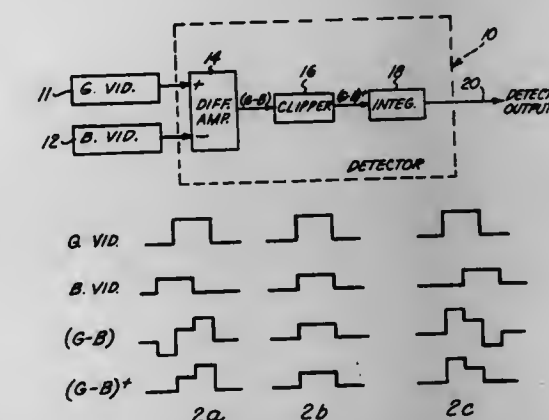
surrounds the sheathed conductors of the electrical cable and wherein said assembly includes means providing communication of the external pressure acting on the assembly with said insulator material through the outer wall of the assembly.

4,053,202
LAY-IN CONNECTORS
Alexander R. Norden, 350 Central Park West, New York, N.Y. 10025
Filed Apr. 27, 1976, Ser. No. 680,739
Int. Cl.² H01R 7/08
U.S. Cl. 339—272 UC 14 Claims



1. A lay-in connector including a resilient first member having a base portion and two opposite and spaced-apart walls upstanding integrally from said base portion, said walls having inward projecting overhangs spaced from said base portion, a screw-threaded second member removably received between said walls and having marginal portions underlying said overhangs, said second member being movable along the overhangs for removal from said first member, and a screw extending through said second member for tightening a conductor in place in said first member, the overhangs cooperating with the second member for resisting displacement of the latter away from said base portion when the screw is tightened, said walls having a first pair of ribs projecting upward between said base portion and said overhangs, and said second member having a second pair of ribs projecting downward and flanking said first pair of ribs, respectively, for resisting outward bulging of the walls when outward pressure is developed against the walls by one or more conductors tightened in place between the walls by the screw.

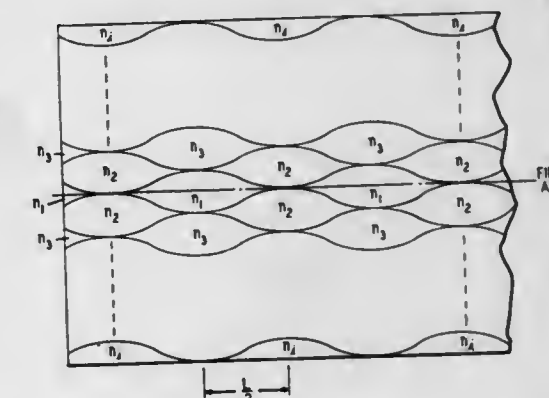
4,053,203
AUTOMATIC CENTERING
John F. Monahan, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio
Filed Dec. 22, 1975, Ser. No. 643,169
Int. Cl.² H04N 9/16
U.S. Cl. 358—51 17 Claims



1. Automatic centering apparatus for use with a video camera having means for providing at least first and second video signals and means responsive to a registration control signal for adjusting the registration of said signals, said centering apparatus comprising:
first delay means responsive to said first video signal for

delaying said signal by a first amount to provide a first delayed signal;
second delay means responsive to said second video signal for delaying said signal by a second amount substantially twice the length of said first amount to provide a second delayed signal;
detector means comprising signal subtractor means for differentially combining said second video signal and said first delayed signal to provide a first difference signal and similarly combining said second delayed signals and said first delayed signal to provide a second difference signal, signal clipper means responsive to said first and second difference signals for selectively limiting the amplitudes thereof to respectively provide first and second clipped signals, and integrator means responsive to said first and second clipped signals for respectively integrating the amplitudes thereof to provide first and second detector output signals; and
means responsive to said first and second detector output signals for providing said registration control signal and for changing said registration control signal in response to the difference between said detector output signals.

4,053,204
OPTICAL FIBER HAVING REDUCED DISPERSION
Stewart Edward Miller, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed July 30, 1976, Ser. No. 710,136
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 GN 6 Claims

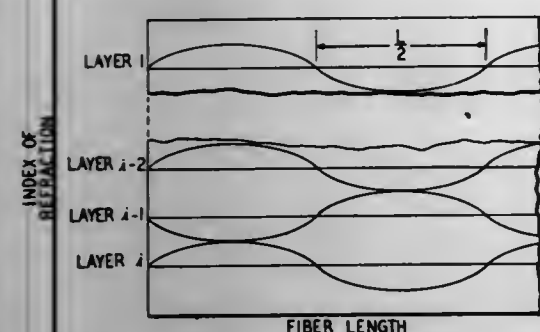


1. A graded index optical fiber having decreased optical dispersion comprising a core member and a cladding surrounding said core member, said core member including a plurality of layers, the refractive indices of which radially decrease from a maximum at the center of the fiber, characterized in that the thickness of each of said layers has spatial fluctuations along the longitudinal axis of said fiber, said fluctuations occurring slowly, the thickness of each layer varying between maximum and minimum values with the minimum thickness of each of said layers being proximate to zero.

4,053,205
OPTICAL FIBER HAVING REDUCED DISPERSION
Stewart Edward Miller, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed July 30, 1976, Ser. No. 710,137
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 GN 6 Claims

1. A graded index optical fiber having decreased optical dispersion comprising a core member and a cladding surrounding said core member, said core member including a plurality of layers the refractive indices of which radially decrease from a maximum at the center of the fiber
CHARACTERIZED IN THAT
the index of refraction of each of said layers has spatial fluctuations along the longitudinal axis of said fiber, the fluctuations in the refractive index of each layer occurring

slowly, the minimum refractive index of each layer being proximate in value to the maximum index of the radially next furthest adjacent layer, and the maximum refrac-



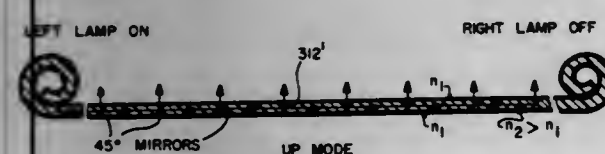
tive index of each layer being proximate in value to the minimum index of the radially more central adjacent layer.

4,053,206 MULTIPLE FUNCTION RECORDING AND READOUT SYSTEM

George Johannes Yevick, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.
Division of Ser. No. 515,344, Oct. 16, 1974, Pat. No. 4,007,958.
This application Aug. 12, 1976, Ser. No. 713,770
Int. Cl.² G02B 5/14

U.S. Cl. 350-96 R

3 Claims



1. A light-conducting sheet, comprising,
 - a. a sheet of transparent material having an index of refraction N_2 ,
 - b. a first coating on both sides of said sheet having an index of refraction N_1 less than N_2 ,
 - c. said sheet having a plurality of light-conducting channels over its surface,
 - d. a reflector positioned in each said channel at approximately 45° , whereby light passing along one of the channels is reflected out from the channel in a direction normal to the sheet, said reflectors being positioned over the surface of said sheet,
 - e. a second, opaque coating on both sides of said sheet and superposed on said first coating, said opaque coating being apertured on both sides at the said reflectors, and also being apertured on both sides adjacent each said reflector.

4,053,207 ELECTRO-OPTIC DEVICES

Edward T. Keve, Warlingham, and Keith L. Bye, Reigate, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1976, Ser. No. 688,066
Claims priority, application United Kingdom, June 9, 1975, 24622/75

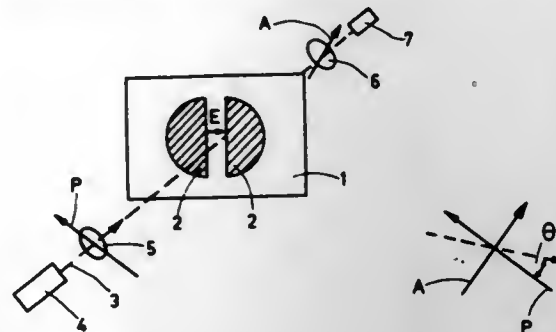
Int. Cl.² G01B 1/00

U.S. Cl. 350-150

6 Claims

1. An electro-optic device including a platelet of a ferrelec-

tric ceramic material having an electric field-dependent birefringence value and the individual grains of which have a



domain structure, in which the thickness of the platelet is smaller than twice the average grain diameter of the material.

4,053,208

REAR PROJECTION SCREENS

Hisatoyo Kato, and Junji Miyahara, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

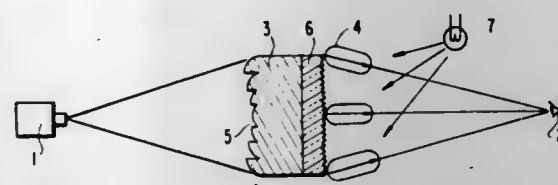
Filed Feb. 3, 1976, Ser. No. 654,830

Claims priority, application Japan, Feb. 3, 1975, 50-14541

Int. Cl.² G03B 21/56

U.S. Cl. 350-117

21 Claims



1. A rear projection screen comprising a diffusion layer containing at least one light scattering material selected from the group consisting of wax and crystalline polymers wherein a micro-optical surface irregularity is provided directly on at least one side of said diffusion layer.

4,053,209

ELECTROCHROMIC DEVICE

Toshitami Hara, Tokyo; Yoshiaki Hajimoto, Chofu; Yoshiaki Shirato, and Masaaki Matsushima, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

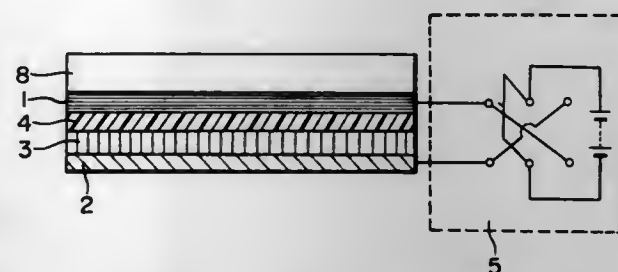
Filed Nov. 26, 1975, Ser. No. 635,427

Claims priority, application Japan, Nov. 27, 1974, 49-136847; Apr. 4, 1975, 50-40910; July 9, 1975, 50-84076; June 23, 1975, 50-77185; June 18, 1975, 50-73854

Int. Cl.² G02F 1/16

U.S. Cl. 350-160 R

28 Claims



1. An electrochromic device comprising a pair of opposed electrodes, at least one of which is light transmissive, having disposed therebetween a laminated electrochromic layer consisting essentially of a metal oxide selected from the group consisting of WO_3 , MoO_3 , and TiO_2 , and a laminated auxiliary electrochromic layer consisting essentially of a compound of a metal; wherein said metal oxide and said metal compound are

selected such that the difference in electronegativity between the metal of said metal oxide and a metal of said metal compound is not greater than 0.4; and wherein said metal compound is selected from the group consisting of ZrO_2 , Ta_2O_5 , Nb_2O_5 , V_2O_5 , TiO_2 , $BaTiO_3$, $CaTiO_3$, $SrTiO_3$, Y_2O_3 -containing ZrO_2 , AgI , Ag_2S , Ag_3SI , Ag_3SBr , Ag_4IWO_4 , and mixtures thereof.

4,053,210

TRANSLUCENT BUILDING BLOCKS

Maximilian Gustav Alfred Cecil Michaelis, 13 Quai St. Michel, Paris V, France

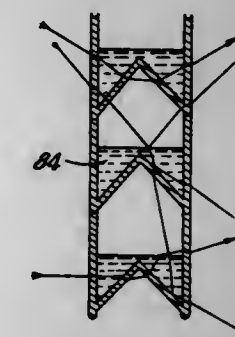
Continuation-in-part of Ser. No. 445,699, Feb. 25, 1974, Pat. No. 3,954,326. This application Dec. 27, 1974, Ser. No. 537,008

Claims priority, application United Kingdom, Jan. 3, 1974, 273/74; Jan. 25, 1974, 41576/74; Apr. 2, 1974, 41786/74; Apr. 30, 1974, 41977/74; Sept. 17, 1974, 43428/74

Int. Cl.² E04C 1/42

U.S. Cl. 350-262

9 Claims



1. In an article of manufacture in the form of a hollow translucent block having substantially vertical and substantially parallel side walls connected to substantially vertical and substantially parallel end walls, said side walls being longer than said end walls, said side walls and said end walls being connected to a bottom wall, the improvement comprising said bottom wall being defined by at least two oblique portions each forming an acute angle with respect to said side walls, said oblique portions having smooth upper and lower surfaces, said oblique portions converging to a ridge within said block, each side wall cooperating with the adjacent one of said oblique portions to form first and second trough portions, at least one of said trough portions being at least partially filled with a transparent liquid such that said liquid cooperates with the oblique portions with which it is in contact to transmit at least some light incident on said side walls through said block by total internal reflection and refraction.

4,053,211

FOCUS ADJUSTING DEVICE FOR TELEPHOTOGRAPHIC LENS

Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

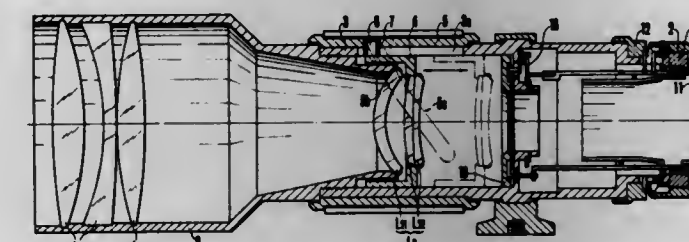
Filed Aug. 16, 1976, Ser. No. 714,597

Claims priority, application Japan, Aug. 20, 1975, 50-101617

Int. Cl.² G02B 7/02

U.S. Cl. 350-255

2 Claims



1. In a telephotographic lens of a type to move a part of the lens system thereof for focusing, a focus adjusting device comprising:

a movable lens which is movably held along an optical axis; an operating member which is rotatable for focusing; and a nonlinear cam means which moves said movable lens in response to the rotation of the operating member, the nonlinear cam means being provided with a cam face which is shaped in such a manner as to move the movable lens to a relatively shorter extent for focusing on an object to be photographed located at a greater distance in response to a given angle of rotation of the operating member and to a relatively greater extent for focusing on an object to be photographed located at a shorter distance in response to the given angle of rotation of the operating member.

4,053,212

TEST DISK FOR EYE EXAMINATION

Otwald Teichner, Wolfrathhausen, and Manfred Born, Munich, both of Germany, assignors to Optische Werke G. Rodenstock, Germany

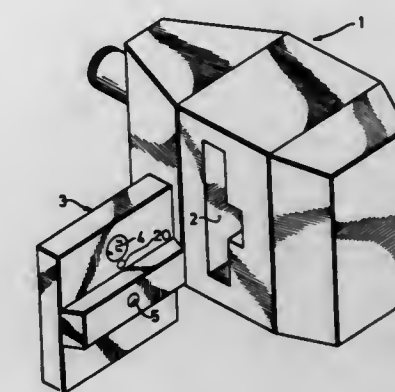
Filed Oct. 17, 1975, Ser. No. 623,473

Claims priority, application Germany, Oct. 31, 1974, 2451750

Int. Cl.² A61B 3/02

U.S. Cl. 351-32

10 Claims



1. An exchangeable test pattern device for ophthalmological examination instruments comprising
 - a cassette housing for insertion into an ophthalmological examination instrument, said cassette housing including at least one transparent portion,
 - a disk rotatably mounted in said cassette housing, said disk including a plurality of test patterns, each of said test patterns being selectively visible at said transparent portion, and
 - means for rotating said disk.

4,053,213

SUPPORT FOR AN OPHTHALMIC INSTRUMENT

Donn E. Stevens, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Sept. 13, 1976, Ser. No. 722,953

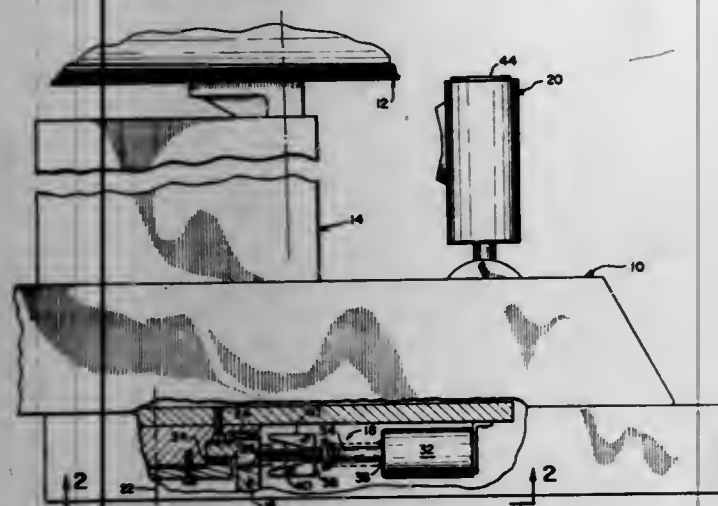
Int. Cl.² A61B 3/00; B60T 13/04

U.S. Cl. 351-38

3 Claims

1. An ophthalmic instrument support apparatus, comprising:
 - a container means for enclosing a portion of the ophthalmic instrument;
 - a base;
 - movable support means for pivotally moving said container means relative to said base;
 - braking means for selectively permitting pivotal movement of said fixed support means relative to said movable support means, having alternatively disposed first and second series of plates, a solenoid with a movable core, a Vee-shaped member attached to the core with the sides of the member extending over the alternatively disposed first and second series of plates, and a clamp member attached

to the outermost series of plates and between the sides of the Vee-shaped member; and



control means for activating and inactivating the solenoid to permit arcuate movement of said container means.

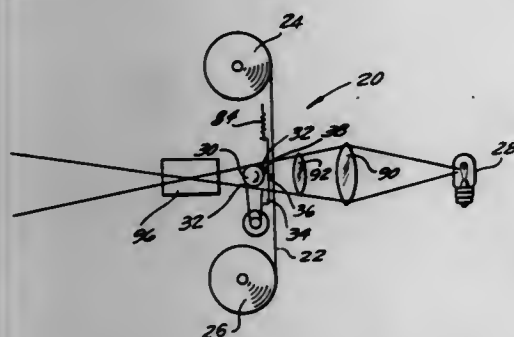
4,053,214

ADVANCE MECHANISM

John N. Brunt, Floral Park, N.Y., assignor to Instructional Communications Technology, Inc., Lloyd Harbor, N.Y.
Filed Mar. 5, 1976, Ser. No. 664,145
Int. Cl.² G03B 1/22

U.S. Cl. 352-191

23 Claims



1. An advance mechanism for perforated materials for advancing the material through a path of light comprising:
a support structure adapted to be in line with a source of light so that light passes through an aperture in the support;
material support and advance means for directing the perforated material along the pathway into and out of alignment with the aperture;
a pawl mechanism including spring means on the support adjacent the aperture and normally positioned in a normal retracted position in alignment with a slot adjacent to the aperture in the support;
drive means for cooperating with the material advance means and for biasing the spring and directing the pawl mechanism through the slot into engagement with a perforation in the material and then along the slot a predetermined distance to advance the material and then releasing the pawl mechanism permitting this spring to return the pawl to the retracted position out of the slot;
return means responsive to release of the pawl mechanism and retraction of the pawl through the slot to return the pawl to normal retracted position;
limit means positioned on the support and on the pawl mechanism to restrict the distance of movement of the pawl mechanism along the length of the slot;
the limit means including at least one enlarged receiving surface on the support and a corresponding enlarged bearing surface on the pawl mechanism whereby movement of the pawl mechanism along the slot a predetermined distance will bring the enlarged bearing surface into engagement and stop further movement of the advance mechanism with respect to the slot and with the

engagement between the enlarged surfaces distributing the force applied in limiting the movement of the pawl mechanism;
the pawl mechanism including an elongated leaf spring mounted on the support and having a downwardly extending pawl intermediate its ends in alignment with and in position for extension through the slot in the support;
a drive projection extending from the side of the elongated leaf spring opposite to the pawl and in position for engagement by a portion of the drive means;
the elongated leaf spring being slidably positioned on the support so that engagement of the drive means with the drive projection and application of a force thereto will bias the leaf spring until the pawl extends through the slot into engagement with a perforation in the perforated material and then the leaf spring will be slidably moved by the drive means and the perforated material accordingly advanced, and when the drive means is disengaged from the leaf spring, the leaf spring will return to its initial configuration with the pawl disengaged from the perforated material and withdrawn through the slot in the support whereupon the return means can return the leaf spring to the normal retracted position; and
the drive projection being resilient and capable of acting as a spring independent of the remainder of the leaf spring to facilitate continued movement of the drive means after the movement of the advance mechanism has been stopped to permit disengagement therebetween and to cooperate in permitting the leaf spring to flex and disengage the pawl from the perforated material thereby preventing damage to the perforated material when the perforated material is manually pulled or when a perforation is not properly aligned with the pawl.

4,053,215

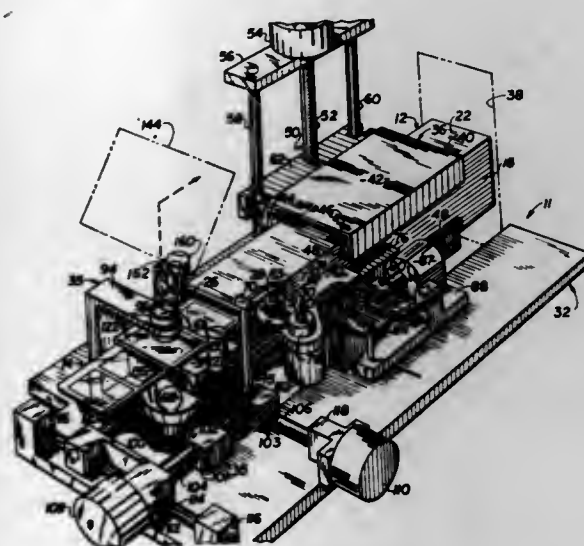
FILM STRIP HANDLING APPARATUS AND METHOD

James O. Haning, Palo Alto; Bram Kool, Saratoga; Jules G. Moritz, Los Altos Hills, and Robert Mizrahi, El Cerrito, all of Calif., assignors to Microform Data Systems, Inc., Mountain View, Calif.
Division of Ser. No. 536,510, Dec. 26, 1974, Pat. No. 3,963,336, which is a division of Ser. No. 313,902, Dec. 11, 1972, Pat. No. 3,909,122, which is a division of Ser. No. 101,224, Dec. 24, 1970, Pat. No. 3,743,400. This application Jan. 2, 1976, Ser. No. 646,133

Int. Cl.² G03B 23/04; B65H 3/32

U.S. Cl. 353-116

12 Claims



1. In information retrieval apparatus a support; means on the support for mounting an information-containing strip in an operative position for movement with respect thereto; a rotor; means mounting the rotor for frictional engagement with a side edge of the strip disposed in said operative position; and means coupled with the rotor for rotating the same in opposed directions to thereby move said strip relative to said support.

4,053,216

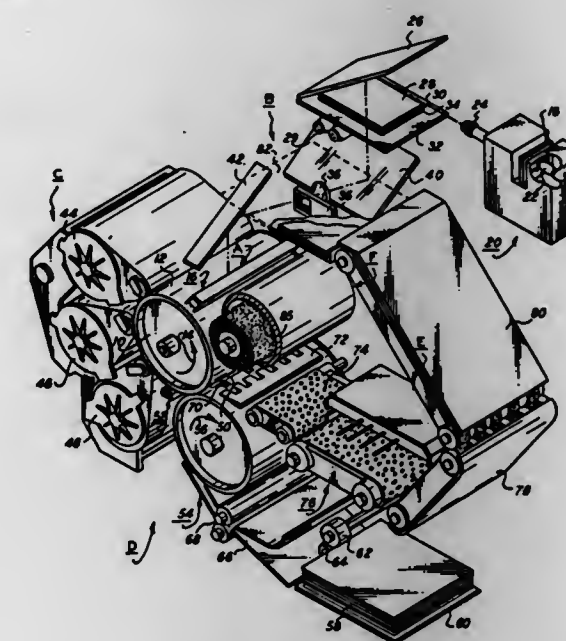
COLOR TRANSPARENCY REPRODUCING MACHINE

Louis D. Mailloux, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 540,617, Jan. 13, 1975. This application Aug. 6, 1976, Ser. No. 712,623
Int. Cl.² G03G 15/01

U.S. Cl. 355-4

1 Claim U.S. Cl. 355-4



1. An electrophotographic printing machine for reproducing a color transparency, including:
a photoconductive member;
a means for charging at least a portion of said photoconductive member;
a platen;
means for projecting a light image of the transparency onto said platen;
a screen member disposed on said platen for modulating the light image of the transparency projected onto said platen to form a half-tone light image thereof;
means for filtering the half-tone light image to form a single color light image;
a composition frame disposed on said platen defining an opaque border extending outwardly from the color transparency image formed on said platen;
means for exposing the charged portion of said photoconductive member to a light image of said composition frame and the single color half-tone light image of the transparency to record on said photoconductive member a combined electrostatic latent image of the transparency and the electrostatic latent image of said composition frame;
means for developing the combined electrostatic latent image recorded on said photoconductive member with toner particles complementary in color to the color of the single color light image;
means for transferring the toner powder image adhering to the combined electrostatic latent image recorded on said photoconductive member to a sheet of support material, said transferring means comprising corona generating means disposed adjacent to said photoconductive member and adapted to apply an alternating charge potential to said photoconductive member pre-conditioning the toner particles thereon to readily facilitate the transfer therefrom, a transfer member operatively associated with said corona generating means and having the sheet of support material secured releasably thereto, means for electrically biasing said transfer member to a potential of sufficient magnitude and polarity to attract the pre-conditioned toner particles from the combined electrostatic latent image recorded on said photoconductive member to the sheet of support material secured thereto; and
means for fusing the toner powder image to the sheet of support material.

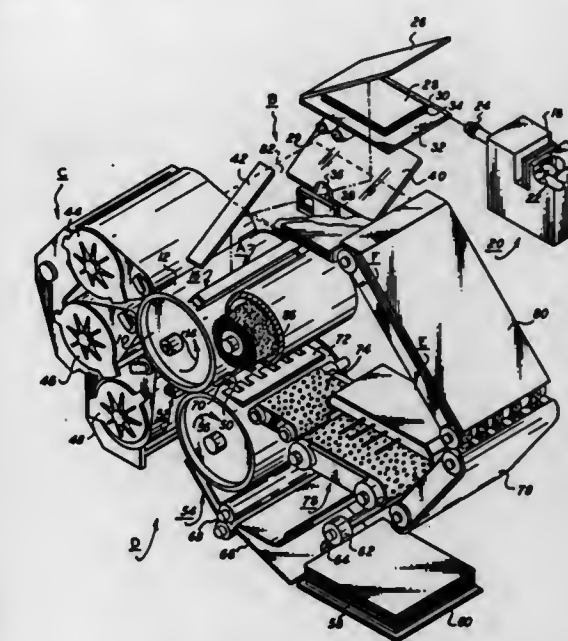
4,053,217

COLOR TRANSPARENCY REPRODUCING MACHINE

Louis D. Mailloux, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 540,617, Jan. 13, 1975. This application Aug. 6, 1976, Ser. No. 712,431
Int. Cl.² G03G 15/01

1 Claim



1. An electrophotographic printing machine for reproducing a color transparency, including:
a platen;
means for projecting a light image of the color transparency onto said platen;
a screen member disposed on said platen for modulating the light image of the color transparency projected onto said platen to form a half-tone light image thereof;
a photoconductive member;
means for charging at least a portion of said photoconductive member;
means for filtering the half-tone light image;
a composition frame disposed on said platen defining an opaque border extending outwardly from the color transparency image formed on said platen;
means for exposing the charged portion of said photoconductive member to a light image of said composition frame and the filtered half-tone light image of the color transparency to record on said photoconductive member a combined electrostatic latent image of the color transparency and said composition frame;
means for developing the combined electrostatic latent image recorded on said photoconductive member with toner particles complementary in color to the color of the filtered half-tone light image;
means for transferring the toner powder image adhering to the combined electrostatic latent image recorded on said photoconductive member to a sheet of support material; and
means for fusing the toner powder image to the sheet of support material, said fusing means comprising means for transporting the sheet of support material with the toner powder image deposited on one surface thereof along a path of movement, said transporting means being arranged to be in substantial contact with the other surface of the support material, means for heating said transporting means, and a radiant energy source arranged to be in thermal communication with a sheet of support material for supplying the energy output thereof onto the sheet of support material being moved with the toner powder image thereon by said transporting means along the path of movement for affixing substantially permanently the toner powder image to the sheet of support material.

4,053,218

DEVELOPMENT SYSTEM

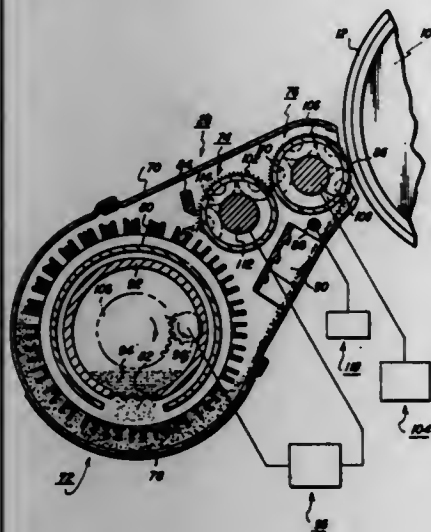
Eugene A. Mikolas, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 10, 1975, Ser. No. 630,836

Int. Cl.² G03G 15/09

U.S. Cl. 355—15

14 Claims



1. An apparatus for forming a powder pattern on a surface, including:
 - means, operable for a variably selectable duration of time, for advancing particles;
 - means, in a particle receiving relationship with said advancing means, for applying particles to at least a portion of the surface, in response to said advancing means being operable, and for removing other extraneous particles from the surface, in response to said advancing means being inoperable, said applying means being a fixed distance from the surface; and
 - electromagnetic means operatively associated with said applying and removing means to remove particles therefrom, said electromagnetic means being operable in response to said advancing means being inoperable.

4,053,219

DEVICE FOR USE IN PHOTOGRAPHICALLY PRINTING ENLARGED COPIES OF COLOR IMAGES

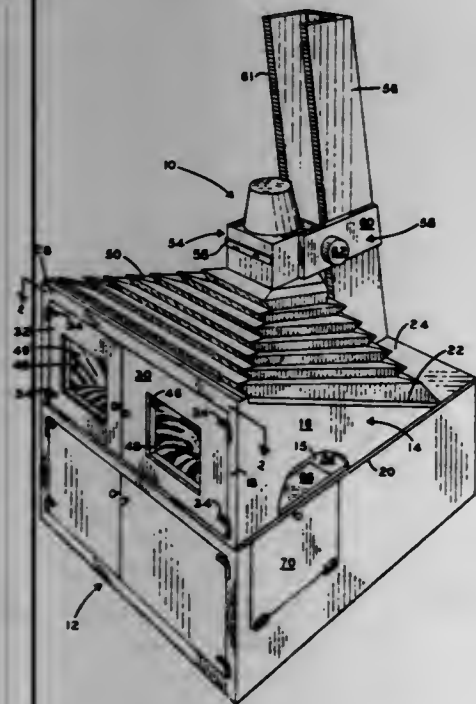
William R. Danna, 563 Tiffany Drive, and Jerry S. Danna, 528 6th St., Apt. A, both of Hollister, Calif. 95023

Filed Apr. 8, 1976, Ser. No. 675,069

Int. Cl.² G03B 27/32

U.S. Cl. 355—27

9 Claims



9. In a color enlarging device for providing enlarged color

images taken from negatives, slides and the like, the combination comprising:

- A. a cabinet having defined therein a processing chamber normally maintained in a light-tight condition defined by means including a pair of upstanding side walls, each being characterized by a substantially horizontally oriented bottom edge surface, a front edge surface normally related to the bottom edge surface, and a downwardly inclined top edge surface, a removable closure panel defining an access door for the processing chamber, and a tubular bellows attached to said pair of side walls defining an extensible cover for said processing chamber;
- B. an easel disposed within said chamber adapted to receive a sheet of sensitized paper;
- C. means for photographically exposing a sheet of sensitized paper received by said easel including a movable lamp housing externally related to the chamber;
- D. a roll processing tube disposed within said chamber for receiving said sheet of sensitized paper while a light-tight condition for said chamber is maintained; and
- E. means including a flexible sleeve extended into the chamber for facilitating simultaneous digital manipulation of the sheet of sensitized paper and said roll processing tube while maintaining the chamber in a light-tight condition.

4,053,220

APPARATUS FOR OPTICALLY COPYING SMALL FILM IMAGES WITH GOOD RESOLUTION

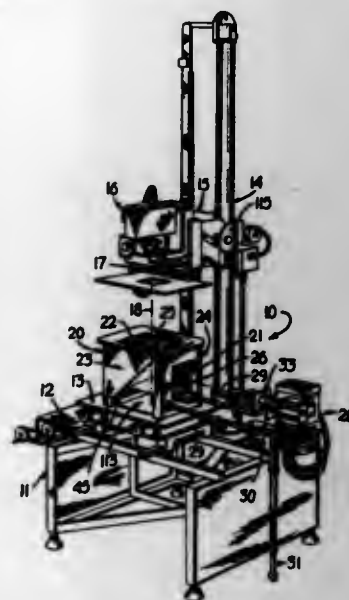
Paschal S. Mathison, New Rochelle, N.Y., assignor to Photographic Equipment Service, Inc., New Rochelle, N.Y.

Filed Feb. 20, 1976, Ser. No. 660,035

Int. Cl.² G03B 13/28, 27/70

U.S. Cl. 355—45

7 Claims



1. Apparatus for optically copying to a desired scale with good resolution reproductions of small film images, comprising, in combination with

- A. the equivalent of a filmstrip/slide or animation stand apparatus including a reproducing camera mounted upon an upright track support for elevational adjustment and having the axis of its focally adjustable lens and its gate arranged substantially downward, and a lateral tabletop supported below the camera lens for interception of the axis of the latter thereby, of
 1. means defining an in-focus, image-displaying internal chamber including a lateral bottom wall structure and an entrance upright sidewall with a top portion of said means having a large opening down through which the axis of the reproducing camera lens extends to the top face of the bottom wall structure and with the entrance wall having a beam entrance window;
 2. means providing the top face of said bottom wall structure with a screen surface upon which an image bearing beam may be projected for display thereon of an in-

4,053,222

ILLUMINATING APPARATUS FOR PHOTOGRAPHIC COLOR ENLARGER

Mario Gandini, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate Bozen, Bolzano-Bozen, Italy

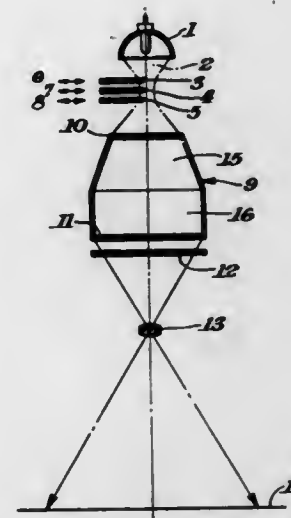
Filed May 13, 1976, Ser. No. 685,975

Claims priority, application Italy, May 20, 1975, 4827/75

Int. Cl.² G03B 27/76

U.S. Cl. 355—71

7 Claims



- focus image for photographic transfer upwardly into the reproducing camera;
3. means supporting a projector with the optical axis of its gate and projecting lens arranged substantially laterally and extending through the beam entrance window into said chamber; and
4. an oblique transparent mirror mounted in said chamber behind said entrance window and canted obliquely forward toward the latter so that its reflective surface is arranged at an acute angle to the bottom lateral screen surface with the beam entrance window located in this angle whereby said reflective surface receives image bearing beams from said projector and reflects them in focus downward to and upon said top face of the screen for reflection of the in-focus images back upward through said transparent mirror and the top opening for reception by said camera;
5. said transparent mirror being of good optical glass and of a thickness (\leq) one-eighth of an inch.

4,053,221

MULTI-MODE REPRODUCING APPARATUS

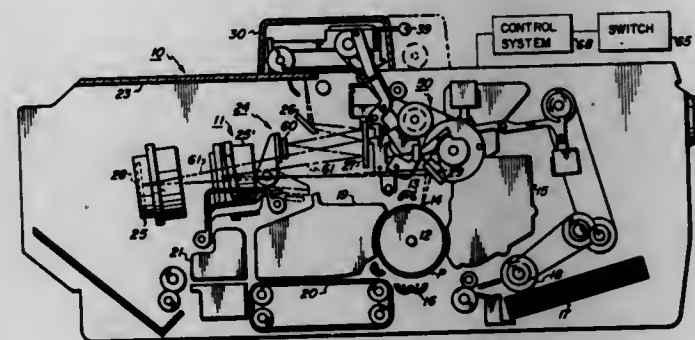
Thomas Lynch, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 14, 1975, Ser. No. 621,898

Int. Cl.² G03G 15/28; G03B 27/70

U.S. Cl. 355—60

15 Claims



4. A multi-mode reproducing apparatus for copying documents selectively at one of a plurality of copy image magnifications comprising:
 - an imaging surface arranged for movement at a given velocity;
 - optical means for viewing said document and for projecting an image thereof onto said surface selectively at one of said plurality of copy image magnifications, said optical means including:
 - a first fixed lens which is not movable to change the projected image magnification, said first lens being arranged to project an image of said document onto said surface at a first projected image magnification; means for supporting said first lens in a stationary position;
 - a second movable lens and means for supporting said second lens for movement between a first stored position where it is inoperative and a second position where it is operative to project an image of said document onto said surface at a second projected image magnification different from said first magnification; and
 - means for selectively employing either said first lens or said second lens, but not both in combination for viewing said document.

4,053,223

DOCUMENT PLATEN COVER FOR PHOTOCOPY MACHINE

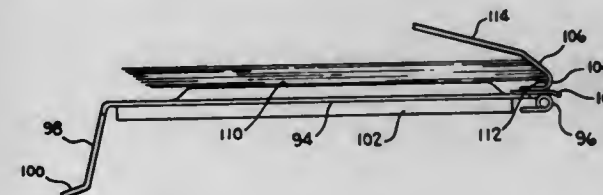
Arthur W. Nebiker, Stamford, Conn., and Daniel N. Yanofsky, Jericho, N.Y., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 9, 1976, Ser. No. 647,889

Int. Cl.² G03B 27/62

U.S. Cl. 355—75

10 Claims



1. A document cover for a copying machine having a platen on which documents are placed for copying, said cover comprising:
 - A. a relatively rigid body member adapted to overlie the platen of the copying machine and a document when the latter is placed on the platen for copying, said body member having a flat planar portion dimensioned at least to cover the platen of the copying machine and having an upper surface opposite a lower surface normally juxtaposed the copying machine platen;
 - B. means disposed along one edge of said flat portion of said body member for pivotally connecting said body member to the copying machine whereby said body member can be moved to a raised position in which the copying machine platen is exposed for placing or removing of documents,

C. means disposed adjacent the opposite edge of said body member of grasping said body member for movement thereof between the normal position overlying the platen and said raised position, and

D. a relatively rigid retaining means on said body member adjacent said one edge of said body member against which retaining means the documents bear and by which retaining means the documents are supported and retained in position on said upper surface of said body member of easy removal of successive documents by an operator when said body member is moved to its raised position.

4,053,224

DOCUMENT HANDLING SYSTEM

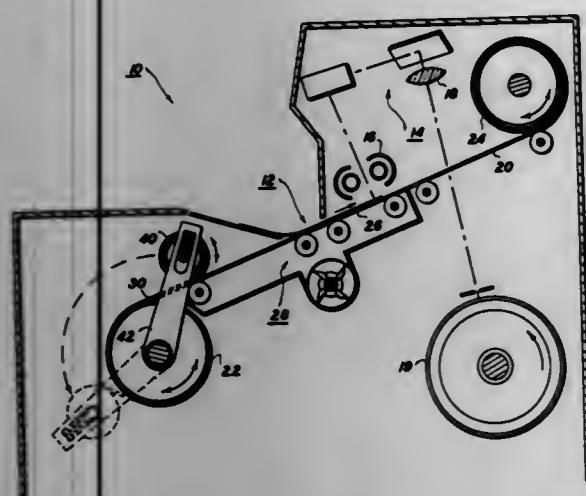
Charles M. Burkard, Fairport, and Edward C. Bock, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 1, 1976, Ser. No. 701,701

Int. Cl.² G03B 27/62, 27/64; B65H 5/02, 5/04

U.S. Cl. 355-76

5 Claims



1. In an automatic handling system of a copying apparatus for making pre-collated copy sheet sets by repeated collated imaging of a set of original document sheets, the improvement comprising:

- an elongated windable document holding first web with a document side thereof being adapted for supporting said imaging documents thereon;
- first web scroll means wound from one end of said first web and inside wound from said document side for winding up a set of otherwise unattached documents on only said first web into said first scroll means and for retaining the documents between the turns of only said first web in said first scroll means;
- second web scroll means wound from the opposite end of said first web, said second scroll means being outside wound, in the same winding direction as said first scroll means;
- a second elongated windable document retaining web;
- said second web being commonly interleavingly wound with said first web on only said second web scroll means from one end of said second web to retain documents in said second scroll means between turns of said first and second webs;
- means for winding a third web scroll from the opposite end of said second web;
- said first web having a minor intermediate unwound exposed segment extending between said first and second scroll means for the imaging of documents on said first web;
- means for recirculatingly winding and unwinding said first web between said first web scroll means and second web scroll means to recirculatingly expose individual documents on said intermediate segment of said first web between said first and second web scroll means in a pre-collated order;
- optical imaging means for imaging documents on said intermediate segment of said first web between said first and

second web scroll means for copying of said documents in a pre-collated order;

said second web normally merging with said document supporting side of said first web between said intermediate segment and said second scroll means, but separating from said first web before said intermediate segment so that documents are not imaged through said second web by said optical imaging means.

4,053,225

PORTABLE COPIER

Hisao Morohashi, Tokyo, Japan, assignor to Ohno Research & Development Laboratories Co., Yokohama, Japan

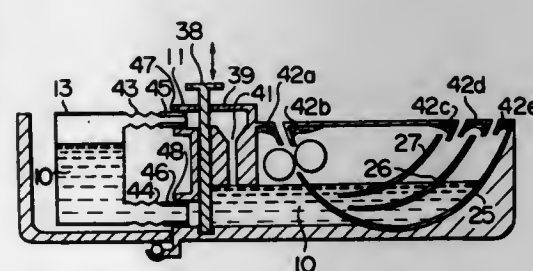
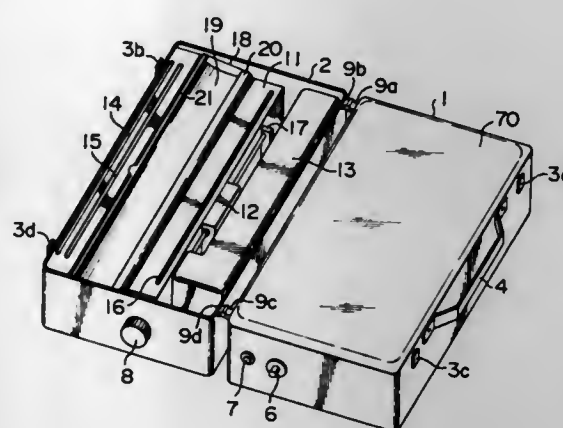
Filed Apr. 14, 1976, Ser. No. 676,799

Claims priority, application Japan, Apr. 17, 1975, 50-4667; June 12, 1975, 50-71247; Apr. 19, 1975, 50-53811

Int. Cl.² G03B 27/72

U.S. Cl. 355-115

20 Claims



1. A portable copier, comprising:
 - a. a contact exposure unit including
 - i. a first housing part having at one face side thereof a light-pervious exposure contact surface, and
 - ii. exposure means disposed in said first housing part and having a light source for illuminating said exposure contact surface;
 - b. a liquid development unit including
 - i. a second housing part having an access face side, and
 - ii. liquid development means disposed within said second housing part and comprising a developing chamber and slot means located at said access face side to provide openings for inserting photosensitive and transfer papers into and withdrawing them from said developing chamber;
- and
- c. means for separably connecting said first and second housing parts to each other such that said first and second housing parts, when interconnected, locate said exposure contact surface in face to face relation with said slot means and coact to form a complete outer housing for the copier.

4,053,226

PHOTOGRAPHIC PRINTER

Maksymilian A. Michalski, Woodside, N.Y., and Ellis Ashkenazi, Ridgewood, N.J., assignors to Berkey Photo, Inc., Woodside, N.Y.

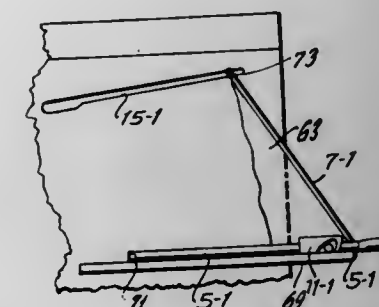
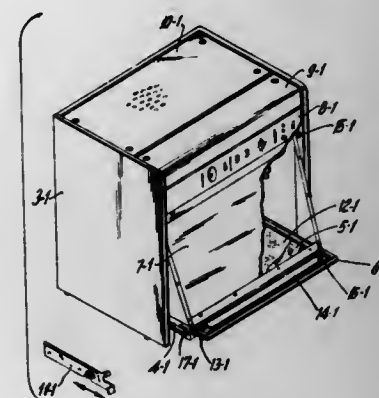
Continuation of Ser. No. 504,706, Sept. 10, 1974, abandoned.

This application Mar. 8, 1976, Ser. No. 664,425

Int. Cl.² G01J 1/00

U.S. Cl. 355-121

16 Claims



1. A printer for use in exposing photosensitive material comprising a base, a transparent plate substantially covering the base, means pivotally mounting the transparent plate above the base to receive photosensitive material and copy therebetween, a source of printing light mounted above the transparent plate and directed towards the transparent plate, a cabinet including said base and projecting upwardly from said base and surrounding said transparent plate, said cabinet holding said source, said cabinet having a panel at least partially opaque to rays closing the front of the cabinet above the transparent plate and movable therewith, guideway means on the cabinet for slidable movement of the viewing panel as it is raised and lowered with the transparent plate as the plate is swung upwardly and downwardly to provide space so as to insert or remove the photosensitive material and the copy from between the plate and the base, said guideway means including guide means for guiding the top of the viewing panel horizontally as the viewing panel is moved upwardly to cause the viewing panel to rest horizontally within the cabinet when it is lifted.

4,053,227

METHOD AND APPARATUS FOR AUTOMATIC AND CONTACTLESS MEASUREMENT OF THE HEIGHT OF MOVING BLADES OF A TURBINE

Viktor Bodlaj, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 3, 1975, Ser. No. 619,489

Claims priority, application Germany, Oct. 7, 1974, 2448219

The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.

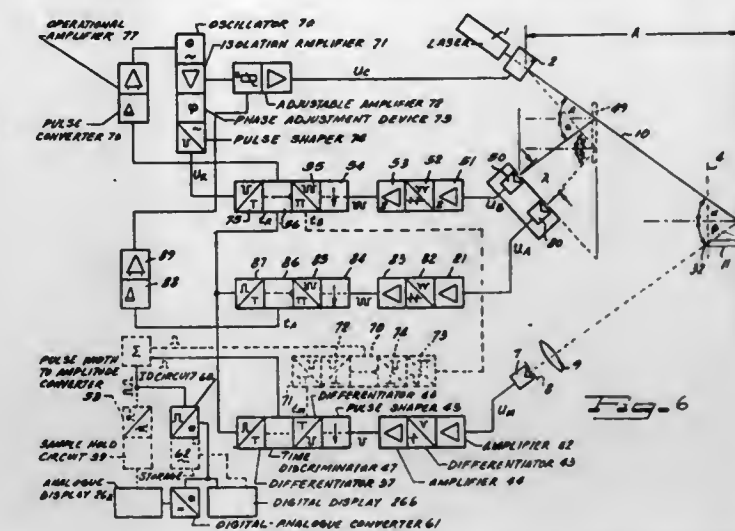
Int. Cl.² G01C 3/08

U.S. Cl. 356-4

8 Claims

1. A method for automatic, contactless measurement of the height of individual blades on a rotating turbine rotor comprising rotating the turbine rotor having the blades arranged thereon, deflecting a laser beam from a given path at a known frequency of deflection to move the deflected beam across the

path of the moving blade to have a portion of the beam reflected from an end of the blade, sensing the portion of the beam reflected from the end of the blade to create a reflected signal, synchronizing the speed of rotation of the rotor with the



frequency of deflection so that the end of the blade and deflected beam reach the same point simultaneously, and applying the reflected signal and a reference signal from the beam to an electronic analysis system to determine the height of the individual blade.

4,053,228

FINGER IDENTIFICATION

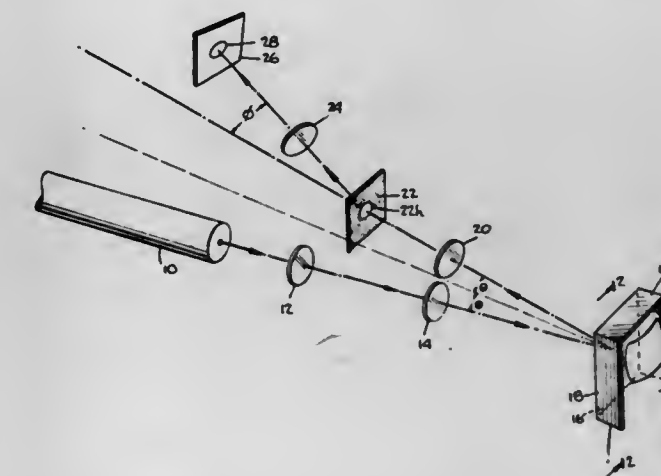
Michael Schiller, 4465 Douglas Ave., Riverdale, N.Y. 10471

Filed Dec. 12, 1975, Ser. No. 640,174

Int. Cl.² G06K 9/08; G01B 11/24; G06K 9/00

U.S. Cl. 356-71

22 Claims



1. Identification apparatus comprising:
 - a source of spatially coherent light to provide an interrogating beam,
 - a plate transparent to said interrogating beam, said plate having first and second surfaces, said second surface being adapted to receive a fingerpress,
 - said beam being directed to said first surface of said plate, said beam being partially reflected at said second surface of said plate when a fingerpress is applied at said second surface to provide a reflected light beam modulated with identification information,
 - said partial reflection having a first magnitude at an optical discontinuity between said plate and the finger crests applied thereto, said partial reflection having a second magnitude substantially different from said first magnitude at an optical discontinuity between said plate and air,
 - said beam being substantially orthogonal to the plane of said first and second surfaces to provide said reflected light beam with spatially undistorted identification information and optimized signal to d.c. ratio,
 - said reflected light beam containing spatial frequencies down to zero to provide finger geometry information and

identification means optically coupled to said reflected light beam.

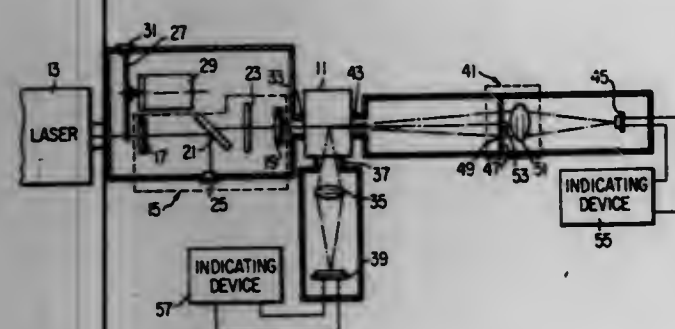
4,053,229

2°/90° LABORATORY SCATTERING PHOTOMETER
William R. McCluney, Greenbelt, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 13, 1976, Ser. No. 648,700
Int. Cl.² G01N 21/00

U.S. Cl. 356-103

13 Claims



1. A photometer for measuring the light scattered by particles in a hydrosol at substantially 2° and substantially 90° simultaneously, comprising:

- a body having a passage for receiving the hydrosol;
- a light source;
- rotatable chopper means axially aligned with the light of said source for periodically interrupting said light;
- first optical means for directing the light passed through said chopper means toward the hydrosol in the passage as an incident beam having an optical first axis;
- light source detector means surrounding a portion of the outer periphery of said chopper means and emitting another beam of light through said chopper means and detecting the same for providing a reference signal to synchronously detect the light scattered by the hydrosol;
- a first photoelectric detector;
- second optical means for directing the light of the beam scattered by the hydrosol in the passage onto said first photoelectric detector and for thereby causing said first photoelectric detector to generate an electrical signal indicative of the amount of the scattered light;
- said second optical means having an optical second axis defining an angle of substantially 90° relative to the first axis, said second optical means being spaced from the first axis;

a second photoelectric detector;

third optical means having a radiant energy mask with an aperture for directing light of the incident beam scattered by the hydrosol in the passage toward said second photoelectric detector, the axis of the portion of the incident beam linearly transmitted by the hydrosol in the passage and the rays of the incident beam scattered through the aperture of said radiant energy mask defining an angle of substantially 2°;

a light trap spaced from the point of intersection in the direction of the first axis away from said light source for absorbing the light of said source linearly transmitted by the hydrosol in the passage; and

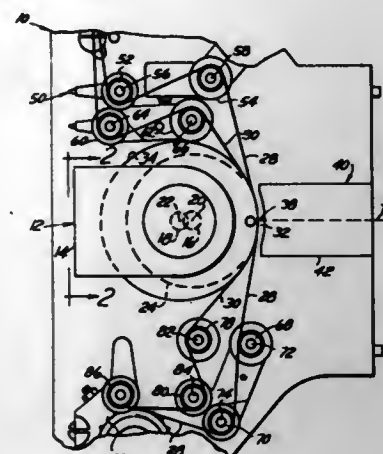
means in circuit with each of said photoelectric detectors for producing an indication of the amount of light directed towards said photoelectric detectors by the associated optical means respectively.

4,053,230
FULL-WIDTH FILM-SUPPORTING, DRIVING, AND STRIPPING ARRANGEMENT FOR MOTION PICTURE FILM PRINTING MACHINES

Ronald R. Balousek, Bloomfield Hills, Mich. 48013
Filed Sept. 13, 1976, Ser. No. 722,746
Int. Cl.² G03B 27/22

U.S. Cl. 355-104

7 Claims



1. An improved film-width-supporting, driving, and stripping arrangement for superimposed edge-perforated negative and positive films adapted to replace the conventional film-edge-supporting and stripping arrangement in a conventional motion picture film printing machine having power-driven mechanism operatively connected to film-supplying and film-receiving devices disposed respectively preceding and succeeding a film exposure zone disposed adjacent said conventional film-edge-supporting and stripping arrangement and illuminated by an optical illuminating system, said improved arrangement comprising

- an arrangement-carrying structure adapted to be mounted adjacent said film-exposure zone,
- a rotary film drive sprocket rotatably mounted on said structure and drivably connected to said power driven mechanism and rotatable on a first axis of rotation with a portion of its periphery disposed substantially in said film-exposure zone and having film-driving teeth adapted to project into the edge perforations of the superimposed negative and positive film fed thereto from said film-supplying devices, - and a rotary film-supporting and stripping element of greater diameter than said drive sprocket rotatably mounted on said structure upon a second axis of rotation disposed in spaced parallel relationship to said first axis of rotation and having a periphery with a portion thereof disposed in said film-exposure zone adjacent to and in lateral alignment with said sprocket peripheral portion and having a width adapted to extend across said support substantially the entire width of said superimposed films exclusive of their respective perforations.

4,053,231
INTERFEROMETER MIRROR TILT CORRECTING SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Rudolf A. Schindler, Sierra Madre, Calif.

Filed Dec. 18, 1975, Ser. No. 641,903
Int. Cl.² G01B 9/02

U.S. Cl. 356-106 S

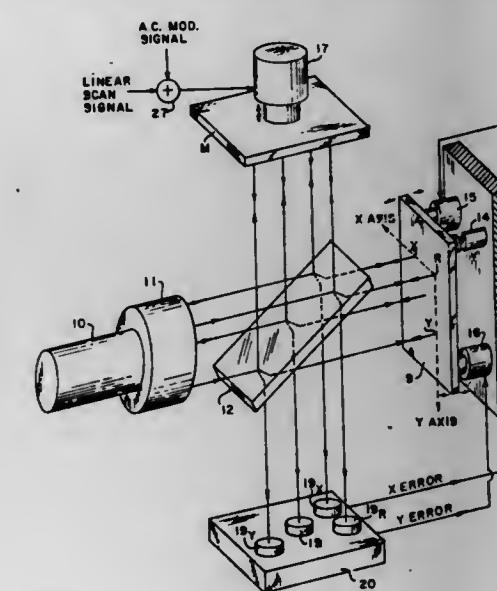
7 Claims

1. In an interferometer having two optical paths from a monochromatic source to a data detector and actuating means for varying the length of one of said optical paths, a servo system for so automatically adjusting the angular tilt of a reflecting planar surface in one of said paths as to maintain parallel the interfering beams of said two paths at the optical output of said interferometer, said reflecting planar surface having three points R, X and Y spaced apart on mutually perpendicular X and Y axes, said point R being at the intersec-

tion of said axes, and said points X and Y being on respective X and Y axes, the combination comprising

three detectors near said optical output of said interferometer disposed on said X and Y axes as reflected to said optical output on a plane normal to the nominal beam axis at said optical output, one detector placed to receive light reflected from said point R of said reflecting surface, one of the other two detectors placed to receive light reflected from said point X of said reflecting surface and the third detector placed to receive light reflected from said point Y of said reflecting surface,

means for producing a 90° phase shifted signal e_r in response to light waves detected by said one detector from said point R, said signal e_r being proportional to the optical



path difference of light reflected from said point R, and separate means responsive to separate ones of said other two detectors for producing signals e_x and e_y proportional to the optical path differences of light reflected from said points X and Y,

means responsive to an X error signal for tilting said X axis in said reflecting surface through an angle proportional to the amplitude of said X error signal,

means responsive to a Y error signal for tilting said Y axis in said reflecting surface through an angle proportional to the amplitude of said Y error signal,

means for multiplying said signal e_x by said signal e_r to obtain said X error signal, and

means for multiplying said signal e_y by said signal e_r to obtain said Y error signal.

4,053,232
ROTATING-COMPENSATOR ELLIPSOMETER
Frederick H. Dill, South Salem, and Peter S. Hauge, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 373,540, June 25, 1973, Pat. No. 3,880,524. This application Apr. 28, 1975, Ser. No. 572,476. The portion of the term of this patent subsequent to Apr. 29, 1992, has been disclaimed.

Int. Cl.² G01J 4/02; G02F 1/01
U.S. Cl. 356-118

5 Claims

1. In an automatic ellipsometer for measuring characteristics of a sample and including:

- a monochromatic light source for directing a light beam of a known wavelength onto said sample at a known angle of incidence so that the beam is reflected from the surface of the sample;
- a first polarizing element in the path of incident light beam and adapted to be fixed at a predetermined angle relative to the plane of incidence of the beam;
- adjusting means for setting the azimuth of said first polarizing element at different discrete predetermined angles relative to said plane of incidence;

a second polarizing element disposed in the path of the reflected light beam;

a photoresponsive device in the path of said reflected light beam and responsive to said beam, after it has passed through said second polarizing element, to produce an electrical signal which is a function of the intensity of the reflected light beam;

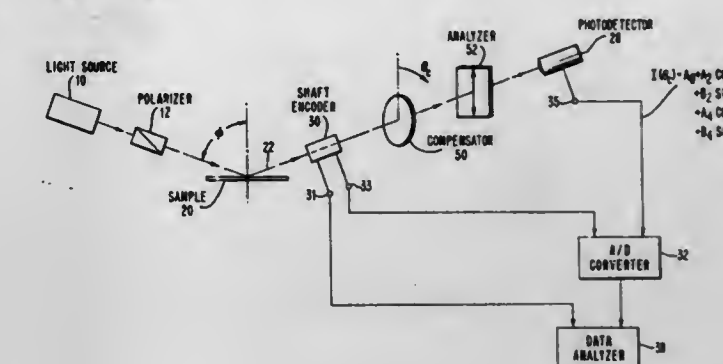
an angular encoder;

an analog-to-digital converter; and

a data analyzing means;

the improvement comprising:

a rotating optical compensator disposed in the path of the light beam;



said second polarizing element being fixed at a known angle relative to said plane of incidence;

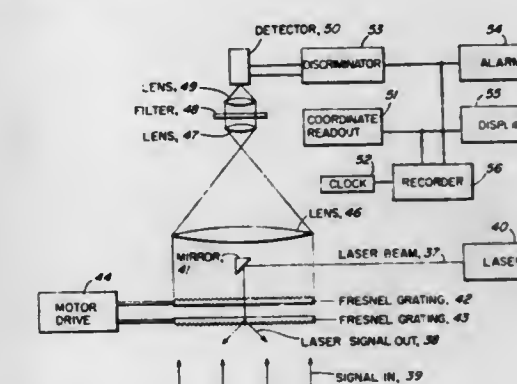
said angular encoder being associated with said rotating compensator for providing outputs consisting of first pulses for each revolution of said rotating compensator and respective second pulses for each chosen fraction of each of the revolutions;

said analog-to-digital converter being responsive to the outputs of said angular encoder and to the signal from said photoresponsive device for digitizing said signal in accordance with said second pulses; and

said data analyzing means being responsive to the digitized signal from said analog-to-digital converter and to said first pulses for analyzing the digitized signal.

4,053,233
RETROREFLECTORS
Fritz Bien, Arlington; Morton Camac, Lexington, and Michael Elliot Gersh, Bedford, all of Mass., assignors to Aerodyne Research, Inc., Bedford, Mass.
Filed Mar. 15, 1976, Ser. No. 667,035
Int. Cl.² G01B 11/26; G01D 21/04; G02B 5/12
U.S. Cl. 356-141

2 Claims



2. A method for detecting and locating a person on the surface of a body of water comprising:

positioning on said person an article of apparel having a plurality of retroreflectors mounted in an upper surface thereof and distributed angularly around said surface, said retroreflectors having front surfaces to receive a radiation signal and right angled rear reflective surfaces to reflect impinging radiation back at 180° angle from incoming radiation,

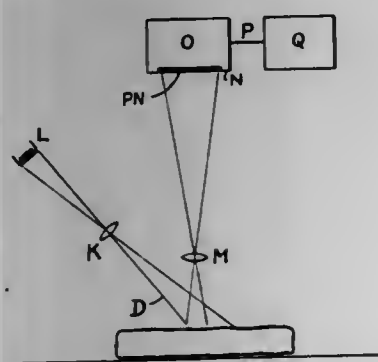
directing from an airplane radiation scanned across an area at a scan rate to cause at least three scan lines of radiation to pass across an area of the size of said retroreflectors, receiving and detecting at said airplane radiation reflected from said retroreflectors, and deriving a signal from said reflected radiation to denote the presence of said retroreflectors.

4,053,234

THICKNESS MEASUREMENT

Ian Duncan McFarlane, Beaconsfield, England, assignor to United Discs Limited, Isleworth, England
Filed Feb. 18, 1975, Ser. No. 550,170
Int. Cl.² G01B 11/00; G01N 21/48
U.S. Cl. 356—156

7 Claims

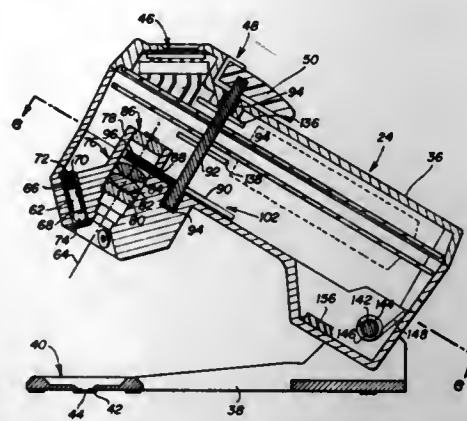


1. In an apparatus for use in measuring the position of a surface in a direction normal to said surface, as said position is related to a datum, wherein a beam of light is projected onto said surface along a first axis with the light reflecting from said surface along a second axis, said axes being in a common plane, the improvement comprising:

a photodiode strip comprising a plurality of photodiodes positioned sequentially along a line, said strip being positioned transverse to said second axis with said line in said plane, whereby a change in the position of said surface in said direction will cause said second axis to move along said line with the result of a change in which of the photodiodes are illuminated by the reflected light; and means connected to said photodiode strip for determining which photodiodes are illuminated to a predetermined degree, said means being arranged to repetitively scan the strip in a given direction to determine the voltage output of each diode in sequence along said line to thereby create a composite voltage signal which is a composite, as related to time, of the voltage output of each photodiode, as related to the direction of scan said beam having a leading edge and a trailing edge, said means connected to said photodiode strip producing a square wave initiated by that part (TA) of the composite voltage signal corresponding to the voltage output of the first diode to be illuminated to said degree and terminated (at TS) by the termination of said scan, the width of said beam between said leading edge and said trailing edge being sufficient to simultaneously illuminate a plurality of said diodes, said means determining which of the diodes, with respect to the direction of scan, is the first to be illuminated to said predetermined degree thereby determining the position of the reflected beam along said line, said means producing a sensible indication of the position of the reflected beam along said line calibrated in terms of the dimension between the part of said one surface at which the axes converge and said datum, said sensible indication being related to the time difference between said signals TA and TS.

4,053,235
DIGITAL REFLECTION DENSITOMETER SYSTEM
Perry Dwaine Hampton, Dallas, and James R. Cox, Richardson, both of Tex., assignors to Cosar Corporation, Garland, Tex.
Filed Apr. 27, 1973, Ser. No. 355,024
Int. Cl.² G01J 3/50; G01N 21/48
U.S. Cl. 356—188

1 Claim



1. In a reflection densitometer, the improvement comprising: a housing adapted for manual positioning over a surface; an optical system mounted in the housing and having a predetermined axis for receiving the light reflected from the predetermined portion of the system; a plurality of lamp receiving cylinders formed in said housing at spaced points around the axis of the optical system; a plurality of lamps for detachably fitting within said cylinders for illuminating the predetermined area of the surface; each of said lamps having a pair of pins extending from the rear thereof; a lamp socket mounted in each of said cylinders and having conductive sockets connected to a source of power for receiving said pins of said lamps; light sensitive means mounted within the housing on the axis of the optical system for receiving reflected light passing through the optical system and for generating an output in accordance with the intensity of the received light; optical filter means for selective positioning within the optical system and in alignment with the axis thereof; electronic circuitry means mounted within said housing for receiving the output of said light sensitive means for generating a digital output indicative of the output of the light sensitive means; said electronic circuitry including an operational amplifier coupled across the output of said light sensitive means for producing an output voltage proportional to the output current produced by the light sensitive means; a logarithmic amplifier connected to the output of the operational amplifier; digital volt meter means connected to the output of the logarithmic amplifier; and digital display means including light emitting diodes mounted in the housing for actuation by the output of the digital volt meter means to provide a digital visual readout on said housing indicative of the output of the light sensitive means.

4,053,236

ABSORBANCE MEASURING PHOTOMETER

John G. Atwood, Hamilton W. Marshall, Jr., and Charles F. de Mey, II, all of Redding, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Continuation of Ser. No. 499,617, Aug. 22, 1974, abandoned.
This application July 8, 1976, Ser. No. 703,520
Int. Cl.² G01J 3/50

U.S. Cl. 356—189

11 Claims

4. Apparatus for measuring the absorbance of a reaction mixture in a photometer sample cell comprising:
a. a light source emitting predetermined wavelengths; b.

means for forming the light from said source into a first beam;
c. means for defining the etendu of said first beam including a field stop and an aperture stop;
d. means for splitting said first beam into second and third contemporaneous beams while preserving the uniformity of illumination over both second and third beams and directing said second beam through said cell;
e. lens means to symmetrically image said field stop near the entrance of said cell and said aperture stop near the exit of said cell in such manner that, when passing through said cell, said second beam does not touch the sides thereof;

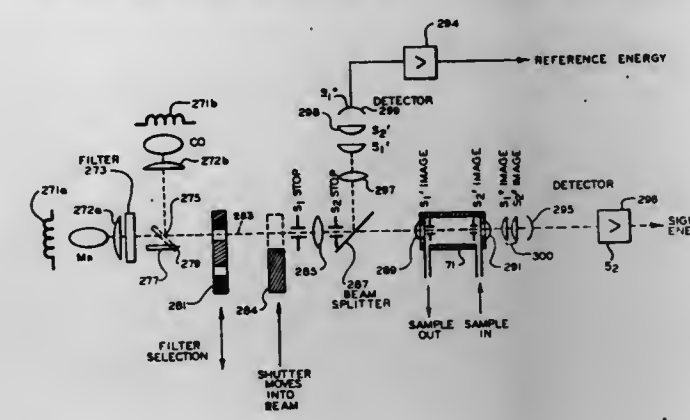
spectral data to determine the expected surface texture from plastic film that may be cast against said test roll.

4,053,238

SELF-LEVELING CONSTRUCTION ALIGNMENT LASER
Lyndell J. C. George, and Robert S. Shelly, both of Jacksonville, Ark., assignors to A G L Corporation, Jacksonville, Ark.
Filed Oct. 20, 1975, Ser. No. 624,238
Int. Cl.² G01C 9/18

U.S. Cl. 356—249

9 Claims



f. a first detector;
g. means forming an image of said aperture stop wholly on the sensitive area of said first detector;
h. a second detector in the path of said third beam;
i. means forming an image of one of said field and aperture stops wholly on the sensitive area of said second detector; and
j. signal amplifying means including means to cause the signal from said second detector to cancel out any variations in the signal from said first detector resulting from light source fluctuations.

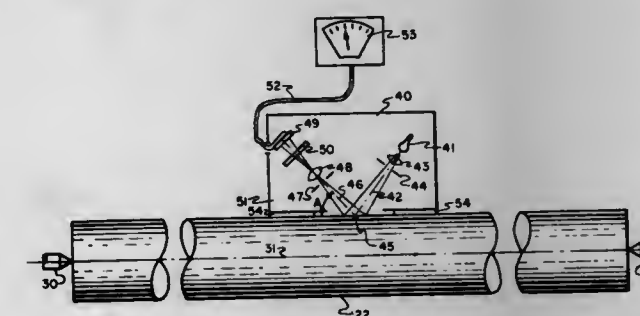
4,053,237

MEASURING THE SURFACE OF A ROLLER BY GLOSSMETER

Harry B. Casey, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.
Filed July 2, 1976, Ser. No. 701,907
Int. Cl.² G01N 21/48

U.S. Cl. 356—209

3 Claims



1. A method of testing the surface texture of a chill roll having a cylindrical surface of revolution about an axis for casting a film of thermoplastic material thereagainst, said method comprising the steps of:

obtaining co-relative spectral gloss data from the surfaces of representative chill rolls and respective plastic films cast thereagainst;
calibrating a gloss meter having incident and reflective optical axes converging in an optical plane at an illumination test area, said calibration corresponding to said co-relative spectral gloss data;
positioning said glossmeter on the surface of a cylindrical test roll with said optical plane aligned to substantially parallel coincidence with the cylindrical axis of said roll; correlating the response measure of said glossmeter to said

3. A system for projecting and utilizing a light beam as a reference line for laying conduit comprising:
a light beam projecting device for projecting the reference beam of light,
a vertically adjustable leg attached to the front end of said projecting device for being positioned in the vertical plane passing through the axis of said beam of light so that said beam of light is centrally positioned within said conduit which said leg is positioned at the lowest point in the conduit,
horizontally pivotable side legs, one of said legs being attached to each side of said projecting device toward the rear of said device, said pivotable legs being vertically extendable so that said device may be centrally positioned in a conduit and leveled by the adjustment of said rear and front legs, whereby the reference beam of light coincides with a reference line within said conduit.

4,053,239

AXIS DEFINITION APPARATUS

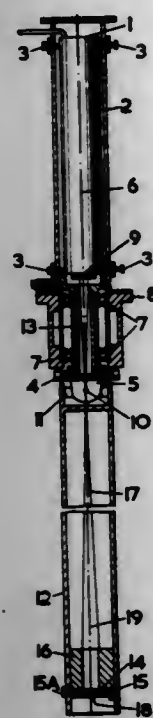
Francis Richard Tolmon, Leatherhead, England, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, London, England
Filed Nov. 4, 1975, Ser. No. 628,780
Claims priority, application United Kingdom, Nov. 5, 1974, 47777/74; May 19, 1975, 21314/75
Int. Cl.² G01C 9/14

U.S. Cl. 356—250

16 Claims

1. Axis definition apparatus including a laser operable to produce an output beam, focussing means for defining a point source of light from the said output beam, an optical image forming device having an optical center and being adapted to operate on light when diverging from the said point source to produce at least one real image, the said optical image forming device and point source of light defining an optical axis in terms of a line through the said optical center and point source of light, an axis control member to control the positions of the said optical center and point source of light and thereby that of the optical axis, the axis control member being freely suspended from a rotatably mounted relatively fixed member to pivot about a pivotal point whereby rotation of the relatively fixed member produces a corresponding rotation of the axis control member about a vertical axis, the said corresponding rotation producing motion of the optical axis to sweep out a

conical surface characterised by a semi-angle, and means for adjusting the relative positions of the optical image forming



device and the point source of light to reduce the said semi-angle to zero.

4,053,240

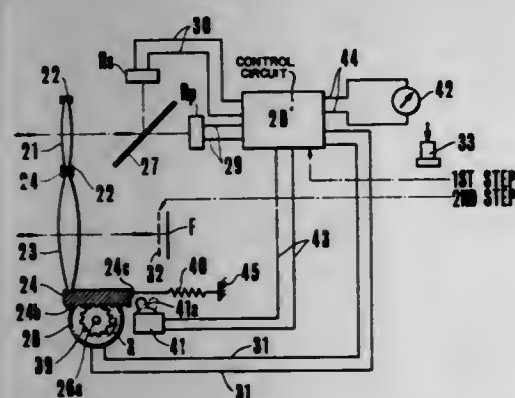
OBJECT DISTANCE MEASURING SYSTEM FOR AN OPTICAL INSTRUMENT

Hiroshi Aizawa, Kazuya Hosoe, both of Machida; Seichi Matsumoto, Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 18, 1974, Ser. No. 515,927

Claims priority, application Japan, Oct. 26, 1973, 48-120555
Int. Cl.² G01C 3/08; G03B 13/20

U.S. Cl. 356-4

22 Claims



1. An object distance measuring system comprising:

- A. an image forming optical system capable of forming an image of an object, the optical system having an optical axis and being arranged to be shiftable along the axis from a predetermined first position on the axis to a second position in which the image of the object is placed on a desired image forming plane;
- B. driving means for driving said optical system from said first position toward said second position, the driving means being operatively connected to said optical system;
- C. detecting means for detecting the positional variation of said optical system on the optical axis, said detecting means being responsive to the positional variation of the optical system and producing a signal for stopping the optical system when the optical system reaches the second position, said driving means being electrically connected to said detecting means and stopping the shifting of said optical system in response to said signal produced by said detecting means;
- D. converting means for converting a shifting distance of

said optical system in moving from the first position to the second position, into a digital signal, the converting means producing a digital signal corresponding to the shifting distance of the optical system from the first position in relation to the shifting of the optical system; and
E. displaying means for digitally displaying the object distance said displaying means responsive to the digital output signal of said converting means to digitally display said object distance based on the digital signal which is produced by the converting means and which corresponds to the shifting distance of the optical system.

4,053,241

CHAMBERED MIRROR CONSTRUCTION FOR LASERS

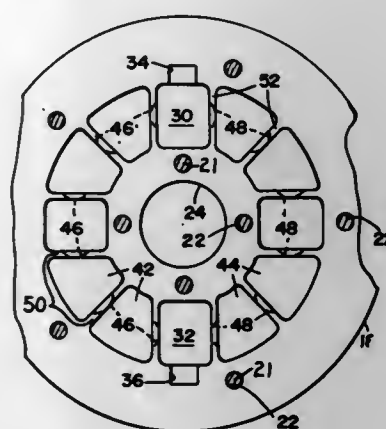
Gerald P. Simmons, Washington; Hiram A. Brubaker, Peoria, and William E. Streight, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 24, 1976, Ser. No. 689,691

Int. Cl.² G02B 5/08

U.S. Cl. 350-310

8 Claims



1. In a fluid cooled mirror assembly, a generally circular mirror having a reflective surface and a centrally disposed opening therethrough, a plurality of coolant chambers beneath said reflective surface of said mirror, said coolant chambers being serially arranged in two generally semicircular arcs from a first one to a last one of said plurality of coolant chambers, an inlet in said mirror for admitting coolant fluid to said first one of said plurality of coolant chambers, an outlet in said mirror for allowing removal of coolant fluid from said last one of said plurality of coolant chambers, walls formed in said mirror intermediate adjacent ones of said plurality of coolant chambers, and coolant passages in said walls interconnecting adjacent ones of said plurality of coolant chambers for flow of coolant fluid from said inlet to said outlet.

4,053,242

DISPOSABLE PRODUCT APPLICATOR AND DISPENSING PACKAGE THEREFOR

John George Mast, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 18, 1976, Ser. No. 668,253

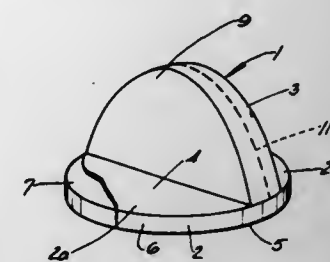
Int. Cl.² A46B 5/02

U.S. Cl. 401-6

13 Claims

1. A hand-held, T-shaped disposable product applicator comprising a resilient, integral, one-piece structure having an applicator pad portion and an upstanding finger grip portion, said pad portion being normally substantially planar with a top surface and a bottom product-applying surface, said upstanding finger grip portion being normally substantially normal to and extending transversely across said top surface of said pad portion bisecting said pad portion into two substantially equal parts, said pad portion being foldable along its juncture with said finger grip portion with said bottom product applying surface folded upon

itself, said finger grip portion being of a thickness substantially twice the thickness of said pad portion whereby when said



applicator pad portion is folded, said finger grip portion and said folded pad portion are substantially coplanar and of substantially the same thickness.

4,053,243

LIQUID APPLICATOR

David Levin, 10, Hope Road, Mountainview, Johannesburg, South Africa

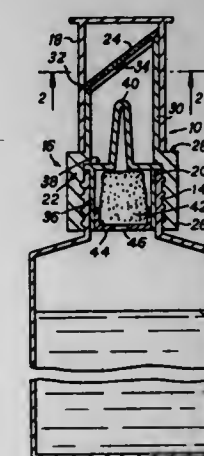
Filed Dec. 1, 1975, Ser. No. 636,418

Claims priority, application South Africa, July 24, 1975, 75/4767

Int. Cl.² B43M 11/06; B43K 5/00

U.S. Cl. 401-186

9 Claims



1. A liquid applicator comprising:

- a. a liquid reservoir,
- b. flow restrictor means having an inlet communicating with the reservoir and an outlet,
- c. said flow restrictor means being effective to receive liquid from the liquid reservoir through said inlet, produce foam and direct said foam through said outlet,
- d. a foam flow passage means extending outwardly from the flow restrictor means and having an open outer end, and
- e. wear resisting cover means disposed over the outer end of the foam flow passage means and being porous to the flow of foam therethrough,
- f. said foam flow passage means comprising a hollow elongated outlet support member extending between the flow restrictor means and the cover means to form a foam chamber in which the passage of liquid foam is guided from the outlet of the flow restrictor means to the cover means,
- g. said flow restrictor means including a restrictor material effective to permit liquid in foam form to pass therethrough.

4,053,244 COMPRESSION COUPLING MEANS FOR A RAISE BORING HEAD

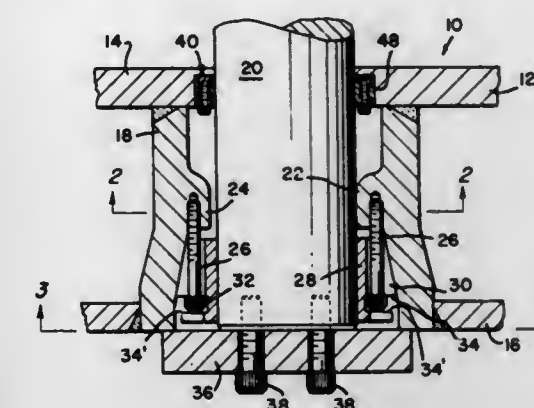
Charles R. Dively, Seattle, Wash., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 6, 1975, Ser. No. 619,658

Int. Cl.² F16B 2/14; F16D 1/08

U.S. Cl. 403-13

8 Claims



1. Compression coupling means for replaceably coupling a raise borer drive stem to a raise borer cutterhead, comprising: a plurality of first means for mutually and interpositionally engaging both a cutterhead element, and a drive stem element therefor, for effecting locking or clamping contact pressure therebetween at a plurality of locations spaced-apart lengthwise of a drive stem element; and second means for replaceably fastening one of said first means to at least one of said elements; wherein said one first means comprises a plurality of wedge sectors for effecting an interference fit between a cutterhead element and a drive stem element therefor; and said sectors are cooperative together to define a complete annulus for enveloping a portion of a drive stem element; each of said sectors defines a quadrant of said annulus; said sectors each having a first arcuate inner surface and a second arcuate outer surface for engaging a drive stem and a cutterhead, respectively; one of said inner and outer surfaces has a plurality of grooves formed therein to receive fasteners; and each of said grooves is interrupted by a channel formed in said one surface transverse of said grooves.

4,053,245

CONNECTOR

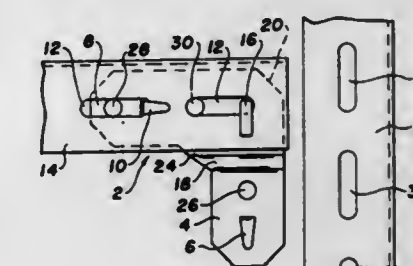
Peter Damian Wright, 137 West 2nd Ave., Vancouver, B.C., Canada (V5Y 1B8)

Filed May 3, 1976, Ser. No. 682,231

Int. Cl.² F16B 1/00

U.S. Cl. 403-188

9 Claims



1. A connector for use in connecting two perforate members at a predetermined angle, the connector comprising: a base plate; a first catch member on the base plate able to engage in a perforation in one of the perforate members; a second catch member on the base plate able to engage with a perforation in the second perforate member when the

two members are placed together at the predetermined angle;
 a third catch member on the base plate able to engage a perforation in each perforate member that is spaced from a perforation engaged by the first and second catch members;
 an offset formed in the base plate between either the first or the second catch member and the third catch member, the offset being about equal to the thickness of one perforate member;
 the three catch members each being L-shaped and extending outwardly from, and substantially parallel to the base plate.

4,053,246

STORAGE RACK ASSEMBLY AND MOUNTING CLAMP THEREFOR

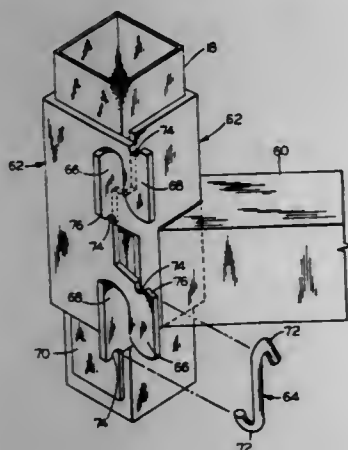
Salvatore A. Uccello, East Hartford, Conn., assignor to Lok-Rak Corporation of America, East Hartford, Conn.

Filed Mar. 3, 1976, Ser. No. 663,452

Int. Cl.² A47F 5/00

U.S. Cl. 403—233

2 Claims



1. In a mounting clamp assembly for detachably securing horizontal members to posts, the combination comprising a post having a polygonal cross section, a sleeve having an internal cross section complementary to said cross section of said post and detachably secured to said post in tightly fitting engagement therewith, a horizontal member secured to said sleeve, a projection on said post below said sleeve preventing downward displacement of said sleeve, and a plurality of resiliently deformable S-configured clamping members, said sleeve comprising a pair of interfitting sections each having two horizontal and two vertical edges, a generally L-shaped finger along each of said vertical edges and a recess along the base portion of said fingers, said fingers on said sections being oppositely disposed and interfitting, said clamping members each having hook portions adjacent the ends thereof offset in different planes with one of said hook portions being seated in the recess of one interfitting finger and the other of said hook portions being seated in the recess of the other interfitting finger to prevent inadvertent disassembly.

4,053,247

DOUBLE SLEEVE PIPE COUPLER

Richard O. Marsh, Jr., 1101 Standard Life Bldg., Pittsburgh, Pa. 15219

Continuation-in-part of Ser. No. 598,624, July 24, 1975, which is a continuation of Ser. No. 453,501, March 21, 1974, abandoned.

This application Aug. 2, 1976, Ser. No. 710,571

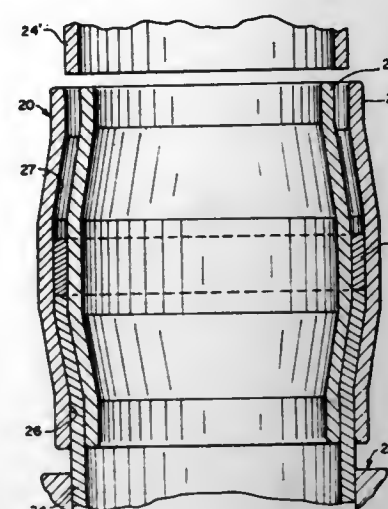
Int. Cl.² B25G 3/28

U.S. Cl. 403—279

22 Claims

1. A metal coupler for joining two sections of coaxially juxtaposed plain end metal pipe and pipe pile, comprising an inner sleeve element of circular form, an outer sleeve element of circular form concentrically surrounding said inner sleeve element, and a centrally disposed annular member which connects and supports said sleeve elements in uniformly spaced

radial relation along the length thereof, the space between said sleeve elements providing annular sockets on opposite sides of said annular member into which the ends of pipe and pipe pile will fit snugly, each of said annular sockets having an outer section of substantial length and one average diameter and an inner terminal section of a different average diameter adjacent



said annular member and an intervening conical section, the inner terminal section of each of said sockets having a length such that a line through the intersection of the conical section with the inner terminal section at the inner diameter thereof and the outer diameter of the inner terminal section at the inner terminus thereof, when projected, forms an angle with the longitudinal axis of the coupler less than 45°.

4,053,248

COUPLING FLANGE FOR A TORQUE TRANSMITTING SHAFT

Josef Schultenkamp, Essen; Bernd Eckert, Bruchkoebel, and Siegfried Schumann, Essen, all of Germany, assignors to Gelenkwellenbau GmbH, Essen, Germany

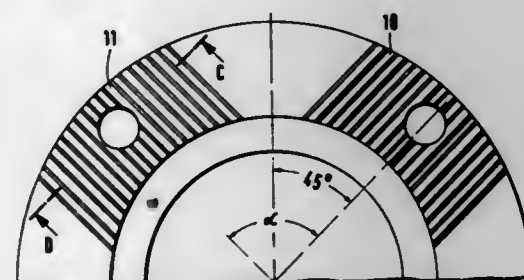
Filed Dec. 3, 1976, Ser. No. 747,226

Claims priority, application Germany, Dec. 4, 1975, 2554574

Int. Cl.² F16D 1/00

U.S. Cl. 403—337

6 Claims



1. A flange, particularly on a torque transmitting shaft or the like, for rigidly but detachably coupling to a counter-flange and comprising a coupling plate having a coupling surface engagable face-to-face with a counter-coupling flange and there being a plurality of openings through said coupling plate to receive detachable fastener elements, said coupling surface having two tooth systems thereon each comprising a plurality of substantially parallel axially projecting teeth having inclined flanks, at least one tooth in each tooth system having one of a different height, spacing and shape from the other teeth in said system and said tooth systems are engagable with a complementary configuration on a counter-flange to connect nonrotatably the flanges.

4,053,249

APPARATUS AND METHOD FOR PRECISION OVERBORING AN ARCUATE, VARIABLE DIAMETER BORE

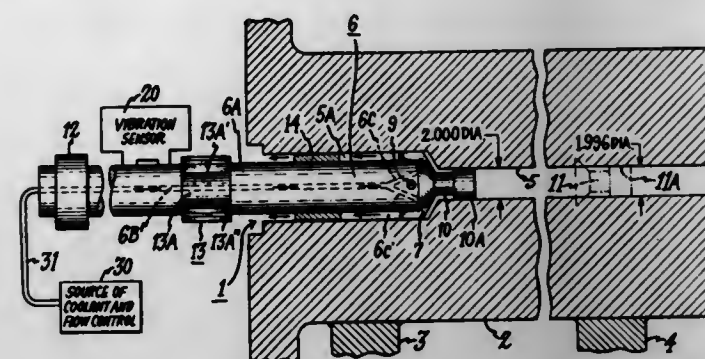
Phillip D. Ness, Bethel Park, and Robert A. Long, Pittsburgh, both of Pa., assignors to General Electric Company, Fairfield, Conn.

Filed Apr. 6, 1976, Ser. No. 674,118

Int. Cl.² B23B 35/00, 27/10, 51/00, 13/00

U.S. Cl. 408—1 BD

10 Claims



6. A method for precision overboring a variable diameter existing bore along the longitudinal center axis of a metal shaft supported in a position wherein the shaft sags along the longitudinal axis of said existing bore, comprising the steps of:

- providing a rotary boring tool having a drive shaft at least as long as said existing bore and having a coolant passageway extending through the length thereof, and providing drive means operatively connected to said tool for driving it through said existing bore,
- providing a source of liquid coolant and flow control means for selectively forcing coolant through said passageway,
- mounting a double-bladed spade bit in operative position on the boring end of said tool, said bit having a fixed cutting diameter substantially larger than said existing bore diameter,
- providing a plurality of boring tool pilots each having a different diameter, precision-formed, cylindrical guide surface that matches within a predetermined tolerance one of the respective diameters of said existing bore, and mounting on said tool ahead of the bit one of said pilots matched to within said predetermined tolerance of the diameter of said existing bore at one end thereof,
- operating said drive means to drive the pilot through said one end of the existing bore and to cause the bit to cut an overbore the longitudinal axis of which is caused by said pilot to match the longitudinal axis of the existing bore within said predetermined tolerance,
- operating said flow control means to cool said bit and to rapidly flush metal chips out of the overbore,
- monitoring the vibration of said rotary tool as the bit is driven through the shaft, thereby to detect a degree of vibration indicative of said predetermined tolerance being exceeded, and responsive to an indication of such excessive vibration changing the pilot initially mounted on said tool for another pilot having a guiding surface diameter within said predetermined tolerance of the portion of said existing bore then closest to the bit,
- continuing the overboring by repeating steps (e) and (f) and then repeating step (g) to successively substitute different diameter pilots as indicated by the detection of excessive tool vibration until the overbore is completed,
- providing a plurality of generally cylindrical follower bearings each having a plurality of coolant exhaust passages extending longitudinally therethrough, and each having a maximum outer diameter that matches the maximum cutting diameter of said bit within said predetermined tolerance, and
- mounting said follower bearings at spaced points on said drive shaft prior to the movement of said spaced points

into the overbore as the operations of step (h) are continued.

4,053,250

LINEAR INDEXER

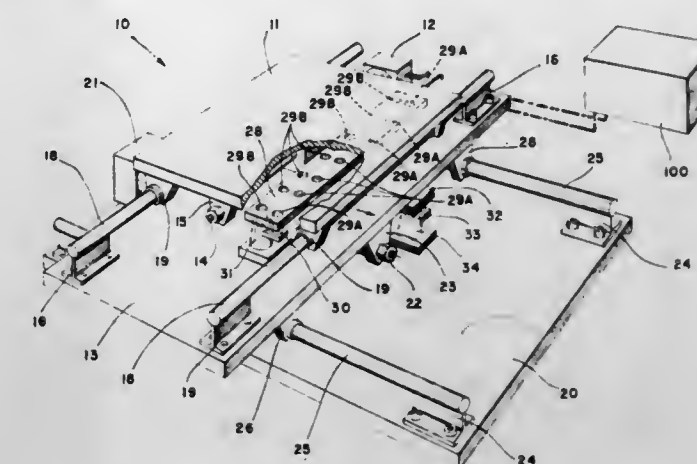
James E. Jestice, Middletown, and Robert G. Weatherby, Northfield, both of Ohio, assignors to Weatherby & Associates, Inc., Middletown, Ohio

Filed Apr. 30, 1976, Ser. No. 682,151

Int. Cl.² B23B 39/08

U.S. Cl. 408—3

24 Claims



1. Apparatus for indexing a worktable carrying a workpiece upon which work operations are to be performed comprising, drive means to translate the worktable, program means movable with the worktable and dictating predetermined locations at which the worktable will stop for operations on the workpiece, lock means cooperatively interacting with said program means to hold the worktable at the predetermined locations, and control means directed by said program means to intermittently operate said drive means to position the worktable at the predetermined locations.

4,053,251

DRILLING MACHINE WITH AUTOMATIC TOOL CHANGER

Hiromichi Shichida, 984-121, Misawa, Hino, Tokyo; Hideo Katsube, 2-2-2, Myojin-cho, Hachioji, Tokyo; Kenichi Toyoda, 3-27, Tamadaira, Hino, Tokyo, and Mitsuo Saito, 2-2-15, Seijo, Setagaya, Tokyo, all of Japan

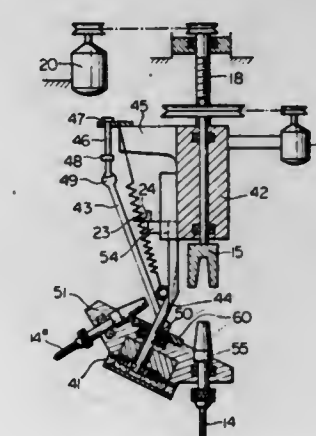
Filed Apr. 13, 1976, Ser. No. 676,563

Claims priority, application Japan, Apr. 25, 1975, 50-49748

Int. Cl.² B23B 39/20

U.S. Cl. 408—35

7 Claims



1. A machine provided with an automatic tool changer, comprising:
 a motor,
 a spindle head, means operatively connecting said motor and said spindle head to move said spindle head along an axis, a spindle rotatably held by said spindle head,

a bar having one end thereof slidably supported by said spindle head,
 a tool magazine rotatably supported by the other end of said bar,
 a plurality of tool arbors rotatably held by said tool magazine and arranged such that as said tool magazine is rotated said tool arbors are sequentially aligned with said axis of movement of said spindle head, and means adapting said tool arbors to be engaged by said spindle to rotate said tool arbors and to be disengaged from said spindle,
 spring means urging said bar and said tool magazine attached thereto to a position wherein said tool arbors engage said spindle in driving relationship,
 a rod, means universally connecting one end of said rod to said tool magazine, and means universally connecting the other end of said rod to said spindle head such that as said spindle head is driven by said motor along said axis said rod causes said tool magazine to be rotated with respect to said bar.

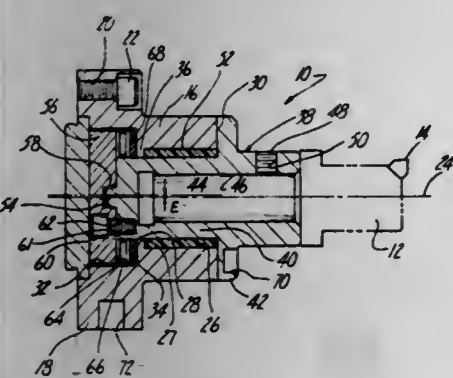
4,053,252 CUTTING TOOL HOLDER

Richard C. Gersch, 617 June Court, Traverse City, Mich. 49684
 Filed May 5, 1976, Ser. No. 683,422

Int. Cl.² B23B 29/034

U.S. Cl. 408-150

17 Claims



7. A cutting tool holder, comprising:
 a hub member having a mounting end and an outwardly extending end and adapted to be rotated around its axis of rotation, said hub member having a cylindrical bore formed therein eccentric to said axis of rotation;
 a bar holder having a cylindrical shank portion disposed in said hub bore and adapted to support a cutting bar having a cutting edge;
 means for securing said bar holder in said bore while permitting rotation of said bar holder in said bore whereby rotation of said bar holder in said bore alters the radial distance of the cutting edge of said cutting bar from said axis of rotation, and
 a tubular and cylindrical bearing sleeve constructed of a compressible material disposed between said eccentric bore and the shank of said bar holder whereby substantially the entire outer periphery of said bearing sleeve flatly abuts against the eccentric bore and whereby substantially the entire inner periphery of said bearing sleeve flatly abuts against the outer periphery of said shank.

4,053,253 POWER GENERATING APPARATUS

Carl E. Coffey, 140 W. Hopkins, Pontiac, Mich. 48055
 Filed July 14, 1975, Ser. No. 595,584

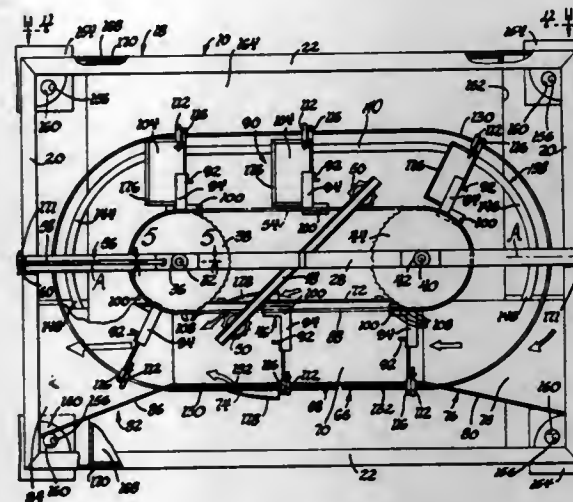
Int. Cl.² F03B 9/00, 13/00; F01D 23/00

U.S. Cl. 415-5

15 Claims

1. Power generating apparatus, comprising body means adapted to be anchored against downstream or lateral movement in a generally horizontally flowing water stream, said body having a centerline to be aligned generally parallel with the direction of water flow, spaced vertical rotatable shafts

mounted on said body approximately on said centerline, said body being formed to provide directing means generally parallel to but horizontally disposed entirely on one side of said centerline for directing water flow through said body, movable means driven by the water flow through said body and including single endless driven and drive means mounted to move in a generally horizontal plane about said shafts, said movable single endless means being arranged so that a portion



thereof moves adjacent said water flow directing means and the opposite portion thereof is disposed on the side of said centerline opposite said flow directing means, said movable means further including a plurality of supported paddle assemblies extending horizontally outwardly beyond said endless means and means for changing said paddle positions from a vertical position in said directing means to a substantially horizontal position beyond said directing means.

4,053,254 TURBINE CASE COOLING SYSTEM

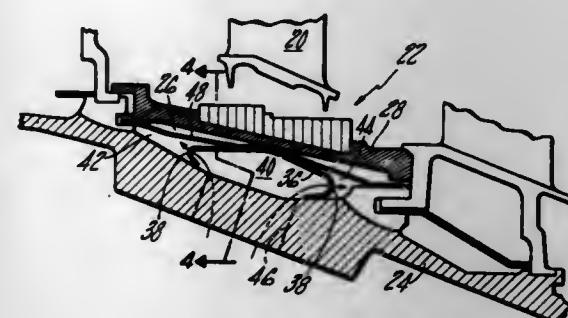
Gary Francis Chaplin, Vernon, and Frederick Michael Schwarz, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 26, 1976, Ser. No. 670,916

Int. Cl.² F01D 11/08, 25/14

U.S. Cl. 415-116

7 Claims



1. For a gas turbine engine, a turbine stator assembly comprising:
 a turbine case having a plurality of cooling air ports circumferentially spaced about the outer periphery thereof;
 a first row of stator vanes extending inwardly from the case upstream of the cooling air ports;
 a second row of stator vanes extending inwardly from the case downstream of the cooling air ports;
 an outer air seal which is positioned between said first and second rows of stator vanes and which radially opposes the blades of the engine rotor assembly, said outer air seal and said turbine case cooperatively forming an annular chamber therebetween which is in gas communication with the cooling air ports;
 a manifold which is disposed within the annular chamber forming a cooling air distribution conduit for flowing cooling air from said ports circumferentially about the

engine, wherein said manifold has a multiplicity of cooling holes through which cooling air is uniformly flowable during operation of the engine; and
 a cylindrical element which is attached to said manifold and spans the annular chamber to position the manifold axially within the chamber.

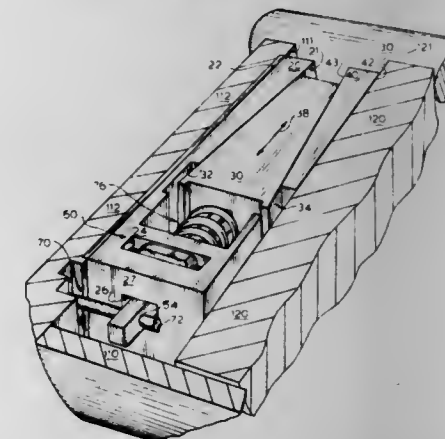
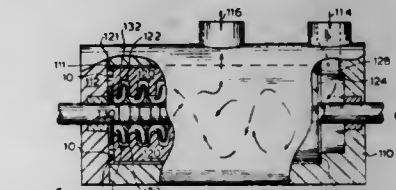
4,053,255 SELF-ADJUSTING SPACER FOR CENTRIFUGAL PUMPS

Carl A. Taylor, 1503 Glastonberry Road, Maitland, Fla. 32751
 Filed Sept. 17, 1976, Ser. No. 724,398

Int. Cl.² F03B 11/02, 11/04

U.S. Cl. 415-127

14 Claims



1. A self-adjusting spacer for use in a centrifugal pump of the type having a volute movable axially within a barrel and covered by an end barrel cover, said self-adjusting spacer comprising in combination:

a first sliding plate having an outer surface coupled with an inside surface of the barrel cover, with said first sliding plate having a first inclined surface thereon;
 a second sliding plate having an outer surface coupled with an inner surface of the volute, with said second sliding plate further having a second inclined surface thereon generally parallel to and in sliding communication with said first inclined surface of said first sliding plate; and
 bias means coupled between said first and second sliding plates for advancing the sliding communication therebetween in a preferred direction for increasing the separation between said outer surfaces of said first and second sliding plates, whereby any increase in the separation between the volute and the barrel cover will be absorbed by the effective combined width between said outer surfaces of said first and second sliding plates.

4,053,256 VARIABLE CAMBER VANE FOR A GAS TURBINE ENGINE

John Edward Hertel, East Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 29, 1975, Ser. No. 617,921

Int. Cl.² F01D 9/02, 9/00

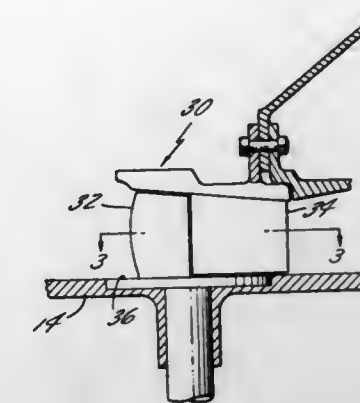
U.S. Cl. 415-161

5 Claims

1. Apparatus for directing the medium gas within the flow path of a gas turbine engine to a preferred angle within the flow path, comprising:

a variable camber vane having a leading edge element which is rotatably cantilevered from the outer wall of the flow path and a trailing edge element which is rotatably fixed relative to the outer wall at a point downstream of the

leading edge element, wherein said leading and trailing edge elements are cooperatively disposed to form the



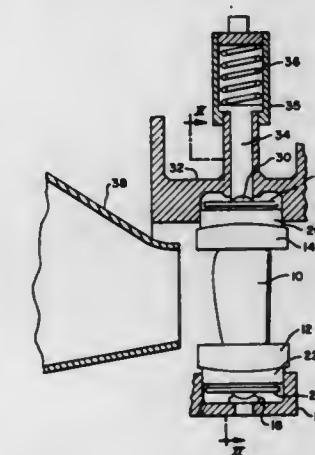
vane and wherein the trailing edge element is cantilevered from the inner wall of the medium flow path.

4,053,257
STATOR VANE ASSEMBLY FOR GAS TURBINES
 Thomas J. Rahaim, Claymont, Del.; Richard J. Schaller, Allentown, Pa., and Elbert H. Wiley, Jr., Wenonah, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
 Filed Feb. 20, 1976, Ser. No. 659,869

Int. Cl.² F04D 29/02

U.S. Cl. 415-214

1 Claim



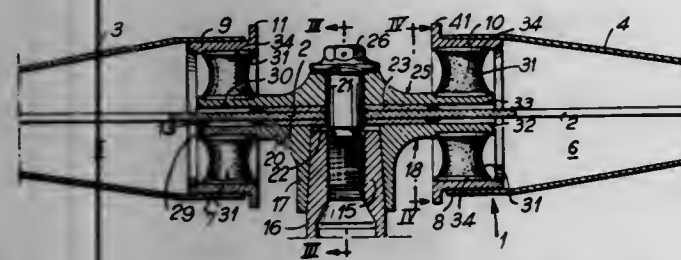
1. An improved turbine stator vane assembly having ceramic components comprising a vane member disposed between, and in compressive intimate contact with, opposed end caps, wherein the inner surface of each of said end caps contains a groove for receipt of the respective end of the vane member providing pivot and seat interengaging surfaces, each of said grooves defining a compound arcuate surface having a major radius of curvature in a plane substantially parallel to the plane of the longitudinal direction of the vane and a minor radius of curvature in a plane perpendicular to the plane of the major radius wherein the improvement comprises:

said vane member defining an airfoil portion terminating at radially opposed ends in integral tenon portions having an outer surface conforming to the arcuate configuration of said groove for intimate substantially coextensive contact therebetween; and,
 wherein the inner surface of said tenon portion is generally flush with the inner surface of said end cap when in the assembled position;
 whereby, the tenon portion of the vane member fills the groove in the end cap providing a continuous smooth surface for non-turbulent fluid flow thereacross and wherein the configuration of the tenon further provides a cross-sectional area in the tenon relating to the immediately adjacent thickness of the airfoil portion such that the largest cross-sectional area of the tenon is adjacent the thickest portion of the airfoil portion for general equal rates of heating and cooling of said adjacent portions to

minimize thermal gradients with attendant thermal stresses at their juncture.

4,053,258

TAIL-ROTOR ARRANGEMENT FOR ROTOR CRAFTS
René Louis Mouille, Aix-en-Provence, France, assignor to Société Nationale Industrielle Aérospatiale, Paris, France
Filed Aug. 27, 1975, Ser. No. 608,215
Claims priority, application France, Sept. 19, 1974, 74.31664
Int. Cl.² B64C 27/38
U.S. Cl. 416—134 A 10 Claims

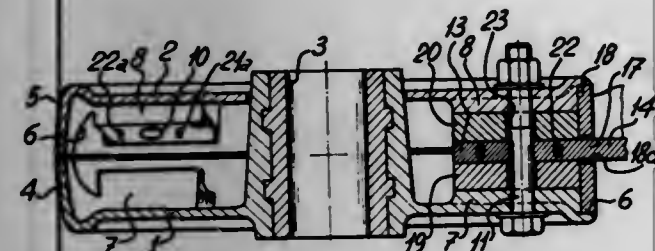


1. A two-bladed tail rotor arrangement for lightweight moderately priced gyroplanes or helicopters comprising a strip-like flexible spar having a uniform rectangular cross-section, said spar being held at its median portion in a boss secured to the rotor shaft formed by a pair of plates having laterally opposed ends, a shaped blade shell surrounding each half of the spar and connected to the latter solely in the area of its outer end and extending freely up to the corresponding lateral end of the plates, each blade shell progressively evolving in cross-section from its outer end into a cylindrical blade root forming a sleeve surrounding the corresponding lateral end of the plates, a cylindrical flange inserted in and fixed to the sleeve of said blade root and an elastic contact interposed between the flange and the corresponding lateral end of said plates thereby connecting said blade root to said boss.

4,053,259

AXIAL FAN ADJUSTABLE PITCH CONNECTABLE BLADES

Emilio Bianchi, Varese, Italy, assignor to Axial International Establishment, Mauren, Liechtenstein
Filed Oct. 28, 1975, Ser. No. 626,067
Claims priority, application Italy, Oct. 31, 1974, 29044/74; Oct. 14, 1975, 28250/75
Int. Cl.² F04D 29/36
U.S. Cl. 416—208 6 Claims



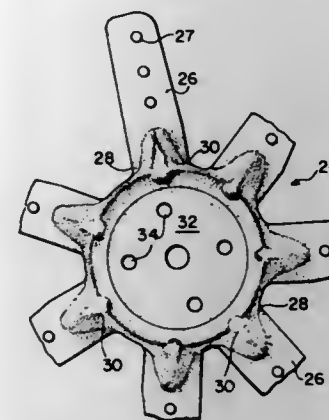
1. A fan comprising:
 - a. a first shell member having a first axis;
 - b. drive means for rotating said shell member about said axis;
 - c. a second shell member axially juxtaposed to said first shell member;
 - d. a plurality of circumferentially distributed ribs projecting from each shell member toward respective, opposite ribs on the other shell member,
 1. each rib having a seating face of circularly arcuate cross section about a second axis transverse to said first axis;
 - e. a plurality of elongated blade members having each a root portion and a wing portion,
 1. said root portion being of circularly arcuate cross section and interposed between two associated, opposite ribs;

2. said wing portion projecting radially outward relative to said first axis beyond said shell members; and
- f. releasable clamping means axially clamping said shell members and said root portions to each other in a position in which each root portion is fixedly secured in conforming engagement between the seating faces of the associated ribs,
 1. said clamping means including a plurality of clamping members, each clamping member axially passing through aligned respective openings in said shell members, two opposite ribs, and the associated root portion.

4,053,260

DOUBLE SPIDER STIFFENING ASSEMBLY FOR FAN BLADES

Clifford S. L. Yee, Indianapolis, Ind., assignor to Wallace Murray Corporation, New York, N.Y.
Continuation of Ser. No. 550,657, Feb. 18, 1975, abandoned.
This application June 18, 1976, Ser. No. 697,515
Int. Cl.² F04D 29/34
U.S. Cl. 416—210 R 2 Claims



1. A fan blade spider arm mounting assembly of the type including hub and spider arm sheet metal workpieces for mounting fan blades, wherein the mounting assembly is defined by two sheet metal workpieces, each having integral angularly spaced fan blade mounting arms joined to a central hub portion at the root of each arm, the workpieces angularly aligned and in superimposed relation, to thereby define double-thickness hub and spider arm portions, an outwardly extending rib at the root portion of each spider arm, the ribs of one workpiece oppositely facing the ribs of the other workpiece to thereby define a closed cavity at each spider arm root portion, the cavities being of lesser width than the width of the spider arms, the hubs and arms of the two workpieces being in abutting, facing relation to each other, the two workpieces being fastened to each other at their arms radially outwardly of said root portions, whereby each spider arm is stiffened by both compressive and tensile loading of its corresponding cavity walls when a transverse force is applied to that arm.

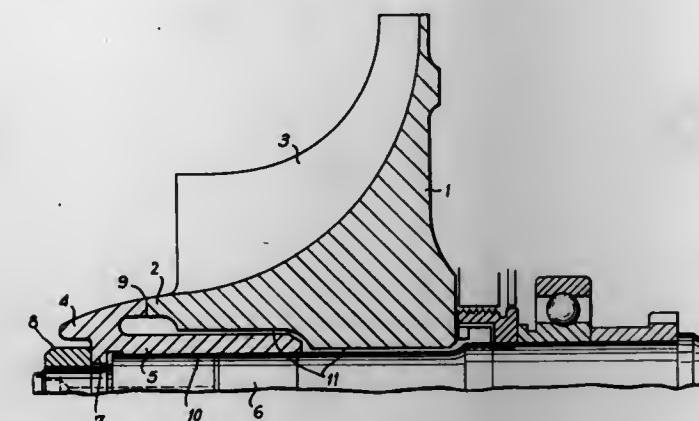
4,053,261

IMPELLER FOR A HIGH-SPEED TURBOMACHINE

Gregor Pennig, Munich, Germany, assignor to MTU Motoren- und Turbinen Union München GmbH, Munich, Germany
Filed Dec. 1, 1975, Ser. No. 636,831
Claims priority, application Germany, Dec. 4, 1974, 2457231
Int. Cl.² F01D 5/04
U.S. Cl. 416—244 A 6 Claims

1. In an impeller wheel for a high-speed turbomachine having a shaft; and a hub frictionally fastened on said shaft through a tapered fit therebetween; the improvement comprising the combination of:
 - a. said impeller wheel being a centrifugal radially-shaped impeller having a predetermined width;
 - b. said hub being an elongate cylindrical sleeve extending into said impeller wheel in an axial direction;

- c. said impeller wheel encompassing said shaft and said hub so as to form a narrow radial gap therebetween; and
- d. said hub at the axial end thereof remote from said impeller wheel including a thin-walled, cylindrical connecting part

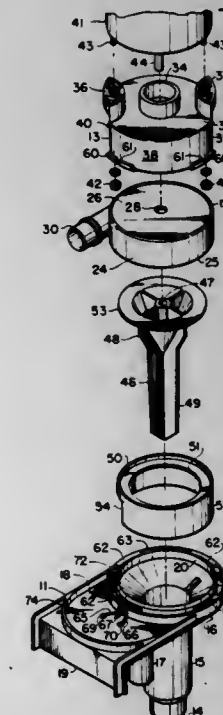


extending radially outwardly and being welded at its free end to said impeller wheel, said hub being an elongated cylindrical sleeve extending partly into a central bore of said impeller wheel in an axial direction.

4,053,262

AQUARIUM PUMP STRUCTURE

Tibor Horvath, Brooklyn, N.Y., assignor to Aquology Pet Corporation, Newark, N.J.
Filed Sept. 27, 1976, Ser. No. 726,932
Int. Cl.² F04B 17/00; E04H 3/16
U.S. Cl. 417—424 8 Claims



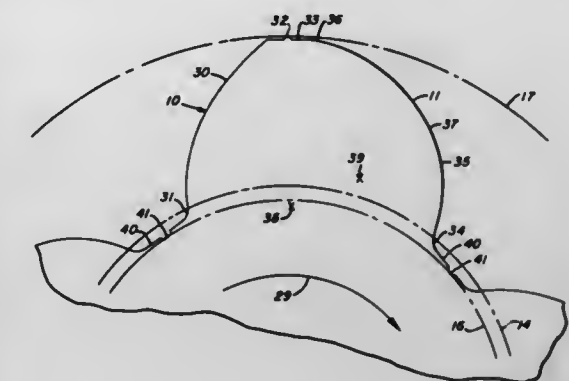
1. An aquarium pump having a housing with a large diameter upper cylindrical chamber having a top wall containing an aperture, a smaller diameter lower chamber containing an inlet, an outward flare between said lower chamber and said upper chamber, and a tangential outlet leading from said upper chamber, an impeller within said chambers of said housing having a larger portion in said upper chamber and a smaller portion extending downward into said lower chamber, a motor disposed over said housing having a shaft extending through said aperture in said top wall and mounting said impeller, and seal means disposed about said shaft adjacent to said aperture in said top wall; the improvement comprising, in combination, an upper portion of said housing including said top wall of said housing and at least part of said upper chamber, a lower portion of said housing extending downward below said upper portion of said housing, mating edges of said upper and lower portions of said housing, a motor mounting element having a top wall containing a central opening and having mounting

flanges to which said motor is fixed with said motor shaft extending downward through said opening, skirt elements extending downward about said top wall of said motor mounting element, said top wall of said motor mounting element and said skirt elements nesting about said upper chamber, locking lugs projecting outwards from said skirt elements, and inwardly facing locking lips formed on said lower portion of said housing so that rotating said motor mounting element moves said lugs under said lips fixing said motor over said housing and holding said upper and lower portions of said housing together.

4,053,263

SCREW ROTOR MACHINE ROTORS AND METHOD OF MAKING

Robert A. Ingalls, Springfield, Vt., assignor to Joy Manufacturing Company, Pittsburgh, Pa.
Continuation of Ser. No. 374,032, June 27, 1973, abandoned.
This application Jan. 2, 1976, Ser. No. 645,981
Int. Cl.² F01C 1/16; F04C 17/12; F16H 55/08
U.S. Cl. 418—201 8 Claims



8. A pair of helical rotors for a screw rotor machine comprising:

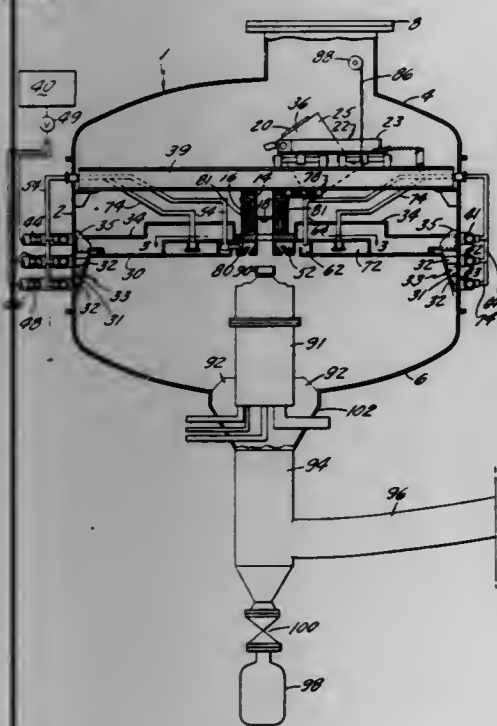
- a male rotor and a female rotor adapted to be rotatably carried within a casing of said machine on respective parallel axes for intermeshing counterrotation of said male and female rotors on such respective axes,
 - said male rotor being rotatable about a central longitudinal axis and having a pitch circle centered on such axis, a plurality of elongated asymmetrical helical lobes extending longitudinally of said rotor and circumferentially spaced about such pitch circle so as to provide intervening grooves therebetween; a major portion of each of said lobes extending generally radially outward from such pitch circles, the profile of each of said lobes in a plane perpendicular to such axis having a tip portion and respective, generally convex leading and trailing flank portions extending intermediate said tip portion and the root portion of the respective adjacent groove; the profile of said leading flank portion consisting of involute curvature extending between said respective root portion and an intermediate point and traversing such pitch circle, and a circular arc portion extending between said intermediate point and said tip portion, said circular arc portion consisting of at least two circular arcs of different radii; and the profile of said trailing flank consisting of involute curvature extending between the other of said respective root portions and said tip portion and traversing said pitch circle, and
 - said female rotor being rotatable about a central longitudinal axis and having a pitch circle centered on such axis; a plurality of elongated asymmetrical helical lobes extending longitudinally of said rotor and circumferentially spaced about such pitch circle so as to provide intervening grooves therebetween; a major portion of each of said lobes extending generally radially inwardly of such pitch circle; the profile of each of said lobes in a plane perpendicular to such axis having a tip portion and respective generally concave leading and trailing flank portions

extending intermediate said tip portion and the root portion of the respective adjacent groove; the profile of each of said leading and trailing flank portions consisting of involute curvature extending between said tip portion and a respective intermediate point and traversing said pitch circle, and a circular arc portion extending between said respective intermediate points, said circular arc portion consisting of at least two circular arcs of different radii, whereby said rotors are adapted to form variable volume working chambers.

4,053,264

APPARATUS FOR MAKING METAL POWDER

Jerry A. King, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Division of Ser. No. 653,693, Jan. 30, 1976, Pat. No. 4,025,249.
This application Dec. 6, 1976, Ser. No. 748,084
Int. Cl.² B22D 23/08; B05B 1/14
U.S. Cl. 425—8 4 Claims



1. An apparatus for producing metal powder comprising a housing, a disc means mounted for rotation, a nozzle plate means in said housing for directing an annular curtain of cooling fluid therefrom around said disc means, said nozzle plate means including three annular manifolds, a first annular inner manifold, a second annular middle manifold, and a third annular outer manifold, said first annular manifold having an annular nozzle, said second manifold having an annular baffle to properly distribute the flow therein, said third annular manifold having an annular distribution box therein for properly distributing the flow therein.

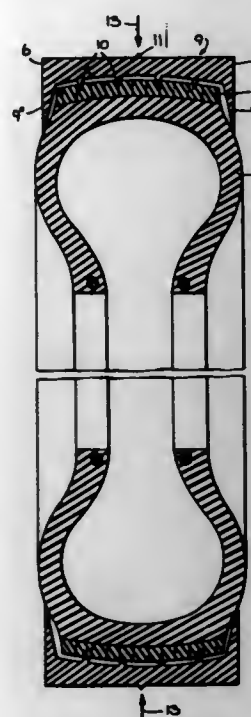
4,053,265

MOLD FOR RETREADING PNEUMATIC TIRES

Jan-Eric Lennart Walker, Transtolvsage, and Gote Bertil Sivert Bohman, Varberg, both of Sweden, assignors to Decapo AB, Varberg, Sweden
Continuation-in-part of Ser. No. 536,775, Dec. 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 465,878, May 1, 1974, Pat. No. 3,983,193. This application Dec. 20, 1976, Ser. No. 752,026
Claims priority, application Sweden, Nov. 12, 1973, 7315263; Apr. 10, 1974, 7404835
Int. Cl.² B29H 5/04
U.S. Cl. 425—20 19 Claims

1. A resilient, stretchable mold for embossing a pattern in a layer of unvulcanized rubber on the peripheral surface of a supporting body, said mold being made of an elastomeric material and having the shape of a generally circular, continuous band having an inner face extending around and facing the axis of said band, said inner face having a normal diameter

when said mold is in its unstretched condition, said band having a plurality of spaced, pattern forming projections of a dimension in the radial direction extending from said inner face toward said axis and said band having a pair of axially spaced lips, one on one side and the other on the other side of said projections, extending toward said axis and inwardly of said inner face, said lips being substantially continuous in a direction circumferentially of said axis, the normal diameter between the innermost extents of said projections when said mold is in said unstretched condition thereby being less than said normal diameter of said inner face and said band being stretch-

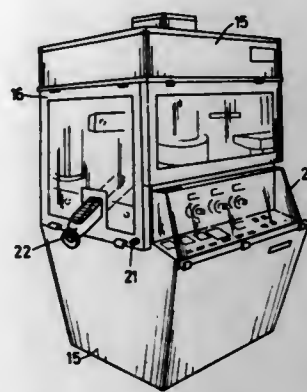


able to a size such that the diameter between said innermost extents of said projections is at least equal to said normal diameter of said inner face, the elasticity of said elastomeric material being sufficient to permit stretching of said band to said size without exceeding the elastic limit thereof and said elastomeric material of said mold having a tensile strength at break of at least 500 p.s.i., an elongation at break at least 20 percent, a modulus at 300 percent elongation of at least 100 p.s.i., a hot tear strength of at least 100 p.s.i., a Shore hardness of at least 50, a compression set not exceeding 40 percent and a Lupke rebound in the range from 15 to 30 at temperatures up to about 70° C.

4,053,266

PROTECTIVE HOOD FOR PELLETING PRESSES

Konrad Friedrichs, Jürgen Hinzpeter, and Walter Bräuner, all of Schwarzenbek, Germany, assignors to Fa. Wilhelm Fette GmbH, Schwarzenbek, Germany
Filed May 5, 1976, Ser. No. 683,594
Claims priority, application Germany, May 9, 1975, 2520691
Int. Cl.² B29C 3/00
U.S. Cl. 425—73 5 Claims



1. A tablet compressing machine comprising a plurality of

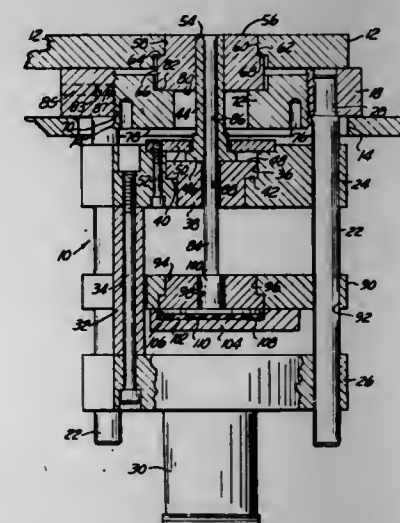
lateral walls for enclosing a pelleting press and defining a protective hood, and wherein at least one of said walls includes an opening therein providing access to the hood interior, and a window hinged to said at least one wall for closing off said opening, and wherein said at least one wall comprises an airtight closure for sealing said window about said opening, the improvement wherein:

said closure comprises a profile strip defining a sealed air chamber facing said window and air connecting channels disposed within said profile strip and opening to said air chamber for subjecting said air chamber to positive air pressure, whereby, upon loss of seal between said air tight closure and said window, positive air pressure exiting from said chamber and between said window and said closure prevents contamination of the interior of said hood by the atmosphere.

4,053,267

DIE AND PUNCH ASSEMBLY FOR COMPACTING POWDER MATERIAL

Raymond P. DeSantis, Royal Oak, Mich., assignor to Wolverine Aluminum Corporation, Lincoln Park, Mich.
Filed Oct. 22, 1976, Ser. No. 734,970
Int. Cl.² B30B 11/02
U.S. Cl. 425—78 11 Claims

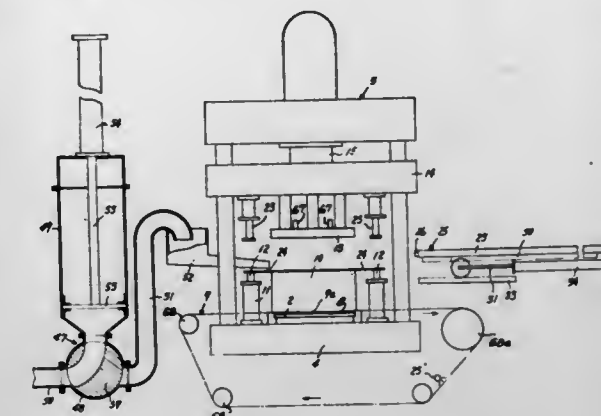


1. A unitary punch and die assembly for mounting on a powder compacting press, said assembly comprising a die plate, a pocket in said die plate a removable die bushing disposed in said pocket, at least one guidepost supported by said die plate and extending substantially parallel to the axis of said assembly, a pair of spaced apart plates slidably reciprocable in unison relative to said die plate and being supported and guided by said guidepost, a recess in one of said plates most proximate to said die plate, a punch member normally slidably engaged in a die bore in said die bushing and having an enlarged foot portion in said recess in said plate, means for clamping said punch on said plate, coupling means disposed below the other of said plates for connection to an actuating member dependent from said press, linking means interconnecting said plates for reciprocating said plates in unison, and a die bushing retainer in the form of a cylindrical member provided with a peripheral thread engageable with an internal thread formed in the pocket in said die plate, said thread being of an asymmetrical shape with the driving side of said thread forming an acute angle with a plane perpendicular to the axis of said thread.

4,053,268

APPARATUS FOR MOLDING A SLURRY OF CALCIUM SILICATE CRYSTALS

Junji Kishino, Gifu, Japan, assignor to Kabushiki Kaisha Osaka Packing Seizosho, Japan
Filed Dec. 22, 1975, Ser. No. 642,652
Claims priority, application Japan, Dec. 27, 1974, 50-2661; Feb. 21, 1975, 50-24716
Int. Cl.² B28B 3/04
U.S. Cl. 425—84 8 Claims



1. An apparatus for molding a slurry of calcium silicate crystals comprising:
a base plate provided with drain passages on the upper surface,
a net conveyor having meshes for dewatering the slurry and disposed on the upper surface of the base plate in contact therewith, said conveyor being movable from the upper surface of the base plate to enable discharge of the shaped product after the molding operation is completed,
a frame-shaped lower mold movable between a position wherein said mold is disposed on said net conveyor immediately above said base plate, and a position above said net conveyor,
an upper mold provided on the lower surface thereof with dewatering means for dewatering the slurry, located above and movable into engagement with the lower mold to press and dewater the slurry in cooperation with the lower mold and to thereby form a shaped product,
first drive means operatively associated with said lower mold for lowering said lower mold onto the net conveyor immediately above said base plate and for raising said lower mold relative to said net conveyor,
second drive means operatively associated with said upper mold for lowering said upper mold into contact with said lower mold and for raising said upper mold, and
lower mold holder means operatively associated with said lower mold for pressing said lower mold downwardly during the molding operation independently of the movement of said upper mold and for holding said lower mold so that said upper and lower molds can be raised together by said first drive means, said lower mold holder means allowing relative movement between said molds subsequent to their being raised together to cause the discharge of the shaped product.

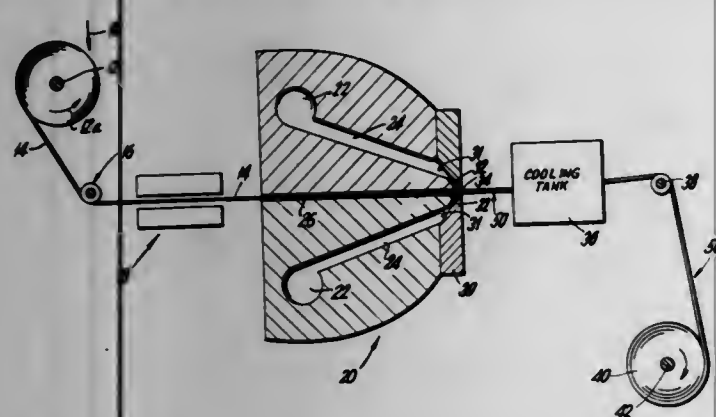
4,053,269

APPARATUS FOR FORMING A COMPOSITE TAPE

Sidney Levy, 145 W. Cathbert Blvd., Oaklyn, N.J. 08107
Continuation-in-part of Ser. No. 341,238, March 14, 1973, Pat. No. 3,917,890, which is a continuation-in-part of Ser. No. 887,990, Dec. 24, 1969, abandoned. This application Feb. 26, 1975, Ser. No. 553,280
Int. Cl.² B29F 3/10 7 Claims

U.S. Cl. 425—113
1. An extrusion die for coating a foraminous core material comprising an extrusion member having a channel extending therethrough dimensioned and configured to substantially correspond to external dimensions of the core material to be

coated to permit passage of the core material through said channel with clearance, said channel having an entry end and an exit end, a passageway provided on each side of said channel in said extrusion member which merges with and opens into said channel proximate to said exit end and a die orifice where the core material leaves said extrusion member, a section disposed on one side of and adjacent to a point of merging of said passageways with said channel at said exit end, said section providing a die lip area communicating with said die orifice on an opposite side thereof, said passageways having lengths of approximately 0.25 inches with an effective dimension across their flow path being approximately 0.05 inches,



said die lip area having a length along the flow path of approximately 0.05 inches with an effective dimension across the flow path of approximately 0.02 inches, said dimensions of said passageways and of said die lip area permitting a coating of resin material under suitable extrusion pressures to encapsulate the core material during the course of passage through the extrusion die and prior to its emergence therefrom, whereby controlled application of pressure on the extruded resin material by selection of the extrusion die dimensions forces the resin material into interstices of the foraminous core material prior to emergence from the die orifice to impart a layer of resin material about the core material.

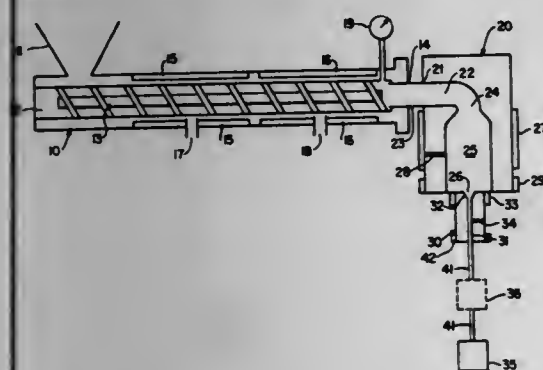
4,053,270

APPARATUS FOR THE EXTRUSION OF HIGHLY ORIENTED POLYMERIC MATERIALS

John R. Collier, Athens, Ohio, and Thomas Y. T. Tam, Chester, Va., assignors to Research Corporation, New York, N.Y.
Filed Jan. 29, 1976, Ser. No. 653,584
Int. Cl.² B29F 3/08

U.S. Cl. 425-144

9 Claims



1. An extrusion apparatus for producing a highly oriented extrudate of a thermoplastic polymeric material, comprising:
 - a. a plasticating extruder means for providing a melt of said polymeric material and for feeding said melt under pressure through a discharge opening in said extruder means;
 - b. an elongational flow pattern-developing reservoir means having an inlet opening communicating with said discharge opening of said extruder means, an enlarged diameter flow cavity, and a constricted discharge orifice, the relative geometries of said flow cavity and said constricted discharge orifice being such as to develop within

the molten polymeric material flowing from said extruder means through said reservoir means an elongational flow pattern which induces molecular orientation in the direction of flow within said molten polymeric material and elevates the effective melting point of said flowing polymeric material;

- c. an orientation-retaining extrusion die means provided with an orifice extending therethrough, said die orifice having an inlet end and an outlet end, said constricted discharge orifice of said reservoir means opening into said inlet end of said die orifice so as to permit flow of the oriented molten polymeric material from said reservoir means into said die means without any increase in the cross-sectional area of flow, said die orifice having a cross-sectional area no greater than that of said constricted discharge orifice of said reservoir means so as to radially constrain said oriented molten polymeric material flowing therethrough against its natural tendency to lose its molecular orientation by radial swelling;
- d. temperature control means for maintaining the temperature of said flowing molten polymeric material at at least about said elevated effective melting point thereof in said reservoir means and said inlet end of said die orifice and for maintaining in said die orifice an axial temperature gradient descending in the direction of flow through a median die temperature substantially equal to the normal melting point of said polymeric material so that solidification of said polymeric material will be inhibited in the entrance region of said die means and initiated within said die means; and
- e. a variable speed take-up means for withdrawing from said outlet end of said die orifice a partially solidified extrudate of said polymeric material at a controlled draw rate such that said extrudate becomes completely solidified immediately after exiting from said outlet end of said die orifice and before any radial swelling of said extrudate can occur.

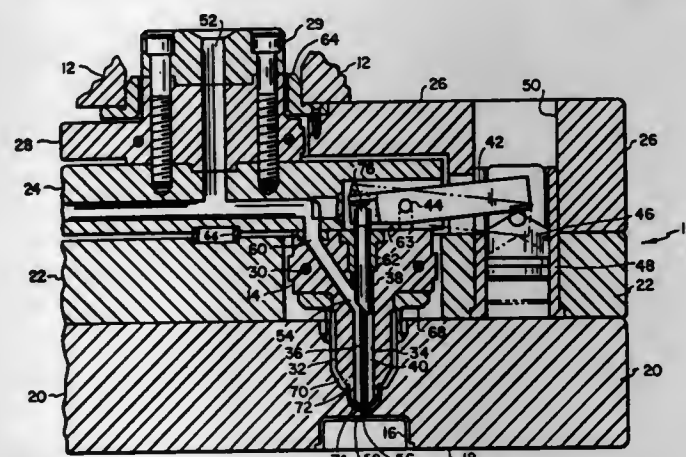
4,053,271

VALVE-GATED INJECTION MOLDING MECHANISM

Jobst Ulrich Gellert, 11 Newton Road, Brampton, Ontario, Canada
Continuation-in-part of Ser. No. 655,057, Feb. 4, 1976, Pat. No. 4,013,393. This application Oct. 12, 1976, Ser. No. 731,510
Int. Cl.² B29F 1/00

U.S. Cl. 425-562

3 Claims



1. In an injection molding valve-gated mechanism having a vertical valve pin which reciprocates in a passage bore in a heater located in a mold to control flow of molten plastic from a molding machine to a cavity, the heater having a lower nozzle portion which is separated from the surrounding mold by a circumferential air space and through which the valve pin projects to provide a valve in a gate to the cavity, the improvement comprising a generally cylindrical seal having a vertical inner wall, a vertical outer wall and a lower surface, said seal being horizontally located in the air space between the lower nozzle portion of the heater and the wall of a recess in the mold, said seal being located where the air space flares out-

wardly upward, the lower surface extending upwardly from the mold across the air space to an overhanging shoulder on lower nozzle portion of the heater, the lower surface having a uniform V-shaped cross section formed by a first face extending diagonally outwardly upward from the inner surface and a second face extending diagonally inwardly upward from the outer surface, the lower surface forming an inner lip defined between the inner surface and the first diagonal face and an outer lip defined between the outer surface and the second diagonal face, the seal being positioned so that only a portion of the outer lip abuts on the mold to reduce heat transfer through the seal from the lower nozzle portion of the heater to the mold.

4,053,272

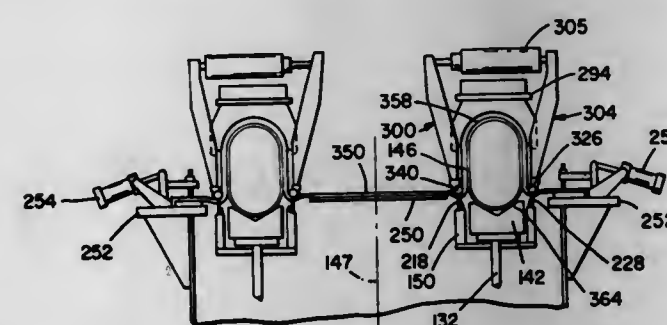
APPARATUS AND METHOD FOR FORMING A TUBE ARTICLE ON A CORE

Charles E. Grawey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 588,732, June 20, 1975, which is a continuation-in-part of Ser. No. 385,956, Aug. 6, 1973, abandoned. This application Nov. 15, 1976, Ser. No. 742,389
Int. Cl.² B29C 17/04

U.S. Cl. 425-302.1

18 Claims



1. Apparatus for forming a portion of a tube on a toroidal core from elastomeric sheet material comprising:
 - frame means;
 - a toroidal core support means operatively associated with the frame means for supporting the toroidal core;
 - means operatively associated with the frame means for positioning and supporting a sheet of elastomeric material adjacent the so-supported core along one side of the so-supported core;
 - means for depositing elastomeric material of the sheet thereof onto the so-supported toroidal core along a continuous path thereof; and
 - means for selectively applying force to an annular portion of the elastomeric material associated with the core to urge an annular portion of elastomeric material against the so-supporting core.

4,053,273

APPARATUS FOR THE MANUFACTURE OF PRESSED BODIES OF DEPOLARIZING MATERIAL FOR GALVANIC CELLS

Ernst Karobath; Leopold Rippel; Wolfgang Pulitzer, and Hans Schmidinger, all of Vienna, Austria, assignors to Telephon- und Telegraphen-Fabriks-Aktiengesellschaft Kapach & Sohne in Wien, Vienna, Austria

Filed Mar. 15, 1976, Ser. No. 667,100

Claims priority, application Austria, Apr. 4, 1975, 2573/75
Int. Cl.² B30B 11/10, 15/30

U.S. Cl. 425-357

12 Claims

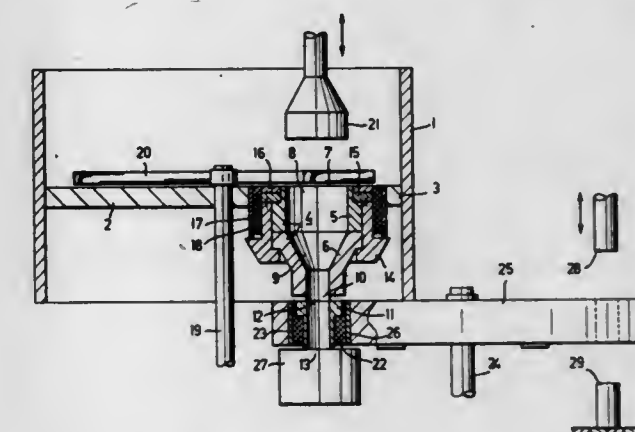
1. An apparatus for the manufacture of a pressed body of depolarizing material for use in a galvanic cell, comprising, in combination:
 - at least one elongated mold having a substantially uniform cross section and being open at each end;
 - a pre-mold having a capacity greater than that of said mold and being open at each end, one of the openings of said

pre-mold being generally the same size and shape as the openings of said mold;

filling means operable for filling said pre-mold with said depolarizing material;

pressing means operable for cooperating with said pre-mold to compress and discharge the depolarizing material in said pre-mold to said mold and operable for simultaneously cooperating with said mold to press the depolarizing material therein;

moving means operable to move said mold to align one of its openings with said one opening of said pre-mold and to



move said mold after it receives the compressed depolarizing material; and

shearing means operable to cooperate with said moving means to shear off a portion of the compressed depolarizing material extending above the top of said mold;

said pressing means and said moving means operable for cooperating with each other whereby said mold is moved to a position below said pre-mold, receives the compressed depolarizing material, and is thereafter moved away so that another mold can be moved to the position below said pre-mold.

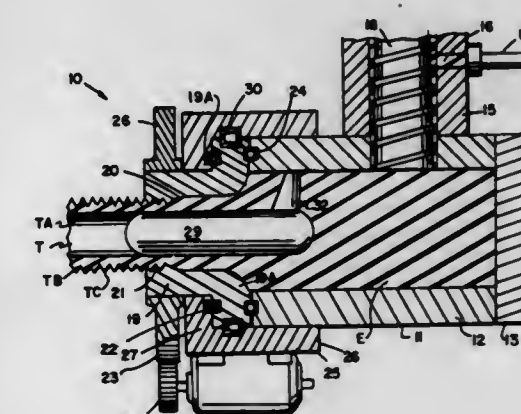
4,053,274

TUBE WALL FORMING APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Filed Jan. 28, 1975, Ser. No. 544,834
Int. Cl.² B29D 23/04

U.S. Cl. 425-381

7 Claims



1. An apparatus for continuously extruding tubing having a smooth interior wall surface which has a substantially constant internal diameter and having an exterior wall which varies in configuration along the length thereof wherein said configuration is in the form of corrugations having a depth equal to at least one-half of the wall thickness of the extruded tube to provide a flexible tube having a resistance free flow path comprising:
 - an extruder including an extrusion die having a die opening,
 - a mandrel supported within said die and extending beyond

said die opening to define with said die opening an annular passageway,
means connected to said die to define a chamber adapted to be filled with an extrudate,
means associated with said chamber for forcing the extrudate about said mandrel and through said annular passageway,
said mandrel having a smooth outer surface to form the tubular extrusion having a smooth regularly shaped internal surface having a substantially constant diameter,
corrugating means operatively associated with said die and having a corrugating formation for engaging the exterior surface of the tubular extrusion formed in said die,
said corrugating formation having a depth equal to at least one-half the thickness of tubular extrusion formed in said die,
drive means connected to said corrugating means for effecting the rotation thereof as said tubular extrusion is being formed in said die to form a series of spiral protrusions in the outer stratum of the tubular extrusion only,
wherein said corrugating means comprises a component part of said die defining said die opening.

4,053,275

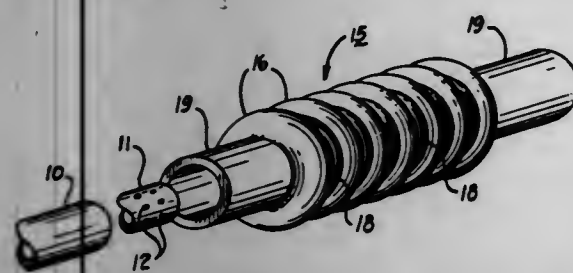
APPARATUS FOR MAKING FLEXIBLE CORRUGATED RUBBER TUBING

Vance M. Kramer, Sr., 402 E. Broadway Road, Perrysburg, Ohio 43551, and Vance M. Kramer, Jr., 1913 Greendale Ave., Findlay, Ohio 45840

Filed Apr. 12, 1976, Ser. No. 676,281
Int. Cl.² B29C 17/04

U.S. Cl. 425—389

9 Claims



1. In apparatus for making flexible corrugated tubing from an extruded sleeve of uncured rubber and including a forming mandrel adapted to receive said sleeve and means for supplying air under pressure to the interior of said sleeve for radially expanding said sleeve, the improvement which comprises:
an axially extendible external form adapted to be disposed over said mandrel and sleeve, said form comprising a tubular cylindrical member formed of elastomeric material and having a plurality of circumferential corrugations formed intermediate its ends whereby when said sleeve is radially expanded by said air pressure supplying means, said sleeve is bulged outwardly against said external form so that the exterior surface of said sleeve conforms to the surface of said external form and embryonic corrugations are formed in said sleeve, said embryonic corrugations corresponding generally in axial spacing and radial depth to the corrugations in said external form when in its unextended relaxed condition.

4,053,276

PRESS FOR EXERTING A PRESSURE OVER AN AREA

Karl-Heinz Ahnweiler, Kurt Quoss, and Edward Kusters, all of Krefeld, Germany, assignors to Edward Kusters, Krefeld, Germany

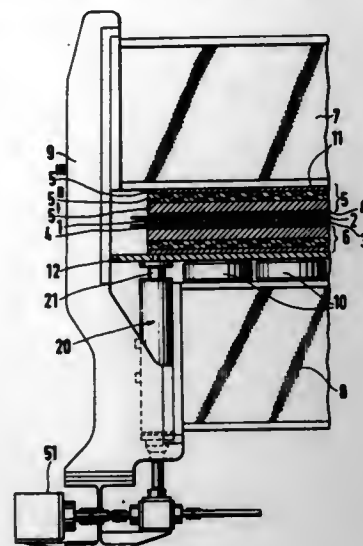
Filed Mar. 17, 1976, Ser. No. 667,546
Claims priority, application Germany, Mar. 18, 1975, 2511873
Int. Cl.² B29C 3/00

U.S. Cl. 425—484

9 Claims

1. In a press for exerting a pressure over an area in a longitudinal section of a sheet, particularly a press for producing wood chip board and similar materials, having two opposed

pressure plates which are braced against respective support structures provided outside the pressing area between said plates and in which the pressure is transmitted from at least one support structure to at least one associated pressure plate by



supplying a pressure medium to several pressure elements disposed in lines across the sheet, the improvement comprising means associated with at least some of the pressure elements for permitting said pressure elements to exert a force which is controllably variable.

4,053,277

APPARATUS AND METHOD FOR HEATING THREADS

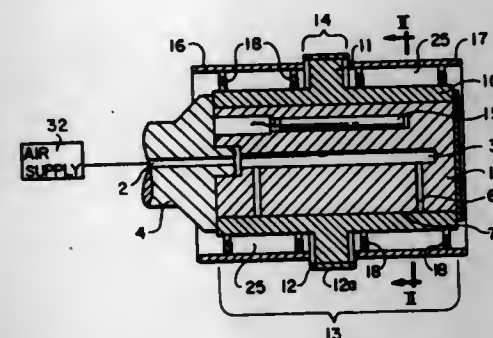
Cornelis Bos, Dieren, and Jacobus J. H. G. Daamen, Arnhem, both of Netherlands, assignors to Akzoona Incorporated, Asheville, N.C.

Filed Sept. 3, 1976, Ser. No. 720,496
Claims priority, application Netherlands, Sept. 5, 1975, 7510463

Int. Cl.² F27B 9/28

U.S. Cl. 432—60

7 Claims



1. An apparatus for heating threads comprising: a core fixedly mounted to a frame and having a cylindrical surface; a cylindrical jacket rotatably mounted over said core and separable by a narrow gap from said core, a portion of the jacket having thermal insulation means on its exterior surface, the remaining exterior surface being the running surface for the threads; means for heating the core; and means for supplying a compressed gas to the gap between the core and the jacket.

4,053,278

TUNNEL KILN

Werner Fleischmann, Frankfurt; Heinz-Otto Reinkenobbe, and Manfred Schmidt, both of Ratingen, all of Germany, assignors to "Keramag" Keramische Werke AG, Ratingen and Firma Adolf A. Fleischmann, Frankfurt, both of Germany

Filed Sept. 7, 1976, Ser. No. 720,738
Claims priority, application Germany, Sept. 11, 1975, 2540401
Int. Cl.² F27B 9/00; F27D 1/00

U.S. Cl. 432—137

16 Claims

1. A structure for a tunnel kiln enclosure of substantially rectangular interior cross-sectional outline, especially a kiln for

the firing of ceramic objects on a production line basis, under continuous or intermittent motion, the tunnel kiln structure comprising in combination:

- a tunnel frame of structural steel extending the length of the tunnel kiln and including upright frame sections on both sides thereof;
- a plurality of longitudinally adjoining tunnel kiln sections, each of said kiln sections including a unitary prefabricated heat resistant ceiling panel extending transversely over the entire width of the kiln enclosure and being supported by

guide rails supporting the rail cars, the rails being mounted in parallel alignment with the tunnel frame.

4,053,279

FUEL-FIRED, RADIANT HEATER

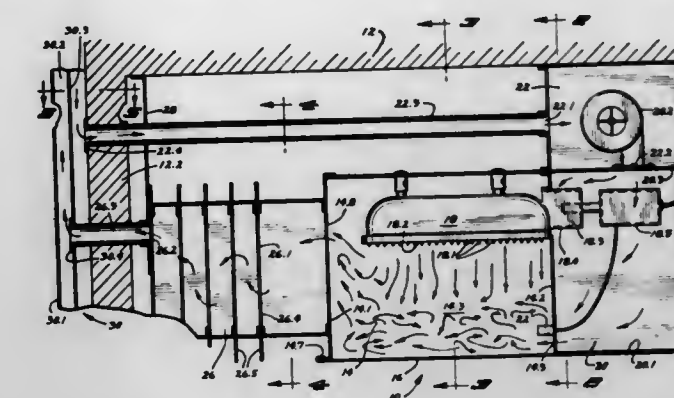
John E. Eichenlaub, 5212 Kellogg Ave., Edina, Minn. 55424

Filed Feb. 23, 1976, Ser. No. 660,134

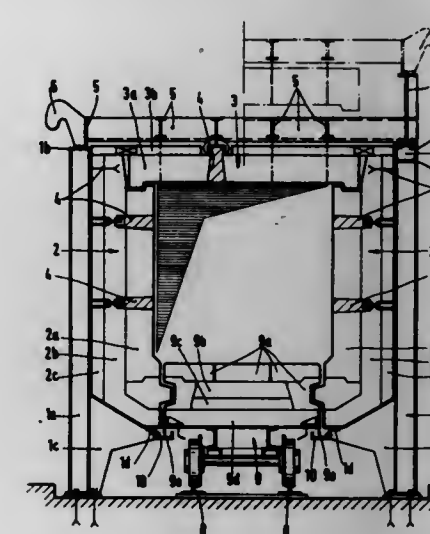
Int. Cl.² F27B 17/00; F24C 3/02

U.S. Cl. 432—222

19 Claims



1. A fuel-fired, radiant heater comprising a fuel-fired radiant; a combustion chamber housing the radiant and having a lower wall spaced below the radiant and providing a generally downwardly open port closed by a thin panel highly transmissive of infrared radiation and having an inner surface confronting the radiant, the combustion chamber having an outlet port to permit escape of combustion product gases; and air supply means for supplying flows of air to the combustion chamber at a pressure higher than the combustion chamber pressure, the air supply means including means conveying air to the radiant for use as primary combustion air and means providing an air flow passage into the combustion chamber and configured to provide a constantly replenished pool of cooling air above the panel to cool the same and to prevent the impingement thereon of hot combustion product gases from the radiant.

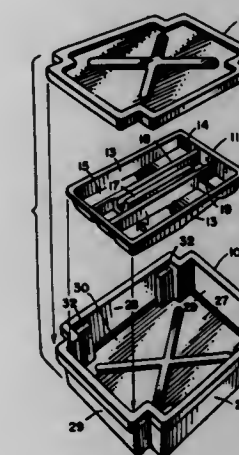
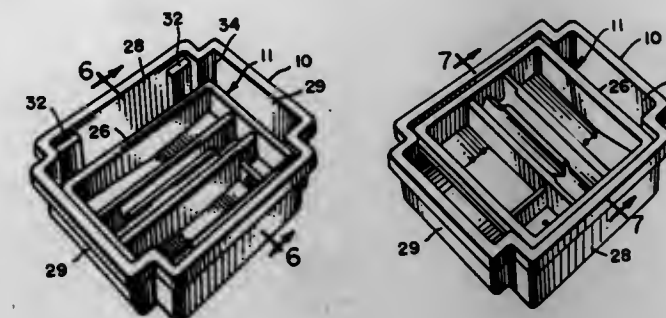


said upright frame sections, and a similar unitary prefabricated heat resistant side panel on each side of the kiln extending over the entire height of the kiln enclosure, the side panels being likewise supported on said upright frame sections;

- a plurality of longitudinally adjoining rail cars carrying thereon similar unitary prefabricated heat resistant bottom panels which form a movable bottom for the tunnel kiln enclosure; and

CHEMICAL

4,053,280
INSTRUMENT TRAY AND SOAK BASIN COMBINATION
 Thomas E. Salisbury, Highland Park, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
 Filed Apr. 23, 1976, Ser. No. 679,570
 Int. Cl.² A61L 3/00; B08B 3/04; B65D 81/00
 U.S. Cl. 21—87 10 Claims

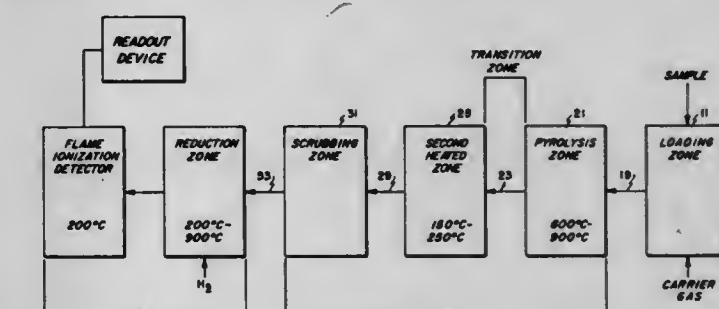


1. In combination, a generally rectangular instrument tray having a bottom wall and having side and end walls upstanding from said bottom wall, at least one of said walls having apertures so positioned therein to provide for the substantially complete drainage of fluid from said tray; said tray having a length, measured from one upstanding end wall to the other, substantially greater than its width, measured from one upstanding side wall to the other; and a soak basin having bottom, side, and end walls defining a chamber for removably receiving said tray; said chamber having a depth substantially greater than the height of the upstanding walls of said tray and being both longer and wider than said length of said tray; whereby, said tray is selectively receivable in said chamber in a first position wherein the length of said tray extends longitudinally of said basin and in a second position wherein said length of said tray extends transversely of said basin; support means provided by said basin for supporting said tray in a fluid drainage and instrument storage position with its bottom wall spaced a substantial distance above the basin's bottom wall when said tray is in its second position; stop means provided by said basin and engageable with said tray for preventing relative horizontal movement of said tray without restraining relative vertical upward movement of the tray when said tray is in its second position; and flanges projecting outwardly from the top of said end walls of said tray; said support means comprising shoulders provided by said side walls of said basin; said shoulders being engageable with said flanges for supporting said tray in its elevated second position.

6. In combination, a generally rectangular instrument tray having a bottom wall and having side and end walls upstanding from said bottom wall, at least one of said walls having apertures so positioned therein to provide for the substantially complete drainage of fluid from said tray; said tray having a length, measured from one upstanding end wall to the other, substantially greater than its width, measured from one upstanding side wall to the other; and a soak basin having bottom, side, and end walls defining a chamber for removably receiving said tray; said chamber having a depth substantially greater

than the height of the upstanding walls of said tray and being both longer and wider than said length of said tray; whereby, said tray is selectively receivable in said chamber in a first position wherein the length of said tray extends longitudinally of said basin and in a second position wherein said length of said tray extends transversely of said basin; support means provided by said basin for supporting said tray in a fluid drainage and instrument storage position with its bottom wall spaced a substantial distance above the basin's bottom wall when said tray is in its second position; and stop means provided by said basin and engageable with said tray for preventing relative horizontal movement of said tray without restraining relative vertical upward movement of the tray when said tray is in its second position; said stop means comprising pairs of spaced upstanding opposing surfaces provided along each side wall of said basin; said opposing surfaces being spaced apart a distance slightly greater than the width of said tray at each end thereof for limiting horizontal movement of said tray upon engagement with the side walls of said tray.

4,053,281
METHOD AND APPARATUS FOR DETERMINING ORGANIC CARBON IN SULFUREOUS COMPOUNDS
 Melvin Keith Carter, Saratoga, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.
 Filed Jan. 31, 1975, Ser. No. 545,853
 Int. Cl.² G01N 31/12
 U.S. Cl. 23—230 PC 13 Claims



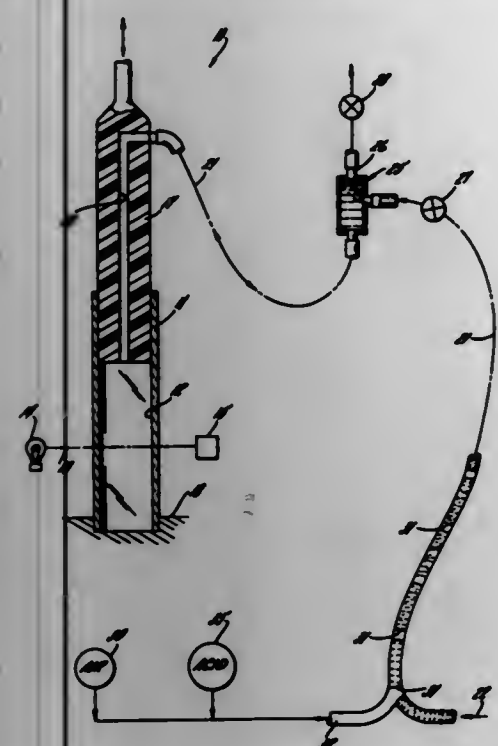
1. A process for determining trace quantities of organic carbon in sulfurous mixtures and compounds comprising the steps of:

- introducing small predetermined sample quantities of sulfurous matter into a first zone of a sealed chamber;
- heating the introduced matter in the first zone to a temperature sufficient to decompose the matter to form sulfur dioxide and sulfur trioxide gases and to oxidize organic substances in the matter to form carbon dioxide gas;
- conveying aforementioned gases from the first zone to subsequent zones in the chamber;
- scrubbing the gases from the first zone in a scrubbing zone by the usage of a transition metal amine complex which reacts to remove sulfurous compounds from the gases without reaction with carbon dioxide gas; and
- analyzing the gases which exit from the scrubbing zone to determine the carbon dioxide content of the gases.

4,053,282
METHOD AND APPARATUS FOR SAMPLING IMPURE WATER
 Clifford C. Hach, and Michael D. Buck, both of Ames, Iowa, assignors to Hach Chemical Company, Ames, Iowa
 Filed Feb. 26, 1976, Ser. No. 661,604
 Int. Cl.² G01N 1/10, 21/00, 33/18
 U.S. Cl. 23—230 R 7 Claims

1. In a liquid analyzer having a colorimetric cell and a pump for pulling liquid into said cell and expelling liquid from the cell, the combination comprising, a liquid sample supply tube running from a body of liquid to be tested to said pump, means for injecting substantial air bubbles into said tube adjacent the tube end in said body of liquid, and a T-connector in said tube

near the tube end at said pump, said connector having a vertically extending section for collecting gas bubbles and a lower



section connected to said pump for supplying liquid without bubbles to said pump and receiving liquid from said pump for ejection of said gas bubbles from said T-connector.

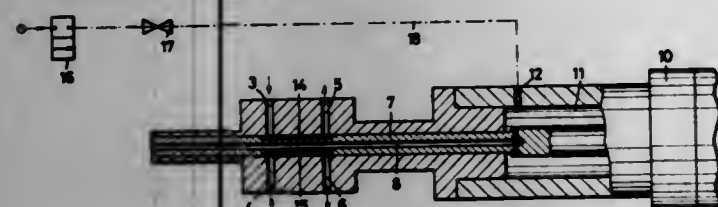
4,053,283 MIXING DEVICE FOR MIXING TOGETHER MULTI-COMPONENT PLASTICS MATERIALS

Fritz W. Schneider, Helmut Ciesca, and Manfred Kelterbaum, all of Strasslach, Germany, assignors to Elastogran Maschinenbau GmbH & Co., Strasslach near Munich, Germany
Filed June 30, 1976, Ser. No. 701,348

Claims priority, application Germany, Aug. 29, 1975, 2538437
Int. Cl.² C08J 9/30

U.S. Cl. 23—252 R

4 Claims



1. In a mixing device for mixing together multi-component plastics materials and air to influence the cell structure of the resulting mixed plastics, said device comprising a housing defining a mixing chamber, means defining supply ducts communicating with said chamber for the supply of said components to said chamber, a piston reciprocally mounted in said chamber and means for reciprocating said piston between a first position in which said supply ducts are shut off from said chamber and a second position in which said supply ducts are communicated with said chamber, the improvement comprising means defining an air supply passage extending axially along said piston in continuous communication with said chamber and means for connecting said passage to a supply of air under pressure to enable said air under pressure to be supplied together with said components into said mixing chamber.

4,053,284 CONTINUOUS FLOW APPARATUS FOR BIOLOGICAL TESTING

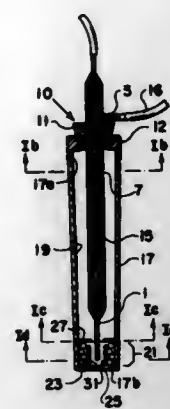
Nancy Ann Posch, La Crescenta, Calif., assignor to Akzona Incorporated, Asheville, N.C.

Filed Mar. 10, 1976, Ser. No. 665,358

Int. Cl.² G01N 33/16, 21/00, 31/14

U.S. Cl. 23—259

15 Claims



1. Test apparatus for the performance of solid supported immunochemical reactions in diagnostic tests on samples of blood, serum, urine, and other liquids comprising:

a reaction vessel having an open end and a closed end, which vessel (1) is fitted with a fluid permeable grid member above the closed end defining a reaction chamber between the grid and the closed end to form a reaction zone and (2) has one or more geometrical solids within said chamber with immunochemical test reagents supported thereon, said chamber adapted to receive a washing apparatus, and (3) is adapted to receive the washing apparatus in vacuum sealing engagement; and

a washing apparatus having a longitudinal axis and adapted for insertion (a) into the reaction vessel through the open end thereof to form a vacuum seal therewith, and (b) into the reaction chamber, comprising (1) a container to receive fluid, said container adapted to communicate with a source of fluid located externally to the reaction vessel, said container being fitted with a plurality of ports in a band, each port equidistant from another for continuously ejecting fluid from the container into the reaction vessel, and for washing the reaction vessel and the geometrical solids therein, and (2) an elongated vacuum conduit passing through the container in parallel to the longitudinal axis thereof, said conduit having a first vent adapted to communicate with a vacuum source and a second vent communicating with the interior of the reaction chamber to capture and remove fluid as said fluid is released from the container.

4,053,285 PROCESS FOR REDUCING THE SULFIDE SULFUR CONTENT OF CHAR WITH CARBON DIOXIDE AND H₂O

Leon Robinson, Houston, Tex., and Allan Sam, Los Angeles, Calif., assignors to Occidental Research Corporation, La Verne, Calif.

Continuation-in-part of Ser. No. 461,992, April 18, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,355

Int. Cl.² C10L 9/10; C10B 57/00

U.S. Cl. 44—1 F

10 Claims

1. In a method for reducing the sulfide sulfur content of char, the step comprising treating said char with a gaseous mixture of carbon dioxide and H₂O at a temperature of from about 500° F to about 1600° F.

5. In a method for reducing the sulfide sulfur content of char, wherein said char has been partially desulfurized by treatment with hydrogen gas, the step comprising treating said char with a gaseous mixture of carbon dioxide and H₂O at a temperature from about 500° F to about 1600° F.

4,053,286 PROCESS FOR THE PREPARATION OF CEPHALOSPORIN ANTIBIOTICS

Leonard M. Weinstein, Belle Mead, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

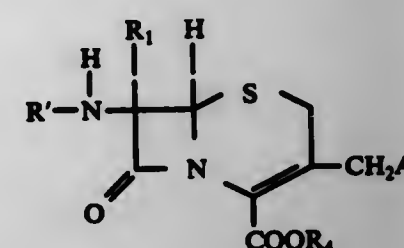
Continuation-in-part of Ser. No. 507,473, Sept. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 420,418, Nov. 30, 1973, abandoned. This application May 24, 1976, Ser. No. 689,408

Int. Cl.² C07D 501/04

U.S. Cl. 544—21

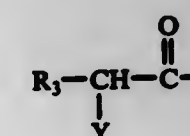
18 Claims

1. The process of preparing a compound of the formula:



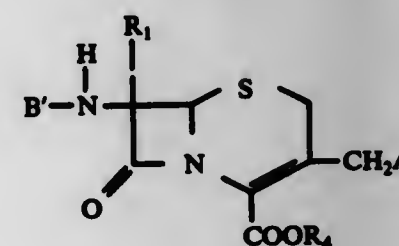
wherein

R₁ is hydrogen or methoxy;
A is carbamoyloxy or loweralkanoyloxy;
R' is an acyl group having the formula:

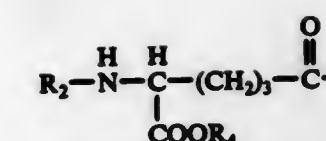


wherein

Y is hydrogen, carboxy, —NHR₂ or —OR₂;
R₂ is hydrogen, trichloroethoxycarbonyl, tertiary butoxycarbonyl, benzoylmethoxycarbonyl, trimethylsilyl, p-methoxybenzyloxy, 2-nitrophenylsulfenyl, 2,4-dinitrophenylsulfenyl, chloroacetyl, p-nitrophenylthio, p-nitrobenzenesulfenyl, p-toluenesulfenyl, methanesulfenyl, benzoyl, p-chlorobenzoyl, p-nitrobenzoyl or toluoyl;
R₃ is phenyl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 1-tetrazoyl, C₁–C₄ loweralkylphenyl, halophenyl, hydroxyphenyl, a C₁–C₄ loweralkyloxyphenyl;
R₄ is methyl, ethyl, tertiary butyl, phthalimidomethyl, succinimidomethyl, phenacyl, p-bromophenacyl, 2,2,2-trichloroethyl, 2-methylthioethyl, 2-(p-methylphenyl)ethyl, 2-(p-methylphenyl)sulfonylethyl, 2-methylaminoethyl, 2-chloro-(or bromo)ethyl, benzyl, p-nitrobenzyl, p-methoxybenzyl, 3,5-dinitrobenzyl, 2,4,6-trimethylbenzyl, 3,5-dichloro-4-hydroxybenzyl, benzhydryl, p-methoxybenzhydryl, acetoxymethyl, pivaloyloxymethyl, methoxymethyl, p-nitrophenyl or 3,5-dinitrophenyl, acetyl, benzoyl or thienylacetyl;
R₅ is hydrogen, methyl, ethyl, phenacyl, p-bromophenacyl, 2,2,2-trichloroethyl, benzyl, p-nitrobenzyl, p-methoxybenzyl, 3,5-dinitrobenzyl, 2,4,6-trimethylbenzyl, benzhydryl, p-methoxybenzhydryl or methoxymethyl; which consisting essentially of reacting a compound of the formula:

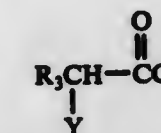


wherein
B' is



wherein

R₂, R₄ are as defined above; or an acyl group R' which is different than the final desired substituent; with an acylating agent having the formula:



wherein

R₃ and Y are the same as before defined, in the presence of a synthetic zeolite of the type 3A, 4A, 5A, or 13X, containing from about 0 to 30% by weight water of hydration; and then cleaving B' by either prolonging the reaction time to between about 30 minutes to about 30 hours; or by adding a loweralkanol of 1 to 6 carbon atoms, loweralkylthiol of 1 to 6 carbon atoms, benzyl alcohol or hydrochloric acid to yield the final product, and recovering the final product.

4,053,287 BRAKE SHOE GRINDING JIG

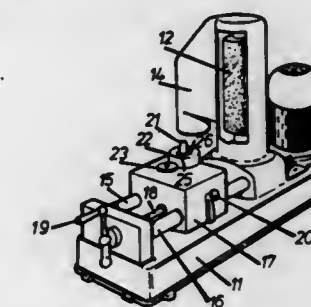
Elsworth Richard Delves, Lower Hackworth Village, England, assignor to Purpose Engineers Limited

Filed Mar. 10, 1976, Ser. No. 665,384

Int. Cl.² B24B 5/36

U.S. Cl. 51—105 R

10 Claims



1. A jig for use in grinding brake shoe linings of brake shoes having pivot means at one end which engage respective spaced pivot pins in the brake drum, the jig comprising a turntable, having central swivel means, mounting means on the turntable, means for radially adjusting the mounting means relative to the swivel means, a pair of pivot pins in fixed spaced relationship and provided on the mounting means, each said pin engaging, in use, with the pivot means of one of the brake shoe linings to be ground, angle setting means on the turntable and diametrically opposite said mounting means, said angle setting means defining a variable dimension abutment whereby the ends of the brake shoes opposite to said mounting means about opposite sides of the abutment, whereby the brake shoe linings can be positioned substantially on the circumference they occupy in a brake drum by adjustment of the mounting means and setting of the angle setting means.

4,053,288 HAND FED GLASS BEVELING APPARATUS

Lee H. Barron, Sr., 4515 Alta Canyon Road, La Canada, Calif. 91011

Filed Mar. 30, 1976, Ser. No. 672,029

Int. Cl.² B24B 9/10, 41/06

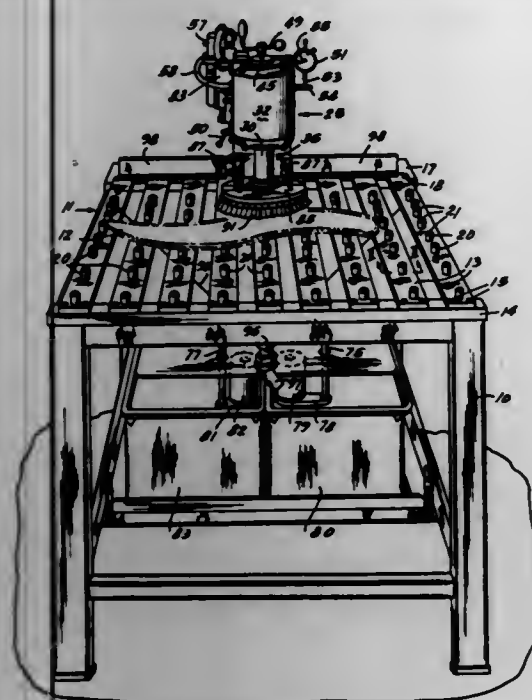
U.S. Cl. 51—109 R

28 Claims

16. Glass beveling apparatus including upwardly facing

means for supporting a flat glass piece to be beveled, and grinding and polishing means operatively related to the supporting means, said supporting means comprising:

a plurality of upwardly extending supporting knobs;



means carrying said knobs in spaced relation to one another and with crown surfaces of the knobs in a common glass supporting plane; and means securing said knobs to said carrying means immovably and in fixed positions relative to said carrying means.

4,053,289

GRINDING METHOD AND APPARATUS WITH METAL REMOVAL RATE CONTROL

Yoji Tsumura, Funabashi, Japan, assignor to Kabushiki Kaisha Daini Seikagaku, Japan

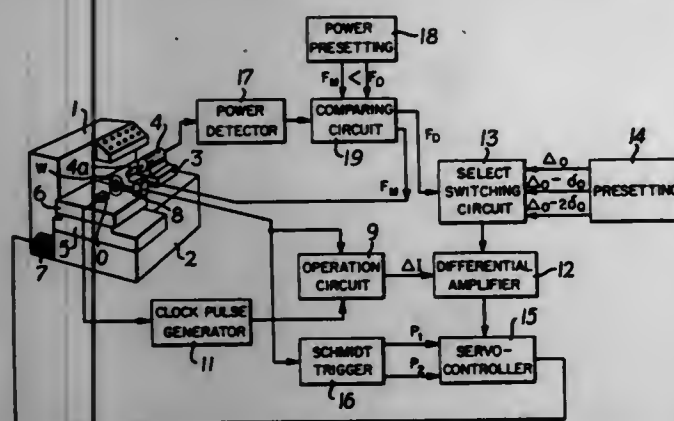
Filed Sept. 3, 1975, Ser. No. 609,948

Claims priority, application Japan, Sept. 3, 1974, 49-101241

Int. Cl.² B24B 49/04

U.S. Cl. 51—281 R

6 Claims



1. A grinding method with metal removal rate control comprising: continuously or intermittently measuring the rate of metal removal of a workpiece during a grinding operation; comparing the measured metal removal rate with a predetermined metal removal program value and providing a difference signal indicative of the difference between the actual metal removal rate from the program value; controlling the grinding operation in accordance with the difference signal to suppress the difference signal; measuring grinding tool deterioration during grinding; and selecting a lower predetermined program value of metal removal rate for determining the difference signal when the measured grinding tool deterioration exceeds a certain amount.

4,053,290

FIBER BED SEPARATOR

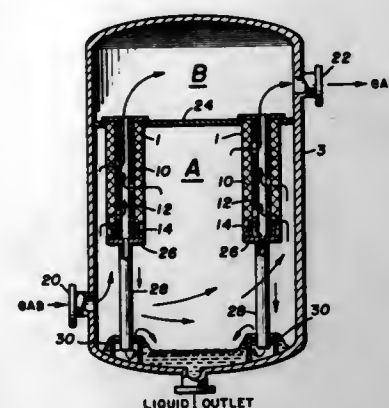
Gilbert K. C. Chen, Manchester, and Lincoln B. Crosby, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 18, 1976, Ser. No. 733,661

Int. Cl.² B01D 19/00

U.S. Cl. 55—187

28 Claims



1. In a fiber bed separator for separation of liquid particulates from a moving gas stream comprising at least one fiber bed element disposed in a substantially vertical position wherein the collected liquid phase drains to the bottom of the fiber bed element, the improvement whereby bubble re-entrainment of the collected liquid phase from the bottom downstream surface of the fiber bed may be substantially reduced or eliminated, which comprises a gas flow baffle means disposed through the entire bottom portion of each fiber bed element intermediate the upstream and downstream surfaces of the fiber bed, said gas flow baffle means extending substantially vertically from the bottom of that portion of said fiber bed which is on the downstream side of said baffle means to a height such that said downstream portion of fiber bed in the lee side of said baffle means is sufficiently shielded from gas flow that the bed velocity of any gas flowing through said shielded portion of the fiber bed is below bubble re-entrainment velocity.

4,053,291

CYLINDRICAL DEAERATOR

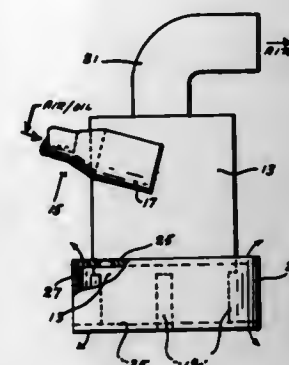
David L. Sims, West Palm Beach, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 18, 1976, Ser. No. 715,594

Int. Cl.² B01D 19/00

U.S. Cl. 55—204

1 Claim



1. In combination, an improved cylindrical deaerator for separating the air from a circulating air/oil mixture and a curved elongated entrance tube having an inlet and an outlet, said deaerator comprising a main cylinder for receiving the air/oil mixture, a downwardly inclined entry tube attached through the sidewall in the upper portion of said main cylinder, said entry tube having a round inlet and a flattened outlet to supply the air/oil mixture tangential to the wall of said main

cylinder, the outlet of said entrance tube being operatively connected to the inlet of the entry tube on said main cylinder, and a series of holes in the wall of said entrance tube to allow a substantial amount of the air in the air/oil mixture passing therethrough to escape prior to entering the deaerator, a series of vertically oriented elongated openings in the lowermost portion of the wall of said main cylinder, a spaced concentric outer cylinder positioned around the lower portion of said main cylinder, upper and lower rims disposed between the upper and lower edges of said outer cylinder and the wall of said main cylinder, a series of outlet holes in said rims to allow the deaerated oil to return to the tank, and a spout in the top center of said main cylinder to allow the separated air to escape.

4,053,292

GAS SCRUBBING PLANT

Jurg Schneider, Muttens, and Volker Fetting, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

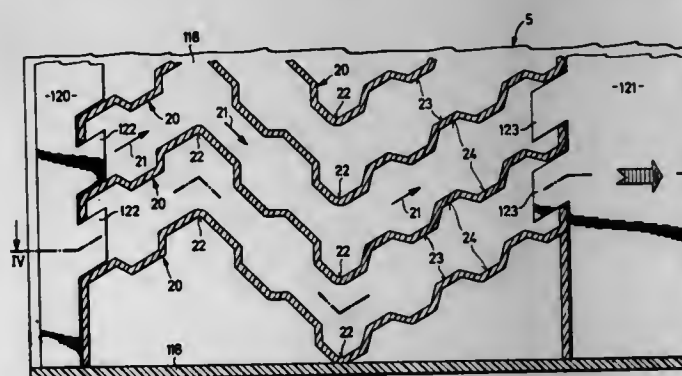
Filed June 10, 1976, Ser. No. 694,754

Claims priority, application Switzerland, June 13, 1975, 7697/75

Int. Cl.² B01D 47/06

U.S. Cl. 55—227

21 Claims



1. An apparatus for purification of a stream of gas, comprising a gas inlet, a gas outlet, and, therebetween, at least one scrubbing stage and at least one drop trap downstream of the said stage for separating the scrubbing liquid from the gas, the drop trap comprising an entry and an exit for the gas and a plurality of vertically spaced corrugated separator plates extending substantially parallel to one another and defining horizontal gas flow passages therebetween which extend from the entry to the exit and through which the gas is required to flow, and flow guide means disposed on the exit of the drop trap substantially outside the separator plates and extending across the latter to transmit a downwardly directed velocity component to the gas flow inside the drop trap at least near its exit.

4,053,293

COMBINATION DUST COLLECTOR AND HEAT EXCHANGER

Donald R. Combs, Seattle, Wash., assignor to Bumstead Woolford Co., Woodinville, Wash.

Filed Nov. 28, 1975, Ser. No. 635,790

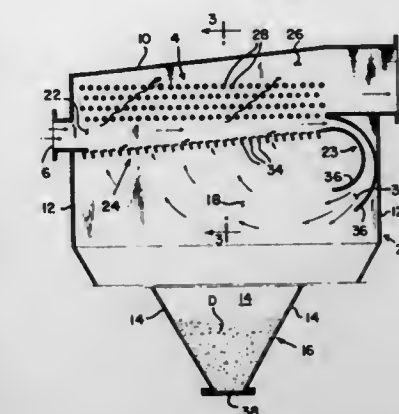
Int. Cl.² B01D 51/00

U.S. Cl. 55—269

4 Claims

1. A combination dust collector and heat exchanger, comprising: means for providing a gravity separation chamber having an inlet and an outlet; means in communication with the inlet for recirculating gases through the chamber at reduced gas velocity so that particulate material entrained by the gases may be separated therefrom by gravity during passage of the gases through the chamber, and for discharging a portion of the gases through the outlet; and heat exchange means operatively associated with the chamber for exchanging heat between the gases and a fluid prior to discharge of the gases through the outlet; said means for recirculating gases including means for directing gases from the inlet along a generally

horizontal course in overlying relation to the chamber and communicating with the outlet, means being interposed between the chamber and said horizontal course for causing a portion of the gases exiting the chamber to be discharged via the outlet, and for causing the remaining portion of said gases to be returned to the chamber along said horizontal course, and means in communication with said horizontal course for first reversing the direction of gas flow from the inlet, and then for



4,053,294

LOW STRESS SEMICONDUCTOR WAFER CARRIER AND METHOD OF MANUFACTURE

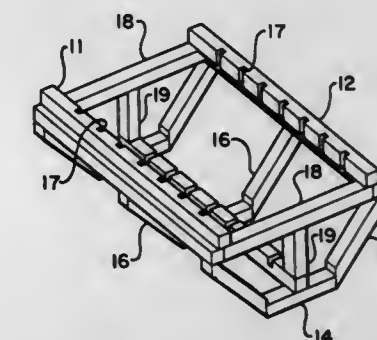
John E. Sullivan, Santa Clara, Calif., assignor to California Quartzware Corporation, Santa Clara, Calif.

Filed May 19, 1976, Ser. No. 687,672

Int. Cl.² C03B 23/20

U.S. Cl. 65—56

3 Claims

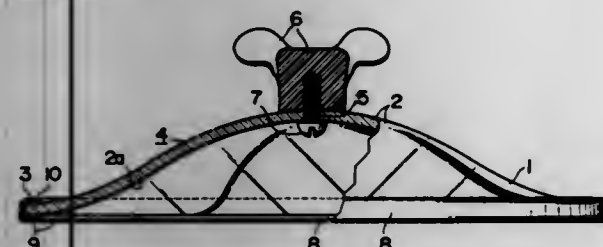


1. A method of fabricating a dimensionally stable carrier for planar semiconductor wafers during high temperature wafer processing, comprising the steps of stress relieving a raw quartz billet, cutting the quartz billet into elongate bars having rectangular cross section, welding the elongate bars in spaced parallel relation to a cross member therebetween at each end thereof, so that an open ended cradle is formed with two side bars and one bottom bar, cutting a plurality of inwardly facing transverse slots simultaneously in the side bars and bottom bar, whereby groups of three of the transverse slots lie in parallel planes adapted to receive the edges of the wafers for three point suspension thereof, and welding lengths of the elongate bars across the open ends of the cradle thereby reinforcing the carrier structure, whereby dimensional shift in the assembled elongate bars at high temperature due to bar internal stress relief is reduced.

4,053,295

METHOD OF MAKING A COOKING UTENSIL LID
Keinosuke Miyachi, 12-15 Shirogane 4-Chome, Minato, Tokyo, Japan

Filed May 5, 1976, Ser. No. 683,497
Claims priority, application Japan, Sept. 8, 1975, 50-108672;
Oct. 21, 1975, 50-143201; Oct. 21, 1975, 50-143202
Int. Cl.² C03B 27/00
U.S. Cl. 65-42



1. A method of making a cooking utensil lid comprising the steps of heating a transparent glass plate cut to have a desired shape, forming the heated transparent glass plate to a lid body having an engaging rim portion provided around the outer circumference of a see-through portion of the lid body, cooling the whole of the lid body by the blast of cool air to a room temperature to render the whole of the lid tempered, and fitting a reinforcing metal ring member integrally onto and around the engaging rim portion to thereby surroundingly embrace said rim portion by covering the the upper and the lower surfaces as well as the end of the engaging rim portion and to form buffer air spaces between the upper surface of the engaging portion and the reinforcing metal ring member and between the lower surface of the engaging portion and the reinforcing metal ring member, respectively.

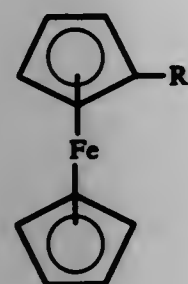
4,053,296

FERROCENE DERIVATIVE FOR SUPPLYING PLANTS WITH IRON

Volker Mues, Wuppertal, and Johannes Niggemann, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 9, 1976, Ser. No. 721,736
Claims priority, application Germany, Oct. 2, 1975, 2543999
Int. Cl.² C05D 9/02; C05F 11/10

U.S. Cl. 71-1 18 Claims
1. A method of supplying plants with the micro-nutrient iron, which comprises applying to the plants or to a plant habitat plant-nutritionally effective amounts of a ferrocene derivative of the general formula

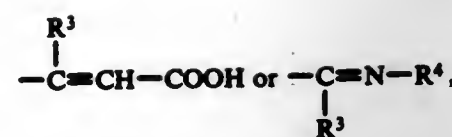


in which
R represent the group COOR¹,
in which

R¹ is hydrogen, alkyl, one equivalent of an alkali metal, alkaline earth metal or heavy metal cation, or an ammonium cation in which one or more hydrogen atoms can be replaced by alkyl, or

R represent the group COR²,

in which
R² is alkyl, substituted alkyl, alkenyl, substituted alkenyl, cycloalkyl, substituted cycloalkyl, cycloalkenyl, substituted cycloalkenyl phenyl or substituted phenyl, or



in which

R³ is hydrogen or alkyl, and
R⁴ is a ureido or thioureido radical, a radical of the formula
-CH₂-CH₂-N=CH-ferrocene, a 5-membered or 6-membered heterocyclic radical or a group of the formula
-OR⁵ or -NH-R⁶,

in which

R⁵ is hydrogen, alkyl, one equivalent of an alkali metal or alkaline earth metal cation, or an ammonium cation in which one or more hydrogen atoms can be replaced by alkyl, and

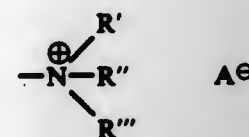
R⁶ is carbocyclic aryl or 5-membered or 6-membered heterocyclic radical, or

R represents the sulphonamide group or the radical
-SO₂R⁷,

in which

R⁷ is hydrogen, alkyl, one equivalent of an alkali metal or alkaline earth metal cation, or an ammonium cation in which one or more hydrogen atoms can be replaced by alkyl, or

R represents an alkyl, aralkyl, aryl or aryl radical substituted by hydroxyl, cyano, COOR¹ or



in which

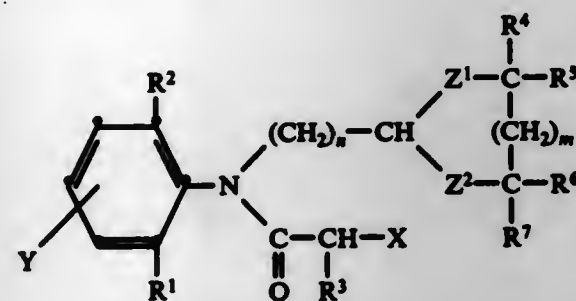
R¹ is identified as above; and
R¹, R², and R³, independently of one another, each represent hydrogen or alkyl and
A—halide or methosulphate.

4,053,297

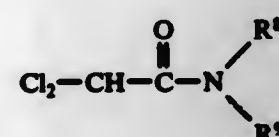
SELECTIVE HERBICIDAL COMPOSITIONS
Sidney B. Richter, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Apr. 21, 1975, Ser. No. 570,125
Int. Cl.² A01N 9/28, 9/12, 9/22

U.S. Cl. 71-88 5 Claims
1. Herbicidal compositions which reduce injury to corn from the treatment of herbicides comprising in combination an herbicide of the formula



wherein Y is hydrogen; R¹ is lower alkyl; R² is lower alkyl; R³ is hydrogen; X is chlorine; n is 1; Z¹ and Z² are oxygen; R⁴, R⁵, R⁶ and R⁷ are hydrogen; and m is 0; and from 0.01 to 15.0 weight percentage of said herbicide of an antidote for said herbicide of the formula



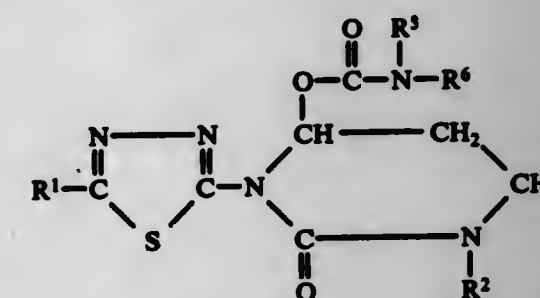
wherein R⁸ and R⁹ are lower alkenyl.

4,053,298

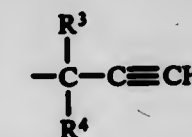
HERBICIDAL COMPOSITIONS CONTAINING
1-THIADIAZOLYL-6-CARBAMOYLOXYTETRAHY-
DROPYRIMIDINONES AND METHODS THEREFOR.
John Kreuzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 507,043, Sept. 18, 1974, Pat. No. 3,951,976.
This application Jan. 12, 1976, Ser. No. 648,356
The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

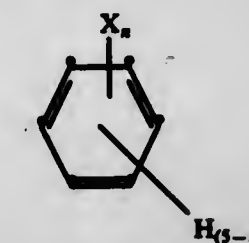
Int. Cl.² A01N 9/12 2 Claims
1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



wherein R¹ is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R² is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl, and



wherein R³ and R⁴ are each selected from the group consisting of hydrogen and lower alkyl; R⁵ is selected from the group consisting of hydrogen and lower alkyl; and R⁶ is selected from the group consisting of lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, and



wherein X is selected from the group consisting of lower alkyl, lower alkoxy, halogen and lower haloalkyl, and n is an integer from 0 to 3.

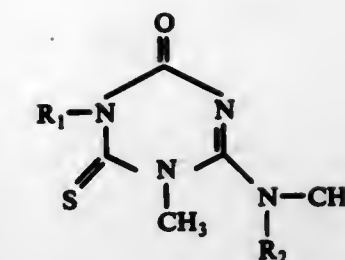
4,053,299

NOVEL THIOTRIAZINEDIONES AND THEIR USE AS HERBICIDES

John Benjamin Adams, Jr., Hockessin; Richard Lee Ellis, Wilmington, and Kang Lin, Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

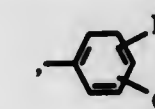
Filed Oct. 10, 1975, Ser. No. 621,401
Int. Cl.² C07D 251/46; A01N 9/22, 9/12

U.S. Cl. 71-93 12 Claims
1. A compound of the formula:



where

R₁ is alkyl of 3-6 carbons; cycloalkyl of 5-8 carbons; cycloalkyl of 5-8 carbons substituted with 1 methyl group; cyclohexyl substituted with 1 trifluoromethyl group, or with 2-4 methyl groups; cyclohexenyl; decahydronaphth-1-yl; 3-trifluoromethylphenyl; or



where

P is hydrogen, methyl, chlorine or fluorine; and
Q is hydrogen or chlorine; and
R₂ is alkyl of 1-4 carbons.

5. A method for the control of undesired vegetation comprising applying to the locus of such undesired vegetation an herbicidally effective amount of a compound of claim 1.

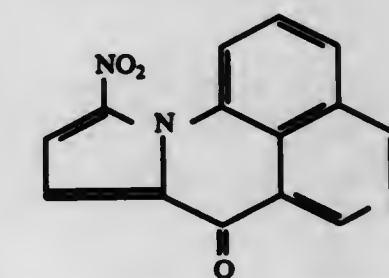
4,053,300

AGRICULTURAL COMPOSITION INCORPORATING
DERIVATIVES OF 7H-INDOLIZINO
(7,6,5-DE)-ISOQUINOLINE

Daniel Farge, Thiais; Yves LeGoff, Bretigny, Orge, and Gilbert Poiget, Thiais, all of France, assignors to Philagro, Lyon, France

Filed July 13, 1976, Ser. No. 704,922
Claims priority, application France, July 15, 1975, 75.22081
Int. Cl.² C07D 471/16; A01N 9/22

U.S. Cl. 71-94 10 Claims
1. A compound, of the formula:



5. An agricultural bactericide, comprising a bactericidally-effective amount of 10-nitro-7-oxo-7H-indolizino (7,6,5-de) isoquinoline, an inert agricultural carrier, and a compatible surface-active agent suitable for agricultural use.

4,053,301

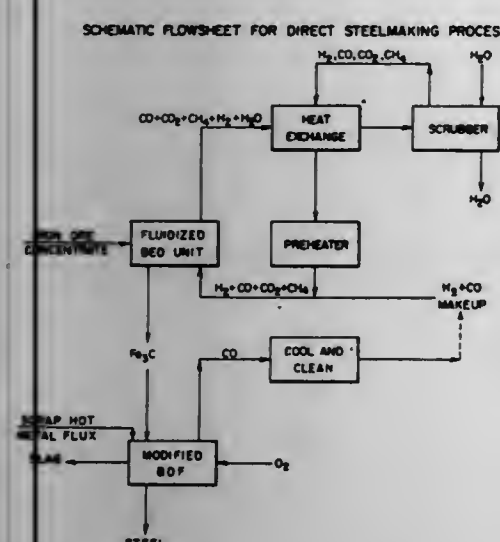
PROCESS FOR THE DIRECT PRODUCTION OF STEEL

Frank M. Stephens, Jr., Lakewood, Colo., assignor to Hazen Research, Inc., Golden, Colo.

Filed Oct. 14, 1975, Ser. No. 622,101
Int. Cl.² C21C 5/52; C22B 1/10

U.S. Cl. 75—11

53 Claims



1. A process for the direct production of steel from iron oxides which comprises:
 - a. converting the iron in the oxides to iron carbide; and
 - b. converting the iron in the iron carbide directly to steel in the basic oxygen furnace.

4,053,302

SYNTHETIC FLUORSPAR FOR CONDITIONING ELECTRIC FURNACE SLAGS

Ralph H. Nafziger, and Henry E. Blake, Jr., both of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation of Ser. No. 729,750, Oct. 5, 1976, abandoned. This application Mar. 11, 1977, Ser. No. 776,697

Int. Cl.² C21C 5/52

U.S. Cl. 75—11

2 Claims

1. In an electric furnace steelmaking process employing a slag conditioner to lower the viscosity of the molten slag, the improvement comprising employing as the slag conditioner a composition prepared by reacting an aqueous scrubber solution from wet-acid processing of phosphate rock, said scrubber solution containing about 1 to 10 percent of fluosilicic acid and about 0.05 to 3 percent phosphoric acid, with about 18 to 180 grams of calcium hydroxide per liter of scrubber solution at a temperature of about 50° to 90° C and a pH of about 7 to 9.

4,053,303

METHOD OF CARBOTHERMICALLY PRODUCING ALUMINUM-SILICON ALLOYS

C. Norman Cochran, Oakmont; Subodh K. Das, Natrona Heights, and Richard A. Milito, Natrona, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 6, 1976, Ser. No. 747,999

Int. Cl.² C22B 21/02

U.S. Cl. 75—48 A

25 Claims

1. A method of carbothermically producing an aluminum-silicon alloy from alumina and silica bearing materials, the method comprising:
 - a. bringing a mix containing sources of alumina, silica and carbon to a temperature in the range of 1500° to 1600° C to form silicon carbide and carbon monoxide;
 - b. bringing said mix containing said silicon carbide to a temperature in the range of 1600° to 1900° C to form aluminum oxycarbide and carbon monoxide;
 - c. bringing said silicon carbide and said aluminum oxycarbide to a temperature in the range of 1950° to 2200° C to form said aluminum-silicon alloy;

- d. removing said carbon monoxide formed in step (a) without its passing through materials in steps (b) and (c); and
- e. removing said carbon monoxide formed in step (b) without its passing through materials in step (c).

4,053,304

FLUX FOR REFINEMENT OF PRO-EUTECTIC SILICON CRYSTAL GRAINS IN HIGH-SILICON ALUMINUM ALLOYS

Masatoshi Tsuda, 6 Minamichijochi, Taishogun, Kita, Kyoto, Japan

Filed Sept. 10, 1976, Ser. No. 721,970

Claims priority, application Japan, June 18, 1976, 51-70979
Int. Cl.² C22B 9/10; C22C 21/02

U.S. Cl. 75—257

6 Claims

1. A grain-refining flux for high-silicon aluminum alloys, characterized in that it is made of a fused mixture consisting of, by weight, from about 95% to about 65% of sodium hexametaphosphate, (NaPO₃)₆, and from about 5% to about 35% of alumina, (Al₂O₃).

4,053,305

RECOVERY OF COPPER AND SILVER FROM SULFIDE CONCENTRATES

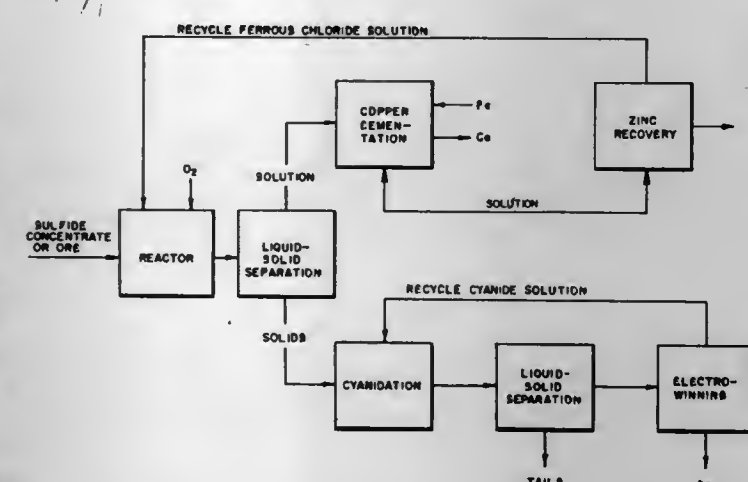
Gary A. Smyres, Sparks; Philip R. Haskett, Reno; Bernard J. Scheiner, Sparks, and Ronald E. Lindstrom, Reno, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 15, 1976, Ser. No. 732,675

Int. Cl.² C22B 15/00

U.S. Cl. 75—104

1 Claim



1. A process for recovering copper and silver from complex sulfide ores or concentrates containing copper, zinc, silver, lead, arsenic, antimony and iron comprising (1) treating a slurry of the ore or concentrate in an aqueous solution of ferrous chloride with gaseous oxygen at a temperature of about 100° to 115° C and a pressure of about 20 to 80 psig for a time sufficient to solubilize copper and zinc, (2) filtering the resulting reaction mixture, (3) precipitating copper from the filtrate by addition of metallic iron, (4) treating the resulting copper-free filtrate for removal of zinc by solvent extraction and recycling the resulting ferrous chloride solution to step (1), (5) treating the residue from step (2) with an alkaline solution to sodium cyanide to solubilize the silver and, (6) electrolyzing the silver solution from step (5) to recover metallic silver.

4,053,306

TUNGSTEN CARBIDE-STEEL ALLOY

Ralph V. Rodriguez, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Feb. 27, 1976, Ser. No. 661,897

Int. Cl.² C22C 1/10

U.S. Cl. 75—123 J

2 Claims

1. A hard metal composition comprising 1-20 micron particles of tungsten carbide uniformly dispersed in a high tungsten

alloy steel matrix and having a uniform surface hardness in excess of Rockwell C 55, obtained by addition of pressed unsintered granules of tungsten carbide particles less than 325 mesh in size to molten steel in a ratio of 50-250 parts by weight of tungsten carbide to 100 parts by weight of steel, the high tungsten alloy steel matrix being produced by in situ decomposition of the tungsten carbide added to the molten steel.

region, and separating the silico-chromium alloy phase to obtain silico-chromium.

4,053,308

NONPRECIOUS ALLOY FOR FUSION TO PORCELAIN

John A. Teak, Woodridge; Ronald P. Dudek, River Grove, and Peter Kosmos, Alsip, all of Ill., assignors to Howmedica, Inc., New York, N.Y.

Filed Dec. 24, 1974, Ser. No. 536,328

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.
Int. Cl.² C22C 19/05

U.S. Cl. 75—171

10 Claims

1. A nonprecious alloy consisting essentially of the following constituents in the indicated percentages by weight:

Constituent	Proportional Range
Nickel	Balance
Chromium	10.0-22.0
Aluminum	1.0-5.0
Silicon	0.5-2.0
Manganese	0.01-0.2
Molybdenum	0.0-7.0

and one of the following Groups A or B:

Group A	
Strontium, lanthanum and/or zirconium individually or as a combination of strontium and zirconium, either iron or tungsten separately or in combination	0.2-2.0 0.0-5.0
Group B	
Strontium, lanthanum and/or zirconium individually or as a combination of strontium and zirconium, gallium, iron	0.0-2.0 1.0-3.0 0.0-1.0

4,053,309

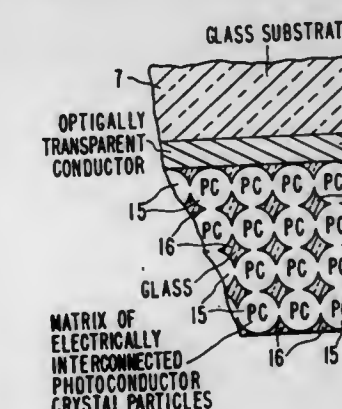
ELECTROPHOTOGRAPHIC IMAGING METHOD

Guy A. Marlor, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 477,568, June 10, 1974, abandoned, which is a division of Ser. No. 272,241, July 17, 1972, which is a continuation of Ser. No. 149,821, June 3, 1971, which is a continuation of Ser. No. 721,331, April 15, 1968, abandoned.
This application Jan. 12, 1976, Ser. No. 648,449
Int. Cl.² G03G 5/12, 5/04; H01L 31/08

U.S. Cl. 96—1 TE

8 Claims



1. In a repetitive imaging method for reproducing on the charge-retentive surface of a recording medium a charge pattern reproduction of an image to be copied, the method comprising the steps of:
 - providing a reusable electrophotographic plate comprising a

photoconductive layer including inorganic glass binder and inorganic photoconductive particles formed over a conductive substrate, the glass binder in the photoconductive layer comprising between 10% and 45% by weight of the photoconductive layer exclusive of the glass binder; placing the charge-retentive surface closely adjacent to the photoconductive layer; and exposing the electrophotographic plate to the image to be copied with a d.c. voltage applied across the plate and recording medium to cause a brief and relatively transient flow of electrons within the plate and to form an electrostatic charge image on the charge-retentive surface conforming in configuration to the image being copied, said charge image being developable into a visible image.

4,053,310

DURABLE CARRIER COATING COMPOSITIONS COMPRISING POLYSULFONE

Lieng-Huang Lee, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 30, 1976, Ser. No. 653,792

Int. Cl.² G03G 13/08, 9/10; B32B 15/08, 27/14

U.S. Cl. 96—1 SD

24 Claims

17. An electrostatic imaging process comprising the steps of providing an electrostatic imaging member having a recording surface, forming an electrostatic latent image on said recording surface, and contacting said electrostatic latent image with a developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of carrier particles having an average diameter from between about 1 micron and about 1,000 microns, said carrier particles comprising a core having an outer coating, said outer coating comprising a polysulfone, whereby at least a portion of said finely-divided toner particles are attracted to and deposited on said recording surface in conformance with said electrostatic latent image.

4,053,311

POLY-N-VINYLCARBAZOLE IMAGE TRANSPORT LAYER PLASTICIZED BY BIS(4-DIETHYLAMINO-2-METHYLPHENYL)-PHENYLMETHANE

William W. Limburg, Penfield; John F. Yarus, Webster, and Damodar M. Pal, Fairport, all of N.Y.

Filed Apr. 2, 1976, Ser. No. 673,236

Int. Cl.² G03G 5/04, 5/06, 5/08

U.S. Cl. 96—1 PC

18 Claims

13. A method of imaging which comprises:

- providing a flexible recyclable xerographic imaging member consisting essentially of a photoconductive layer of photoconductive material dispersed in a resinous binder and a contiguous layer of electrically active material consisting essentially of poly(N-vinylcarbazole) having dispersed therein from about 1 to about 25 percent by weight of bis(4-diethylamino-2-methylphenyl)phenylmethane as an electrically active plasticizer for said poly(N-vinylcarbazole), to cause said poly(N-vinylcarbazole) to retain its original flexibility after extensive cycling in a xerographic process while maintaining the capability of supporting the injection and transportation of photogenerated holes, said photoconductive layer exhibiting the capability of photo-excited hole generation and injection and said layer of poly(N-vinylcarbazole) containing bis(4-diethylamino-2-methylphenyl)phenylmethane being substantially non-absorbing in the spectral region at which the photoconductive layer generates and injects photogenerated holes but being capable of supporting the injection of photo-generated holes from said photoconductive layers and transporting said holes through said layer of poly(N-vinylcarbazole) containing bis(4-diethylamino-2-methylphenyl)phenylmethane;

- uniformly electrostatically charging said member; followed by
- imagewise exposing said charged member to a source of activating radiation to which the photoconductive material dispersed in a resinous binder is absorbing and to which the layer of electrically active material is non-absorbing, whereby the photo-generated holes generated by said photoconductive material dispersed in a binder are injected into and are transported through said layer of poly(N-vinylcarbazole) containing bis(4-diethylamino-2-methylphenyl)phenylmethane to form a latent electrostatic image on the surface of said member.

4,053,312

O-SULFONAMIDONAPHTHOL DIFFUSIBLE DYE IMAGE PROVIDING COMPOUNDS

Lee J. Fleckenstein, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 4, 1974, Ser. No. 503,128

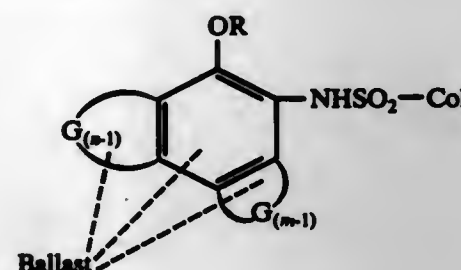
Int. Cl.² G03C 7/00, 5/54, 1/40, 1/76

U.S. Cl. 96—3

21 Claims

17. A process for producing a photographic transfer image in color comprising:

- imagewise-exposing a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a non-diffusible sulfonamidonaphthol compound which is alkali-cleavable upon oxidation to release a diffusible color-providing moiety from the benzene nucleus, said compound having the formula:



wherein:

- Col is a dye or dye precursor moiety;
 - Ballast is an organic ballasting radical of such molecular size and configuration as to render said compound nondiffusible during development in an alkaline processing composition;
 - R is hydrogen or an alkali labile group;
 - G represents an aromatic ring directly fused to the benzene nucleus to form a naphthalene nucleus; and
 - n and m are dissimilar positive integers of 1 to 2;
- treating said element with an alkaline processing composition in the presence of a silver halide developing agent to effect development of each of said exposed silver halide emulsion layers, thereby oxidizing said developing agent;
 - said oxidized developing agent thereby cross-oxidizing said sulfonamidonaphthol compound;
 - said sulfonamidonaphthol compound then cleaving, thus forming an imagewise distribution of diffusible dye or dye precursor as a function of said imagewise exposure of each of said silver halide emulsion layers; and
 - at least a portion of said imagewise distributions of diffusible dye or dye precursor diffusing to a dye image-receiving layer to provide an image.

4,053,313

PROCESS FOR IMAGE REPRODUCTION USING MULTILAYER PHOTOSENSITIVE SOLVENT PROCESSABLE ELEMENTS

Roxy N. Fan, East Brunswick, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 583,454, June 3, 1975,

abandoned. This application May 13, 1976, Ser. No. 685,990

Int. Cl.² G03C 5/00

U.S. Cl. 96—36

15 Claims

1. An image reproduction process comprising: (1) exposing imagewise to actinic radiation a photosensitive element comprised of, in order, (A) a solvent-processable photosensitive layer, (B) a nonphotosensitive tonable contiguous layer comprised of an elastomeric material, and (C) a sheet support, either the exposed or unexposed areas of said solvent-processable photosensitive layer being solvent-soluble after said imagewise exposure, (2) washing out either exposed or unexposed areas of said solvent-processable photosensitive layer while the other areas of said layer remain on said contiguous elastomeric layer, and (3) toning the areas of the contiguous elastomeric layer from which areas of the photosensitive layer were removed.

12. A process for producing an image from a photosensitive element comprising, in order from bottom to top, (A) a sheet support, (B) a tonable contiguous layer comprised of an elastomeric material, (C) a solvent-processable photosensitive layer, and (D) a removable cover sheet or layer, comprising:

- removing said sheet support from said element,
- laminating the surface of said contiguous layer of said element to a substrate, in either order,
- exposing said laminated photosensitive element imagewise to actinic radiation, either the exposed or unexposed areas of said solvent-processable photosensitive layer being solvent-soluble and
- removing said cover sheet, then
- washing out either exposed or unexposed areas of said solvent-processable photosensitive layer while the other areas of said layer remain on said contiguous elastomeric layer, and
- toning the areas of the contiguous elastomeric layer from which areas of the photosensitive layer were removed.

4,053,315

PHOTODEVELOPABLE SILVER HALIDE MATERIAL

Hendrik Alfons Borginon, Mortsel, and Willy Joseph Vanaasche, Kontich, both of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed Aug. 8, 1974, Ser. No. 495,815

Claims priority, application United Kingdom, Sept. 17, 1973, 43540/73

Int. Cl.² G03C 5/24, 1/84

U.S. Cl. 96—63

18 Claims

1. Photographic element comprising a support bearing a radiation-sensitive silver halide emulsion layer wherein the emulsion layer is a direct-print photodevelopable silver halide emulsion layer containing at least one spectrally sensitizing dye to provide an extra range of sensitivity in the green and/or red regions of the spectrum, and wherein at least one dye compound absorbing radiation in the inherent sensitivity range of the silver halide is or are present in the silver halide emulsion layer and/or in a superposed layer, so as to be effective for protecting a photodeveloped image, when formed in the said element, from deterioration by prolonged exposure to light.

4,053,316

PHOTOPOLYMERIZATION OF ETHYLENICALLY-UNSATURATED ORGANIC COMPOUNDS

Robert T. Lu, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 341,992, March 16, 1973, Pat. No.

3,982,942. This application Mar. 24, 1976, Ser. No. 670,027

Int. Cl.² G03C 1/68; C08F 2/46, 4/00

U.S. Cl. 96—115 P

7 Claims

1. A photopolymerizable composition comprising an ethylenically unsaturated compound and a photosensitizing composition comprising a blend of from 0.05% to 5% by weight, based on the weight of ethylenically unsaturated compound, of $Mn_2(CO)_{10}$ and from 0.1% to 5% by weight, based on the weight of ethylenically unsaturated compound, of a co-catalyst selected from the group consisting of cumene, diisopropyl benzene, alkyl mercaptans containing from 10 to 16 carbon atoms, and mixtures thereof, wherein the weight ratio of co-catalyst to $Mn_2(CO)_{10}$ is from 0.2 to 10.

4,053,317

LIGHT-SENSITIVE COMPOSITION

Kiyomi Naka, and Michisuke Oe, both of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 494,187, Aug. 2, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 649,965

Claims priority, application Japan, Aug. 7, 1973, 48-87983

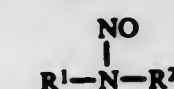
Int. Cl.² G03C 1/68; C25C 1/14

U.S. Cl. 96—115 P

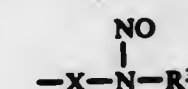
10 Claims

1. A light-sensitive composition consisting essentially of

- an N-nitroso compound present in from 0.001 to 5 parts by weight per 100 parts by weight of the composition, and having the general formula



wherein R^1 and R^2 , which may be the same or different, are each a member selected from the group consisting of a monovalent hydrocarbon radical, a monovalent hydrocarbon radical attached to the nitrogen atom of amine through $-SO_2-$, and a group of the formula



where X is a divalent hydrocarbon radical, and R^3 is a monovalent

4,053,314

AMINE DEVELOPER LIQUID FOR DIAZOTYPE REPRODUCTION

Masanori Kimura, Funabashi, and Koji Iriino, Kamakura, both of Japan, assignors to Kabushiki Kaisha Banashodo, Tokyo, Japan

Filed Aug. 4, 1975, Ser. No. 601,539

Claims priority, application Japan, Aug. 9, 1974, 49-90713

Int. Cl.² G03C 5/34

U.S. Cl. 96—49

2 Claims

1. A developer liquid for use in a development system using developer liquid applicator roller means wherein the liquid is supplied from said roller means to an exposed diazotype paper at a rate of not higher than 3 g/m², said developer liquid consisting essentially of a mixture containing, one or more organic amines in a quantity adequate to develop an azo dye image in said diazotype paper, a diluent, and an additive of 0.01 to 1% by weight of a fluorocarbon non-ionic surface active agent based on the total weight of the mixture; said fluorocarbon non-ionic surface active agent being a compound selected from the group consisting of straight chain alkyl fluorocarbons, branched chain alkyl fluorocarbons, perfluoroalkyl fluorocarbons, and perfluorocyclic fluorocarbons.

lent hydrocarbon radical, which may be the same as R¹ or different therefrom, and R¹ and R² may together form, directly or by being bonded through an oxygen atom or nitrogen atom, a ring;

2. a photopolymerization initiator; and
3. a photopolymerizable compound having a photopolymerizable ethylenic double bond in its molecule.

4,053,318

SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Akira Sato, Akira Ogawa, Masanao Hinata, and Haruo Takel, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

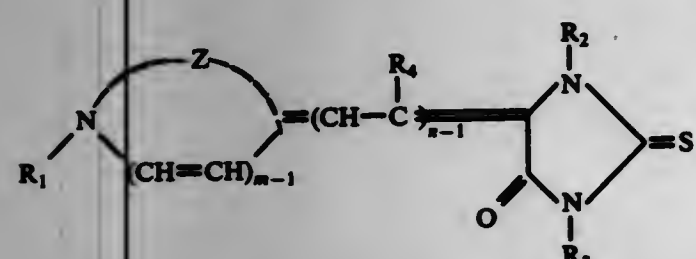
Filed Dec. 18, 1975, Ser. No. 642,207

Claims priority, application Japan, Dec. 18, 1974, 49-145176
Int. Cl.² G03C 1/10, 1/22

U.S. Cl. 96-139

7 Claims

1. A silver halide photographic emulsion containing at least one spectral sensitizing dye represented by formula (I)



wherein Z is an atomic group necessary for completing a 5- or 6-membered heterocyclic ring, such atomic group consisting of at least one carbon atom and of one or more nitrogen, oxygen, sulphur or selenium atoms, R₁ is an aliphatic group, R₂ is an aliphatic group having an alkylthio group or is an aliphatic group having two alkoxy groups on the same carbon atom, R₃ is an aryl group, an alkyl group or an alkenyl group, R₄ is a hydrogen atom, an alkyl group or an aryl group, m and n is 1 or 2.

4,053,319

HYDROPHILIZING COMPOSITION FOR LITHOGRAPHIC PRINTING PLATES

Raymond R. Nadann, Natick, and John E. Wyman, Lexington, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Division of Ser. No. 366,953, June 4, 1973, Pat. No. 3,970,455.
This application Aug. 7, 1975, Ser. No. 602,863

Int. Cl.² C09K 3/00, 11/34, 11/42

U.S. Cl. 106-2

16 Claims

1. An acidic, aqueous, printing solution comprising a reaction product of (1) phosphoric acid or one of the anions derived from such acid, (2) an organic alkylene diamine having 2-6 carbon atoms between the amine groups, and (3) a hydrophilic metal cation selected from the group consisting of aluminum, titanium, zirconium and tin.

4,053,320

PRODUCTION OF REFRACTORY ARTICLES

John Peter Hugh Williamson, Chester, and Harry Augustus Morris, Wolverhampton, both of England, assignors to Keeling & Walker Limited, Stoke-on-Trent, England

Filed June 4, 1976, Ser. No. 692,822

Claims priority, application United Kingdom, June 10, 1975, 24813/75

Int. Cl.² C04B 35/48

U.S. Cl. 106-57

18 Claims

1. A process for the production of a refractory body comprising comminuting plasma dissociated zircon sand, shaping the resulting comminuted sand and firing to form a body of single mass.

4,053,321

HEAT FUSED REFRACTORY PRODUCT CONTAINING ZIRCONIA HAVING HIGH CORROSION RESISTANCE

Masataro Okumiya, Chigasaki, and Takuro Ono, Yokohama, both of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 30, 1976, Ser. No. 718,575

Claims priority, application Japan, Sept. 30, 1975, 50-117160
Int. Cl.² C04B 35/48

U.S. Cl. 106-57

9 Claims

1. A heat fused refractory product which comprises by weight: ZrO₂ + SnO₂: 40-70%; Al₂O₃ + Cr₂O₃: 10-58%; SiO₂: 2-20%; and from 0.2-3% of an alkali metal oxide; wherein the amount of alkali metal oxide is less than that of SiO₂; the amount of SnO₂ is more than that of SiO₂; the amount of ZrO₂ is more than that of SnO₂; and the amount of Al₂O₃ is more than that of Cr₂O₃.

4,053,322

METHOD OF PREPARING PRODUCTS COMPRISING MINERAL FIBRES AND A BINDER

Kjeld Holbek, Allerslev Huse, DK-4320 Lejre, Denmark

Filed July 22, 1974, Ser. No. 490,851

Claims priority, application United Kingdom, July 26, 1973, 35626/73

Int. Cl.² C04B 7/02

U.S. Cl. 106-99

7 Claims

1. A method of preparing fiber reinforced articles which consist essentially of a matrix and mineral fibers distributed in the matrix, the method comprising the steps of heat treating a quantity of mineral fibers at a temperature of between 550° C and 900° C for a time sufficient to cause at least partial crystallization of the mineral fibers so that the surfaces thereof become uneven causing the mineral fibers to separate from each other, intimately mixing a major amount of a matrix material and a minor amount of the heat treated mineral fibers so that the separated mineral fibers are uniformly distributed throughout the matrix material, and causing the matrix material to set whereby the matrix material is bound securely to the individual separated heat treated mineral fibers producing articles of superior physical properties.

4,053,323

METHOD OF USING CEMENTING COMPOSITION HAVING IMPROVED FLOW PROPERTIES

Sally Lee Adams, Pittsburgh, Pa.; Michael M. Cook, Boxford, Mass., and Fred David Martin, McMurray, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

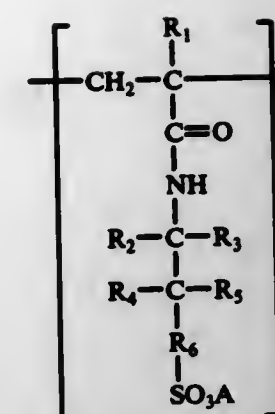
Continuation of Ser. No. 742,734, Nov. 11, 1976, which is a continuation-in-part of Ser. No. 610,197, Sept. 4, 1975, abandoned, which is a division of Ser. No. 465,936, May 1, 1974, Pat. No. 3,936,408. This application Mar. 4, 1977, Ser. No. 774,294

Int. Cl.² C04B 7/38

U.S. Cl. 106-100

4 Claims

1. In the method of wet processing cement, comprising the steps of subjecting an aqueous slurry of hydraulic cement precursor solids to flow for the purpose of mixing and transporting said slurry, followed by kiln heating of said slurry, the improvement comprising adding to said slurry, prior to subjecting said slurry to flow, from about 0.01 to about 5.0 percent by weight, based on weight of hydraulic cement on a dry basis, of a polyamidosulfonic compound having recurring units represented by the following formula:



wherein R₁ is hydrogen or methyl; R₂, R₃, R₄, and R₅ are each independently selected from the group consisting of hydrogen, phenyl, straight or branched alkyl of from one to twelve carbon atoms, and cycloalkyl of up to six carbon atoms; R₆ is straight or branched alkyl of one to twelve carbon atoms, cycloalkyl of up to six carbon atoms, phenyl, or is absent; A is hydrogen, alkali metal ion or ammonium; and n is an integer of from 2 to about 100, such that the weight average molecular weight of the polyamido-sulfonic compound is from about 200 to about 10,000.

4,053,324

PRODUCTION OF REDUCED CHARGE MONTMORILLONITE PIGMENT

Walter L. Haden, Jr., Westfield, and Peter A. H. Isaac, Summit, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Sept. 22, 1976, Ser. No. 725,570

Int. Cl.² C09C 1/28

U.S. Cl. 106-288 B

4 Claims

1. A method for producing a coating pigment useful as a sensitizer for record material from clay material, a substantial amount of which is dioctahedral montmorillonite having its ion-exchanged sites occupied by alkali metal or alkaline earth cations, which comprises forming said clay material into an aqueous slurry and incorporating therein a mineral acid the anion of which forms soluble salts with exchangeable cations in the clay, sufficient acid being used to exchange hydrogen ions for exchangeable cations in said clay, separating the clay thus ion-exchanged from the aqueous phase of the slurry by means of filtration or centrifugation, washing the remaining solids, pugging the solids with a preselected amount of a lithium salt to exchange lithium ions for hydrogen ions, without washing the pugged mixture, heating it mildly to collapse the structure of the dioctahedral montmorillonite, and grinding the material after heat treatment to produce pigment-sized particles.

4,053,325

HEAT STABLE IRON OXIDES

Dennis B. Vanderhelden, Easton, Pa., assignor to Pfizer Inc., New York, N.Y.

Filed Sept. 14, 1976, Ser. No. 723,083

Int. Cl.² C09C 1/24

U.S. Cl. 106-304

13 Claims

1. A coated particle comprising an iron oxide and a protective coating of insoluble metal metaphosphate wherein the coating comprises between about 1% and 20% of the total particle weight.

4,053,326

PHOTOVOLTAIC CELL

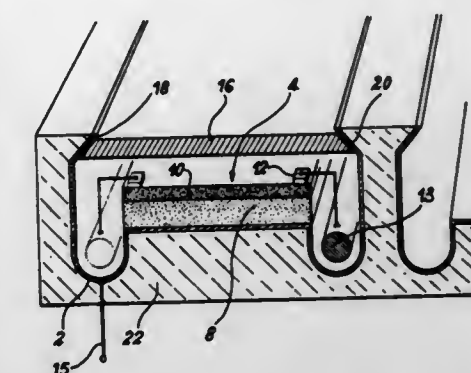
Francis Forrat, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed July 28, 1975, Ser. No. 599,435

Claims priority, application France, July 31, 1974, 74.26521
Int. Cl.² H01L 31/06

U.S. Cl. 136-89 CC

5 Claims



1. A photovoltaic cell comprising a steel plate having a textured structure coated with tin and a crystalline layer of a semiconductive material deposited thereon with the semiconductive material being doped to form a p-n junction, said photovoltaic cell being produced by decomposing a gaseous compound containing a material which forms the semiconductive crystalline layer in a chamber containing said steel plate having a textured surface coated with the tin, wherein the temperature of the tin is raised to a temperature such that the tin is in the liquid state and forms a liquid tin substrate on which the crystalline layer forms by epitaxy, and wherein the gaseous compound is suitably doped so that the semiconductive layer has the p-n structure.

5. A photovoltaic cell comprising a steel support coated with tin and a crystalline layer of silicon deposited on said tin-coated steel support with the silicon being doped to form a p-n junction.

4,053,327

LIGHT CONCENTRATING SOLAR CELL COVER

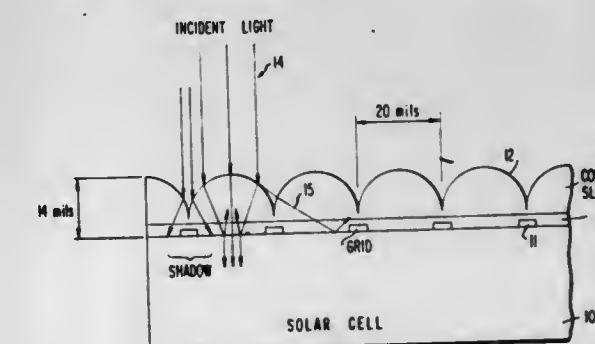
Andrew Meulenber, Jr., Gaithersburg, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Sept. 24, 1975, Ser. No. 616,468

Int. Cl.² H01L 31/06

U.S. Cl. 136-89 CC

5 Claims



1. In the combination of a single solar cell and a cover slide covering the surface of the solar cell which is exposed to incident light, said solar cell being of the type having a plurality of fine opaque grid lines which comprise the top electrode of said surface which is exposed to incident light, the improvement wherein said cover slide for said single solar cell consists of a plurality of converging lens means for concentrating incident light on the exposed surface areas of the solar cell between the grid lines, the repeat period of said converging lens means being equal to the distance between said grid lines.

4,053,328

ZINC PHOSPHATE COATING PROCESS

Shoji Oka, Nara; Tamotsu Sobata, Osaka; Tetsuo Kishimoto, Izumiotsu, and Kazuo Nobe, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Aug. 25, 1975, Ser. No. 607,821

Claims priority, application Japan, Aug. 30, 1974, 49-100077 Int. Cl.² C23F 7/08

U.S. Cl. 148—6.15 Z

14 Claims

1. In a continuous process for coating a zinc phosphate film on the surface of a metal article by spraying a zinc phosphate coating solution consisting essentially of nitrate ions, phosphate ions and zinc ions, onto the surface of the metal article, which metal article is one in a line of metal articles suspended and moving continuously or intermittently, at a station having a receptacle provided beneath the metal article, collecting the sprayed zinc phosphate coating solution in the receptacle and circulating the collected zinc phosphate coating solution for spraying, the improvement wherein the zinc phosphate coating solution is controlled continuously throughout the coating process such that:

1. the phosphate ion concentration in the solution is at least 0.5% by weight;
2. nitrate ions are present in an amount such that the molar ratio of the phosphate ions to the nitrate ions in the solution is about 1:0.7 to 1:1.3;
3. the zinc ion concentration in the solution is at least 0.03% by weight;
4. the molar ratio of the zinc ions to the phosphate ions in the solution is less than 0.116:1; and
5. the pH of the solution is from 3.3 to 3.8.

4,053,329

METHOD OF IMPROVING CORROSION RESISTANCE OF METAL SUBSTRATES BY PASSIVATING WITH AN ONIUM SALT-CONTAINING MATERIAL

Nicholas T. Castellucci, Pittsburgh, and Joseph F. Bono, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

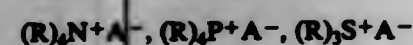
Filed Apr. 2, 1976, Ser. No. 673,170 Int. Cl.² C23F 9/02, 7/10

U.S. Cl. 148—4.15 R

18 Claims

1. A method of providing improved corrosion resistance to ferrous metal substrates, comprising:

- a. passivating the surface of the substrate by pretreatment with an at least 3 percent by weight dispersion or solution in a compatible vehicle of an onium salt selected from the class consisting of:



where R are organic radicals and A is an anion of a weak acid which will not detrimentally attack the surface of the ferrous substrate, followed by

- b. directly coating the pretreated metal surface with an adhesive or protective coating material.

4,053,330

METHOD FOR IMPROVING FATIGUE PROPERTIES OF TITANIUM ALLOY ARTICLES

Robert Jacob Henrichs, Farmington; Duane Louis Ruckle, Enfield, and Raymond Bender Slack, South Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 19, 1976, Ser. No. 678,090 Int. Cl.² C22F 1/18

U.S. Cl. 148—11.5 F

3 Claims

1. A thermomechanical process to improve the fatigue properties of titanium alloys of the class which contain both alpha and beta stabilizers and contain from about 5 to about 20 volume percent of the beta phase under equilibrium conditions at room temperature, including the steps of:

- a. providing the alloy;
- b. heating the alloy to a temperature above the beta transus

for a period of time sufficient to produce a structure which is substantially all beta;

- c. hot deforming the alloy at a temperature above the beta transus, an amount sufficient to refine the beta grain size;
- d. rapidly quenching the alloy to produce an acicular martensitic structure;
- e. tempering the martensite by reheating to an elevated temperature below the beta transus for a period of time sufficient to partially convert the martensite to acicular alpha, while permitting the formation of discrete equiaxed beta particles.

4,053,331

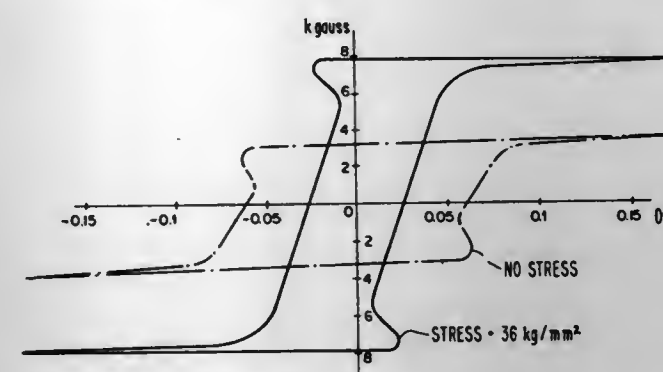
METHOD OF MAKING AMORPHOUS METALLIC ALLOYS HAVING ENHANCED MAGNETIC PROPERTIES BY USING TENSILE STRESS

Charles D. Graham, Jr., Ardmore, Pa.; Philip J. Flanders, Moorestown, N.J., and Takeshi Egami, Narberth, Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 507,859, Sept. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 495,850, Aug. 8, 1974, abandoned. This application July 29, 1976, Ser. No. 709,875 Int. Cl.² H01F 1/00

U.S. Cl. 148—120

8 Claims



1. A method of providing a metal having superior magnetic properties, including low coercivity and high permeability, comprising the steps of:

- a. selecting a metal from the group consisting of the substantially amorphous, noncrystalline metallic magnetic alloys having positive magnetostriction;
- b. subjecting said alloy to a tensile stress less than the elastic limit of the alloy; and
- c. sustaining said tensile stress, thereby producing, during said sustaining step, an amorphous alloy having superior soft magnetic properties including low coercivity and high permeability.

4,053,332

ENHANCING MAGNETIC PROPERTIES OF AMORPHOUS ALLOYS BY ROLLING

Takeshi Egami, Narberth, Pa., and Philip J. Flanders, Moorestown, N.J., assignors to University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 507,860, Sept. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 495,787, Aug. 8, 1974, abandoned. This application July 29, 1976, Ser. No. 709,857 Int. Cl.² H01F 1/00

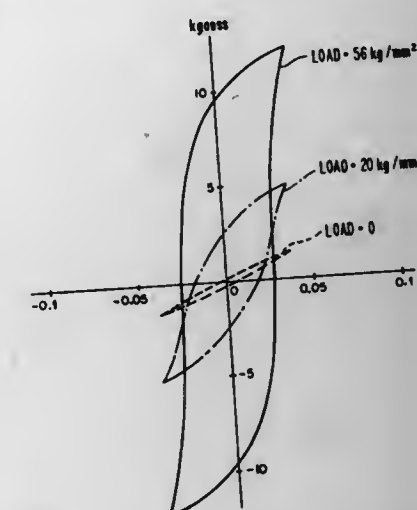
U.S. Cl. 148—120

8 Claims

4. A method of providing a metal having controlled stress sensitivity of soft magnetic properties including coercivity and remanence, comprising the steps of:

- a. selecting a metal from the group consisting of substantially amorphous, noncrystalline metallic magnetic alloys having positive magnetostriction;
- b. subjecting said sample to a thickness reduction by rolling at a temperature less than its crystallization temperature

- and maintaining its amorphous character, increasing its coercivity, and reducing its remanence;
- c. subjecting said sample to a tensile stress less than the elastic limit of the alloy; and



- d. sustaining said tensile stress, thereby producing, during said sustaining step, an amorphous alloy having further altered superior soft magnetic properties including increased remanence and reduced coercivity.

4,053,333

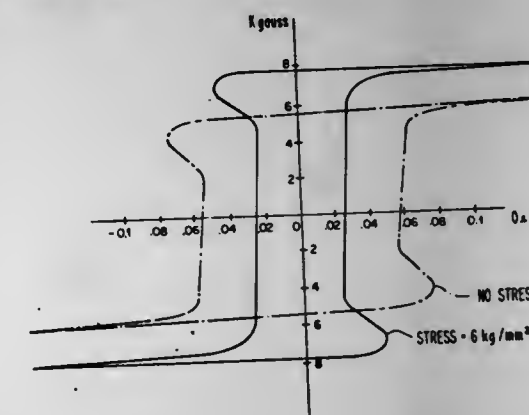
ENHANCING MAGNETIC PROPERTIES OF AMORPHOUS ALLOYS BY ANNEALING UNDER STRESS

Takeshi Egami, Narberth, Pa., and Philip J. Flanders, Moorestown, N.J., assignors to University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 507,861, Sept. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 495,786, Aug. 8, 1974, abandoned. This application July 29, 1976, Ser. No. 709,876 Int. Cl.² H01F 1/00

U.S. Cl. 148—120

8 Claims



4. A method of providing a metal having superior magnetic properties, including low coercivity and high permeability, comprising the steps of:

- a. selecting a metal from the group consisting of substantially amorphous, noncrystalline metallic magnetic alloys having positive magnetostriction;
- b. subjecting said alloy to a tensile stress less than the elastic limit of the alloy;
- c. heating said sample in a stressed condition to a predetermined temperature below the crystallization point temperature of the sample;
- d. maintaining said sample in a stressed, heated state for a predetermined duration, said heating and maintaining steps constituting an annealing process;
- e. cooling said sample; and
- f. removing said stress after said cooling step;
- g. said subjecting, heating, maintaining, cooling, and removing steps substantially increasing the remanence of said sample and substantially decreasing the coercivity of said

sample while maintaining the amorphous, noncrystalline character of said sample.

4,053,334

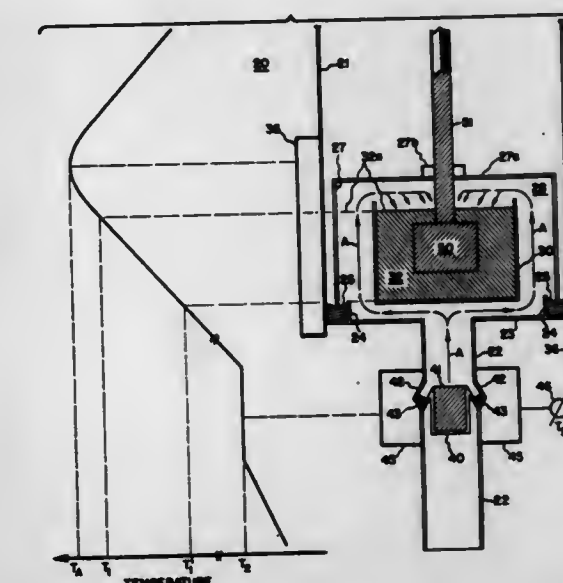
METHOD FOR INDEPENDENT CONTROL OF VOLATILE DOPANTS IN LIQUID PHASE EPITAXY

Roger S. Ehle, and Walter Garwacki, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 21, 1976, Ser. No. 707,274 Int. Cl.² H01L 21/208

U.S. Cl. 148—171

13 Claims



1. A method for the independent control of the concentration of each of a plurality of volatile dopants in a doped layer of a semiconductor material fabricated by liquid phase epitaxy upon a semiconductor substrate, comprising the steps of:

- a. providing a substantially vapor-tight volume;
- b. providing a first quantity of at least one element of the semiconductor material within said volume;
- c. heating said first quantity to a selected temperature sufficient to melt said first quantity;
- d. saturating the molten first quantity with a desired quantity of a first volatile dopant;
- e. immersing said substrate in said molten first quantity;
- f. providing a source of a second volatile dopant at a position below and spatially removed from said molten first quantity;
- g. independently heating said source of said second volatile dopant to cause a vapor thereof to rise without use of a carrier gas and be present at a selected partial pressure above a surface of said molten first quantity to achieve a desired concentration of said second volatile dopant within said molten first quantity at the selected temperature thereof; and
- h. cooling said molten first quantity containing said substrate and said first and second volatile dopants in their respective concentrations, to fabricate a doped layer of said semiconductor material upon said substrate.

4,053,335

METHOD OF GETTERING USING BACKSIDE POLYCRYSTALLINE SILICON

Shih-Ming Hu, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

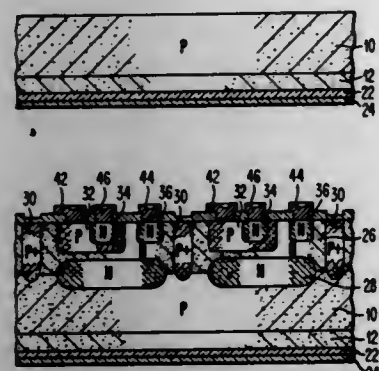
Filed Apr. 2, 1976, Ser. No. 672,906 Int. Cl.² H01L 21/324, 29/04

U.S. Cl. 148—174

11 Claims

1. The method for gettering impurities and for removal of point defects from silicon semiconductor material comprising: providing a body of monocrystalline silicon material suitable for forming semiconductor devices therein; depositing a layer of polycrystalline silicon on one major surface of said body by hydrogen reduction of a silicon-

containing gas which is passed over said body along with a inert carrier gas while said body is maintained at a temperature between about 600° C to 800° C; said layer being predominantly oriented to one crystallographic orientation; and



forming semiconductor devices on the major surface opposite to the said one major surface of said body which involve processing temperatures between about 800° C to 1100° C

4,053,336

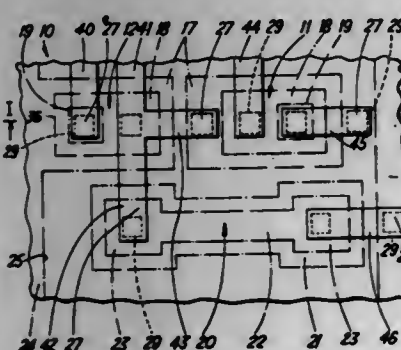
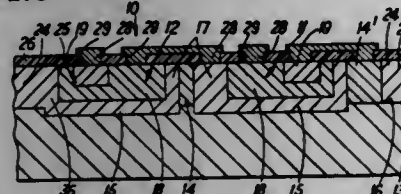
METHOD OF MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A CONDUCTIVE PLANE AND A DIFFUSED NETWORK OF CONDUCTIVE TRACKS

David Latham Grundy, Grasscroft, and Kenneth Lawson Hughes, Hale Barns, both of England, assignors to Ferranti Limited, Hollinwood, England
Division of Ser. No. 542,674; Jan. 21, 1975, Pat. No. 3,945,032, which is a continuation of Ser. No. 359,597, May 11, 1973, abandoned. This application Nov. 21, 1975, Ser. No. 634,277
Claims priority, application United Kingdom, May 30, 1972, 25168/72

Int. Cl.² H01L 21/20, 21/22, 21/70

U.S. Cl. 148—175

16 Claims



1. A method of manufacturing a semiconductor device having a plurality of constituent components and a plurality of different possible metallization patterns of conductors for interconnecting said components in a desired functional circuit arrangement, includes providing a semiconductor body with a substrate of one conductivity type forming a conductive plane in the device, and an epitaxial layer on the substrate of the same conductivity type, forming a plurality of diffused regions of opposite conductivity type in the epitaxial layer, a plurality of said diffused regions of opposite conductivity type and a plurality of unmodified regions of the device, simultaneously with forming said plurality of diffused regions of opposite conductivity type forming in the epitaxial layer a diffused network of

conductive tracks of said opposite conductivity type remote from the conductive plane, forming at least one metallization pattern of conductors of said plurality of different possible metallization patterns of conductors on said epitaxial layer and connecting the conductive plane via at least one unmodified region of the epitaxial layer and to the components and the conductive tracks to form the desired functional circuit arrangement.

4,053,337

HEATING COMPOSITION

William H. Collins, Timonium, Md., assignor to Catalyst Research Corporation, Baltimore, Md.
Division of Ser. No. 378,489, June 23, 1964. This application Aug. 24, 1967, Ser. No. 665,191
Int. Cl.² C06B 33/00

U.S. Cl. 149—37

3 Claims

1. A combustible composition consisting essentially of an intimate mixture of finely divided tungsten trioxide and a finely divided metal selected from the group consisting of iron, cobalt, nickel, chromium, molybdenum, aluminum, boron, magnesium, titanium, zirconium and tantalum.

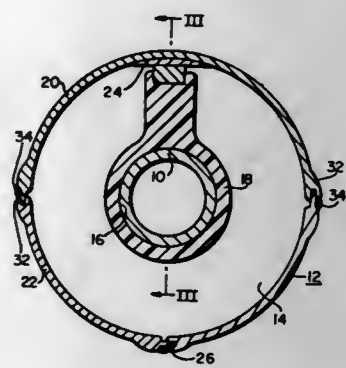
4,053,338

METHOD OF FABRICATING COMPRESSED GAS INSULATED CABLE

Philip C. Bolin, Northboro, Mass., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed June 4, 1976, Ser. No. 693,241
Int. Cl.² H01B 13/00

U.S. Cl. 156—48

11 Claims



1. A method of fabricating a compressed gas insulated cable including a cylindrical electrical conductor disposed within a cylindrical opening formed in a post spacer, said spacer supporting said conductor within a substantially cylindrical outer sheath, and an insulating gas electrically insulating said conductor from said sheath, said sheath being formed of a plurality of sheath sectors each of which forms a portion of the circumference of said sheath, said method comprising:

inserting said conductor within said post spacer opening; securing said spacer to one of said sheath sectors; and sealingly securing said sheath sectors together to form said outer sheath.

7. A method of fabricating a multiconductor compressed gas insulated transmission line wherein a plurality of cylindrical electrical conductors are supported within a generally outer cylindrical sheath by a plurality of post spacers with an insulating gas electrically insulating said conductors from said sheath and from each other, said sheath being formed from a plurality of sheath sectors each of which forms a portion of the circumference of said sheath, each of said conductors having a spacer and a sheath sector associated therewith, said conductors being disposed within cylindrical openings formed within said post spacers, said method comprising:

inserting each of said conductors within the opening formed in said post spacer associated therewith;

securing each of said spacers to said sheath sector associated therewith; and sealingly securing said sheath sectors together to form said outer sheath.

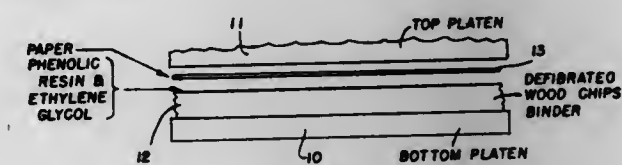
4,053,339

METHOD OF MAKING COMPOSITE PAPER HARDBOARD PANEL

Charles F. Story, and Donald B. Gibson, both of Rock Hill, S.C., assignors to Champion International Corporation, Stamford, Conn.
Filed June 5, 1975, Ser. No. 584,175
Int. Cl.² D21J 1/08

U.S. Cl. 156—62.2

3 Claims



1. In a method for the production of a composite, paper-overlaid panel comprising:

- forming a mat of lignocellulose particles and a binding agent of phenolic or modified phenolic resin;
- laying a dry sheet of paper over said mat; and
- curing said paper-overlaid mat at a temperature between 300° F to 400° F;

the improvement in which a solution comprising resin and polyhydric alcohol or ester thereof selected from the group consisting of ester of ethylene glycol, ester of glycerine, ethylene glycol, glycerine and polymer of ethylene glycol having a boiling point higher than that of water is applied to said mat prior to over-laying said sheet of paper.

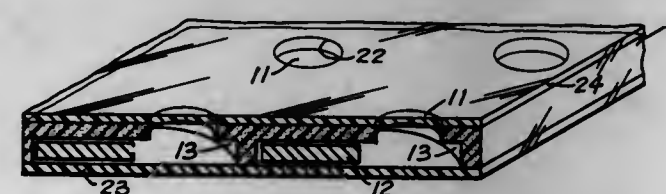
4,053,340

METHOD FOR PRODUCING DISPLAY SIGN PANEL

Gerald L. Work, Spokane, Wash., assignor to American Sign and Indicator Corporation, Spokane, Wash.
Filed July 26, 1976, Ser. No. 708,580
Int. Cl.² B32B 3/24, 3/26

U.S. Cl. 156—70

5 Claims



1. A method for producing a panel for a display sign wherein the panel has a pattern of recesses each partially intersected by a light-transmitting area, and containing discs movable between bi-stable positions covering or clear of the light-transmitting areas, comprising the following steps:

deforming one surface of a planar sheet of permanently compressible material by pressing said one surface of the sheet against a mold having an exterior configuration complementary to the desired recess configuration while maintaining the remaining surface of the sheet in a planar condition to thereby reduce the sheet thickness in a pattern corresponding to the desired pattern of recesses; forming apertures through the sheet at locations each bounded by a corresponding portion of each recess; placing within each recess a circular disk having a diameter adequate to overlie the aperture formed therein; and laminating said one surface of the sheet to a layer of light-transmitting sheet material.

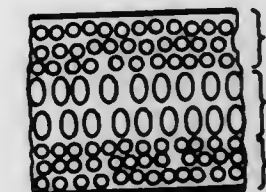
4,053,341

LAMINATES OF POLYETHYLENE FOAM WITH AN ANISOTROPIC PORE STRUCTURE

Frank Gerald Kleiner, Cologne; Hans Radojewski, Leverkusen; Richard Mühlbauer, Leichlingen, and Karl-Heinz Müller, Quadrath-Ischendorf, all of Germany, assignors to Bayer Aktiengesellschaft, Germany
Filed Feb. 17, 1976, Ser. No. 658,404
Claims priority, application Germany, Feb. 20, 1975, 2507274
Int. Cl.² B32B 5/20

U.S. Cl. 156—79

11 Claims



1. A process for producing a laminate comprising a plurality of crosslinked polyethylene foam layers having an anisotropic pore structure in at least one internal layer, said process comprising the steps of arranging at least three polyethylene sheets or layers which contain equal quantities of a peroxidic crosslinking agent and differing quantities of a chemical blowing agent which decomposes at a temperature higher than the temperature at which the peroxidic crosslinking agent functions, as a multi-layer structure with each of the two external layers containing a smaller proportion of blowing agent than contained in the internal layer, heating the multi-layer structure to a temperature at which each of the sheets or layers is crosslinked and at the same time welded together to form a laminate and subsequently heating the laminate at a higher temperature which causes the chemical blowing agent to decompose and foam the laminate structure.

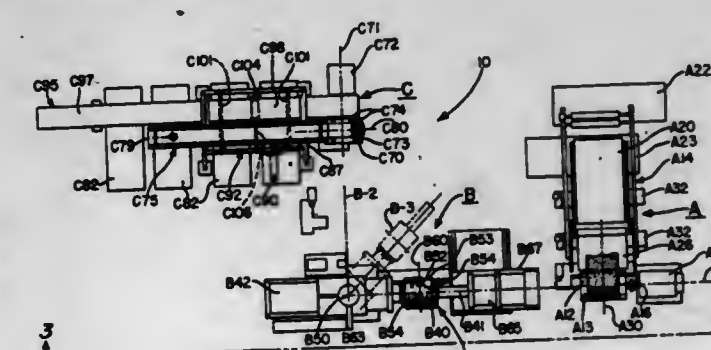
4,053,342

TIRE BUILDING SYSTEM

Paul E. Appleby, Cuyahoga Falls; Christopher E. Christie, Akron; John H. Gerstenmaier, Akron; Thomas F. Minter, Akron, and Edwin S. Woodhall, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 266,884, June 28, 1972, abandoned. This application May 17, 1976, Ser. No. 686,846
Int. Cl.² B29H 17/14, 17/22

U.S. Cl. 156—123 R

4 Claims



1. A method of building a tire having an axially spaced pair of inextensible beads, a cord or wire-reinforced ply extending in toroidal shape between said beads and turned about said beads, a tread, and an inextensible endless belt disposed circumferentially between said ply and said tread; the method comprising: wrapping said ply circumferentially about a rigid axially and circumferentially continuous cylinder having a first rotation axis to form a cylindrical ply band of a first diameter from 15 to 25 percent greater than said beads; while wrapping said ply to form said band, concurrently building said belt in endless form about a building surface having a second rotation axis, translating said band coaxially of said cylinder while supporting said band in cylindrical form without change of its

said first diameter and while free of any contact with its inward surface to a predetermined position; with said band in said predetermined position simultaneously expanding a central portion thereof in cylindrical form to a second diameter from one-tenth to five percent greater than said first diameter; turning radially inwardly the respective end portions of said band and securing beads therein so as to convert said band to a tire carcass in cylindrical form; then swinging said carcass about a vertical axis spaced axially away therefrom from collinear alignment with the first axis to collinear alignment with the second axis and concurrently with said swinging shaping the carcass from its cylindrical to a toroidal form; then translating said belt in endless form coaxially to a predetermined position symmetrical with said carcass, and further expanding the carcass into symmetrical coherent contact with the endless belt in its said predetermined position.

4,053,343

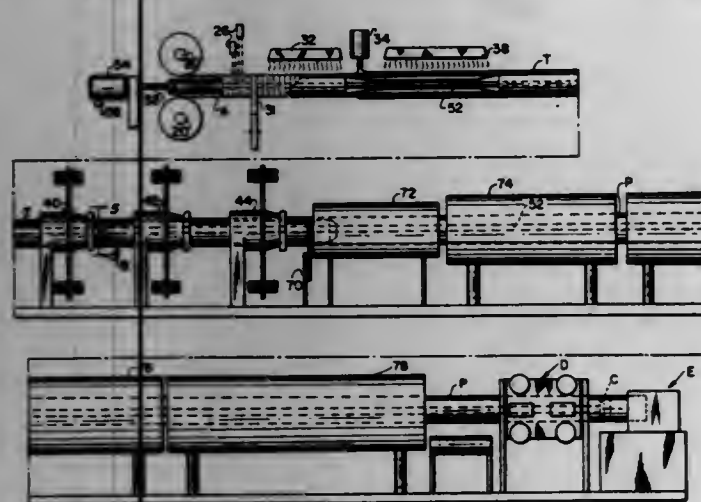
METHODS OF MAKING FIBER REINFORCED PLASTIC PIPE

J. Warner Carter, Wichita Falls, Tex., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 10, 1973, Ser. No. 359,065
Int. Cl.² B65C 3/26; B65H 81/06

U.S. Cl. 156-172

11 Claims



1. A method of continuously making fiber reinforced plastic pipe devoid of an inner removable liner comprising providing a first mandrel section and a second mandrel section in alignment therewith and longitudinally spaced therefrom by a gap, providing a tube of resin-absorbent material upon said first section, continuously advancing the tube across the gap and over the second mandrel section, applying a thermosetting resin to the tube as it passes over the gap in an amount sufficient to saturate the tube, at least partially curing the resin prior to the arrival of the advancing resin-saturated tube onto the second mandrel section to provide a conveyor tube, applying a plurality of bands of thermosetting resin composition coated continuous fiber elements onto said conveyor tube, and curing the resin to provide a fiber reinforced pipe assembly having the conveyor tube integral therewith.

4,053,344

PROCESS OF PRINTING ON NON-PAPER MATERIAL

Tetsuji Hirakawa, 615, Oozawa Onaka, Kashiwacho, Katsuragi-gun, Nara, Japan

Filed Apr. 7, 1976, Ser. No. 674,687

Claims priority, application Japan, Apr. 10, 1975, 50-44422
Int. Cl.² B44C 1/14, 3/02

U.S. Cl. 156-447

2 Claims

1. A process of printing a pattern on articles of non-paper materials comprising the steps of:
a. printing the pattern in ink on the article by silk screening;
b. drying said ink until tacky;
c. applying a layer of stamping foil having an adhesive layer thereon over the pattern, said adhesive layer contacting

said pattern and being reactive with said ink at elevated temperatures;
d. applying a heated pressure member through a rubber layer to said stamping foil;
e. the temperature of said heated pressure member being above the temperature at which the ink reacts adhesively with the foil and below the reaction temperature of the article whereby the foil which contacts the ink becomes adhered thereto; and
f. removing the unadhered stamping foil.

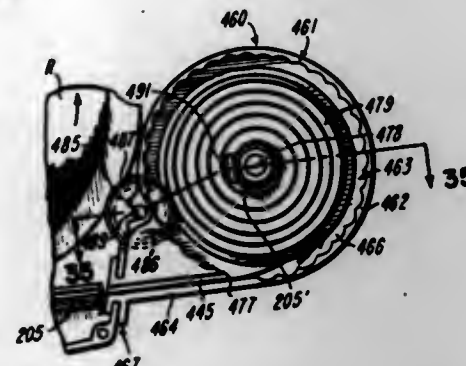
4,053,345

APPARATUS FOR PRINTING AND APPLYING PRESSURE SENSITIVE LABELS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Division of Ser. No. 476,744, June 5, 1974, Pat. No. 3,957,562, which is a continuation-in-part of Ser. No. 380,445, July 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Feb. 17, 1976, Ser. No. 658,159
Int. Cl.² B32B 35/00; B41M 1/40

U.S. Cl. 156-384

4 Claims



1. Hand-held apparatus for printing and applying pressure sensitive labels carried on a web of supporting material, the apparatus weighing less than about three pounds and comprising a frame having a handle, a platen and a cooperable print head mounted for relative movement on the frame, a delaminator for delaminating printed labels carried on the supporting material web, an applicator for applying the printed labels, means in contact with the web downstream of the delaminator for feeding the web, an actuator disposed at the handle, means drivingly connecting the actuator with the print head and the web feeding means, and means carried by the frame for re-winding the web, the re-winding means includes a re-winder body removably connected to the frame, the body having an inlet communicating with a generally annular compartment, the surface of the compartment having means to reduce the contact area with the web.

4,053,346

METHOD AND APPARATUS FOR FORMING THERMOPLASTIC CONTAINERS

Stephen W. Amberg, Toledo, Ohio, and Thomas E. Doherty, Setauket, N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

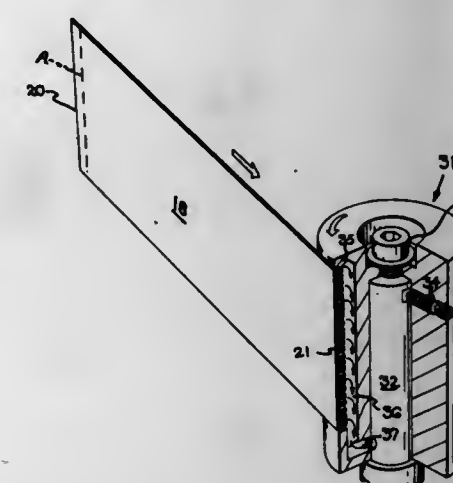
Division of Ser. No. 479,421, June 14, 1974, Pat. No. 3,970,492, which is a continuation-in-part of Ser. No. 354,305, April 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 211,259, Dec. 23, 1971, Pat. No. 3,854,583. This application May 6, 1976, Ser. No. 683,745
Int. Cl.² B65B 51/14

U.S. Cl. 156-446

7 Claims

1. Apparatus for forming a sheet of thermoplastic material into a cylindrical sleeve comprising: a generally cylindrical shaped rotatable support having said sheet of material wrapped therearound so that one end portion overlaps an underlying end portion; vacuum means on said support for holding said underlying end portion thereagainst, a nip roller for holding

said overlapping end portion against said support such that the facing surfaces of said end portions are capable of being spaced from each other, pneumatic heating means disposed adjacent said support and having an outlet directed toward said overlapping end portion for separating the overlapping end portion from the underlying end portion to apply hot air against the



facing surfaces of said end portions, whereby said facing surfaces are softened; a reciprocable sealing bar mounted adjacent said heating means between said vacuum means and said nip roller; and means for moving said sealing bar into engagement with the overlapping end portion to compress the softened surfaces against one another and form a seam and thereby complete a sleeve.

4,053,347

METHOD FOR FORMING AN INTERNAL TAPER IN THE WALLS OF A SLEEVE-LIKE BODY

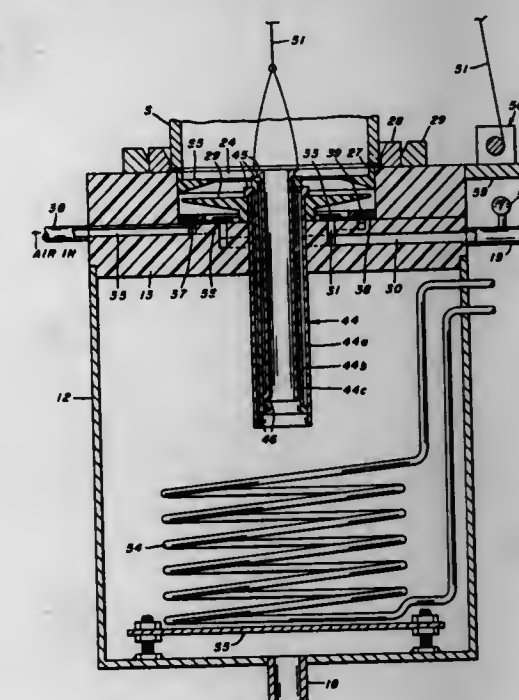
Richard C. Glean, Hempfield Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1973, Ser. No. 339,484

Int. Cl.² C23F 1/02

U.S. Cl. 156-637

8 Claims



1. A method of forming an internal taper in the walls of a sleeve-like body beginning at one end of said body, said method comprising:
mounting said body in an upright stationary position with the end at which the taper is to begin at the bottom;
introducing an etching solution continuously to the interior of said body from the bottom to form a pool within the body to which pool the inside faces of the body are exposed;

agitating said pool;
continuously discharging said solution from said pool through an overflow positioned within said body;
moving said overflow vertically during the tapering operation and thus changing the level of the pool surface; and
controlling the depth to which the walls are etched by control of the rate of movement of said overflow to provide maximum time of exposure to said solution at the lower end of said body and a diminishing time of exposure at each successive level thereabove.

4,053,348

DIE AND METHOD OF MAKING THE SAME

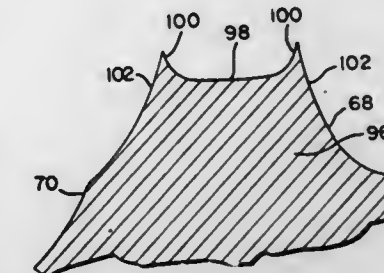
Walter Weglin, Bellevue, Wash., assignor to Jerobee Industries, Inc., Redmond, Wash.

Filed June 16, 1976, Ser. No. 696,564

Int. Cl.² B32B 31/00; C23F 1/02

U.S. Cl. 156-515

17 Claims



1. A method of making a precision die particularly adapted to form from a foil sheet a circuit board comprising a plurality of circuit elements corresponding within close tolerances to a preselected base pattern of pattern figures with delineating edge lines, said pattern being characterized by having separating areas separating relatively closely spaced circuit elements and at least one background area of a larger width dimension separating more widely spaced circuit elements, said die having die element adapted to engage said foil to form the circuit elements therefrom, said die elements each having a surface area with edge portions corresponding closely to the edge lines of a related pattern figure, and side walls leading from its edge portions into adjacent recesses on opposite sides of the die element, said method comprising:

- providing a die block having a working face at which the die elements are to be formed,
- providing a plurality of modified overlay patterns, each of which has a pattern area made up of a base area corresponding in configuration to the base pattern and having an enlarged edge portion extending beyond the delineating edge lines of the base pattern by a predetermined substantially uniform width dimension, said overlay patterns comprising a first background pattern, having an enlarged edge portion of a greater width which is less than half the width dimensions of the background area, a second separating overlay pattern having an enlarged edge portion of an intermediate width which is less than half the spacing of closely spaced circuit elements, and a third truing overlay pattern having an enlarged edge portion of a relatively small width corresponding quite closely to the base pattern,
- covering the working face of the die block with a first protective overlay corresponding to the first background pattern to leave at least a portion of the background area of the die exposed,
- exposing the working face of the die to an etching medium to form a recessed area at least at the background area and provide a first relief area including the area of the die block at which the circuit elements are to be formed,
- covering the working face of the die block with a second protective overlay corresponding to the second separating overlay pattern to leave exposed a greater portion of the

background area and also expose at least a portion of separating areas of the die block,
 f. again exposing the working face of the die block to an etching medium to remove further material from the background area and to also form recesses at the separating areas of the die block,
 g. covering the working face of the die with a third protective overlay corresponding to the third truing pattern to protect the areas of the die at which the die elements are to be finally formed and extend moderately beyond the edge portions thereof,
 h. again exposing the working face of the die to an etching medium to form the die elements to a configuration corresponding quite closely to the preselected base pattern, and
 i. forming the surface areas of each of the dies with a middle recess to leave upstanding foil engaging edge portions of the die elements.

6. A die made according to the method of claim 1, said die being particularly adapted to form from a foil sheet a plurality of individual circuit elements and simultaneously bond said elements to a substrate, said circuit corresponding within close tolerances to a preselected base pattern of pattern figures with delineating edge lines, said pattern being characterized by having separating areas separating relatively closely spaced circuit elements and at least one background area of a larger width dimension more widely spaced circuit elements, said die comprising:

- a plurality of die elements, each of which has a foil engaging surface area with upstanding foil engaging edge portions corresponding to edge lines of the circuit elements being formed,
- some of said die elements being spaced closely adjacent to one another and having separating recesses corresponding in location to the separating areas of the base pattern, said separating recesses being of a lesser depth, and
- said die having a background recess of a greater depth corresponding in location to the background area of said base pattern,

whereby when said die is pressed against said foil sheet to form a circuit board, excess foil at said recess areas is able to be located in said recess areas without becoming bonded to said substrate, and excess foil in said background area is able to become located in said background recess without becoming bonded to said substrate.

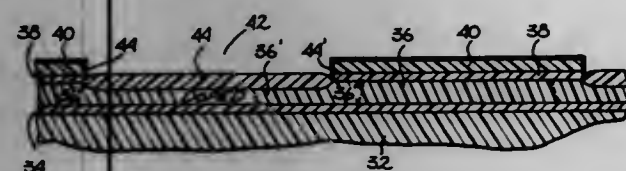
4,053,349

METHOD FOR FORMING A NARROW GAP
 Richard T. Shaha, Mountain View, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 2, 1976, Ser. No. 654,111
 Int. Cl.² H01L 21/306

U.S. Cl. 156-628

14 Claims



1. A method for forming a narrow gap in a material comprising the steps in sequence, of:
 disposing a first masking layer on said material;
 disposing a second masking layer on said first masking layer;
 selectively removing said first and second masking layers to expose a first portion of the surface of said material;
 disposing a third masking layer on at least the exposed first portion of said material, a portion of said third masking layer being in immediate contact with said first masking layer;
 selectively removing after said third masking layer has been disposed said first and third masking layers to expose a

second portion of the surface of said material underlying said remaining second masking layer; and
 selectively removing through said exposed second portion a preselected amount of said material to form said gap.

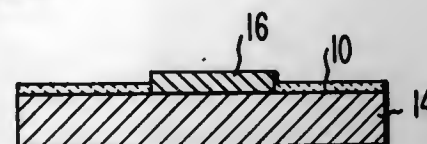
4,053,350

METHODS OF DEFINING REGIONS OF CRYSTALLINE MATERIAL OF THE GROUP III-V COMPOUNDS
 Gregory Hammond Olsen, Cranbury, and Vladimir Sinisa Ban, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed July 11, 1975, Ser. No. 595,289
 Int. Cl.² C23F 1/02; B05D 5/12

U.S. Cl. 156-659

8 Claims



1. A method of forming a defined region of a group III-V crystalline material on a substrate of nucleating the growth of said material comprising the steps of:
 providing a thin masking coating of carbon on a surface of the substrate except where the defined region of crystalline material is to be provided, said carbon coating being incapable of nucleating the growth of said crystalline material, and
 contacting the masked substrate with the crystalline material to deposit a first layer of crystalline material thereon, whereby said material is not deposited on the carbon coating but only on the surface of the substrate which is not covered by said coating.

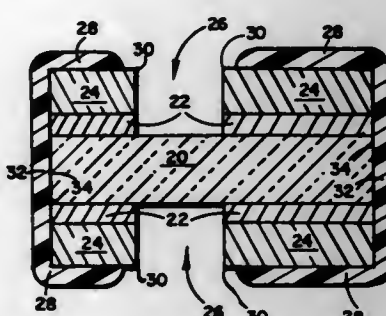
4,053,351

CHEMICAL MACHINING OF SILICA AND GLASS
 William S. DeForest, Seal Beach, and Henry V. Connelly, Jr., Corona, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 634,015, Nov. 21, 1975, abandoned.
 This application Apr. 7, 1977, Ser. No. 785,376
 Int. Cl.² C23F 1/02

U.S. Cl. 156-661

13 Claims



1. A method of chemically machining relatively deep cuts in an object of a material of a type which is conventionally etchable by acid fluoride etchants, said method comprising:
 forming an etching mask which is both highly adherent to said material and highly resistant to acid fluoride etchants by depositing, in a vacuum chamber, a relatively thin layer of a first metal immediately on a surface of said object wherein said first metal is highly adherent to said material;
 selectively defining a region of said object for chemical machining by removing said etching mask from said surface in said region;
 covering said etching mask with a relatively thick, relatively stress-free layer of sealing material by electrodepositing a layer of a second metal immediately on said etching mask; then, after said step of forming said etching mask and said

step of covering said etching mask with said layer of sealing material are completed, contacting said object in said region with acid fluoride etchant for a period of time sufficient to machine a cut in said object to a depth of at least about one mil; and
 removing said etching mask and said layer of sealing material.

4,053,352

METHOD FOR PRODUCING OXIDIZED WHITE LIQUOR

Bengt Goran Hultman, Domsjoverken, and Sture Erik Olof Noreus, Husum, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

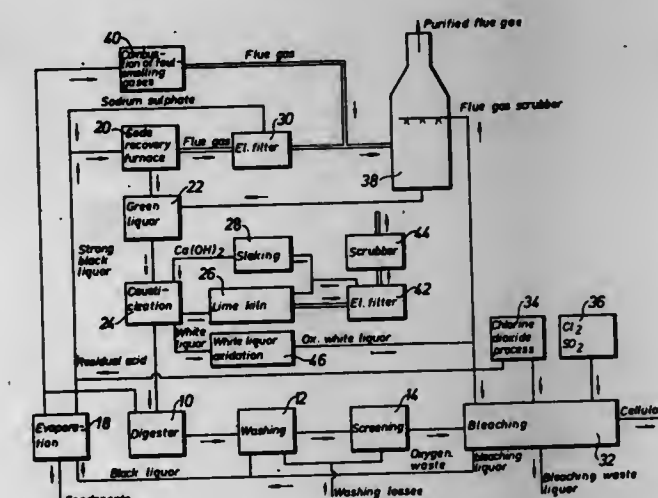
Continuation of Ser. No. 490,530, July 22, 1974, abandoned.

This application Apr. 26, 1976, Ser. No. 679,945

Claims priority, application Sweden, July 25, 1973, 7310328
 Int. Cl.² D21C 11/00

U.S. Cl. 162-29

19 Claims



1. In the cyclic process for utilizing sodium values in sulfate cellulose pulping, in which sodium losses normally are less than sodium additions to the process, thus tending to build up a sodium surplus, and which includes the steps of pulping cellulosic material with a pulping liquor comprising sodium hydroxide and sodium sulfide, separating spent pulping black liquor containing sodium values, evaporating and combusting the black liquor to recover sodium values as sodium sulfide and sodium carbonate, dissolving the sodium sulfide and sodium carbonate in water to form green liquor, causticizing the green liquor with calcium hydroxide to form white liquor, and recycling white liquor to form pulping liquor, the improvement which comprises maintaining sodium balance at least in part by removing sodium values as white liquor, oxidizing the white liquor with a free oxygen-containing gas at a temperature within the range from about 50° to about 130° C by injecting a free oxygen-containing gas at a flow to maintain the white liquor in motion within the range from about 50 to about 500 Nm³/hm² while maintaining the aqueous solution at a depth of least 2 meters above the point at which the gas is injected into the solution for a time to convert substantially all sodium sulfides to sodium thiosulfates, and utilizing the oxidized sodium thiosulfate-containing white liquor as a source of alkali outside the cyclic process for sulfate cellulose pulping.

4,053,353

METHOD OF CONTROLLING BASIS WEIGHT OF A CYLINDER BOARD MACHINE

Nils Leffler, Mountain View, Calif., assignor to Messurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 499,455, Aug. 22, 1974, abandoned.

This application Jan. 13, 1976, Ser. No. 648,655

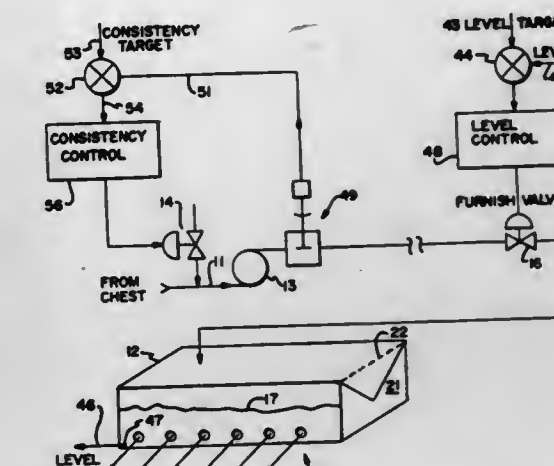
Int. Cl.² D21F 1/06, 1/08

U.S. Cl. 162-198

4 Claims

1. A method of controlling the basis weight of a sheet material manufactured from a variable consistency liquid stock in a machine having a sheet former and a flow box from which

liquid stock is supplied to said sheet former said flow box having predetermined upper and lower limits of the level of liquid stock said method comprising: measuring said level of liquid stock in said flow box; measuring the basis weight of said sheet material and comparing said basis weight to a desired target to provide a basis weight error control signal; deriving a level target from said basis weight error control signal, comparing said measured level to said level target, and controlling said level by controlling the flow of said liquid stock to minimize any error in basis weight; measuring said consistency on



an on-line basis of said liquid stock being supplied to said flow box and controlling said consistency to a normally constant consistency target by regulation of water added to said liquid stock; comparing said derived level target to said predetermined upper and lower limits of said level; when said derived level target reaches one of said limits modifying said level target in a direction away from the limit reached, and modifying said consistency target only in response and correspondingly to said level target modification to prevent any upset in basis weight.

4,053,354

METHOD AND DEVICE FOR FORMING A FILTERING FIBER CAKE IN AN APPARATUS FOR MEASURING THE BEATING DEGREE OF PULP FLOWING THROUGH A CONDUIT

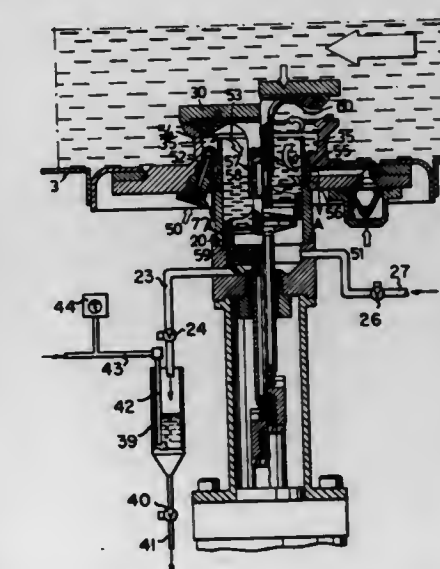
Henrik Martin Kitznik, Segmon, Sweden, assignor to AB Kalle-Regulator, Industrivägen, Saffle, Sweden

Filed Mar. 29, 1976, Ser. No. 671,404

Claims priority, application Sweden, Apr. 10, 1975, 7504129
 Int. Cl.² D21F 7/06; G01N 15/00

U.S. Cl. 162-198

6 Claims



1. A method utilizing a porous strainer disc for forming a fiber cake from a sample of a fibrous suspension, comprising the steps of:
 withdrawing a sample of a fibrous suspension from a conduit

through which said suspension flows and introducing said suspension into a sampling vessel containing the disc so that the suspension enters on one side of the disc; introducing a fluid into said vessel and on the same side of said disc at a first pressure greater than the pressure of said suspension flowing through said conduit as said suspension is being introduced into said vessel, said fluid being introduced into said vessel in a direction which is substantially tangential to the wall of the vessel to cause rotation of said suspension about the longitudinal axis of said vessel to form a fiber cake of even density upon said disc; draining the fluids from the vessel; introducing said fluid into said vessel at a second predetermined pressure, which is lower than said first pressure, upon the fiber cake formed upon said disc in said vessel; measuring the rate of flow of fluid per unit time through the fiber cake to determine the degree of beating of the pulp flowing through the conduit.

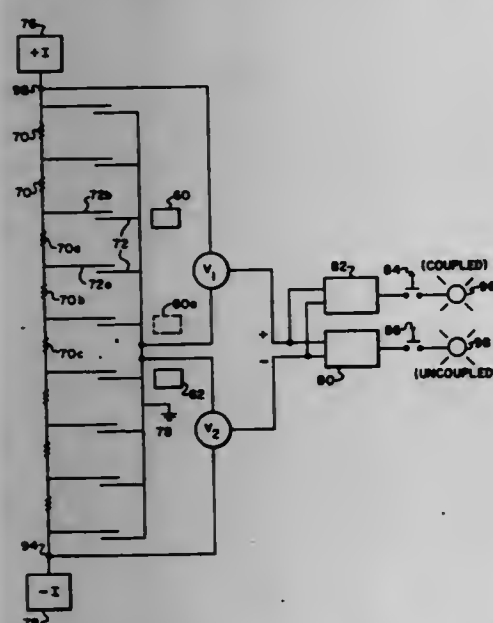
4,053,355

NUCLEAR REACTOR REMOTE DISCONNECT CONTROL ROD COUPLING INDICATOR

Michael Vachovich, McKeesport, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Oct. 14, 1975, Ser. No. 621,994
Int. Cl.² G21C 17/00

U.S. Cl. 176-19 R

10 Claims



1. A coupling indicator system for use with remotely disengageable control rod assemblies wherein the connection of an elongated control rod to an elongated control rod drive shaft is dependent upon the longitudinal axial position of a plunger, one position of said plunger creating coupling between said control rod and said drive shaft, and a second position of said plunger creating uncoupling between said control rod and said drive shaft, said control rod assembly including a control rod drive means, movable along the drive shaft longitudinal axis, for axially moving said drive shaft along the drive shaft longitudinal axis, said coupling indicator system comprising:
means for determining the axial position of said plunger;
means for determining the axial position of said drive means;
and
means for comparing the axial position of said plunger with respect to the axial position of said drive means, said means for determining the axial position of said plunger comprising:
an elongated position indicator tube fixedly secured to and axially movable with, said plunger;
a position indicator magnet secured to said position indicator tube;
a plurality of equal resistances serially connected and having a first end point and a second end point;

a common node;
a plurality of normally non-conducting magnetically actuated switches parallelly connected between said resistances and said common node, one of said magnetically actuated switches being connected between each pair of adjacent resistances, said magnetically actuated switches being located such that at least one magnetically actuated switch is in magnetic communication with said position indicator magnet to cause such switch to conduct electric current;
a first current source having a first electrical polarity serially connected to said plurality of resistances at said first end point; and
means for measuring the voltage generated between said first current source and said common node to obtain a first voltage.

4,053,356

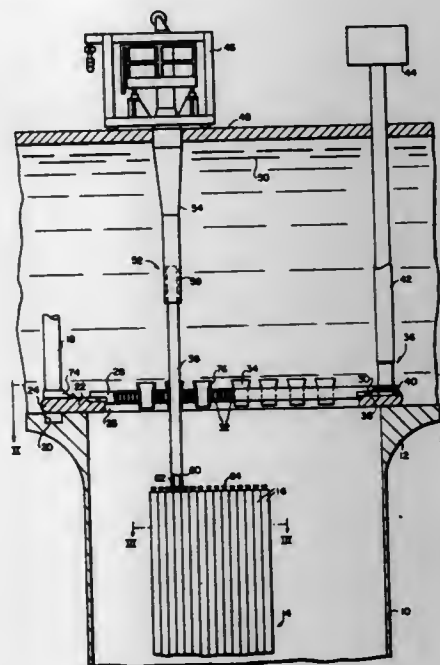
GUIDE DEVICE

Chris M. Brammer, Jr., Houston, Tex., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 8, 1975, Ser. No. 603,077
Int. Cl.² G21C 19/16

U.S. Cl. 176-30

5 Claims



1. A guide device for use in nuclear reactors during fuel handling operations comprising:
an open-ended nuclear reactor pressure vessel having a flange around the top periphery thereof, said pressure vessel having a nuclear core positioned therein, said nuclear core comprising:
an elongated center fuel assembly;
a plurality of similar elongated fuel assemblies said plurality of elongated fuel assemblies being positioned symmetrically about said center fuel assembly;
a member supported by said pressure vessel flange, said member having an opening therein, said opening having a horizontal size at least as large as said core size;
a rotatable support positioned in said member opening, said rotatable support being rotatably supported by said member, said support having a plurality of openings therein, said support openings being positioned in a predetermined pattern in said support so that by rotation of said rotatable support, each of said fuel assemblies except said center fuel assembly is in alignment with at least one of said support openings;
a truncated cone positioned in each of said support openings, said cones having radial extensions extending radially outwardly beyond said support openings, said truncated cones being longitudinally spaced apart from said fuel assemblies; and
a device for rotating said rotatable support.

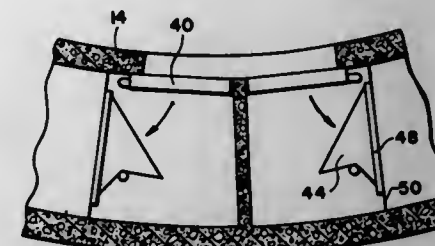
4,053,357 AIR BOX SHOCK ABSORBER FOR A NUCLEAR REACTOR

Ashok V. Pradhan, Beechwood, Ohio, and John A. George, Greensburg, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 3, 1975, Ser. No. 637,553
Int. Cl.² G21C 19/32

U.S. Cl. 176-37

6 Claims



1. An improved shock absorber system for use in an ice condenser compartment of a nuclear reactor including:
i. a containment enclosing a reactor compartment containing a nuclear reactor having a closed cooling system including piping connecting the reactor, pumps and a steam generator in a closed loop;
ii. a wall in the reactor compartment spaced from the inner surface of the containment, the space therebetween defining an ice condenser compartment; and
iii. multiple aligned ports located in the bottom of said wall, movable doors mounted in each of said ports, said ports providing access from the reactor compartment to the ice condenser compartment so that in the event of rupture of said piping, coolant released inside the reactor compartment generates steam pressure which forces said doors under high velocity to an open position thereby providing an avenue for escape of steam into the ice condenser compartment, wherein the improvement comprises:
a separate air box shock absorber mounted inside the condenser compartment adjacent one of said ports for absorbing the energy imparted to each door by the steam pressure, said shock absorber comprising a back member slightly larger than each of said doors, a prefolded inward front member, and top and bottom members positioned such that a controlled clearance exists between said top member and said front member and between said bottom member and said front member, whereby upon impact of said door against said front member air within said shock absorber is compressed and forced out of said shock absorber through said controlled clearances such that said shock absorber absorbs the impacting forces of the door without the door rebounding to a closed position.

4,053,358

MODULAR ASSEMBLY FOR SUPPORTING, STRAINING, AND DIRECTING FLOW TO A CORE IN A NUCLEAR REACTOR

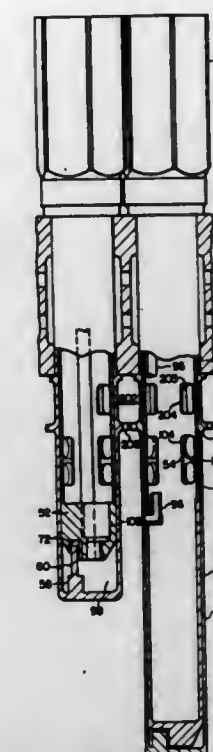
William E. Pennell, Greensburg, Pa., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Dec. 30, 1974, Ser. No. 537,516
Int. Cl.² G21C 19/28

U.S. Cl. 176-50

9 Claims

1. In a nuclear reactor of the type wherein a liquid reactor coolant, is circulated through a reactor vessel housing a core having a plurality of assemblies and said assemblies are removably supported in a plurality of inlet modules removably supported in liners mounted to a bottom plate, said liners extending below said plate into a high pressure region and the area above said plate being a lower pressure region, the improvement comprising:
horizontal debris barriers integrally mounted about the radial periphery of each said liner below said plate, said

barriers spaced closely adjacent one another to collectively form a substantially continuous horizontal boundary dividing said high pressure region into a primary high pressure zone below said boundary and a secondary high



pressure zone between said boundary and said plate, and further comprising aligned primary coolant inlet openings in each said liner and module in said primary zone and aligned secondary coolant inlet openings in each said liner and module in said secondary zone.

4,053,359

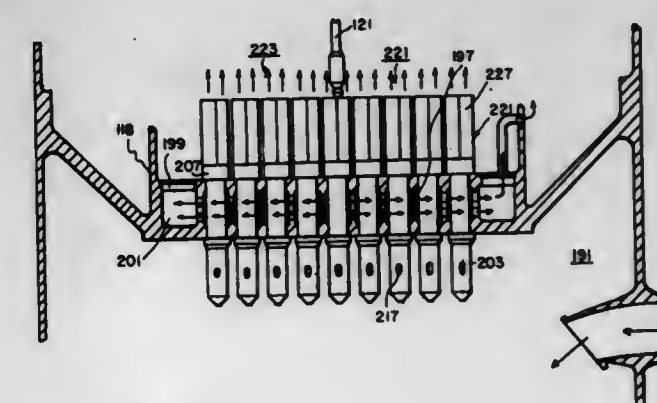
NUCLEAR REACTOR

William E. Pennell, Greensburg, and William J. Rowan, Monroeville, both of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 503,148, Sept. 4, 1974, abandoned. This application Mar. 17, 1976, Ser. No. 667,734
Int. Cl.² G21C 15/02

U.S. Cl. 176-61

3 Claims



1. A liquid metal cooled nuclear reactor having a pressure vessel and also having means for supplying a cooling liquid metal to said vessel, a nuclear core in said vessel bounded below by a lower support plate and bounded radially by a core barrel, said core barrel forming an annular region between said barrel and said vessel, said annular region being at a lower temperature than said core, said core having a plurality of core assemblies for generation and control of energy of nuclear fission, a plurality of liners mounted in said lower plate, an inlet modular unit removably mounted in each said liner held by gravity, each said unit having receptacles for receiving certain of said assemblies, said assemblies being removable from their corresponding receptacles, each said modular unit being pervi-

ous to the flow of said liquid metal, said liquid metal flowing into said modular unit and into the receptacle of said modular unit and along said assemblies received in said receptacle in thermal interchange with said assemblies and upwardly through said core, the flow of said liquid along said assemblies producing a pressure drop is said liquid so that liquid emerging from said core is at a lower pressure than liquid entering said receptacle, and means for producing low pressure regions below said modular unit and below said assemblies to produce a pressure balance on said modular unit and assemblies and to prevent the ejection of said modular unit from said liner and of said assemblies from said receptacle, said means comprising leakage flow paths below said modular unit and below said assemblies and by-pass flow vent-pipe means, said last-named means including a vent pipe disposed within said module and a plurality of flow passageways disposed horizontally through said lower plate to the outer periphery of said core barrel and said annular region, said leakage flow paths passing from below said modular unit and said assemblies to said vent-pipe and then through said passageways to the outer periphery of said core barrel and said annular region.

4,053,360

ENZYMATIC PREPARATION OF 6-D-(-)- α -AMINO- α -(P-HYDROXY-PHENYLACETAMINO)PENICILLIN ACID

Daniel Bonnard, Franconville, and Abraham Weber, Paris, both of France, assignors to Bristol-Myers Company, New York, N.Y.

Filed May 27, 1975, Ser. No. 580,991

Claims priority, application United Kingdom, June 5, 1974, 24848/74; Mar. 19, 1975, 50016/75

Int. Cl.² C12B 1/00; C12D 1/00

U.S. Cl. 195—29

3 Claims

1. A process for preparing 6-D-(-)- α -amino- α -(p-hydroxy-phenylacetamido)penicillanic acid which comprises treating in aqueous solution 6-D-(-)- α -amino- α -(p-acetoxy-phenylacetamido)penicillanic acid with an esterase selected from the group comprising human serum, animal serum, citrus esterase, wheat bran, wheat germ, and bacillus subtilis at a pH between about 5.0 and about 7.5 and at a concentration of about 5 to about 10 mg./ml. of esterase per total volume of the aqueous solution

4,053,361

PROCESS FOR THE PREPARATION OF GLUCOSE ISOMERASE USING CURTOBACTERIUM

Judith Margaret Kelly, and John Laurence Meers, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 24, 1975, Ser. No. 561,662

Claims priority, application United Kingdom, Mar. 29, 1974, 13994/74

Int. Cl.² C12D 13/10; C07G 7/02; C12D 13/02

U.S. Cl. 195—46 R

7 Claims

1. A method for producing a composition selected from the group consisting of glucose isomerase enzyme and enzyme preparations containing glucose isomerase by culturing a microorganism of the Curtobacterium genus capable of producing the composition in a medium containing a carbon source and inorganic nutrients and recovering the composition.

4,053,362

BACTERIAL ISOLATION METHOD AND DEVICE

Anthony Storm, 804 E. 16th St. No. 6A, San Bernardino, Calif. 92404

Filed Apr. 2, 1976, Ser. No. 672,852

Int. Cl.² C12K 1/04, 1/10

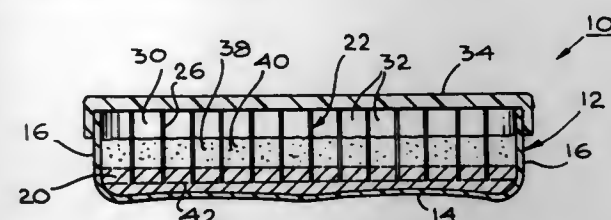
U.S. Cl. 195—103.5 R

16 Claims

1. An improved bacterial isolation device comprising, in combination:

a bacterial test container having a closed bottom, raised sidewalls and an open top;
a layer of predetermined thickness of a bacterially non-nutritive medium covering said bottom, said medium being of an embeddable consistency; and
an isolation grid comprising a first set of spaced walls intersected by and connected to a second set of spaced walls to form a plurality of isolated test cells, said grid having all its walls embedded in said medium, whereby during use of said device swarming bacteria are prevented from passing under said grid from one said isolated area to any other of said isolated areas to overlie and mask other bacteria.

10. The improved method of isolating bacteria for test purposes, said method comprising:



disposing a layer of embeddable bacterially non-nutritive medium in a bacterial test container so as to fully cover the bottom of said container to a predetermined depth; covering said layer of non-nutritive medium with a separate layer of desired bacterial nutritive medium; adding bacteria to the top of the nutritive medium; embedding the bottom of an isolation grid in said non-nutritive medium, the upper edge of said grid being above the level of said nutritive medium to define a plurality of isolated test cells; and covering said container and incubating bacteria therein until the bacteria can be detected in said isolated test cells.

4,053,363

SPUTUM ANALYSIS METHOD

Gordon L. Dorn, Dallas, Tex., assignor to J. K. and Susie L. Wadley Research Institute and Blood Bank, Dallas, Tex.

Filed June 28, 1976, Ser. No. 700,215

Int. Cl.² C12K 1/00; G01N 33/16

U.S. Cl. 195—103.5 M

12 Claims

7. In a method of detecting the presence of pathogenic organisms in the respiratory tract wherein a sputum sample is obtained and thereafter analyzed for the presence of microbial pathogens, the improvement comprising: admixing said sputum sample with an effective mucolytic amount to degrade the viscosity of said sputum sample of a nontoxic saponin which has had microbial toxins removed therefrom which exhibit an apparent molecular weight of less than about 600 in an aqueous solution and allowing the viscosity of said sputum sample to degrade prior to the time that said sample is analyzed.

4,053,364

DRYING AND PREHEATING OF MOIST COAL AND QUENCHING OF THE FORMED COKE

Werner Poersch, Moers; Martin Wischniewski, Krefeld-Uerdingen, and Jakob Essers, Krefeld, all of Germany, assignors to Buttner-Schilde-Haas Aktiengesellschaft, Krefeld, Germany

Filed Sept. 9, 1974, Ser. No. 504,666

Claims priority, application Germany, Apr. 1, 1974, 2415758

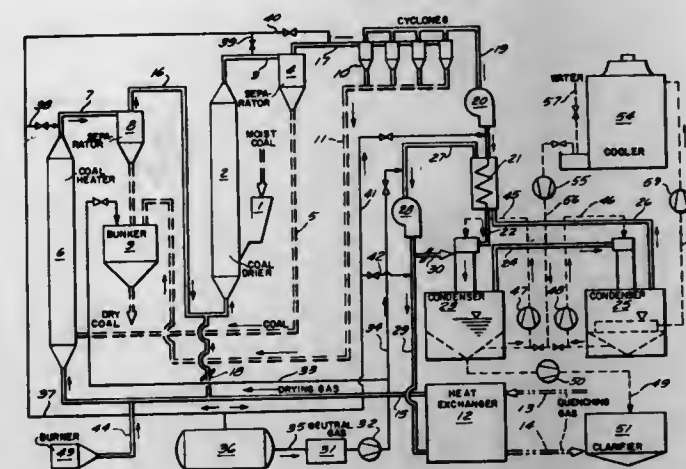
Int. Cl.² C10B 39/02, 47/00

U.S. Cl. 201—13

19 Claims

1. A method of treating coal and coke comprising the steps of: continuously circulating a drying gas in a closed flow circuit past a heating station, a preheating station downstream of said heating station, a drying station downstream of said preheating station, and a condensing station downstream of said drying station and upstream of said heating station; dry

quenching freshly formed coke and imparting heat therefrom to said drying gas at said heating station; directly contacting moist coal with said drying gas at said drying station to at least partially dry said coal and drive water therefrom as water vapor into said drying gas; transporting the dried coal from



said drying station to said preheating station; directly contacting said dried coal at said preheating station with said drying gas to heat said coal; condensing the water vapor in said drying gas at said condensing station thereby removing at least some of said water vapor from said drying gas.

4,053,365

ROTARY CALCINER

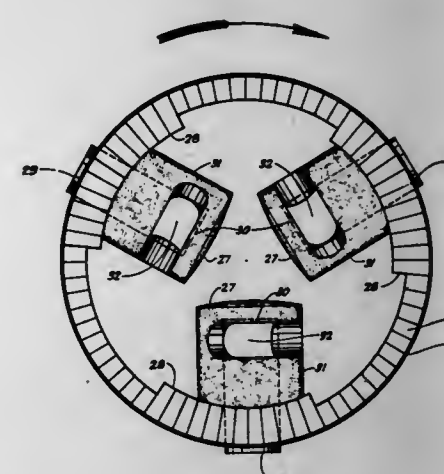
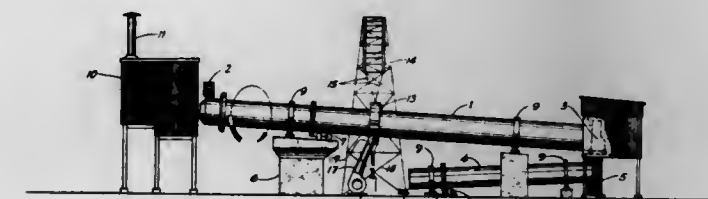
Franklin H. Welter, Port Arthur, Tex., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed Dec. 2, 1975, Ser. No. 637,068

Int. Cl.² C10B 49/06

U.S. Cl. 202—100

2 Claims



1. In a rotary kiln suitable for calcining normally solid carbonaceous material wherein the combustion gases and solid materials to be calcined travel countercurrently in the kiln during calcination, said kiln including, at its lower discharge end, a firing crown equipped with means for admitting combustible gases or liquids and air; a feeding means for such solid carbonaceous material to be calcined adapted to the upper end of the kiln; at least one series of at least two tuyeres passing through the wall of the kiln spaced symmetrically to and at about the middle one-half of the longitudinal axis of the kiln, each tuyere terminating within the kiln through a nozzle which is located on the side of the tuyere at a sufficient height above the bed of

the carbonaceous material being calcined in the kiln to permit the discharge of exterior oxidizing gases passing through the nozzle; at least one shroud which surrounds the kiln in the tuyere area and which is movably mounted with respect to the kiln wall, thereby allowing the kiln but not the shroud to rotate; said tuyeres terminating on the outside of the kiln and within the shroud; and means to cause air or other oxygen-containing gases to flow into the shroud through the tuyeres and into the kiln, the improvement which comprises:

1. locating the nozzle in said tuyeres perpendicular to the radius of the kiln and pointing them at an acute angle from the longitudinal axis of the kiln in substantially the same direction toward the upper end of the kiln in order to direct the oxidizing gases toward said end and to provide a vortex flow pattern for said gases; and
2. means at the junction of each tuyere with the interior surface of the kiln lining to cause forced movement of the carbonaceous material being calcined past the tuyeres as the kiln rotates.

4,053,366

COKE-OVEN PLANTS

Heinz Holter, 39-41 Beisenstrasse, Glaubeck 439, Germany

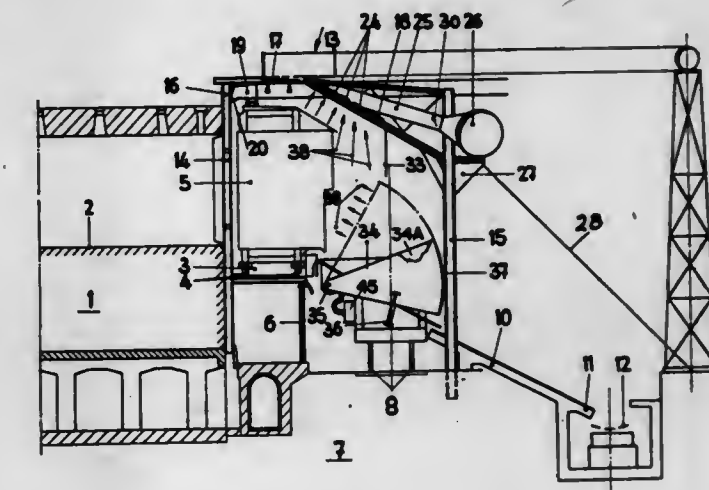
Filed Aug. 20, 1975, Ser. No. 606,171

Claims priority, application Germany, Aug. 21, 1974, 2440014

Int. Cl.² C10B 39/00, 39/04, 39/14

U.S. Cl. 202—227

10 Claims



1. A coke-oven plant comprising:

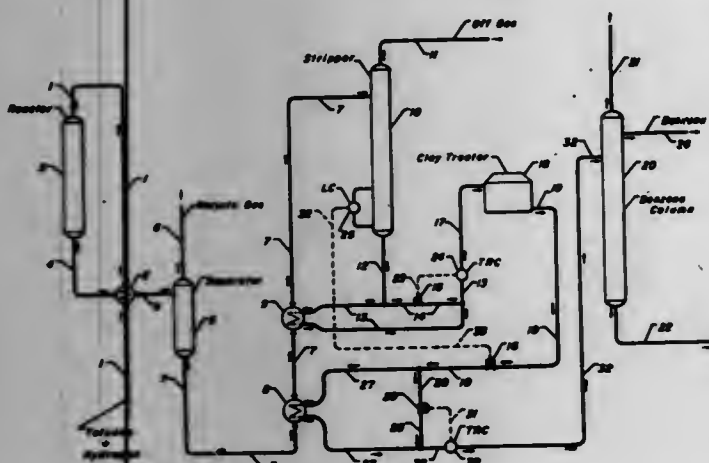
- i. a battery of coke-ovens;
- ii. a quenching truck;
- iii. a trackway along which the quenching truck travels between the coke-ovens and a quenching tower;
- iv. a roof extending lengthwise of the battery from a position above the doors of the coke-ovens to a position above the trackway;
- v. an extractor duct extending lengthwise of the battery and opening into a roof space beneath the roof;
- vi. control means to establish progressive communication between the extractor duct and successive regions of said roof space as the quenching truck passes therebeneath; and
- vii. channelling means to cause fumes emitted from the quenching truck to be directed towards the roof space, said channelling means comprising:
 - a. a deflector apron extending lengthwise of the battery and downwardly from the roof towards the quenching truck trackway; and
 - b. a barrier device mounted on the truck, said barrier device comprising a fume deflector member extending lengthwise of the truck and being mounted for movement towards the coke-ovens from an inoperative to an operative position, and which, when in its operative position, cooperates with the deflector apron to provide, in conjunction therewith, a barrier extending

upwardly from the outer side of the quenching truck to the roof.

4,053,367 TEMPERATURE CONTROL OF INTEGRATED FRACTIONATION AND CLAYTREATING OF HYDROCARBONS

Steve A. Gewartowski, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 717,978, Aug. 26, 1976, Pat. No. 4,024,026. This application Jan. 24, 1977, Ser. No. 762,220
Int. Cl.² B01D 3/42; C07C 7/04, 7/12
U.S. Cl. 203—2

10 Claims



1. A method for controlling the temperature of a fractionation column effluent stream as the effluent stream is being passed into a clay treating zone and of adjusting the temperature of the clay treating zone effluent stream which comprises the steps of:

- passing a hydrocarbon feed stream which comprises C_2-C_5 hydrocarbons into a first fractionation column operated at effective fractionation conditions including a bottom temperature above a maximum desired inlet temperature of a downstream clay treating zone, and effecting the removal of C_2-C_5 hydrocarbons from the hydrocarbon feed stream by fractionation to thereby produce a fractionation column effluent stream having a first temperature which is above an instantaneous preselected inlet temperature for the clay treating zone;
- cooling the fractionation column effluent stream to a second temperature by dividing the fractionation column effluent stream into a first portion and a second portion, cooling the second portion by indirect heat exchange against the hydrocarbon feed stream, and then recombining the first portion and the second portion of the fractionation column effluent stream;
- measuring the second temperature of the fractionation column effluent stream, and comparing the second temperature to the instantaneous preselected inlet temperature for the clay treating zone;
- adjusting the relative flow rates of the first portion and the second portion of the fractionation column effluent stream in a manner which changes the second temperature of the fractionation column effluent stream to the instantaneous preselected inlet temperature for the clay treating zone;
- passing the fractionation column effluent stream through the clay treating zone at clay treating conditions including an inlet temperature within the range of from about 210° F. to about 425° F. to produce a clay treating zone effluent stream having a first temperature;
- cooling the clay treating zone effluent stream to a second temperature by dividing the clay treating zone effluent stream into a first portion and a second portion, cooling the second portion by indirect heat exchange against the hydrocarbon feed stream, and then recombining the first portion and the second portion of the clay treating zone effluent stream;
- measuring the second temperature of the clay treating

zone effluent stream, and comparing the second temperature to the instantaneous preselected inlet temperature of a downstream second fractionation column; and,

- adjusting the relative flow rates of the first portion of the second portion of the clay treating zone effluent stream in a manner which changes the second temperature of the clay treating zone effluent stream to the instantaneous preselected inlet temperature of the second fractionation column.

8. A method for controlling the temperature of a fractionation column effluent stream as the effluent stream is being passed into a clay treating zone and of adjusting the temperature of the hydrocarbon stream being fed to the fractionator column which comprises the steps of:

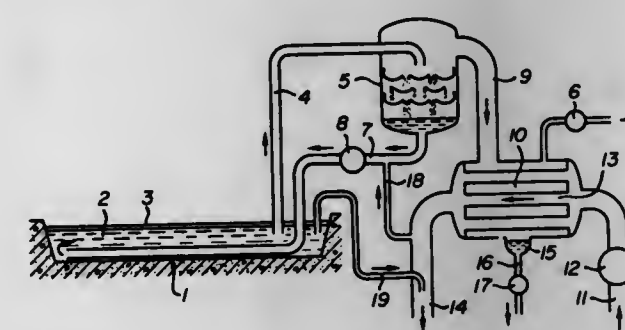
- measuring the existing temperature of a hydrocarbon feed stream which comprises C_2-C_5 hydrocarbons as the hydrocarbon feed stream is being passed into a fractionation column operated at effective fractionation conditions including a bottom temperature above a desired inlet temperature of a downstream clay treating zone, and effecting the removal of C_2-C_5 hydrocarbons from the hydrocarbon feed stream by fractionation to thereby produce a fractionation column effluent stream having a first temperature which is above an instantaneous preselected inlet temperature for the clay treating zone;
- cooling the fractionation column effluent stream to a second temperature by dividing the fractionation column effluent stream into a first portion and a second portion, cooling the second portion by indirect heat exchange against the hydrocarbon feed stream, and then recombining the first portion and the second portion of the fractionation column effluent stream;
- measuring the second temperature of the fractionation column effluent stream, and comparing the second temperature to the instantaneous preselected inlet temperature for the clay treating zone;
- adjusting the relative flow rates of the first portion and the second portion of the fractionation column effluent stream in a manner which changes the second temperature of the fractionation column effluent stream to the instantaneous preselected inlet temperature for the clay treating zone;
- passing the fractionation column effluent stream through the clay treating zone at clay treating conditions including an inlet temperature within the range of from about 210° F. to about 425° F. to produce a clay treating zone effluent stream;
- dividing the clay treating zone effluent stream into a first portion and a second portion, heat exchanging the second portion against the hydrocarbon feed stream and thereby heating the hydrocarbon feed stream, and then recombining the first portion and the second portion of the clay treating zone effluent stream;
- comparing the existing temperature of the hydrocarbon feed stream to a preselected inlet temperature for the hydrocarbon feed stream; and,
- adjusting the relative flow rates of the first portion and the second portion of the clay treating zone effluent stream in a manner which changes the existing temperature of the hydrocarbon feed stream as determined in step (a) to the preselected inlet temperature of the hydrocarbon feed stream entering the fractionation column.

4,053,368
PROCESS FOR THE PURIFICATION OF WATER
Jean-Claude F. Courvoisier, Jean-Lac Ch. Meylan, both of Geneva; Daniel M. Gross, Carouge, all of Switzerland, and Jacques Pierre D. Fournier, Selez, France, assignors to Battelle Memorial Institute, Switzerland
Continuation of Ser. No. 520,941, Nov. 4, 1974, abandoned. This application May 21, 1976, Ser. No. 688,834
Claims priority, application Switzerland, Nov. 7, 1973, 15642/73

Int. Cl.² B01D 3/00, 3/10

U.S. Cl. 203—10

3 Claims

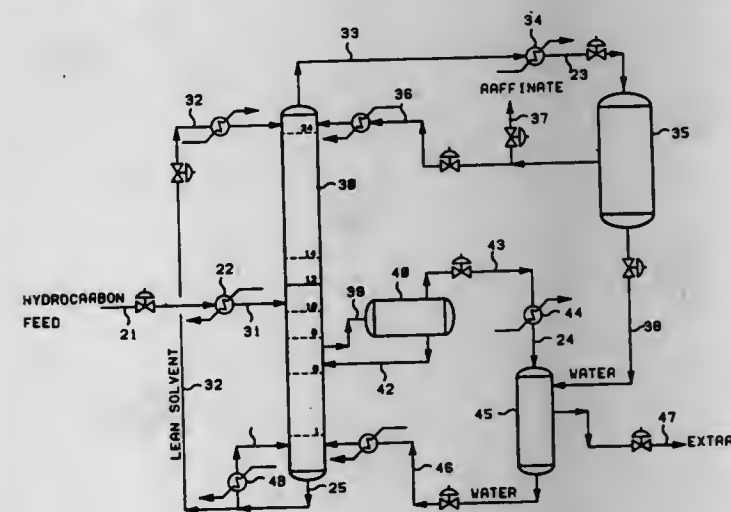


- A process for the purification of water comprising:
 - feeding water onto a solar heat absorbing surface so as to form a sheet of water thereon,
 - feeding a liquid which has a density and vapor pressure less than said water, onto said sheet, so as to form a layer of said liquid on said sheet, which functions at least to transmit solar radiation to said water,
 - preheating said water by direct solar radiation,
 - further preheating said water by reflected solar radiation and forming a still air blanket over said layer with reflection and still air blanket producing means,
 - conducting step (c) and (d) simultaneously, so as to produce preheated water,
 - feeding said preheated water from said sheet to an evaporator means,
 - evaporating at least a portion of said preheated water within said evaporator means, to form water vapor,
 - feeding said water vapor to a condenser means,
 - condensing water vapor so as to recover a purified water product therefrom.

4,053,369
EXTRACTIVE DISTILLATION
Martin R. Cines, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Continuation of Ser. No. 474,498, May 30, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,857
Int. Cl.² B01D 3/34

U.S. Cl. 203—52

21 Claims



- A method of operating an extractive distillation column means at substantially maximum separation efficiencies so as to

separate at least one component from a feedstock comprising an admixture of at least two organic components such that the relative volatilities of said components are sufficiently close as to substantially preclude effective separation by fractional distillation, wherein said extractive distillation column means comprises an upper extractive distillative zone and a contiguous lower stripping zone, which process comprises: feeding said feedstock to said extractive distillative zone of said column means, contacting said feedstock with a lean highly selective solvent in amounts sufficient to provide predetermined ratios of solvent:feedstock effective to substantially change the relative volatilities of said components under extractive distillation conditions, so as to form an overhead vaporous stream of the more volatile of said components and a bottoms stream of the less volatile of said components plus said solvent, separating said bottoms stream into a stream of separated selective solvent and a stream of said less volatile components, recycling said separated selective solvent to said contacting step as said lean highly selective solvent, recycling at least a portion of said stream of less volatile components to the said stripping zone of said column means, to function as stripping vapor therein, condensing at least a portion of said vaporous overhead as a condensed stream, removing the remainder of said overhead as raffinate, and returning at least a portion of said condensed stream as reflux to said extractive distillative zone of said column means in amounts sufficient to provide effective substantially optimum predetermined ratios of reflux:raffinate, such that the said predetermined ratios of solvent:feedstock and reflux:raffinate are effective in combination to provide two immiscible liquid phases only in the upper portion of said extractive distillative zone of said column means, above the point of entry of said feedstock, and to operate said extractive distillation column means at said substantially maximum separation efficiencies, and wherein said two immiscible liquid phases represent a solvent-rich phase and a phase rich in the more volatile feedstock components.

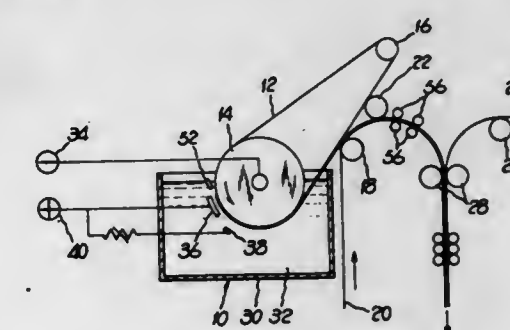
4,053,370 PROCESS FOR THE FABRICATION OF PRINTED CIRCUITS

Keizo Yamashita, Shizuoka; Tatsuo Wada; Yukio Okamura, both of Shimizu, all of Japan, and William H. Safranek, Columbus, Ohio, assignors to Koito Manufacturing Company Limited, Tokyo, Japan
Filed Sept. 13, 1976, Ser. No. 722,479
Claims priority, application Japan, Sept. 18, 1975, 50-113244; Sept. 18, 1975, 50-113245

Int. Cl.² C25D 1/04, 1/20

U.S. Cl. 204—13

8 Claims



- A process for the fabrication of printed circuits which comprises:
 - masking a metal surface with a plating resist so as to leave exposed areas to form a circuit pattern;
 - making said metal surface cathodic in an electrolyte containing copper sulfate, with the copper concentration in

said electrolyte being in the range of from about 1 to 2 moles per liter;

c. forming a high density major layer which is about 90% to about 95% of the desired thickness of the circuit pattern by electroplating said exposed areas at a current density of between about 0.3 to about 3.0 amp/CM² of said metal surface with copper while said metal surface is held opposite to a first insoluble anode in said electrolyte with a predetermined spacing of about 1 to about 10 mm therebetween, said electrolyte being force-fed to flow turbulently at predetermined speed of about 1.5 to 2.5 meters per second at a temperature of about 55° C to about 70° C through the spacing between said metal surface and said first insoluble anode during formation of said major layer;

d. forming a relatively thin, roughened surface layer of from about 5% to about 10% of the desired thickness of the circuit pattern by electroplating the surface of said major layer with copper while said major layer formed on said metal surface is held opposite to a second insoluble anode in said electrolyte, said metal surface being held spaced from said second insoluble anode a distance greater than said predetermined spacing during formation of said roughened surface layer, said electrolyte being caused to flow turbulently through the spacing between said major layer on said metal surface and said second insoluble anode at speed substantially equal to said predetermined speed but slower and at a temperature substantially equal to said temperature during formation of said major surface layer; and

e. attaching the completed circuit pattern to an insulating base by bonding said roughened surface layer thereto.

4,053,371

CELLULAR METAL BY ELECTROLYSIS

Frank E. Towley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 1, 1976, Ser. No. 691,692
Int. Cl.² C25D 1/08, 7/04, 5/54

U.S. Cl. 204—20 28 Claims

1. A cellular metal structure comprising a continuous interconnected network of electrolytically deposited metal defining therebetween a plurality of substantially convex and substantially electrically nonconductive cellular compartments arranged in both closed and open cellular arrays such that the deposited metal interfaces the cellular compartments within the cellular metal structure.

4,053,372

TIN-LEAD ACIDIC PLATING BATH

Thomas Francis Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 9, 1975, Ser. No. 620,981
Int. Cl.² C25D 3/60; C09K 3/00

U.S. Cl. 204—43 S 7 Claims

1. A method for depositing tin-lead alloys from an aqueous electrolyte solution comprising electrolyzing a solution comprising from

Sn metal (as stannous chloride)	7.5-75 g/l
Pb metal (as lead chloride)	1-99% of total Sn and Pb concentration
A thiourea	10-200 g/l
NH ₄ Cl	00-300 g/l
Na ⁺ , or K ⁺ with -H ₂ PO ₂ ·H ₂ O	10-200 g/l
HCl, 36% concentrated	20-500 ml/l

said solution being at a pH from 0.5 to 1.5, said bath being at a temperature from 130° to 200° F and depositing said lead alloy on a cathodic work piece and recovering said work piece.

5. A storage stable solids composition for use to make the electrolyte solution used in the method of claim 1 consisting essentially of tin metal as a stannous salt, lead metal as a lead salt, ammonium chloride, a thiourea, and a hypophosphite

wherein said lead on an elemental basis is from 1 to 99 percent based on the amount of total metal in said composition.

4,053,373

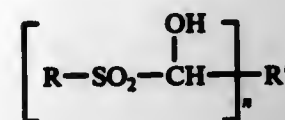
ELECTROPLATING OF NICKEL, COBALT, NICKEL-COBALT, NICKEL-IRON, COBALT-IRON AND NICKEL-IRON-COBALT DEPOSITS

Warren H. McMullen, East Brunswick, and Thomas J. Mooney, Edison, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

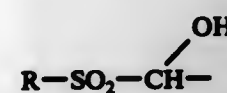
Continuation of Ser. No. 594,214, July 9, 1975, Pat. No. 4,014,759. This application June 17, 1976, Ser. No. 697,032
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.² C25D 3/12, 3/56

U.S. Cl. 204—43 T 22 Claims

12. In a composition for the preparation of an electrodeposit which contains; at least one metal selected from the group consisting of nickel and cobalt or; binary or ternary alloys of the metals selected from nickel, iron, and cobalt; which comprises an aqueous acidic electroplating solution containing at least one member selected from the group consisting of nickel compounds and cobalt compounds and iron compounds providing nickel, cobalt and iron ions for electrodepositing nickel, cobalt, nickel-cobalt alloys, nickel-iron alloys, cobalt-iron alloys or nickel-iron-cobalt alloys and containing at least one additive; the improvement comprising the presence of 2×10^{-5} moles per liter to 0.1 moles per liter of an α -hydroxy sulfone having the formula:



wherein R is selected from the group consisting of alkyl, aralkyl, aryl and alkaryl; R' is hydrogen or a mono or divalent alkyl, aralkyl, aryl, or alkaryl group, or the group



where R is as previously defined; and n is an integer 1 or 2 corresponding to the valence of R'; provided that when n is 2, R' present or absent.

4,053,374

CHROMIUM ELECTROPLATING BATHS

John C. Crowther, Stourbridge, England, assignor to Albright & Wilson Limited, Warley, England

Filed Aug. 25, 1976, Ser. No. 717,765
Claims priority, application United Kingdom, Aug. 27, 1975, 35337/75

Int. Cl.² C25D 3/06 5 Claims

1. An aqueous chromium electroplating bath having a pH between 1.8 and 4.9 consisting essentially of water, from 0.05 moles to saturation of ammonia and a water soluble complex of trivalent chromium with (A) glycolic acid, and (B) 0.1 to 3.5 moles of a halide per mole of chromium, said chromium being present in an amount sufficient to provide 0.5 to 3 moles per liter of trivalent chromium.

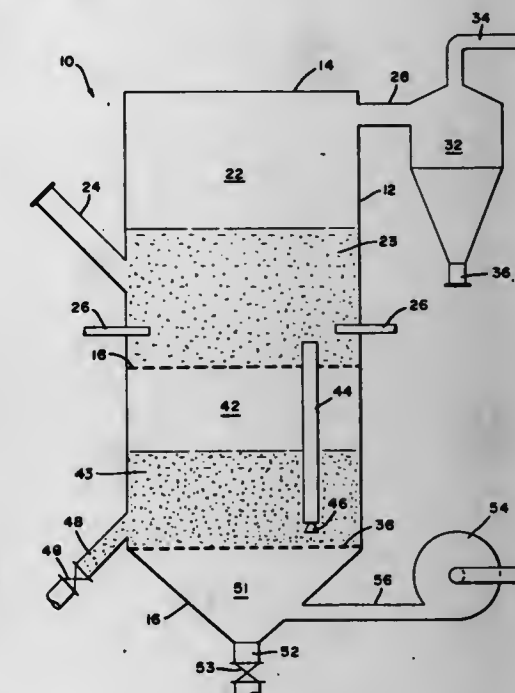
4,053,375

PROCESS FOR RECOVERY OF ALUMINA-CRYOLITE WASTE IN ALUMINUM PRODUCTION

Elliott J. Roberts, Westport; Stanley Bunk, Glenville, and Peter Allen Angevine, Ridgefield, all of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed July 16, 1976, Ser. No. 706,028
Int. Cl.² C25C 3/06

U.S. Cl. 204—67 7 Claims



1. A process for recovering alumina-cryolite waste generated in aluminum pot lines comprising, charging the alumina-cryolite waste containing carbon and organic contaminants into a reaction bed of particulate solids maintained in the fluidized state by an upflowing stream of oxidizing gas, maintaining the temperature of said bed in the range from about 770° to 800° C to promote a combustion reaction and produce at least a small amount of a liquid phase in said bed to promote agglomeration, retaining the alumina-cryolite waste in the fluidized bed until the combustion reaction consumes the carbon and organic contaminants, the alumina-cryolite product agglomerating at temperature in the fluidized bed to pellet form, discharging the product pellets from the fluidized bed and cooling the discharged pellets.

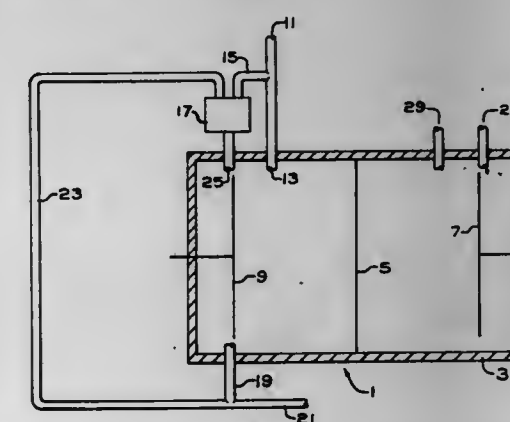
4,053,376

ELECTROLYTIC PRODUCTION OF HYDROGEN IODIDE

William W. Carlin, Portland, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 27, 1976, Ser. No. 735,867
Int. Cl.² C25B 1/22, 1/24

U.S. Cl. 204—103 12 Claims



9. A method of producing hydrogen hydrogen iodide comprising passing an electrical current through an aqueous an-

lyte liquor to an aqueous catholyte liquor which catholyte liquor contains iodine.

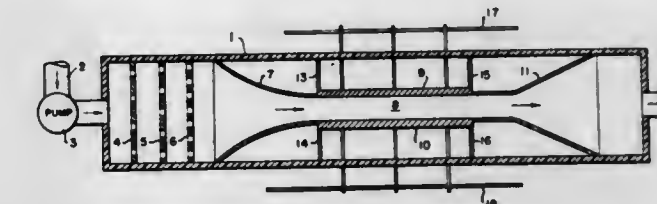
4,053,377

ELECTRODEPOSITION OF COPPER

David Schlain, Greenbelt; Frank X. McCawley, Cheverly, and Gerald R. Smith, Columbia, all of Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 13, 1976, Ser. No. 657,894

Int. Cl.² C25C 1/12, 7/00; C25D 3/38, 17/00
U.S. Cl. 204—106 1 Claim



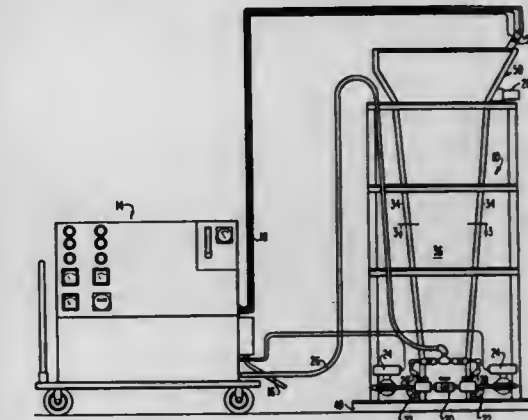
1. A method for electrorefining or electrowinning of copper comprising electrodepositing the copper from an electrolyte consisting essentially of an aqueous solution of copper sulfate and sulfuric acid under conditions comprising cathode and anode current densities of about 60 to 400 amp/sq. ft. and a substantially non-turbulent flow of electrolyte past the electrode surfaces at a rate of about 150 to 400 ft/min, said non-turbulent flow being achieved by means of a venturi section and a single cathode-anode pair.

4,053,378

WATER PURIFICATION METHOD AND APPARATUS
Karl Moeglich, Williamsville, N.Y., and Graham L. Hodgetts, Mars, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 4, 1976, Ser. No. 663,792
Int. Cl.² C02B 1/82; C02C 5/12

U.S. Cl. 204—149 11 Claims



1. A continuous method for agglomerating solids of colloidal size of larger suspended in aqueous media comprising: providing at least a pair of metal electrodes having facing surface areas substantially closely spaced with respect to one another; providing a fluidized bed of conductive, attrition resistant particles between said facing surface areas; causing said media and suspended solids to continuously flow between and past the facing surfaces of said spaced electrodes and through said bed; causing said suspended solids to agglomerate by applying an alternating (AC) voltage at a frequency between about 0.2 Hz and 800 Hz across said electrodes while controlling said AC voltage in relation to the spacing between said electrode surface areas and the conductivity of said media so as to provide an alternating electric current flowing between said electrode surfaces with the value of said

alternating current being between about 0.08 to 6.0 amperes per square inch of electrode surface; and providing fluid-induced agitation of said liquid media so as to create turbulence therein as the same flows through said bed and between and past the spaced facing surfaces of said electrodes whereby the suspending forces of said solids will be broken so that said solids will agglomerate for removal from said media.

4,053,379

STARCH DERIVATIVES

John Francis Fox; Thomas William Roylance, and Angus Campbell Mair, all of Edinburgh, Scotland, assignors to Arbrook, Inc., Arlington, Tex.

Filed Oct. 10, 1975, Ser. No. 621,441

Claims priority, application United Kingdom, June 20, 1975, 46232/75; Oct. 25, 1974, 46232/74

Int. Cl.² B01J 1/10

U.S. Cl. 204—160.1

15 Claims

1. A starch derivative absorbable by body tissues comprising the product of treating an etherified starch with an acid medium of pH 6 or below or with an alkaline medium of pH 8 or above and subjecting the treated material to a temperature of from about 40° to about 100° C for time sufficient to produce a product exhibiting a reducing power of at least 15 R_C units.

4,053,380

1,1,1-TRIHALOGENO-4-METHYLPENTENES, METHOD OF PREPARING THE SAME AND USE OF THE SAME IN THE PREPARATION OF

1,1-DIHALOGENO-4-METHYL-1,3-PENTADIENES

Yoshiji Fujita, Kurashiki; Yoshiaki Omura, Mitsui; Fumio Mori, Kurashiki; Kazuo Ito, Kurashiki; Takashi Nishida, Kurashiki; Yoshio Tamai, Kurashiki; Sukeji Aihara, Kurashiki; Takeo Hasegawa, Kurashiki, and Fumio Wada, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 13, 1976, Ser. No. 676,517

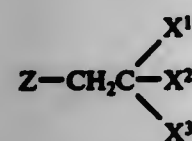
Claims priority, application Japan, Apr. 14, 1975, 50-45068; May 12, 1975, 50-57124; June 16, 1975, 50-72923; June 25, 1975, 50-79561; June 27, 1975, 50-79802

Int. Cl.² B01J 1/10; C07C 21/02

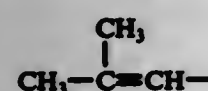
U.S. Cl. 204—163 R

41 Claims

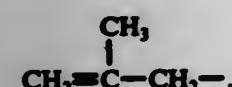
1. A 1,1,1-trihaloeno-4-methylpentene of the formula



wherein X¹, X² and X³ are the same or different and each represents a halogen atom and Z is a group of the formula



or a group of the formula

4,053,381
DEVICE FOR DETERMINING IONIC ACTIVITY OF COMPONENTS OF LIQUID DROPS

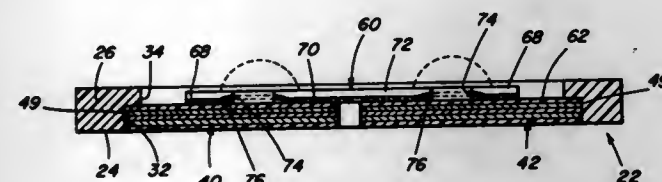
David Phillip Hamblen, Rochester; Clyde Pershing Glover, Pittsford, and Sang Hyung Kim, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1976, Ser. No. 687,725

Int. Cl.² G01N 27/46, 27/58

U.S. Cl. 204—195 M

33 Claims



1. A device useful for determining the activity of ions in a liquid solution, comprising:

a frame capable of being processed by automatic handling devices,

two solid electrodes mounted with respect to said frame, each comprising a first operative layer coated over at least one other operative layer, said layers terminating at edges, means for providing ionic flow between said electrodes upon application of one or more liquid drops, and at each electrode, anti-shorting means for restraining the liquid from simultaneously contacting the edges of both of said layers.

4,053,382

LIQUID JUNCTION OF REFERENCE ELECTRODE
Hiroshi Maruyama, and Masashi Watanabe, both of Kyoto, Japan, assignors to Horiba, Ltd., Japan

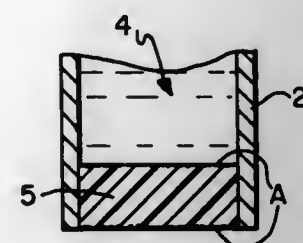
Filed Feb. 6, 1976, Ser. No. 655,975

Claims priority, application Japan, Feb. 25, 1975, 5023621

Int. Cl.² G01N 27/30

U.S. Cl. 204—195 F

5 Claims



1. In a reference electrode comprising an internal electrode, an internal liquid and a liquid junction structure for separating said internal liquid from a liquid sample to be measured, the improvement wherein said junction structure comprises polytetrafluoroethylene having a hydrophilic layer on the liquid junction surfaces thereof.

4,053,383

APPARATUS FOR ELECTRODEPOSITING ALUMINUM
Richard Dötter; Klaus Stüger, both of Nuremberg, and Josef Stadter, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 12, 1976, Ser. No. 713,983

Claims priority, application Germany, Aug. 21, 1975, 2537256

Int. Cl.² C25D 17/06, 17/18

U.S. Cl. 204—225

12 Claims

1. Apparatus for electrodepositing aluminum from an aprotic, oxygen-free and water-free organo-aluminum electrolyte comprising:

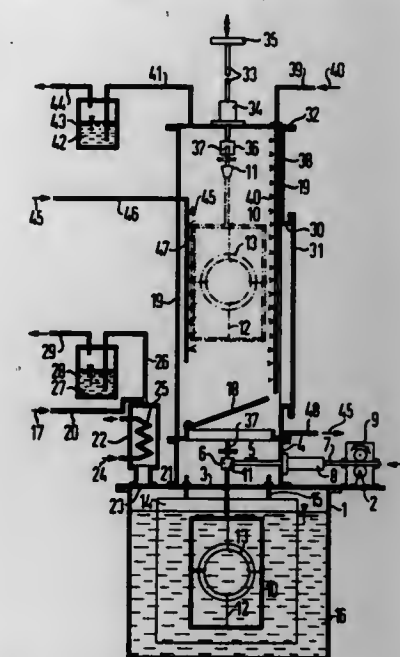
a. an electroplating tank containing the electrolyte having means for closing it off in an airtight manner;

b. means to supply an inert gas to said tank;

c. a contact making and holding device disposed within the electroplating tank and adapted for horizontal or rotatable movement of a work piece holder;

d. a lock chamber disposed above the electroplating tank having a closable lock opening for inserting and removing work pieces to be electroplated;

e. a closable flap coupling said tank and said chamber;



f. an inert gas flooding system for flooding said chamber;

g. a coupling rod arranged in the lock chamber and supported for vertical motion into and out of said electroplating tank for receiving a work piece holder, transferring said holder to the contact making and holding device and reinserting said work piece holder.

4,053,384

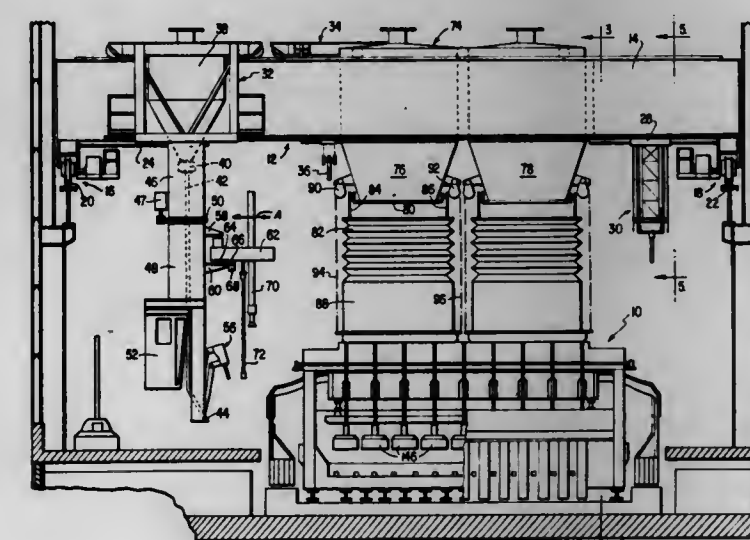
DEVICE FOR CHANGING ANODE BLOCKS, CRUST BREAKING AND CHARGING ALUMINUM FURNACES
Frederik W. Siegmund, Jekerstraat 88 P.O. Box 5018, Utrecht, Netherlands

Filed Oct. 10, 1975, Ser. No. 621,418

Int. Cl.² C22D 3/02, 3/12

U.S. Cl. 204—244

4 Claims



1. In an aluminum making installation having at least one row of electrolysis furnaces and supporting tracks extending along the opposite sides of said row, the combination of:

a pair of trolley means supported on said tracks and movable back and forth therealong, and a bridge structure connected to and bridging between said trolley means sequentially to pass overhead the furnaces of said row, said bridge structure having first rail means disposed along one side thereof and being provided with an elongate, vertical

opening in a region between said trolley means, and second rail means along the opposite sides of said opening; a tool-carrying trolley supported on said first rail means said tool-carrying trolley including a support including upper and lower sections, an operator's cab carried by said lower section, and anode changing means carried by said lower section in full view of said operator's cab, and means for rotating said lower section relative to said upper section; and

a charging hopper assembly supported on said second rail means and including at least one hopper projecting downwardly through said opening and movable back and forth lengthwise of said bridge structure within the confines of said opening so as to be registrable with a particular furnace.

4,053,385

BONDING STABLE MATERIALS TO RESINOUS CELL FRAMES

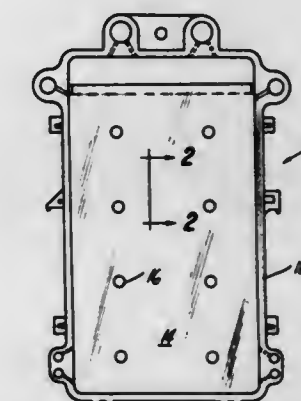
Stanley T. Hirozawa, Birmingham, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 30, 1975, Ser. No. 627,094

Int. Cl.² B01K 3/04

U.S. Cl. 204—254

9 Claims



1. In a bipolar electrolytic filter press cell, said cell having a central frame interposed between the anode and cathode, the central frame being formed from a synthetic resin, the improvement which comprises:

an inert film bonded to the frame with a cyanoacrylate adhesive.

4,053,386

ELECTROLYTIC FILTER FOR ELECTROLYTICALLY FILTERING AND RECOVERING METALS FROM COLLOIDAL SUSPENSIONS

Ferenc J. Schmidt, Ardmore, Pa., assignor to Ametek, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 515,915, Oct. 18, 1974, Pat. No. 4,014,767. This application Aug. 4, 1975, Ser. No. 601,253

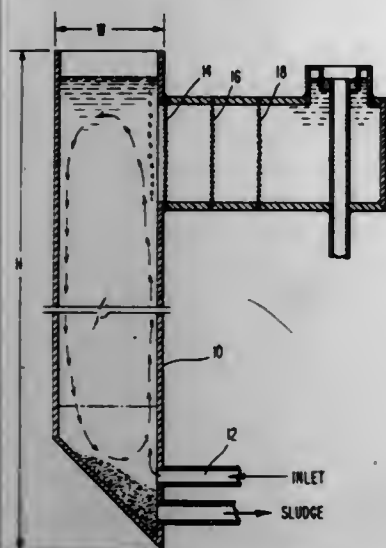
Int. Cl.² B03C 5/00; C25C 7/00, 7/04

U.S. Cl. 204—264

10 Claims

1. An electrolytic filter comprising two electrically conductive vertically disposed sheet porous members, means adapted to cause an electrolytic fluid carrying suspended solids to be separated therefrom, to pass through a first one of said conductive members from an inlet side to an outlet side thereof where the removal of solids is completed on the inlet side thereof, and then through a second one of said conductive members, and means adapted to establish an electrolytic current between said first member, as cathode, and said second member, as anode, through said electrolytic fluid flowing therebetween, said filter adapted to accomplish said removal by the formation of flocs

in the space adjacent said cathode on the inlet side thereof and to facilitate the removal and collection of said flocs by upward



fluid flow parallel to said cathode adjacent its inlet side induced at least in part by electrolytically generated gas thereat.

4,053,387

PROCESS FOR UPGRADING LUBRICATING OIL STOCK
Robert F. Bridger, Hopewell; Costandi A. Andeh, and El-Ahmadi I. Helba, both of Princeton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed June 8, 1976, Ser. No. 693,829
Int. Cl.² C10G 23/02, 34/00

U.S. Cl. 208—88

9 Claims

1. A process for preparing a stabilized lubricating oil resistant to oxidation and sludge formation upon exposure to a highly oxidative environment which comprises a first step of contacting a high boiling hydrocarbon fraction lubricating oil stock with elemental sulfur in the presence of a catalyst material selected from the group consisting of alumina, silica, aluminosilicate, a metal of Groups II-A, II-B, VI-B or VIII of the Periodic Table of Elements, an oxide of a metal of Groups II-A, II-B, VI-B or VIII, a sulfide of a metal of Groups II-A, II-B, VI-B or VIII, clay, silica combined with an oxide of a metal of Groups II-A, III-A, IV-B or V-B and combinations thereof in a flow reactor at a reaction temperature of from about 150° C to about 225° C, a reaction pressure of from about 0 psig to about 500 psig, a liquid hourly space velocity of from about 0.5 hr⁻¹ to about 20 hr⁻¹, said elemental sulfur being added in an amount of about 0.025 to about 0.2 percent by weight of said oil stock, and a second step of contacting the product of the first step with hydrogen in the presence of alumina impregnated with at least about 10 weight percent of MoO₃ and at least about 2.5 weight percent of CoO, said impregnated alumina having at least 50 percent of its pores with a pore diameter of 50 Angstrom Units or more, at a reaction temperature of from about 80° C to about 190° C, a reaction pressure of from about 100 psig to about 300 psig and a liquid hourly space velocity of from about 0.1 hr⁻¹ to about 10 hr⁻¹, said hydrogen in the second step being circulated at from about 100 scf/bbl to about 1500 scf/bbl.

4,053,388

PROCESS FOR PREPARING AROMATICS FROM NAPHTHA

Angus B. Bailey, Dallas, Tex., assignor to Moore-McCormack Energy, Inc., Dallas, Tex.

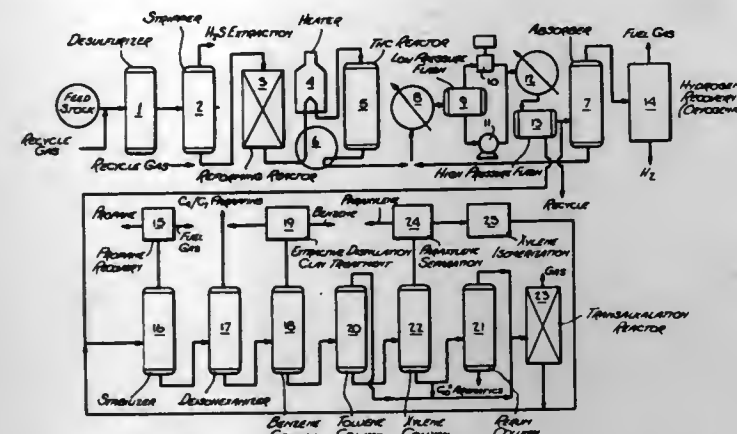
Filed Dec. 6, 1976, Ser. No. 747,863
Int. Cl.² C10G 23/00, 34/00

U.S. Cl. 208—89

15 Claims

1. The process for producing aromatic compounds from naphtha which comprises the steps of
a. desulfurizing the naphtha;
b. catalytically reforming the product stream of step (a) under conditions adapted to produce a substantial amount

of aromatic compounds including a reforming temperature of from about 900° to 100° F and a pressure of from about 125 to 375 psig;
c. thermally hydrocracking the product stream of step (b) at a temperature of from about 1200° to 1380° F and a pressure of from about 125 to 375 psig;
d. separating gaseous hydrogen and lighter hydrocarbons from the product stream of step (c);



e. recycling the hydrogen from step (d) to the feed streams of said desulfurizing, reforming and hydrocracking steps;
f. fractionating the liquid product stream of step (c) to withdraw as products of said process a paraffin stream, a benzene-rich stream, a toluene-rich stream, and a xylene-rich stream.

4,053,389

HYDROCARBON CONVERSION WITH AN ACIDIC MULTI-METALLIC CATALYTIC COMPOSITE

Frederick C. Wilhelm, Ann Arbor, Mich., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 479,231, June 13, 1974, Pat. No. 3,915,846, which is a continuation-in-part of Ser. No. 353,925, April 23, 1973, Pat. No. 3,839,195, which is a continuation-in-part of Ser. No. 152,467, May 28, 1971, abandoned, which is a division of Ser. No. 835,218, June 20, 1969, abandoned. This application Sept. 8, 1975, Ser. No. 611,583

Int. Cl.² B01J 23/62; C10G 35/08

U.S. Cl. 208—139

16 Claims

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.01 to about 2 wt. % rhenium, about 0.1 to about 3.5 wt. % halogen, and lead in an amount sufficient to result in an atomic ratio of lead to platinum or palladium of about 0.05:1 about 0.9:1; wherein the platinum or palladium, rhodium, rhenium, and lead are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium is present in the elemental metallic state; wherein substantially all of the rhenium and rhodium are present in the elemental metallic state; and wherein substantially all of the lead is present in an oxidation state above that of the elemental metal.

4,053,390

START-UP PROCEDURE FOR A RESIDUAL OIL PROCESSING UNIT

Lewis C. James, Ras Tanura, Saudi Arabia, assignor to Cities Service Research and Development Company, Tulsa, Okla.

Filed Dec. 17, 1975, Ser. No. 641,394

Int. Cl.² C10G 13/02, 23/10

U.S. Cl. 208—143

1 Claim

1. In the start-up procedure for an upflow, ebullated bed reactor for the hydroprocessing of heavy hydrocarbon residues, involving charging the reactor with catalyst, heating the

catalyst and reactor with pre-heated hydrogen to an operating range of about 700°–900° F. and about 1000–3000 psig hydrogen partial pressure, adding a light oil and additional hydrogen, with a recycle ebullating pump assisting the hydrogen in forming an expanded, ebullated catalyst bed, with said heating and addition taking a substantial period of time, and then adding heavy hydrocarbon residue, the improvement which comprises

- setting the hydrogen gas flow rate and the ebullating pump rate so as to maintain the expansion of the ebullated bed,
- incrementally substituting heavy hydrocarbon residue for the light oil feed stream until substantially all the light oil is replaced by heavy residue, and
- controlling the viscosity and specific gravity of the incrementally changing feed stream to a range of about $\pm 10\%$ for viscosity and about $\pm 5\%$ for specific gravity, thus maintaining a constant expansion of the ebullated bed, at a constant ebullating pump rate and gas flow rate throughout substitution of the heavy residue for the light oil.

4,053,391
HYDRODESULFURIZATION PROCESS EMPLOYING A GUARD CHAMBER

John Angelo Paraskos, Pittsburgh, and Stephen Joseph Yanik, Valencia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 17, 1975, Ser. No. 632,357

Int. Cl.² C10G 23/02

U.S. Cl. 208—210

6 Claims



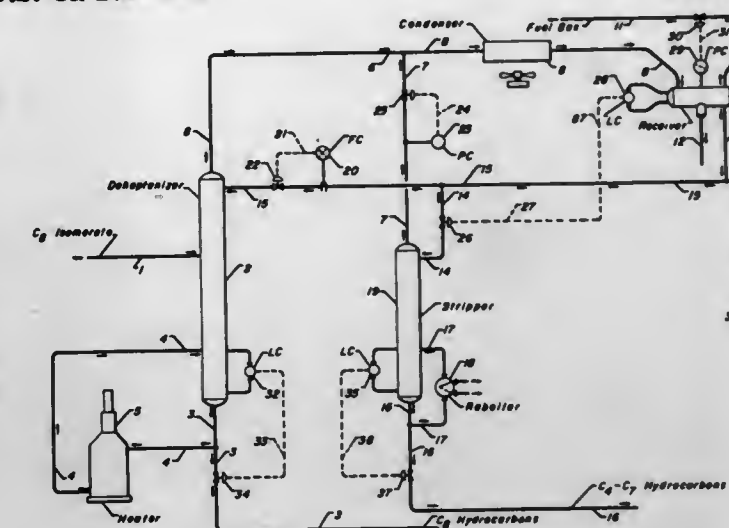
1. A process for hydrodesulfurization of a metal- and sulfur-containing residual oil comprising passing said oil and hydrogen downwardly through both a guard chamber and a reaction zone in series at a temperature in the range of 600° to 900° F. and a hydrogen pressure of 500 to 5,000 psi, said guard chamber and reaction zone each containing a fixed bed of hydrodesulfurization catalyst granules comprising supported Group VI-B and Group VIII metals, terminating the catalyst cycle while the upper portion of the catalyst in the reaction zone has a relatively high level of metals deposits and the lower portion of the catalyst in the reaction zone has a relatively low level of metals deposits, removing deactivated catalyst from the guard chamber, removing the catalyst from said reaction zone by gravity funnel flow through a bottom opening of the reaction zone so that said upper portion of the catalyst is removed before said lower portion and separated therefrom by discharging said upper portion of the catalyst from said process, passing at least a part of said lower portion of catalyst to said guard chamber, inserting fresh catalyst in said reaction zone, and resuming passage of residual oil and hydrogen downwardly through said guard chamber and reaction zones in series.

4,053,392
FRACTIONATION PROCESS
Hong-Kyu Jo, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 12, 1976, Ser. No. 713,940
Int. Cl.² C10G 7/00

U.S. Cl. 208—354

3 Claims



1. A process for fractionating hydrocarbons which comprises the steps of:

- passing a feed stream comprising C₂–C₄ hydrocarbons into an intermediate point of a first fractionation column operated at conditions effective to cause the separation of said feed stream into a first overhead vapor comprising C₂–C₄ hydrocarbons and a first bottoms stream substantially free of C₂ hydrocarbons comprising C₅ and C₆ hydrocarbons, including a superatmospheric pressure and the passage of a reflux stream into the top of said first fractionation column and wherein said first bottoms stream is removed as a product stream from said first fractionation column;
- admixing said first overhead vapor stream with a second overhead vapor stream and passing the resultant admixture through a condensing means, and passing a resultant mixed-phase condensing means effluent stream into an overhead receiver;
- removing an off-gas stream comprising C₁ and C₂ hydrocarbons from said overhead receiver;
- removing an overhead liquid comprising C₃–C₄ hydrocarbons from said overhead receiver, and dividing said overhead liquid into two portions of equal composition;
- passing a first portion of said overhead liquid into said first fractionation column as said reflux stream; and
- passing a second portion of said overhead liquid into an upper portion of a second fractionation column which is operated at conditions effective to cause the separation of said second portion of said overhead liquid into said second overhead vapor stream, which comprises, C₃ hydrocarbons and is substantially free of C₅ or heavier hydrocarbons, and a second bottoms stream comprising C₅ and C₆ hydrocarbons.

4,053,393

CYCLONE ASSEMBLY

Roger W. Day; George S. Ormsby, and Elvis Rich, all of Houston, Tex., assignors to Picenco International, Inc., Houston, Tex.

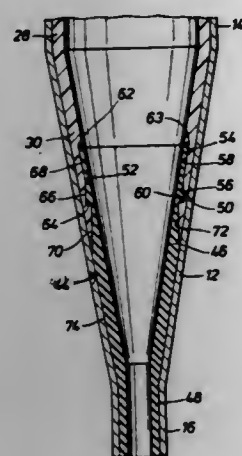
Filed Nov. 19, 1975, Ser. No. 633,405
Int. Cl.² B04C 5/085

U.S. Cl. 209—211

30 Claims

1. A cyclone liner assembly comprising:
a hollow liner body having a generally conical portion;
a tubular insert body having a generally conical portion disposed at least partially within said liner body coaxial

therewith and adjacent the smaller end of the conical portion of said liner body;
said liner body and said insert body having preformed inter-



engageable formations, generally laterally projecting as to one of said bodies and generally laterally receiving as to the other of said bodies, for preventing longitudinal movement of said insert body with respect to said hollow body.

4,053,394

PROCESS FOR SEPARATING AND CONVERTING WASTE INTO USEABLE PRODUCTS

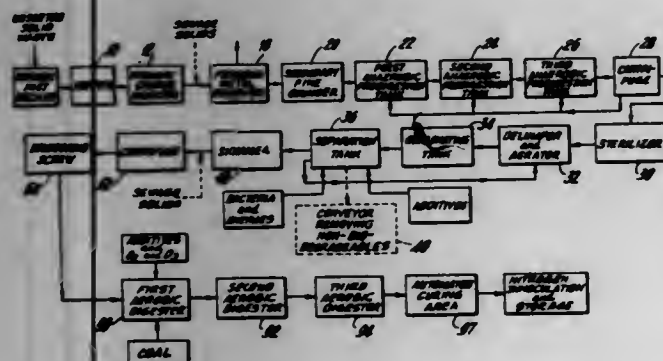
Pitky Flak, Amazon Road & Dale St., Mohegan Lake, N.Y. 10547

Continuation of Ser. No. 462,132, April 18, 1974, abandoned, which is a division of Ser. No. 343,855, March 22, 1973, Pat. No. 3,847,803. This application Apr. 2, 1976, Ser. No. 672,876

Int. Cl.² C02C 1/08; C05F 7/00

U.S. Cl. 210—8

29 Claims



1. A process for converting waste comprising biodegradable and non-biodegradable materials into useable products, comprising the steps of:

- grinding unsorted waste into particulate form;
- anaerobically treating the unsorted waste particles;
- sterilizing the anaerobically treated particles;
- mixing the sterilized particles with an aerobic and enzyme activated liquid to form a slurry;
- inducing the slurry to flow;
- controlling the temperature and pH of the moving slurry to cause fermentation;
- permeating the moving slurry with oxygenating gases to aid in fermentation and in causing the biodegradable material to rise to the surface of the moving slurry and form a froth;
- removing the biodegradable froth from the top of the slurry;
- collecting the non-biodegradable material which settles out;
- adjusting the moisture content of the biodegradable material to approximately 55%;
- separating the biodegradable matter into batches and enclosing the batches in individual vessels;
- aerobically treating the biodegradable matter thus formed

in batches thereby raising the internal temperature thereof;
controlling the environment to stimulate active aerobic bacterial growth in the batches; and
curing the decomposing material so that the carbon to nitrogen ratio becomes established at between about 17/1 and about 22/1.

4,053,395

METHOD FOR PRODUCING METHANE GAS BY PROCESSING WASTE MATERIALS

Harold Switzgale, Freehold, N.J., assignor to Alpha Systems Corporation, Monmouth Junction, N.J.

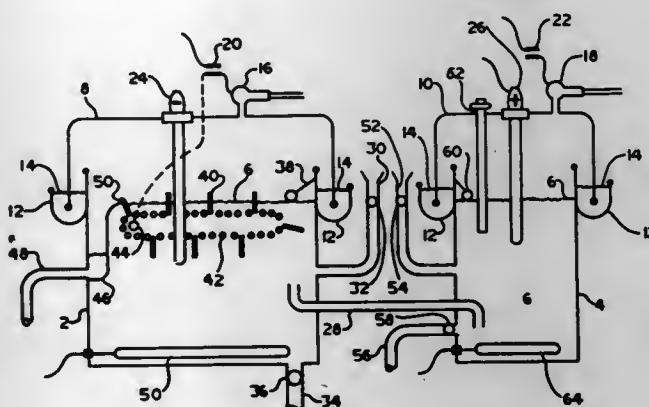
Continuation of Ser. No. 499,751, Aug. 22, 1974, abandoned.

This application May 28, 1976, Ser. No. 691,259

Int. Cl.² C02C 1/14, 1/17, 5/10

U.S. Cl. 210—12

7 Claims



1. A method for producing methane gas by processing waste material consisting essentially of:

- placing organic waste material into a first tank and a second tank, the first tank being interconnected by a conduit with the second tank for limited liquid waste material flow thereto and for full ion flow therebetween, the conduit being of a size small enough with respect to the capacity of the tanks to prevent any substantial flow of slurry between said first tank and said second tank and to prevent the introduction of any substantial amount of oxygen into said first tank and large enough to allow the free passage of ions, the level of liquid waste material being above the interconnecting conduit;
- introducing an anaerobic bacterial inoculant into the first tank to interact with waste material therein;
- introducing an aerobic bacterial inoculant into the second tank to interact with waste material therein;
- positioning a cathode electrode in the first tank, said cathode being the only electrical terminal within said first tank;
- positioning an anode electrode in the second tank to effect an electrolysis reaction with the cathode in the first tank by ion flow through the conduit therebetween, said anode being the only electrical terminal within said second tank;
- applying an electrical current to said electrodes;
- collecting methane produced in the first tank;
- continuously supplying fresh waste material to the first tank;
- continuously transferring waste material which has interacted with the anaerobic bacteria from the first tank to the second tank; and
- continuously removing waste material from the second tank after interaction with aerobic bacteria therein.

4,053,396

CONTROL OF AEROBIC BIOLOGICAL GROWTH IN ACTIVATED CARBON WASTE WATER TREATMENT

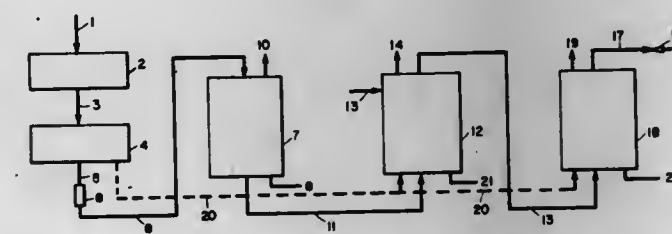
Ronald V. Trense, Metuchen; Allen Clamen, Westfield, and John M. Fernbacher, Madison, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 454,278, March 25, 1974, abandoned, which is a continuation of Ser. No. 267,231, June 28, 1972, abandoned. This application Jan. 20, 1975, Ser. No. 542,588

Int. Cl.² C02C 1/04, 5/04

U.S. Cl. 210—17

27 Claims



1. In a process for removing suspended solids and dissolved organic contaminants from waste water having a COD of from about 100 to 2000 milligrams per liter and derived from the group consisting of petroleum refining, chemical manufacturing waste or mixtures thereof, wherein the waste water is pretreated to remove suspended solids therefrom and thereafter contacted with at least one bed of activated carbon to remove dissolved organic contaminants from the pretreated waste water, the improvement which comprises suppressing the evolution of hydrogen sulfide from the bed of activated carbon and minimizing the production of sludge in the bed due to biological oxidation by dissolving oxygen in the waste water in an amount in the range of from about 0.09 to about 0.15 pound of oxygen consumed per pound of total COD contaminants removed from the waste water in said bed of activated carbon prior to said waste water contacting at least one bed of activated carbon.

4,053,397

METHOD OF RECOVERING BACKWASH LIQUID WITH EXHAUSTED RESIN

George C. Flynn, Somerville, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.

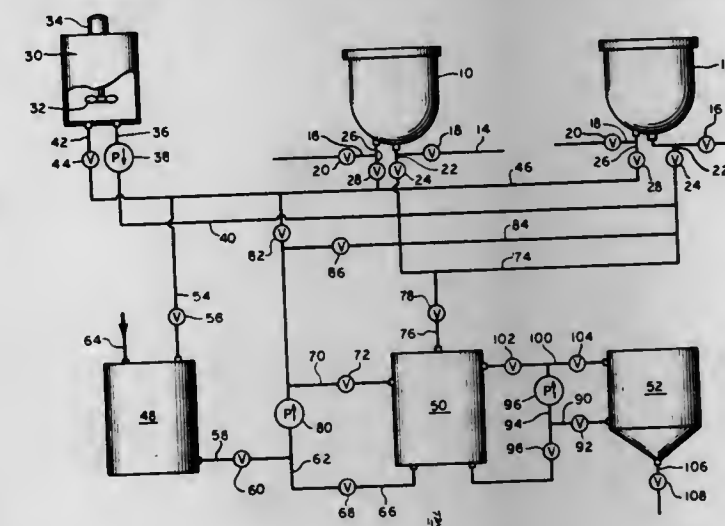
Continuation of Ser. No. 535,563, Dec. 23, 1974, abandoned.

This application Mar. 10, 1976, Ser. No. 665,457

Int. Cl.² B01D 15/00

U.S. Cl. 210—34

9 Claims



1. A method for recovering and reusing backwash liquid contaminated with dissolved and undissolved impurities and which is used to backwash a filter at the end of a service cycle, said filter being precoated with ion exchange resin particles in the size range of 60-400 mesh, comprising:
separating a major first portion of the undissolved impurities from a backwash liquid that has been used to backwash a

filter in a previous backwash cycle so that a smaller second portion of the undissolved impurities remains with said liquid;
placing the remaining second portion of said undissolved impurities in suspension in said liquid from which the major first portion of the undissolved impurities has been separated;
delivering said liquid containing the remaining second portion of said undissolved impurities which has been placed in suspension through said precoated filter at the end of a service cycle of said precoated filter to remove said dissolved impurities and the remaining second portion of said undissolved impurities;
backwashing said filter with said liquid from which dissolved and undissolved impurities have been removed; and
storing said liquid for use in a later backwash operation.

4,053,398

METHOD AND APPARATUS FOR WATER REMOVAL FROM OIL IN SUBMERSIBLE MOTOR ENVIRONMENT

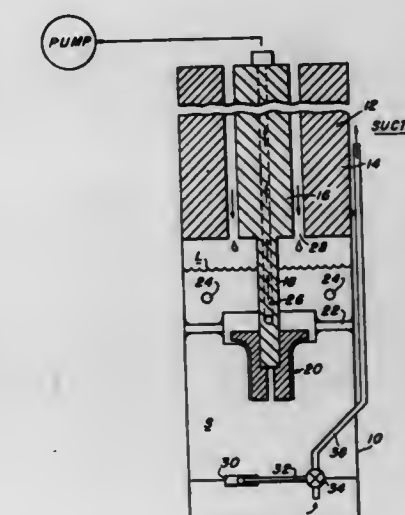
Harry J. Venema, Wheaton, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 26, 1976, Ser. No. 662,191

Int. Cl.² B01D 15/00

U.S. Cl. 210—41

6 Claims



1. A method for removing water which leaks into the housing of a submersible electric motor and into the lubricating oil in said housing in which said motor operates, said lubricating oil having a water-absorbing material dispersed therein which absorbs water in said oil, the steps comprising:
heating said oil and said water-absorbing material at a location in said housing removed from said motor to a temperature sufficient to free absorbed water from said water-absorbing material to this produce free water which because of its density flows to a collection zone in said housing adjacent to the heating location; and thereafter removing the collected free water from said collection zone to a zone outside said housing.

4,053,399

METHOD AND SYSTEM FOR WASTE TREATMENT

Lawrence A. Donnelly, Centerport; Leland C. Flocke, Elmhurst; Victor H. Himmel, Port Washington; John J. Mikala; Alfred E. Munier, both of Huntington, and Lawrence Slotz, Great Neck, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,130

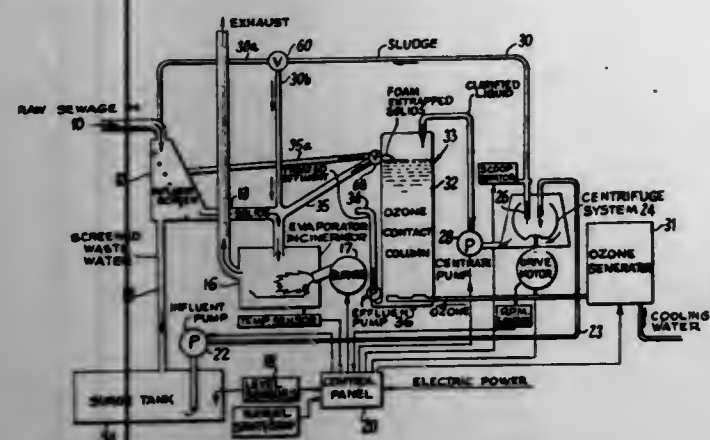
Int. Cl.² C02C 5/06; C02B 1/38

U.S. Cl. 210—44

20 Claims

1. A method for treating raw sewage comprising the steps of:
a. screening influent sewage to divide the influent sewage into solid waste matter and screened waste fluid;

- b. incinerating the solid waste matter;
c. centrifuging the screened waste fluid to divide the screened waste fluid into sludge and clarified liquid;
d. incinerating the sludge;



- e. passing ozone bubbles through the clarified liquid to divide the clarified liquid into foam entrapped solids, solids adhering to ozone bubbles, and disinfected liquid;
f. incinerating the foam entrapped solids and solids adhering to ozone bubbles; and
g. removing the disinfected liquid.

4,053,400

PURIFICATION OF NICKEL AND COBALT ELECTROPLATING SOLUTIONS

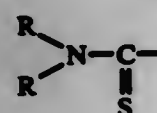
Reuben Mariner, Englewood Cliffs, and Salvatore Lucca, Paramus, both of N.J., assignors to The Metalux Corporation, Paterson, N.J.

Filed Sept. 20, 1973, Ser. No. 398,992
Int. Cl.² C25D 3/12; B01D 9/00

U.S. Cl. 204-49

2 Claims

1. In the process wherein a metal selected from nickel and cobalt is electrodeposited from an aqueous acidic solution containing ions thereof, wherein said solution is at least periodically fed through a filtration chamber to remove impurities therefrom, and wherein, during use, metallic impurities selected from the group consisting of zinc, copper and iron build up in solution; the improvement in said process wherein there is added to the solution in amounts sufficient to precipitate the metallic impurities, whereby the metallic impurities are filtered out of said solution, an organic compound having the general formula $\text{R}-\text{N}=\text{C}-\text{S}$, wherein R represents the radical



in which R is a group selected from methyl, ethyl and butyl, S is sulphur, and X is one of the following: $-\text{H}$, $-\text{Na}$, $-\text{K}$, $-\text{Li}$, $-\text{a}$ as defined hereabove, $-\text{S}-\text{H}$, $-\text{S}-\text{S}-\text{H}$, $-\text{S}-\text{S}-\text{H}$, $-\text{S}-\text{Na}$, $-\text{S}-\text{S}-\text{Na}$, $-\text{S}-\text{S}-\text{Na}$, $-\text{S}-\text{K}$, $-\text{S}-\text{S}-\text{K}$, $-\text{S}-\text{S}-\text{K}$, $-\text{S}-\text{Li}$, $-\text{S}-\text{S}-\text{Li}$, $-\text{S}-\text{S}-\text{Li}$, $-\text{S}-\text{a}$, $-\text{S}-\text{S}-\text{a}$, $-\text{S}-\text{S}-\text{a}$, and $-\text{Co}-\text{S}-\text{a}$.

4,053,401

SLUDGE TREATING PROCESS

Fumiki Furukawa, Oofjho; Tazuka Sagita, Tokyo; Kohel Kobayashi, Tokyo; Hiroshi Asada, Tokyo, and Arata Onishi, Chofu, all of Japan, assignors to Nichireki Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1975, Ser. No. 635,493
Claims priority, application Japan, Nov. 29, 1974, 49-136296
Int. Cl.² C02C 5/02

U.S. Cl. 210-52

16 Claims

1. A process for treating sludges containing mercury, cadmium, lead or arsenic as poisonous pollutants, which comprises

adding to the sludges a bituminous emulsion and dodecyl mercaptan, thereby to coagulate and solidify the sludges.

15. A process for treating sludges containing mercury as a poisonous pollutant, which comprises adding to the sludges a bituminous emulsion and colloidal sulfur, thereby to coagulate and solidify the sludges.

4,053,402

PROCESS FOR PRODUCING SULFONES

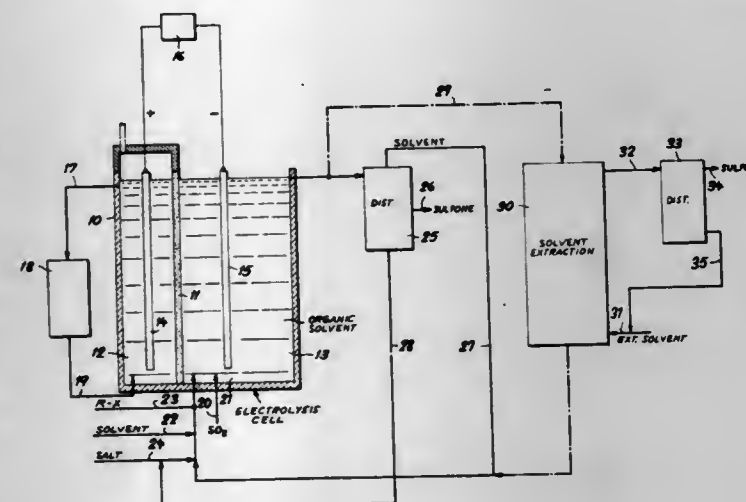
Bertel Kastening, and Dierk Knittel, both of Hamburg, Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Germany

Continuation-in-part of Ser. No. 474,167, May 29, 1974, Pat. No. 3,980,535. This application Jan. 9, 1976, Ser. No. 647,812
Claims priority, application Germany, Jan. 10, 1975, 2500727

Int. Cl.² C25B 3/04

U.S. Cl. 204-59 R

6 Claims



1. A process for producing a sulfone which comprises the steps of:

- a. introducing into the cathode compartment of an electrolysis cell subdivided into an anode compartment and a cathode compartment a reaction system comprising an aprotic organic solvent, a conductivity-promoting salt soluble in said solvent and, which salt releases halogen ions, said salt being selected from the group which consists of tetraalkylammoniumhalogenide, tetraalkylphosphoniumhalogenide, tetraarylammoniumhalogenide and tetraarylphosphoniumhalogenide wherein the halogen is chlorine, bromine or iodine, sulfur dioxide, and an organic ester selected from the group consisting of a sulfonic acid ester, a sulfuric acid ester or an ester of another oxygen-containing acid capable of reacting with the halogen ions released by said salt; and
b. electrolyzing said reaction system at a current density, temperature and voltage sufficient to transform said sulfur dioxide into SO_2^- ions and react said ester to produce the corresponding organosulfone in said cathode compartment, said organosulfone being separable from the solvent.

4,053,403

METHOD OF TREATING AND DEGERMINATING BATH WATER, PARTICULARLY BATH WATER CONTAMINATED BY THE GERM BACT. PSEUDOMONAS PYOCANEA, IN MEDICAL TUB-BATHS AND UNDERWATER MASSAGE BATHS

Bruno Bachhofer, Sanktstrasse 85, 7981 Bavendorf; Anton Locher, Bergstrasse 6, 7981 Torkeweiler; Gerhard Skirde, Trelder Dorfstrasse, 2110 Buchholz-Treide, and Hansjörg Quistorff, Babendiekrasse 17, 2000 Hamburg-Blankenese, all of Germany

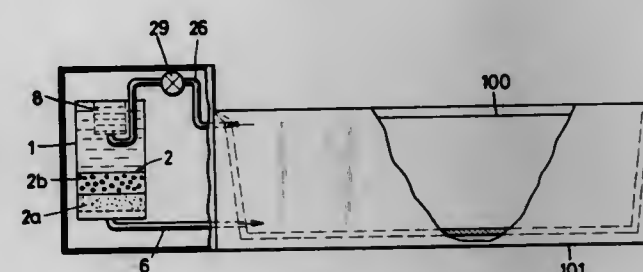
Filed Mar. 12, 1976, Ser. No. 666,485

Claims priority, application Germany, Mar. 15, 1975, 2511499; Feb. 20, 1976, 2606838

Int. Cl.² C02B 1/38; C02C 5/02

U.S. Cl. 210-62

1 Claim



1. A process for purifying bath water containing the organism bact. pseudomonas pyocanea comprising charging the water to be purified with ozone produced by an ozone generator and then filtering the ozone containing bath water with a first filter layer of fine grain activated charcoal and then filtering the thus filtered water with a second filter of a mixture of filter gravel and mineralized charcoal, both the first and second filters having been charged with bromine or hydrobromic acid, said bath water, before purification, being used as a coolant for said ozone generator.

4,053,404

HEAT EXCHANGE METHOD FOR WET OXIDATION SYSTEMS

James W. Van Kirk, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

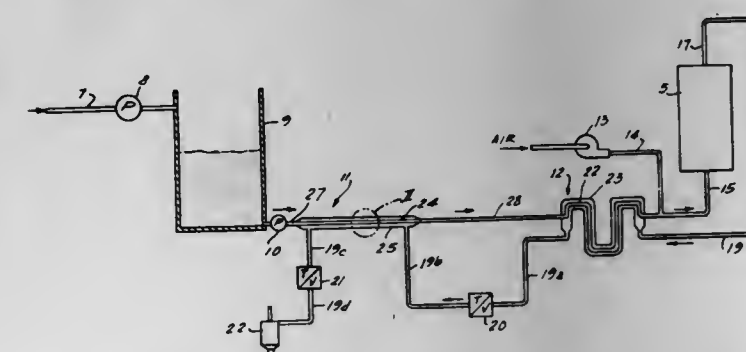
Continuation of Ser. No. 590,274, June 25, 1975, abandoned.

This application Jan. 10, 1977, Ser. No. 758,198

Int. Cl.² C02B 1/34, 3/08, 1/02

U.S. Cl. 210-63 R

2 Claims



1. A method of treating organic waste sewage by continuous wet oxidation process, the method comprising: treating the sewage in the presence of heat at a temperature of about 550°-560° F in a reactor; passing waste sewage as influent to said reactor from a pump in series through a first heat exchanger and downstream from said first heat exchanger through a second heat exchanger and then through an inlet into said reactor; conducting treated liquid from said reactor as hot effluent through said second heat exchanger and then through a throttling device and thence to and through said first heat exchanger and from the first heat exchanger to a disposal point; maintaining pressure of the effluent upstream from the throttling device and thereby the pressure in said second heat exchanger at about 1500 to 1600 psi and temperature of about 560° F; and controlling the pressure downstream from the throttling device and in said first heat exchanger to be no greater than about 500 psi and temperature up to 400° F; whereby the influent waste sewage in travelling from said pump to said reactor is preheated by heat from the effluent liquid in two stages, comprising a first stage in said first heat exchanger and in which said effluent is at a lower pressure and temperature than in a second stage in said second heat exchanger in which said effluent is at higher pressure and temperature than the pressure and temperature in said first heat exchanger.

whereby the influent waste sewage in travelling from said pump to said reactor is preheated by heat from the effluent liquid in two stages, comprising a first stage in said first heat exchanger and in which said effluent is at a lower pressure and temperature than in a second stage in said second heat exchanger in which said effluent is at higher pressure and temperature than the pressure and temperature in said first heat exchanger.

whereby the influent waste sewage in travelling from said pump to said reactor is preheated by heat from the effluent liquid in two stages, comprising a first stage in said first heat exchanger and in which said effluent is at a lower pressure and temperature than in a second stage in said second heat exchanger in which said effluent is at higher pressure and temperature than the pressure and temperature in said first heat exchanger.

4,053,405

WARNING DEVICE AND METHOD FOR FUEL FILTERING SYSTEMS

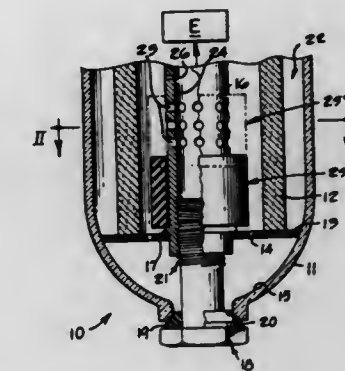
Richard A. DeKeyser, Edelstein, and John H. Parks, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 25, 1976, Ser. No. 699,756

Int. Cl.² B01D 37/00; C02B 3/02

U.S. Cl. 210-65

20 Claims



1. A fuel filtering system for filtering water contaminated fuel in an operator controlled engine comprising a case having an inlet passage and an outlet passage, a filter disposed in said case to communicate said fuel from said inlet passage to said outlet passage, reservoir means within said case for containing water which separates from said fuel, and means responsive to an increasing water level in said reservoir means, said means functioning to progressively decrease flow of said fuel through said outlet passage to a minimum flow range, said minimum flow range functioning to be sufficient to continue operation of said engine while also being effective to alert said operator of said increasing water level.

17. A method for alerting an operator of a vehicle that a fuel filtering system of an internal combustion engine thereof is contaminated with water, said filtering system comprising an inlet passage, reservoir means, and a filter for communicating fuel to an outlet passage during normal engine operation, comprising the step of progressively decreasing flow of said fuel from said inlet passage to said outlet passage and to said engine to some minimum flow range in response to the increasing level of accumulated water in said reservoir means, said minimum flow range functioning to be sufficient to continue operation of said engine in an idle or partial condition of operation sufficient to alert said operator of said increasing water level.

4,053,406

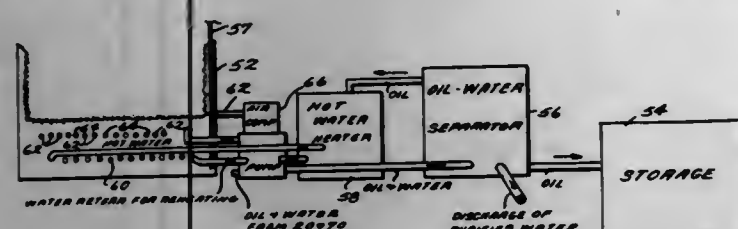
APPARATUS AND METHOD FOR RECOVERING OIL FROM ICY WATERS

Paul C. Desautels, Richard P. Voelker, Everett J. Lecourt, and Lawrence A. Schultz, all of Columbia, Md., assignors to Arctic, Incorporated, Columbia, Md.

Filed Sept. 9, 1975, Ser. No. 611,689
Int. Cl.² E02B 15/04

U.S. Cl. 210-71

46 Claims



1. A method for cleaning-up an oil spill from a body of water containing oil-contaminated ice and floating oil, comprising:
 - a. providing a floating platform with a fore section and an aft section at opposite ends of a midship section, including a conveyor for loading oil-contaminated ice slabs onto the fore section, conveying these slabs along the midships section and then off of the floating platform at the aft section, wherein the floating platform includes:
 - i. a plurality of cutting devices in the fore section, which are mounted to cuttily engage the oil-contaminated ice which is about to be loaded onto the conveyor, for reducing into slabs the oil-contaminated ice in the path of said floating platform,
 - ii. a first collector, in the fore section, for collecting floating oil from the body of water in the path of said floating platform as the ice slabs are loaded onto the floating platform therefrom;
 - iii. an oil removing station, in the midship section, with a cleaning device disposed adjacent the conveyor, for cleaning the ice slabs being conveyed therepast; and
 - iv. a second collector, in the midship section, for collecting oil draining from and being cleaned from the ice slabs being conveyed along the midship section;
 - b. moving said floating platform along said path while operating the cutting devices, conveyor and oil removing station, to reduce oil-contaminated ice in the path of the vessel into slabs, convey those slabs onto the fore section of the floating platform, clean the slabs in the oil removing station, collect oil draining from and cleaned from the ice into the collector, and conveying the thus-cleaned ice off the aft section of the floating platform.

4,053,407

METHOD FOR DISTRIBUTING A SLUDGE TO BE FILTERED OVER THE UPPER SURFACE OF THE FILTER CLOTH OF A ROTATING BELT FILTER

Rolf Gunnar Jönas Nordengren, Landakrona, Sweden, assignor to Nordengren Patent AB, Landakrona, Sweden

Filed Sept. 7, 1976, Ser. No. 720,718

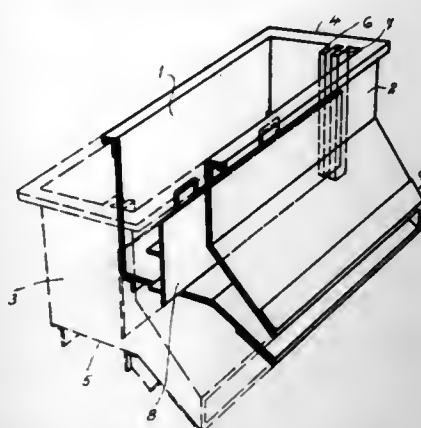
Claims priority, application Sweden, Sept. 5, 1975, 7509896
Int. Cl.² C02B 1/22

U.S. Cl. 210-74

1 Claim

1. In the known method of filtering a sludge which is composed of calcium sulfate as the solid component and phosphoric acid as the liquid component, which method includes transporting a sludge to a point near an endless belt filter, depositing said sludge on said endless belt filter, and filtering at least a portion of the liquid away from said sludge while it is on said endless belt filter, the improvement which comprises:
 - a. introducing said sludge into a sludge receiving zone,
 - b. dividing said sludge into two separate streams in said sludge receiving zone so that one of said two separate streams contains a higher percentage of solids than the other of said two separate streams,

- c. uniting said two separate streams so as to obtain a united sludge stream of substantially uniform solids content, and



- d. discharging said united sludge stream on an endless belt filter.

4,053,408

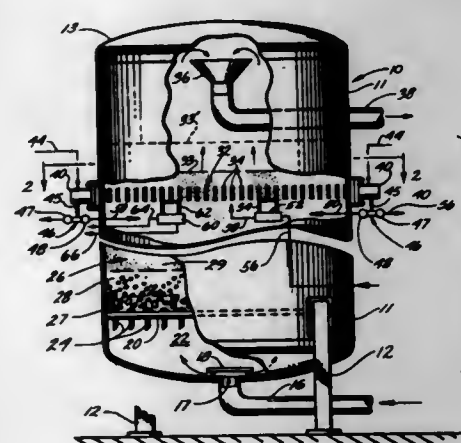
METHOD OF UPFLOW LIQUID TREATMENT

Theodore H. O'Cheakey, Whittier, Calif., assignor to U.S. Filter Corporation, Whittier, Calif.

Filed May 2, 1974, Ser. No. 466,289
Int. Cl.² B01D 25/06

U.S. Cl. 210-79

3 Claims



1. The method of removing material from a liquid comprising the steps of
 - flowing liquid up through a bed of granular solids which remove the material from the liquid,
 - holding the bed of granular solids static with a grate in contact with the solids until the solids are loaded with material removed from the liquid,
 - flowing liquid up through the bed at rate sufficient to cause the bed to fluidize and expand above the grate, whereby at least a portion of the material loaded in the bed while it was static is removed,
 - decreasing the flow of liquid up through the expanded bed to a rate which permits granular solids to settle,
 - vibrating the grate and the solids as they settle to facilitate passage of solids down through the grate and increase the packing density of the solids in the bed below the grate, and
 - thereafter flowing additional liquid up through the static bed to remove material from the additional liquid.

4,053,409

REMOVABLE FILTER ASSEMBLY WITH BYPASS VALVE

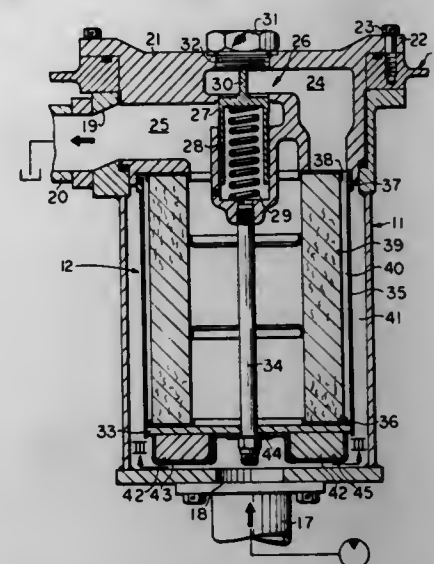
Alvin L. Kahfuss, Jr., Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 562,383, March 26, 1975, abandoned.
This application May 27, 1976, Ser. No. 690,467

Int. Cl.² B01D 29/04

U.S. Cl. 210-130

12 Claims



1. A removable filter assembly detachably mounted on and disposed within a stationary housing for removal as a unit therefrom, said housing having means defining an inlet at a lower end thereof and an outlet at an upper end thereof, said filter assembly comprising
 - a cover detachably mounted on said housing,
 - a support member attached to said cover in axially spaced relationship therefrom,
 - a tubular screen disposed fully axially between and in sealing contact with said cover and said support member and further disposed radially inwardly from said housing to define an annular chamber therebetween communicating directly with said inlet,
 - a tubular filter disposed within said screen to be substantially co-extensive axially therewith and positioned radially inwardly therefrom to define an annular passage therebetween which is isolated from said chamber totally by said screen, and
 - bypass valve means mounted on the upper end of said housing, closely adjacent to said outlet, and movable between a closed position for sequentially communicating fluid from said inlet (1) into said chamber, (2) through the entirety of said screen, (3) into said passage, (4) radially inwardly through said filter, and (5) into said outlet and an open position sequentially communicating said fluid from said inlet (1) into said chamber, (2) through the entirety of said screen, (3) into said passage, (4) through said bypass valve means and (5) into said outlet directly when the pressure of fluid in said chamber exceeds a predetermined level.

11. In a filter assembly of the type comprising a cover detachably mounted on a stationary support, a tubular filter, first passage means for normally communicating fluid from an inlet to said filter assembly, through said filter and to an outlet thereof and bypass valve means for bypassing said filter to communicate said fluid from said inlet, through second passage means to said outlet directly, the invention wherein said cover completely covers one end of said filter and said bypass valve means is solely mounted in said cover and a bolt threadably mounted in an aperture formed through said cover for solely exposing said bypass valve means for permitting removal thereof from said cover, said bypass valve means comprising a spool reciprocally mounted in a bore defined in said cover, spring means disposed between said cover and said spool for normally urging said spool upwardly towards said bolt and to a closed position and stop means formed on an upper closed

end of said spool normally engaging said bolt to position said spool at its closed position.

4,053,410

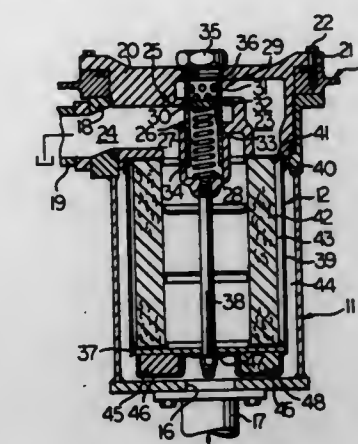
FILTER ASSEMBLY WITH MODULATING BYPASS VALVE

Larry W. Lorimer, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 10, 1975, Ser. No. 612,157
Int. Cl.² B01D 29/04

U.S. Cl. 210-132

15 Claims



1. In a filter assembly of the type comprising a housing having an inlet and an outlet, a filter mounted in said housing and bypass valve means movable between a closed position for sequentially permitting communication of fluid from said inlet, through said filter and to said outlet and an open position for sequentially communicating fluid from said inlet, through a port of said bypass valve means and to said outlet, the improvement wherein said bypass valve means comprises a reciprocally mounted spool and pressure modulating means secured to said spool, comprising a tubular extension formed on an upper end of said spool having a plurality of metering orifices formed therethrough and continuously exposed to fluid from said inlets, for simultaneous movement therewith for modulating the pressure of said fluid through said bypass valve means upon opening thereof by metering fluid directly through said orifices, through said port and to said outlet to control variable differential fluid pressures prevalent on downstream and upstream sides thereof.

4,053,411

AUTOMATIC CENTRIFUGE SAFETY LATCH SYSTEM

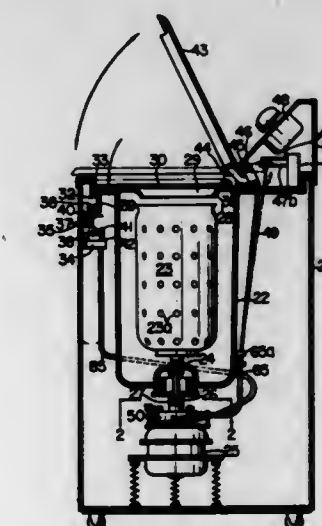
Tadashi Kawamura, Nagoya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed July 7, 1976, Ser. No. 703,246

Claims priority, application Japan, July 10, 1975, 50-84873;
Dec. 15, 1975, 50-169692[U]; Mar. 10, 1976, 51-28480[U]
Int. Cl.² B01D 45/12

U.S. Cl. 210-146

12 Claims



1. A centrifugal dehydrator comprising: an outer casing having an opening,

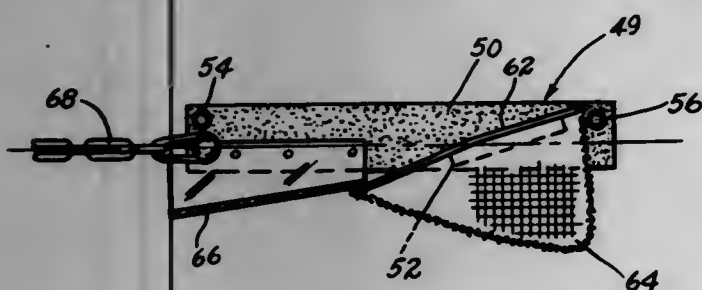
a spin basket facing said opening and rotatably disposed within said outer casing,
a driving motor having a driving shaft connected to said spin basket for rotating said spin basket,
switch means for connecting and disconnecting an electrical supply to said motor,
an inner lid for said outer casing opening for opening and closing said opening,
an outer lid for said outer casing opening for opening and closing said opening outside said inner lid,
a movable member mounted about said shaft for movement between an original and displaced position,
brake means including a first portion mounted on said shaft for rotation therewith and a second portion pivotably mounted on said member for movement between a braking position engaging said first portion and a release position,
means connecting said second portion to said outer lid for causing said second portion to move to said braking position when said outer lid is opened and to move to said release position when said outer lid is closed, the force produced by the shaft rotation and resultant engagement of said first and second portions urging said member to said displaced position is less than a given value,
lock means mounted for movement between a locking position engaging said inner door for preventing opening said inner door and a release position, and
means connecting said member to said lock means for causing said lock means to move to said locking position when said member is in said displaced position and to move to said release position when said member is in said original position,
means for urging said member toward said original position with a force greater than said given value, and
means for connecting said switch means to said outer lid for causing said switch means to disconnect when said outer lid is opened and connect when said outer lid is closed.

4,053,412

COLLECTING DEVICE FOR A SWIMMING POOL
William Stix, 4437 Pershing, St. Louis, Mo. 63108
Filed Jan. 19, 1976, Ser. No. 649,924
Int. Cl.² E04H 3/16

U.S. Cl. 210-169

8 Claims



1. Apparatus for collecting debris floating upon the surface of a body of water in a swimming pool with a water inlet located in an upper portion of a wall thereof which causes water entering said swimming pool through said inlet to cause the water at that surface to flow continuously through a predetermined path that is substantially parallel to a section of one wall of said swimming pool, the flowing water thereby carrying said debris along said predetermined path and hence adjacent to said pool wall section, said apparatus comprising float means for supporting a readily removable net, said float means comprising spaced-apart longitudinal floats with the ends of said floats connected by first and second elongated members constructed and arranged to define an open rectangular area defined by said elongated members and said floats, said float means having spaced-apart frame-supporting surfaces thereon, means for flexibly connecting one of said elongated floats with its longitudinal axis parallel to the longitudinal axis of said pool wall section and hence substantially parallel to said predetermined path, while holding said float means substantially sta-

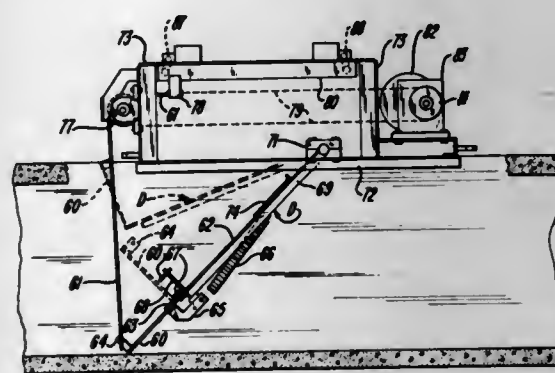
tionary relative to said pool wall section and substantially stationary relative to said flowing water, rigid frame means removably supported by said spaced-apart frame-supporting surfaces on said float means, said frame means being constructed and arranged to be approximately the same rectangular shape as said open rectangular area, a flexible net supported by said frame means, said net having a downwardly-extending shape defined by a bottom wall, opposed side walls, and a rear wall, an edge of said bottom wall supported by the leading edge of said frame means, said bottom wall depending downwardly from the extending below the level of said leading edge of said frame means, an upper edge of said rear wall supported by the trailing edge of said frame means, said net having a capacity greater than the horizontal projection of said frame means multiplied by the distance between said water surface and the lower surface of said leading edge of said frame means, said float means and said frame means being free of interacting fasteners whereby said frame means and said net can easily be lifted upwardly from said float means while said float means continues to float on said water, and said longitudinal floats and said elongated members leaving the front and the top of said open rectangular area substantially unobstructed at all times to permit unobstructed entry of said floating debris into, and to permit the unobstructed substantially-vertical separating movement of said frame means and said net from, said float means.

4,053,413

APPARATUS FOR REMOVING PARTICLES FROM WATER FOR SPRINKLERS AND THE LIKE
John M. Miller, Rte. 1, Box 273, Rocky Ford, Colo. 81067
Filed Nov. 17, 1975, Ser. No. 632,310
Int. Cl.² B01D 33/02

U.S. Cl. 210-104

15 Claims



1. Apparatus for removing sediment and particles from water in a ditch or the like and adapted to be pumped to a plurality of sprinklers, comprising:
a cylindrical screen disposed lengthwise of said ditch and mounted for rotation about its longitudinal axis;
a liquid withdrawal conduit constructed and arranged to receive water from the inside of said screen;
means for moving sediment and particles deposited on said screen in a direction generally longitudinally of said screen to a point of removal, said moving means including a series of fluid nozzles for directing a flow of fluid longitudinally against the outside of said screen above the water at paths spaced both longitudinally and circumferentially of said screen; and
said nozzles being arranged so that each fluid nozzle, in turn, except the last will move said sediment and particles to the longitudinal path of the next nozzle as the screen rotates.

4,053,414

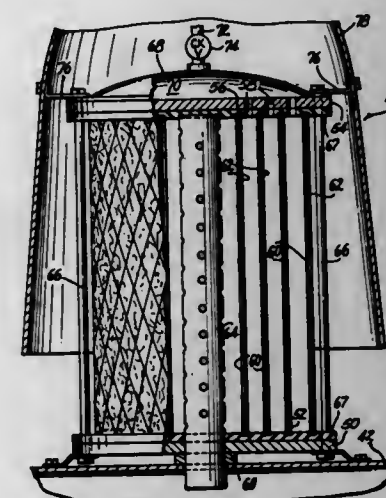
OIL RECOVERY APPARATUS

Cornells in'tVeld, Vlaardingen, Netherlands, assignor to National Marine Service, Inc., St. Louis, Mo.
Filed Aug. 3, 1976, Ser. No. 711,215
Claims priority, application Netherlands, Nov. 26, 1975, 7513810

Int. Cl.² B01D 21/24

U.S. Cl. 210-117

9 Claims



1. In an oil recovery apparatus having a separating tank therein, inlet means for directing an oil-water mixture into the upper portion of said tank and outlet means communicating with the bottom of said tank, the improvement comprising:
said outlet means comprising an outlet manifold extending along the bottom of said tank;
means defining a plurality of separate spaced flow paths between the interior of said tank and said manifold;
a coalescing means extending across each of said flow paths to intercept and coalesce particles of oil in water flowing from said tank to said manifold, said coalescing means comprising a water permeable, oleophobic material;
a cover member overlying each coalescing means to collect coalesced particles of oil rising therefrom but otherwise preventing flow of liquid into or out of the coalescing means from the top thereof;
an outlet passage in the top of each cover member;
a check valve in said passage arranged to permit liquid flow only upwardly and outwardly from beneath each cover member to the interior of said tank; and
a generally conical, upwardly tapered hood member having a lower portion overlying said cover member and the said outlet passage in said cover member.

4,053,415

UNSATURATED POLYESTER ETHER HAVING A PHOTOCROSSLINKABLE MOIETY

Masato Satomura, Fujimiya, Japan, assignor to Fuji Photo Film Co., Ltd., Ashigara, Japan
Filed Jan. 9, 1976, Ser. No. 647,671
Claims priority, application Japan, Jan. 9, 1975, 50-5177
Int. Cl.² C08G 63/66

U.S. Cl. 204-159.19

12 Claims

1. A polyester ether having high molecular weight and film or fiber forming properties containing in its main chain the moiety represented by the formula:



wherein Ar is arylene, R₂ is alkylene or oxaalkylene and R₃ is vinylene, butadienylene, or vinylene or butadienylene substituted by a group containing 6 or less carbon atoms.

5. A light-sensitive composition containing the polyester ether of claim 1 in combination with an amount of a sensitizing agent effective to render the combination light-sensitive.

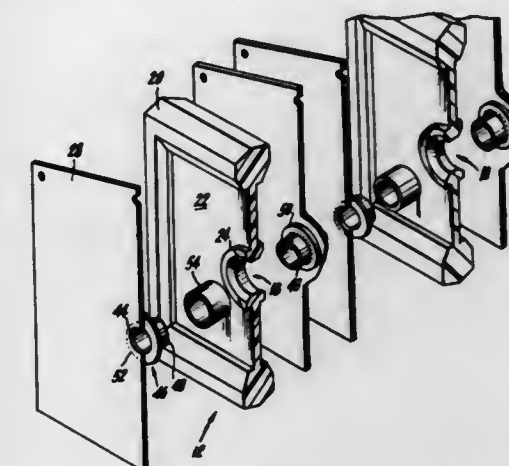
4,053,416

FILTER PRESS ASSEMBLY

Laurence M. Howard, Cresskill, N.J., and Robert Schaaf, Brooklyn, N.Y., assignors to Air Filters, Inc., Brooklyn, N.Y.
Filed Sept. 13, 1976, Ser. No. 722,549
Int. Cl.² B01D 25/00

U.S. Cl. 210-227

9 Claims



1. A method of hanging a filter cloth over the filter plate of a filter press, the filter plate having a center hole, the method comprising the steps of:

- selecting two sections of a filter cloth, each section containing a flexible coupling member having a tubular stem with a flanged base, the flanged base being secured to one side of the cloth and defining a hole in the cloth corresponding to a hole in the filter plate;
- fitting the tubular stem of one of the cloths into one end of a coupling cylinder;
- inserting the other end of the coupling cylinder through the hole in the filter plate;
- adjusting the tubular stem of the other cloth into the other end of the coupling cylinder, said step of adjusting including:
 - reversing the tubular stem such that it passes through the hole in the cloth and extends from the other side of the cloth;
 - positioning the flanged base adjacent the other end of the coupling cylinder; and
 - restoring the tubular stem to its original position and thereby locating it within the coupling cylinder; and
- closing the two cloths around the filter plate.

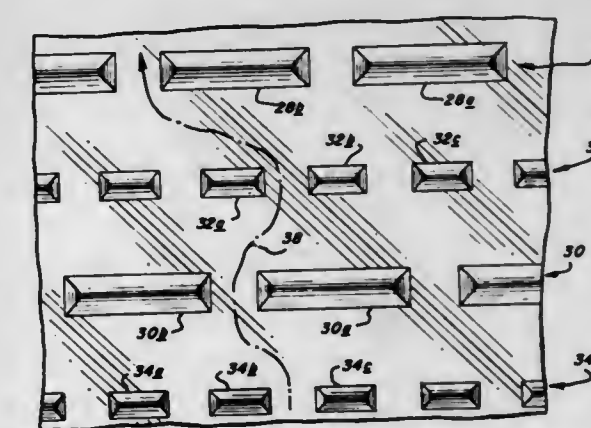
4,053,417

EMBOSSED SUPPORT MEMBER WITH HIGH AND LOW SKIP RIBS

Ferris E. Newman, Wauconda, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Oct. 8, 1975, Ser. No. 620,611
Int. Cl.² B01D 31/00

U.S. Cl. 210-321 B

6 Claims



1. An embossed and elongated flexible support member for use in a coil dialyzer for supporting an elongated semipermeable

ble membrane, which membrane is characterized by stretching further in the transverse direction than in the longitudinal direction, said support member comprising:

an elongated imperforate impermeable web;

means on one side of said web defining a plurality of angle ribs for engaging and supporting said membrane and for cooperation in defining a plurality of angular flow channels;

means on the other side of said web defining a plurality of high skip ribs and a plurality of low skip ribs, said high ribs and said low ribs being arranged in longitudinally extending rows with the ribs in each row being spaced from each other, with the rows of low skip ribs being positioned intermediate the rows of high skip ribs, and the spacing between ribs in a row cooperating in defining sinuous flow channels through said rows;

the height of said skip ribs and said angle ribs being effective to prevent contact between the membrane and the web; and

the configuration of said high skip ribs, said low skip ribs and the spacing between the ribs being dimensioned to maintain substantially equal flow rates on both sides of the membrane.

4,053,418

EMBOSED MEMBRANE SUPPORT

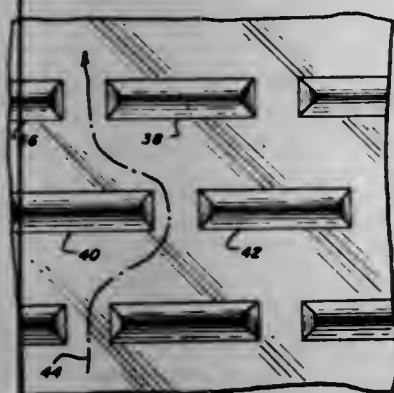
Ferris E. Newman, Wauconda, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 8, 1975, Ser. No. 620,612

Int. Cl.² B01D 31/00

U.S. Cl. 210—321 B

4 Claims



1. An embossed and elongated flexible support member for use in a coil dialyzer for supporting an elongated, tubularly shaped, semipermeable membrane, which membrane is characterized by stretching further in the transverse direction than in the longitudinal direction, said support member comprising:

an elongated imperforate impermeable web;

means on one side of said web defining a plurality of angle ribs for engaging and supporting a side of said membrane and for cooperation in defining a plurality of angular flow channels;

means on the other side of said web defining a plurality of skip ribs for engaging and supporting a side of said membrane, said ribs arranged in a plurality of longitudinally extending rows with the ribs in each row being spaced from each other and for cooperation in defining sinuous flow channels through said rows; and

the height of said skip ribs and angle ribs being effective to prevent contact between said membrane and said web, wherein the height of said skip ribs are of a greater height than said angle ribs.

4,053,419

BAND FILTER PRESS

Jarmil Pav, Reutlingen, Germany, assignor to Firma Bruderhaus Maschinen GmbH, Reutlingen, Germany

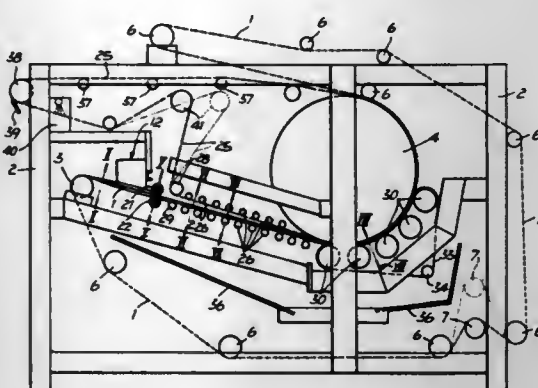
Filed Nov. 2, 1976, Ser. No. 738,077

Claims priority, application Germany, Nov. 13, 1975, 2550956

Int. Cl.² B01D 33/04

U.S. Cl. 210—386

18 Claims



1. A band filter press for separating liquid and solid matter by pressing a mixture thereof when located within an endless filter band consisting of a lower band having a center portion and two sidewall portions connected thereto defining an enclosure, and an upper band covering said enclosure along at least a portion of the length of said lower band, said filter press comprising in combination a loading zone including means for distributing material into the enclosure defined by said lower band before said upper band is positioned thereover, a pressing zone including means for applying pressure to said filter band when said upper band is positioned over said lower band for pressing liquid through said filter band as it passes through the pressing zone, an unloading zone including means for discharging solid matter from said lower band after said upper band is removed therefrom, collection means for collecting liquid pressed through said filter band, and means constructed and arranged to connect at least the lower lateral edges of said sidewall portions of said lower band to at least the lateral edges of said center portion thereof for providing a constant width to said center portion whereby the width of said center portion does not vary as said filter band passes through said pressing zone thereby permitting tracking control of said filter band by means adapted to sense the lateral edges of said lower band.

4,053,420

BLOOD FILTER

Günter Helmut Marx, Grafelfing, Germany, assignor to Dr. Eduard Fresenius Chemisch-Pharmazeutische Industrie KG., Bad Homburg, Germany

Filed Apr. 12, 1976, Ser. No. 676,539

Claims priority, application Germany, Apr. 14, 1975, 2516175

Int. Cl.² B01D 27/00, 35/00, 35/28

U.S. Cl. 210—435

5 Claims

1. A filter for removing decayed blood corpuscles, aggregations of blood corpuscles and foreign components from the blood, comprising a filter housing having an inlet and an outlet, said housing containing a dense packing of fibres having substantially the same diameter as the blood corpuscles, said packing consisting of at least one plastics thread of sufficient length to prevent said at least one plastics thread from being carried away by the blood and from being released from said packing, said at least one plastics thread being crimped and arranged to form a mesh having a mesh width functioning to allow healthy blood cells to pass therethrough, said at least one plastics thread being formed from a material which will repel healthy blood cells, said decayed blood cells and said aggregations of blood corpuscles having no negative electric potential and thereby becoming deposited on said packing.

4,053,421

SEDIMENTATION TANK WITH RAKING STRUCTURE

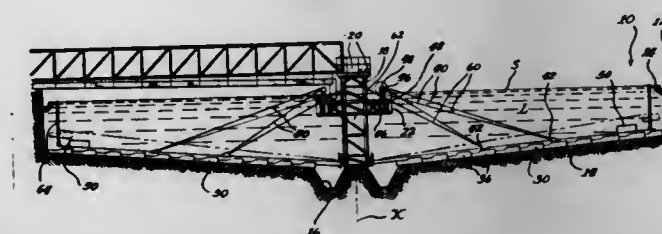
Howard Pentz; R. Henry Weed, both of Lansdale, and John C. Lodholz, Perkaskie, all of Pa., assignors to FMC Corporation, Chicago, Ill.

Filed June 23, 1976, Ser. No. 699,056

Int. Cl.² B01D 12/00, 17/00, 43/00

U.S. Cl. 210—528

8 Claims



1. A raking structure for moving settled solids to a discharge opening in the bottom of a sedimentation tank comprising a rotatable member located in said tank and driven about a vertical axis, a rake arm supported at one end on said rotatable member on a pivot axis that is angularly related to said vertical axis and a horizontal plane, cable means having one end connected to said rake arm at a location spaced from said pivot axis, said cable means being located substantially along a plane extending through said vertical axis, a support located above said pivot axis on said rotatable member with said cable means entrained over said support, and counterweight means connected to an opposite end of said cable means, said cable means and counterweight means functioning to vertically pivot said rake arm through an angle Q , in response to a predetermined resistance to the rotation of said rake arm, said angle Q being defined by the equation:

$$\tan Q = W - C/T$$

where:

W = the component of moment acting on said rake arm, due to the vertical force of the weight of said rake arm,

C = the component of moment acting on said rake arm, due to said cable means and counterweight means, and,

T = the component of moment acting on said rake arm due to said predetermined resistance.

6. A raking structure for moving settled solids to a discharge opening in the bottom of a sedimentation tank comprising a rotating member located in said tank and driven about a vertical axis, a rake arm supported at one end on a pivot axis that is angularly related to said vertical axis and a horizontal axis so that said rake arm is pivoted about said axis when a predetermined torque load is developed on said arm and alterable means connected to said rake arm for determining said predetermined torque load, said means connected to said rake arm for varying said predetermined torque load functioning to vertically pivot said rake arm through an angle Q , in response to a predetermined resistance to the rotation of said rake arms, said angle Q being defined by the equation:

$$\tan Q = (W - C)/T$$

where:

W = the component of moment acting on said rake arm, due to the vertical force of the weight of said rake arm,

C = the component of moment acting on said rake arm, due to said alterable means connected to said rake arm for determining said predetermined torque load, and

T = the component of moment acting on said rake arm due to said predetermined resistance.

4,053,422

DRILLING FLUIDS CONTAINING POLYETHOXYLATED TETRAALKYL ACETYLENIC DIOLS

Thad O. Walker, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed June 16, 1976, Ser. No. 696,661

Int. Cl.² C09K 7/02

U.S. Cl. 252—8.5 C

22 Claims

1. An aqueous drilling fluid containing in the aqueous phase clay solids dispersed therein by a ferrochrome lignosulfonate dispersant and containing a polyethoxylated tetramethyl decynediol or a sulfurized polyoxyethylated tetramethyl decynediol wherein the number of ethylene oxide groups therein is on an average of from 3.5 to about 30, said decynediol being present in said drilling fluid in an amount of from about 0.5 to about 5 pounds per barrel.

4,053,423

COMPOSITIONS FOR SOURING AND SOFTENING LAUNDERED TEXTILE MATERIALS, METHOD OF PREPARING THE SAME, AND STOCK SOLUTIONS PREPARED THEREFROM

John D. Ciko, Allen Park; John J. Cramer, and Geoffrey A. Jamieson, both of Wyandotte, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 30, 1975, Ser. No. 545,382

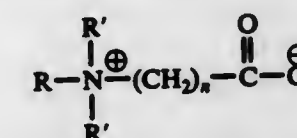
Int. Cl.² D06M 13/38

U.S. Cl. 252—8.75

20 Claims

1. A stable homogeneous liquid composition for souring laundered textile materials and imparting softness thereto consisting essentially of

I. about 0.5–25% by weight of a softening agent for textile materials, the softening agent being a fatty amphoteric compound corresponding to the structural formula



wherein R is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 8–22 carbon atoms, R' is selected from the group consisting of monovalent alkyl radicals and sulfonated monovalent alkyl radicals containing about 1–3 carbon atoms, and n is about 1–6, the said amphoteric compounds having non-acidic isoelectric ranges;

II. about 3–50% by weight of an acidic souring agent for laundered textile materials selected from the group consisting of hydrofluorosilicic acid, ammonium silicofluoride and zinc silicofluoride; and

III. about 25–96.5% by weight of water; the said ingredients I, II and III being present in amounts whereby a stable homogeneous liquid composition is produced.

4,053,424

GREASE CONTAINING SYNERGISTIC EXTREME PRESSURE ADDITIVES

Richard L. Coleman, Port Arthur, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,556

Int. Cl.² C10M 3/18, 5/14, 7/20, 7/24

U.S. Cl. 252—32.7 E

3 Claims

1. A grease comprising

a. a major amount of a lubricating oil,

b. a thickener,

c. the reaction product of butyl acid phosphate and dodecylaniline in an amount ranging from about 0.4 to 0.6 weight percent of the total mixture,

d. Bis(β -chlorophenethyl) disulfide present in an amount

ranging from about 1.5 to 2.5 weight percent of the total mixture, and
e. zinc dialkylthiophosphate in an amount ranging from 1.5 to 2.5 weight percent of the total mixture.

4,053,425

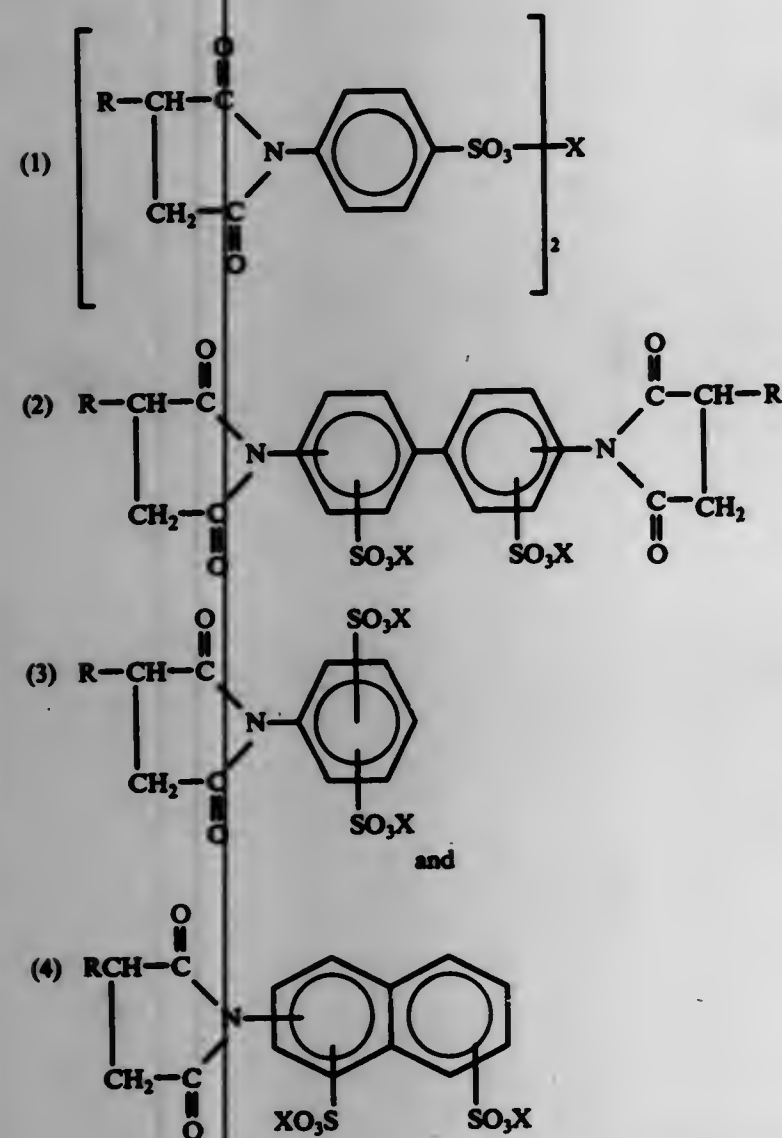
SUCCINIMIDES OF AMINO AROMATIC SULFONIC ACID SALTS

El-Ahmedi I. Hefsa, Princeton; Robert E. Kinney, Lawrenceville, and George E. Stead, South Plainfield, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Division of Ser. No. 391,178, Aug. 24, 1973, abandoned. This application Nov. 24, 1975, Ser. No. 634,812
Int. Cl.² C10M 1/40, 3/34, 5/22, 7/38

U.S. Cl. 252-33

7 Claims

1. A fluid composition comprising a major proportion of a fluid selected from the group consisting of lubricating oil and hydraulic fluid and a minor proportion sufficient to provide dispersant properties thereto of a compound of one of the formulae:



wherein X is selected from the group consisting of ammonium, organoammonium and metal and R is a hydrocarbyl containing from 5 to 1000 carbon atoms.

4,053,426

LUBRICANT COMPOSITIONS

Robert H. Davis, Pittman, and John W. Schick, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Mar. 17, 1975, Ser. No. 558,879
Int. Cl.² C10M 1/32

U.S. Cl. 252-34

3 Claims

1. A water-base metal working fluid consisting essentially of water and, as a biocidal and anti-rust agent, the triethanolamine salt of the monomethyl ester of an alkyl or alkenyl succinic

acid, the alkyl or alkenyl substituent of which contains from about 6 to about 22 carbon atoms.

4,053,427

CROSS-SULFURIZED OLEFINS AND FATTY ACID MONOESTERS IN LUBRICATING OILS

Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed July 26, 1971, Ser. No. 164,869
Int. Cl.² C10M 1/38, 3/32, 5/28, 7/36

U.S. Cl. 252-48.6

21 Claims

1. A lubricating composition comprising a major proportion of a lubricating oil and from about 0.1 to about 10% by weight of a sulfurized mixture of C₁₀-C₂₅ olefins with fatty acid esters of C₁₀-C₂₅ unsaturated fatty acid and a C₁-C₂₅ alkyl alcohol, in a mol ratio of olefin-to-ester of about 1-2:1.

8. A lubricating composition comprising a major proportion of a lubricating oil and from about 0.1 to about 10% by weight of a sulfurized mixture of C₁₀-C₂₅ olefins with fatty acid esters of C₁₀-C₂₅ unsaturated fatty acid and a C₁-C₂₅ alkenyl alcohol, in a mol ratio of olefin-to-ester of about 1-2:1.

15. A lubricating composition comprising a major proportion of a lubricating oil and from about 0.1 to about 10% by weight of a sulfurized mixture of C₁₀-C₂₅ olefins with fatty acid esters of C₁₀-C₂₅ saturated fatty acid and a C₁-C₂₅ alkenyl alcohol in a mol ratio of olefin-to-ester of about 1-2:1.

4,053,428

HYDROCARBON-SUBSTITUTED METHYLOL PHENOLS

John Francis Pindar, Euclid; Jerome Martin Cohen, University Heights, and Charles Peterson Bryant, Euclid, all of Ohio, assignors to The Labrizol Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 540,470, Jan. 13, 1975, Pat. No. 3,980,569, which is a continuation-in-part of Ser. No. 451,644, March 15, 1974, abandoned. This application Sept. 15, 1975, Ser. No. 613,664
Int. Cl.² C10M 1/20, 3/14, 5/12; C10L 1/18

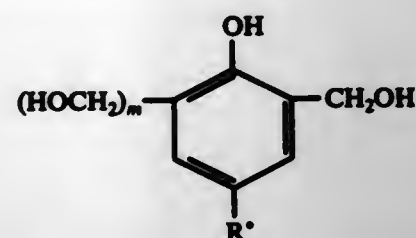
U.S. Cl. 252-52 A

20 Claims

1. A fuel or lubricant composition containing a major proportion of a normally liquid fuel or a lubricating oil of lubricating viscosity and a minor proportion of a composition comprising at least one hydroxy aromatic compound having:

- at least one hydroxyl substituent bonded directly to a carbon atom of an aromatic moiety, Ar,
- at least one hydrocarbon-based substituent of at least about 50 aliphatic carbon atoms bonded directly to a carbon atom of the aromatic moiety, Ar, and
- at least one methylol or lower hydrocarbon-based substituted methylol substituent bonded directly to a carbon atom of the aromatic moiety, Ar, said compound containing no alkylene linkages between carbon atoms of two aromatic nuclei.

4. A composition as claimed in claim 1 wherein the hydroxy aromatic compound is of the general formula



wherein R' is an alkyl substituent of about 50 to about 300 carbon atoms derived from polymerization or interpolymerization of at least one 1-monoolefin of 2 to 10 carbon atoms and m is 1 or 0.

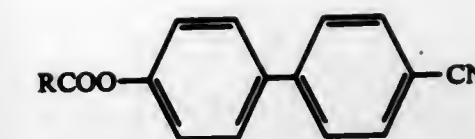
4,053,429

SAFETY-CALCIUM HYPOCHLORITE COMPOSITION
Seiji Tataru, Tokyo; Yasuo Morita; Makoto Nishonomiya, both of Nakago, and Masashi Kumoda, Johetsu, all of Japan, assignors to Nippon Soda Company, Limited, Tokyo, Japan
Continuation-in-part of Ser. No. 518,064, Oct. 25, 1974, abandoned. This application June 30, 1976, Ser. No. 701,283
Claims priority, application Japan, Oct. 27, 1973, 48-121027
Int. Cl.² C01B 11/06

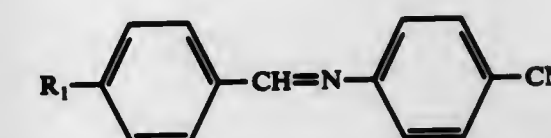
U.S. Cl. 252-187 H

4 Claims

1. Safety-calcium hypochlorite composition which comprises a mixture of neutral anhydrous calcium hypochlorite having a formula Ca(ClO)₂ and neutral calcium hypochlorite trihydrate, having a formula Ca(ClO)₂·3H₂O said mixture containing 16% by weight to about 22% by weight of water and at least an amount of calcium hypochlorite corresponding to 60% by weight of the active chlorine content of a dry basis of the composition, wherein the active chlorine content is a number of percentage of twice the weight of chlorine of calcium hypochlorite divided by the weight of a mixture.



wherein R is straight-chain alkyl of 3 to 8 carbon atoms or straight-chain alkoxy of 3 to 10 carbon atoms, or mixtures thereof, and one or more compounds of the formula



wherein R₁ is straight-chain alkyl of 2 to 8 carbon atoms, straight-chain alkoxy of 4 to 7 carbon atoms, straight-chain alkanoyloxy of 2 to 8 carbon atoms or straight-chain alkylcarbonate of 2 to 11 carbon atoms.

4. A nematic composition which comprises a compound of the formula

4,053,430

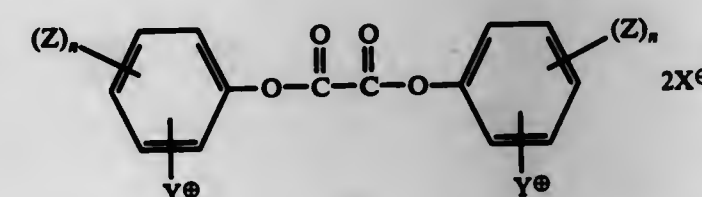
AQUEOUS CHEMILUMINESCENT SYSTEMS

Arthur Gaudens Mohan, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed July 16, 1976, Ser. No. 705,863
Int. Cl.² C09K 11/06

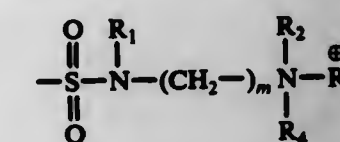
U.S. Cl. 252-188.3 CL

30 Claims

1. A water-soluble ester of oxalic acid having the formula:

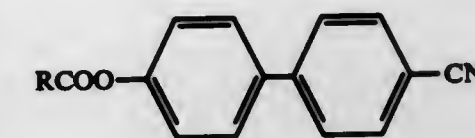


wherein Z is selected from chloro, fluoro and bromo, n is 1 or 2, X- is an anion and Y+ is a radical having the formula:

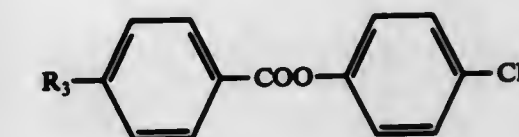


wherein R₁ is an alkyl having 1 to 6 carbon atoms, R₂ and R₃ independently represent alkyl having 1 to 6 carbon atoms or together with the nitrogen atom form a piperidine ring, R₄ is selected from hydrogen and alkyl having 1 to 6 carbon atoms, and m is an integer from 1 to 4.

13. A composition useful for generating chemiluminescent emission comprising an aqueous solution of (a) a water-soluble ester of oxalic acid defined by claim 1 and (b) a water-soluble organic fluorescer having a spectral emission in the range from about 330 to 1,000 nanometers, in proportions capable of producing chemiluminescence on reaction with hydrogen peroxide.

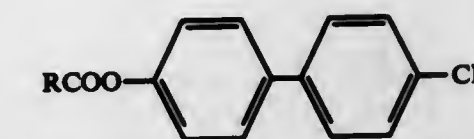


wherein R is straight-chain alkyl of 3 to 8 carbon atoms or straight-chain alkoxy of 3 to 10 carbon atoms, or mixtures thereof, and one or more compounds of the formula

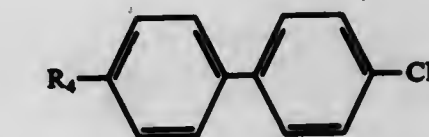


wherein R₃ is straight-chain alkyl of 4 to 8 carbon atoms, straight-chain alkoxy of 5 to 8 carbon atoms or straight-chain alkylcarbonate of 3 to 11 carbon atoms.

5. A nematic composition which comprises a compound of the formula



wherein R is straight-chain alkoxy of 3 to 10 carbon atoms, or mixtures thereof, and one or more compounds of the formula



wherein R₄ is straight-chain alkyl or straight-chain alkoxy.

4,053,431

LIQUID CRYSTALLINE BIPHENYLS

Hanspeter Scherrer, Therwil, and Arthur Boller, Binningen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Division of Ser. No. 523,594, Nov. 14, 1974, Pat. No. 3,952,046.
This application Dec. 22, 1975, Ser. No. 642,819.
Claims priority, application Switzerland, Nov. 19, 1973, 16242/73
Int. Cl.² C09K 3/34; G02F 1/13

U.S. Cl. 252-299

15 Claims

2. A nematic composition which comprises a compound of the formula

4,053,432

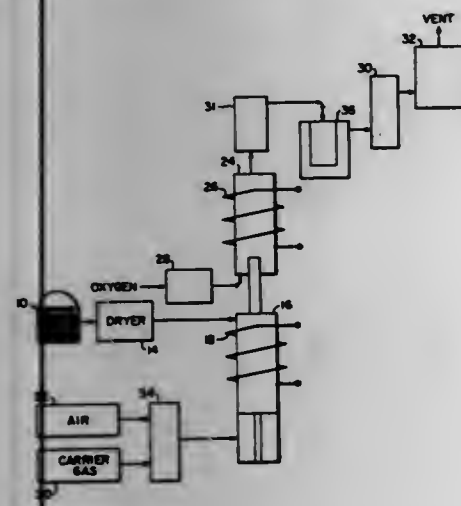
VOLUME REDUCTION OF SPENT RADIOACTIVE
ION-EXCHANGE MATERIALErich W. Toppel, Export; Christopher K. Wu, Wilkins, and
Arnold S. Kline, Pittsburgh, all of Pa., assignors to Westing-
house Electric Corporation, Pittsburgh, Pa.

Filed Mar. 2, 1976, Ser. No. 663,035

Int. Cl.² G21F 9/32

U.S. Cl. 252-301.1 W

10 Claims



1. A process for reducing the volume of spent ion-exchange material comprising the steps of:
drying the spent ion-exchange material to a moisture content of less than 50 percent by weight;
supplying said dried ion-exchange material to a fluid-bed reactor;
inserting a carrier gas selected from the group consisting of inert gases, non-oxygenated gases and limited-free-oxygen-containing gases into said fluid-bed reactor to fluidize said ion-exchange material;
heating said ion-exchange material to a temperature less than 500° C in a limited oxygen atmosphere to thermally decompose said ion-exchange material, said thermal decomposition producing an effluent gas;
removing the gaseous mixture of said carrier gas and said effluent gas from said fluid-bed reactor;
inserting an oxygen-containing gas into said reactor; and
burning said remaining ion-exchange material at a temperature less than 700° C.

4,053,433

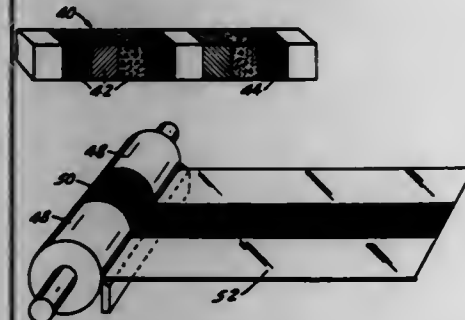
METHOD OF TAGGING WITH COLOR-CODED
MICROPARTICLESPai Kum Lee, White Bear Lake, Minn., assignor to Minnesota
Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 19, 1975, Ser. No. 551,061

Int. Cl.² C09K 3/00; C10L 1/10; C06B 23/00

U.S. Cl. 252-408

18 Claims



1. In a method of tagging individual units of production of a substance with microparticles for the purpose of retrospective identification including the steps of: (1) providing an inventory of batches of microparticles, each batch being uniquely coded, (2) maintaining a record of the unique code employed in each batch and (3) incorporating microparticles from any one batch with only one unit of production of a substance, the improve-

ment comprising the use of microparticles which comprise compilations of, and are encoded according to, a particular orderly sequence of visually color distinguishable dyed and/or pigmented layers of organic materials, each said microparticle being 1 to 1000 micrometers at its broadest dimension across the color sequence, which inventory includes up to (C)(C-1)ⁿ⁻¹ uniquely coded batches of microparticles where C is the number of available colors and n is the number of layers in the sequence.

4,053,434

EXHAUST GAS CONVERSION CATALYST

Dennis P. McArthur, Yorba Linda, Calif., assignor to Union Oil
Company of California, Los Angeles, Calif.

Filed July 19, 1976, Ser. No. 706,684

Int. Cl.² B01J 23/40

U.S. Cl. 252-432

14 Claims

1. A porous, catalytic composite effective for the simultaneous conversion of nitrogen oxides, carbon monoxide and hydrocarbons in engine exhaust gases, said composite comprising a mixture of two separate components, A and B, component A comprising a porous, inert support having dispersed thereon a minor proportion of nickel and/or cobalt and a still smaller proportion of rhodium, and being essentially free of platinum and palladium, component B comprising a porous inert support having dispersed thereon a minor proportion of platinum and/or palladium and being essentially free of rhodium.

4,053,435

CATALYSTS FOR THE POLYMERIZATION OF
ETHYLENEThomas J. Lynch, Oakmont, Pa., assignor to Gulf Research &
Development Company, Pittsburgh, Pa.Division of Ser. No. 557,498, March 12, 1975. This application
Sept. 2, 1975, Ser. No. 609,191The portion of the term of this patent subsequent to Aug. 31,
1993, has been disclaimed.Int. Cl.² B01J 21/08, 29/00

U.S. Cl. 252-451

3 Claims

1. In a process for the preparation of an ethylene polymerization catalyst in which a chromium polymerization catalyst is deposited on a silica support and activated; the improvement which consists of preparing the supported catalyst under rigorously anhydrous conditions and employing as the catalyst support a silica aerogel having a surface area of at least about 300 square meters per gram and a pore volume of at least about 2 milliliters per gram, said values being determined by isothermal liquid nitrogen desorption analysis; said silica aerogel having been prepared by a modified Kistler process consisting essentially of the steps of:

- preparing a silica hydrogel,
- treating the silica hydrogel with an organic solvent that will dissolve at least 10 weight % water to free the silica hydrogel of water, at least the final contact being with a rigorously anhydrous organic solvent so that the organic solvent, after reaching equilibrium with the silica hydrogel, contains less than 200 ppm of water,
- removing the organic solvent from the organic solvent—silica hydrogel mixture of step (b) by heating the mixture to above the critical point in a pressure-resistant vessel and releasing the organic solvent therefrom at a pressure at least equal to the critical pressure of the organic solvent,
- cooling the silica aerogel from step (c) to ambient temperature and pressure under rigorously anhydrous conditions, and
- calcining the silica aerogel from step (d) at an elevated temperature in a rigorously anhydrous environment.

4,053,436

SPRAY DRIED TITANIUM-CONTAINING CATALYST
FOR STRESS CRACK RESISTANT POLYMERJohn P. Hogan, and Donald D. Norwood, both of Bartlesville,
Okla., assignors to Phillips Petroleum Company, Bartlesville,
Okla.

Filed Aug. 26, 1975, Ser. No. 607,977

Int. Cl.² B01J 37/02, 29/00

U.S. Cl. 252-452

7 Claims

1. A catalyst produced by a process comprising forming a hydrogel by contacting an alkali metal silicate with a material selected from the group consisting of acids, acidic salts, and carbon dioxide, said hydrogel having coprecipitated therewith a titanium compound; spray drying said thus-formed hydrogel to form a xerogel; thereafter calcining said xerogel to form said catalyst, said catalyst containing in addition 0.1 to 20 wt. % chromium calculated as CrO₃ based on the total weight of said catalyst.

7. A catalyst according to claim 1 wherein said hydrogel is produced by adding sodium silicate to sulfuric acid which sulfuric acid contains titanyl sulfate, aging said thus formed hydrogel at an elevated temperature and washing to remove sodium ions; said chromium is incorporated by impregnating said xerogel with an aqueous solution of CrO₃; and said calcining is carried out at a temperature within the range of 900°-1700° F.

4,053,437

POLYOLEFIN CATALYST AND METHOD FOR ITS
PREPARATIONJoseph Liu, Hong Kong; Howard L. Grimmer, Lincolnshire,
Ill., and Yu-Tang Hwang, Clinton, Iowa, assignors to Chem-
plex Company, Rolling Meadows, Ill.

Filed Mar. 4, 1976, Ser. No. 664,030

Int. Cl.² B01J 21/04, 21/08, 23/26

U.S. Cl. 252-458

40 Claims

1. The method of preparing a polyolefin catalyst, comprising: preparing a mixture by dispersing on a finely divided, difficult to reduce, inorganic support of the class consisting of silica, alumina, thoria, zirconia, titania, magnesia and mixtures and composites thereof an organic chromium compound pyrolytically decomposable in the substantial absence of oxygen to deposit a catalyst residue including as a contaminant a carbon residue on said support; activating said mixture by subjecting the mixture to non-oxidative pyrolysis to and at an activating temperature within the range of about 600°-2000° F., thereby depositing on said support a catalytically active residue for the polymerizing of 1-olefins of 2-8 carbon atoms and copolymerizing said olefins with 1-olefins of 2-20 carbon atoms, said residue including a black carbon deposit residue; and substantially removing said black carbon deposit by burning in an oxidizing gas at an elevated temperature for a short period of time sufficient to burn off said black carbon deposit residue, thereby simultaneously modifying and improving the characteristics of the resulting activated catalyst.

4,053,438

PROPENE TRIMER ALCOHOL PERFUME
COMPOSITIONSRobert S. DeSimone, Middletown, N.Y., assignor to Polak's
Fratel Works, Inc., Middletown, N.Y.

Filed Aug. 4, 1976, Ser. No. 711,341

Int. Cl.² C11B 9/00

U.S. Cl. 252-522

4 Claims

1. A perfume composition comprising an olfactory effective amount of propene trimer alcohol having a refractive index (N_D²⁰) of about 1.4308 to 1.4359 and density of about 0.8261 to 0.8317 and being essentially free of straight chain and primary alcohols or an ester of such a propene trimer alcohol with a carboxylic acid having 1 to 4 carbon atoms and at least one other olfactory ingredient.

4,053,439

LOW-SMOKE GENERATING POLYURETHANE FOAM

Stanley J. Chylstek, Mountville, Pa., assignor to Armstrong
Cork Company, Lancaster, Pa.

Filed May 28, 1976, Ser. No. 691,090

Int. Cl.² C08G 18/22

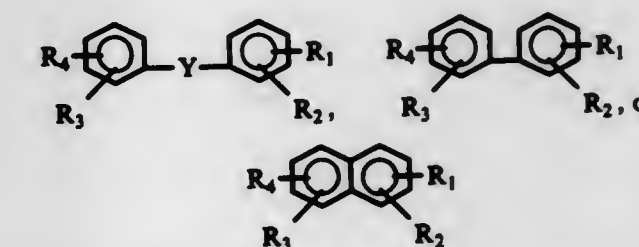
U.S. Cl. 260-2.5 AJ

10 Claims

1. A flame-retardant, smoke-inhibited polyurethane foam having incorporated therein a flame-retardant and smoke-inhibiting composition comprising in combination a halogen-containing, fire-retardant organic material in an amount sufficient to render the final foam selfextinguishing and a smoke-inhibiting amount of at least one metallic salt of an organic polycarboxylic acid free of acid functionality of the formula



wherein R is



wherein R₁ is carboxylate and R₂, R₃ and R₄ are independently selected from the group consisting essentially of hydrogen and carboxylate with at least one being carboxylate and Y is a bridging group selected from the group consisting of C₁-C₆ alkylene, carbonyl, sulfonyl and oxygen; A is a metal selected from the Periodic Table Group, I, II, III or IV; n is 2, 3, or 4; and m is 1/2, 1, 2, 3, or 4.

4,053,440

LATEX COMPOSITIONS SENSITIVE TO HEAT

Jean Claude Bonnet, 41 avenue de France, Blois (Loir & Cher),
and Alain Ribba, 16 rue Ronsard, Chateaufort (Indre &
Loire), both of France

Filed Aug. 1, 1975, Ser. No. 601,042

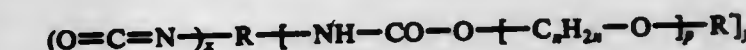
Claims priority, application France, Aug. 2, 1974, 74.27662

Int. Cl.² C08L 7/02

U.S. Cl. 260-4 R

5 Claims

1. A latex composition sensitive to heat consisting essentially of a natural or synthetic latex and 0.5 to 5 parts by weight per 100 parts by weight of dry solids of the latex of a urethane-oxylalkylene copolymer having the formula:



in which R is an aliphatic or aromatic structure which can contain biuret groups, urethane groups or isocyanate groups, R' is selected from the group which consists of hydrogen, lower alkyl having 1 to 8 carbon atoms and of straight or branched chain, aryl and alkylaryl, x is 0 or 1, y is always greater than 2, n has a value of 2 to 4 inclusively, and p has a value at least equal to 5.

4,053,441

HYDANTOIN POLYAMIDE-POLY(OXYETHYLENE)
BLOCK COPOLYMERS AS ANTISTATIC ADDITIVES
FOR POLYAMIDESKenneth Boone Wagener, Asheville; Bron Walter Spivey, Jr.,
Arden, and James Mood Chapman, Jr., Asheville, all of N.C.,
assignors to Akzona Incorporated, Asheville, N.C.

Filed Nov. 29, 1976, Ser. No. 745,933

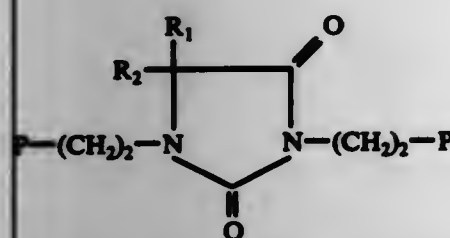
Int. Cl.² C08L 77/00, 91/00

U.S. Cl. 260-18 N

21 Claims

1. An antistatic yarn polymer additive composition consist-

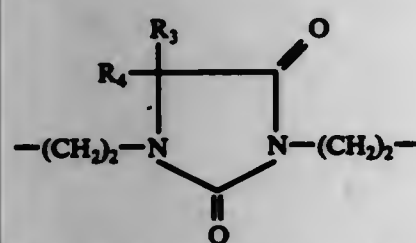
ing essentially of a hydantoin polyamide-poly(oxyethylene) block copolymer comprising the reaction product of a hydroxyl-terminated poly(oxyethylene) having a number average molecular weight of about 200 to about 4000, with a prepolymer comprising the reaction product of a first compound having the structural formula:



wherein R_1 and R_2 are alkyl groups containing from 1 to 6 carbon atoms and P is COOH or CH_2NH_2 , with a second compound from the group consisting of piperazine or a compound having the following structural formula:



where if the second compound is piperazine, P is COOH ; and if the second compound is $\text{Q}-\text{R}_3-\text{Q}$, when P is COOH , Q may be NH_2 or CH_2NH_2 , when Q is NH_2 , R_3 can be a straight chain alkylene radical of 3 to 12 carbon atoms, a branched chain alkylene radical of up to 36 carbon atoms, an alicyclic radical or a radical having the following structural formula:



where R_3 and R_4 are alkyl groups containing from 1 to 6 carbon atoms and when Q is CH_2NH_2 , R_3 can be of the above or an aromatic radical; and when P is NH_2 or CH_2NH_2 , Q is COOH , and R_4 is selected from the group consisting of a straight chain alkylene radical of 2 to 12 carbon atoms, a branched chain alkylene radical of up to 36 carbon atoms, an aromatic radical and a radical having the structural formula III above.

4,053,442

METHOD FOR MANUFACTURING SHAPED ARTICLES FROM MULTI-BLOCK COPOLYMERS

Václav Jung, Artur Stoy, Vladimír Stoy, and Jiri Zima, all of Prague, Czechoslovakia, assignors to Československá akademie věd, Prague, Czechoslovakia

Filed Aug. 18, 1975, Ser. No. 605,509

Claims priority, application Czechoslovakia, Aug. 28, 1974, 3924/74

Int. Cl.² C08F 1/86

U.S. Cl. 260—29.6 R

10 Claims

1. Method for manufacturing shaped articles from multi-block copolymers of acrylonitrile with acrylamide and/or acrylic acid and diacryl imide, said copolymers containing the structure of polyacrylonitrile determinable by X-ray analysis, wherein said copolymers having swelling capacities ranging from 10 to 95% of water (by weight) are formed by pressure in presence of an agent capable of swelling only the amorphous (hydrophilic) phase but incapable of dissolving the material at ambient temperature, the forming being carried out at temperatures that are higher than the glass transition point of any polymeric phase present in the system but lower than 250° C., to a shaped article with substantially unchanged structure and chemical composition.

10. A molding manufactured by the method of claim 1.

4,053,443

SEALING COMPOUND

Franklin G. Reick, Westwood, N.J., assignor to Michael Ebert, Mamaroneck, N.Y., a part interest

Filed July 20, 1976, Ser. No. 707,014

Int. Cl.² C08L 27/18

U.S. Cl. 260—29.6 F

8 Claims

1. A sealing composition comprising an inert filler, an aqueous dispersion of polymers of tetrafluoroethylene lubricating particles in which particles of colloidal size are intermingled with particles of microscopic size, an acidic gelling agent, and an alkali activator for the gelling agent, said activator including an ingredient which renders the compound freeze-thaw stable.

4,053,444

COLLOIDAL POLYAMIC ACID ELECTRODEPOSITION COMPOSITIONS AND PROCESS FOR PREPARING SAID COMPOSITIONS

David C. Phillips, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 245,396, April 19, 1972, abandoned.

This application Apr. 24, 1975, Ser. No. 571,131

Int. Cl.² C08J 3/08; C08K 5/20, 5/41, 5/34

U.S. Cl. 260—30.2

13 Claims

1. A method of making a nonaqueous, colloidal, polyamic acid electrodeposition composition comprising the steps of:

A. providing a salt solution comprising: 1 part by weight of organic aromatic polyamic acid, about 29–37 parts by weight of a non-aqueous, organic, non-electrolyzable, aprotic solvent for the polyamic acid and an amount of nitrogen containing base, selected from the group consisting of tertiary amines and imidazoles effective to form an organic acid salt, and

B. adding the salt solution to about 50–150 parts by weight of a non-aqueous, organic, non-electrolyzable, non-solvent for the salt which is not capable of dissolving the acid salt, to provide a colloidal dispersion of the salt within the solvent mixture,

the composition having a pH of between 8–10 and a solids content of between about 0.5 wt. % to about 1.5 wt. % based on polyamic acid and total solvent.

4,053,445

SOLUTIONS OF ETHYLENE-CHLOROTRIFLUOROETHYLENE COPOLYMERS

Stephen R. Schulze, Gillette, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 1, 1976, Ser. No. 737,231

Int. Cl.² C08K 5/02, 5/10, 5/15, 5/20

U.S. Cl. 260—31.2 R

10 Claims

1. A solution comprising a copolymer of about 55 to 95 mol percent chlorotrifluoroethylene and about 45 to 5 mol percent ethylene dissolved in an organic solvent.

4,053,446

PROCESS FOR PREPARING HIGH TEAR-STRENGTH POLYDIENE POLYURETHANE

Yoji Watabe, Fuchu; Michio Ishii, Murayama; Yutaka Iseda, Tachikawa; Kouei Komatsu; Noboru Ohshima, both of Yokkaichi, all of Japan, and Yozo Nakata, deceased, late of Kawasaki, Japan (by Kichiro Nakata, legal successor), assignors to Bridgestone Tire Company, Ltd. and Japan Synthetic Rubber Company, Ltd., both of Tokyo, Japan

Filed Aug. 31, 1976, Ser. No. 719,130

Claims priority, application Japan, Sept. 9, 1975, 50-108519

Int. Cl.² C08G 18/62; C08K 3/04

U.S. Cl. 260—37 N

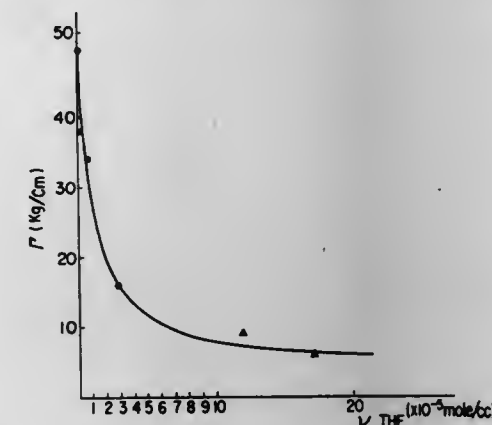
11 Claims

1. A process for preparing a polydiene polyurethane having high tear strength, which process comprises reacting

a. a polydiene glycol prepared with use of a dithio com-

ound as a catalyst, and having a functionality of from 1.8 to 2.1 and a number average molecular weight of from 1,000 to 5,000, the residual lithium content being below 30 ppm,

b. a diisocyanate compound, and
c. a chain-extending agent selected from diamine and diol compounds by the prepolymer method, the equivalent



ratio of the isocyanate groups in said polydiene glycol being 1.5 to 3.0, the equivalent ratio of active hydrogens in said chain-extending agent to isocyanate groups in said prepolymer being 0.8 to 1.1, and the curing temperature being 50 to 140° C, the polydiene polyurethane so obtained having a chemical cross-link density of 4×10^{-5} mole/cc or less.

4,053,447

SYNTHETIC RESIN COMPOSITION-METHOD AND PRODUCT

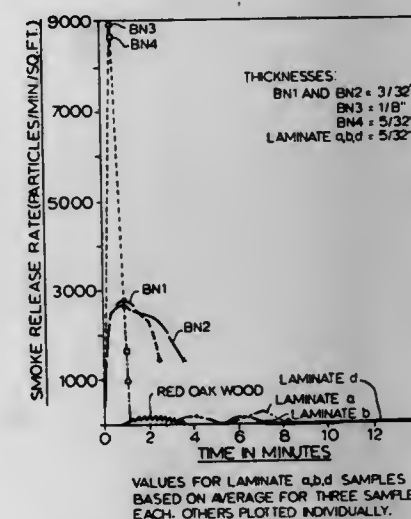
Lawrence E. Shea, 165 Lake Drive, San Bruno, Calif. 94066

Continuation-in-part of Ser. No. 492,881, July 29, 1974, abandoned. This application June 1, 1976, Ser. No. 691,290

Int. Cl.² B65H 81/00; C08G 8/06, 8/22; C08K 3/40

U.S. Cl. 260—38

20 Claims



1. A tough, fire-resistive resin exhibiting low flame spread, good heat release and low smoke evolution when exposed to direct flame or to radiant heat and being resistant to embrittlement and cracking upon curing, consisting essentially of the reaction product of:

a. at least one resorcinol component chosen from the group consisting of resorcinol, a mixture of resorcinol and phenol, and a partially cured resin of phenol, resorcinol and formaldehyde,
b. paraformaldehyde, and
c. at least one second substance chosen from the group consisting of furfural and furfuryl alcohol,
d. said paraformaldehyde and said second substance being added in sufficient amounts to produce said tough, fire-resistive resin.

20. A fire-resistant molded body comprising a reaction product of a resorcinol component chosen from the group consist-

ing of resorcinol, a mixture of resorcinol and phenol, and a partially cured resin of resorcinol, phenol, and formaldehyde, and paraformaldehyde plus at least one substance chosen from the group consisting of furfural and furfuryl alcohol, and including fiberglass, said paraformaldehyde and said substance being added in sufficient amounts to provide a tough, flexible resin of low flame spread and smoke evolution when compared with red oak wood and having satisfactory resistance to cracking and embrittlement.

4,053,448

POLYESTER BASED PATCHING COMPOSITION

Arthur William Holle, 8858 W. 47th St., Brookfield, Ill. 60513

Filed June 21, 1976, Ser. No. 698,059

Int. Cl.² C08K 3/34, 3/36

U.S. Cl. 260—40 R

14 Claims

1. A thermosetting patching composition for the filling of dents, holes and similar imperfections in metal surfaces comprised of (1) about 35 to about 55 percent by weight of a binder component comprised of a mixture of an unsaturated polyester resin and a vinylidene monomer solvent copolymerizable with the polyester; (2) about 35 to about 55 percent by weight of a filler component comprised of an admixture of silica and an alkaline inorganic powder having a pH greater than 7, the silica and the alkaline inorganic powder being present at a weight ratio ranging from 1:3 to 3:1 and (3) about 3 to about 10 percent by weight of inorganic hollow microspheres.

4,053,449

FAST-IDLE CAM APPARATUS IN A CARBURETOR

Yuichi Yoshioka, Asaka, and Tuguo Sanka, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and Kabushiki Kaisha Keihin Seiki Seisakusho, Kawasaki, both of Japan

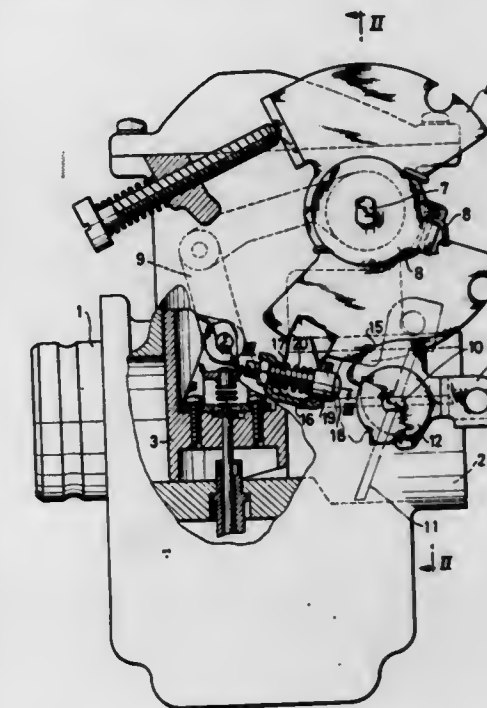
Filed Feb. 20, 1976, Ser. No. 660,029

Claims priority, application Japan, Feb. 26, 1975, 50-25431

Int. Cl.² F02M 1/02

U.S. Cl. 261—44 R

8 Claims



1. A fast-idle cam apparatus for a carburetor having a throttle valve, a choke valve, and a mechanism for opening an closing the throttle valve, said fast-idle cam apparatus comprising means for moving the choke valve and the throttle valve together to respective initial positions for engine starting at low temperature, said choke valve being closed in its initial position, said throttle valve being open in its initial position, and a spring mechanism interposed in the moving means for absorbing closing movement of the throttle valve while the choke valve remains in its initial position, said choke valve

including an operation lever with a fast-idle cam portion thereon, said moving means acting on said fast-idle cam portion, said choke valve being openable by said operation lever for ordinary driving conditions.

4,053,450

DIALKYL ALKYL AND CYCLIC PHOSPHORAMIDOMETHYL PHOSPHONATES
Peter Golborn, Skelmersdale, England, and James J. Duffy, Buffalo, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.
Division of Ser. No. 618,720, Oct. 1, 1974, Pat. No. 4,018,560, which is a continuation of Ser. No. 438,481, Jan. 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 239,799, March 30, 1972, Pat. No. 3,812,218. This application Dec. 30, 1976, Ser. No. 755,884
Int. Cl.² C08K 5/51

U.S. Cl. 260—45.8 R 12 Claims
1. An article comprising a resin composition and a flame retardant amount of a compound of the formula

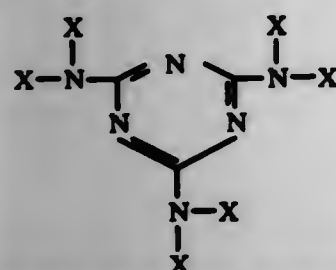


wherein R' is phenyl, lower alkenyl and halogen substituted and unsubstituted lower alkyl of 1-6 carbon atoms, m is an integer from 1-2 wherein when m is 2, R is alkoxy of 1-8 carbon atoms and when m is 1, R is alkylene dioxy of 2-8 carbon atoms.

4,053,451

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS
William Joseph Kroenke, Brecksville, and Arthur Watkins McRowe, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio
Filed Feb. 14, 1977, Ser. No. 770,169
Int. Cl.² C08K 5/34

U.S. Cl. 260—45.75 C 12 Claims
1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with a smoke retardant amount of
A. at least one melamine molybdate or substituted melamine molybdate, the melamine or substituted melamine having the formula

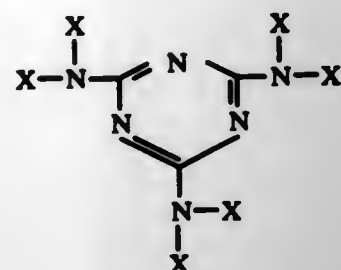


wherein X is hydrogen or an alkyl, alicyclic, aralkyl, alkaryl, aryl or heterocyclic group containing from 1 to 10 atoms of C, O, S and/or N, and with two X's on each of one or more nitrogen atoms optionally being joined together to form a heterocyclic ring; and
B. at least one compound selected from the group consisting of CuI, Cu₂O, CuO, CuSCN, CuSO₄, Cu(II) acetylacetonate, and hydrates thereof.

4,053,452

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS
William Joseph Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Mar. 4, 1977, Ser. No. 774,557
Int. Cl.² C08K 5/34

U.S. Cl. 260—45.75 M 10 Claims
1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with a smoke retardant amount of
A. at least one melamine molybdate or substituted melamine molybdate, the melamine or substituted melamine having the formula



wherein X is hydrogen or an alkyl, alicyclic, aralkyl, alkaryl, aryl or heterocyclic group containing from 1 to 10 atoms of C, O, S and/or N, and with two X's on each of one or more nitrogen atoms optionally being joined together to form a heterocyclic ring; and
B. at least one compound selected from the group consisting of CoCO₃, Co₂O₃, cobalt (II) acetylacetonate, cobalt (III) acetylacetonate, and hydrates thereof.

4,053,453

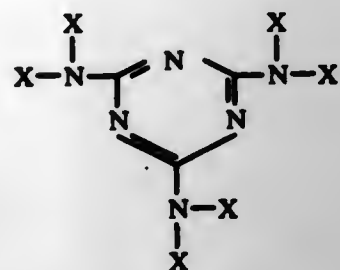
VINYL HALIDE POLYMERS HAVING IMPROVED RESISTANCE TO BURNING AND SMOKE FORMATION
Arthur Watkins McRowe, Akron, and William Joseph Kroenke, Brecksville, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio
Filed Feb. 14, 1977, Ser. No. 770,170
Int. Cl.² C08K 5/34, 5/35, 5/17

U.S. Cl. 260—45.75 C 18 Claims
1. A composition comprising a vinyl halide polymer and smoke retardant amounts of copper oxalate and an amine molybdate.

4,053,454

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS
William Joseph Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Mar. 4, 1977, Ser. No. 774,555
Int. Cl.² C08K 5/34

U.S. Cl. 260—45.75 N 10 Claims
1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with a smoke retardant amount of
A. at least one melamine molybdate or substituted melamine molybdate, the melamine or substituted melamine having the formula



wherein X is hydrogen or an alkyl, alicyclic, aralkyl,

alkaryl, aryl or heterocyclic group containing from 1 to 10 atoms of C, O, S and/or N, and with two X's on each of one or more nitrogen atoms optionally being joined together to form a heterocyclic ring; and
B. at least one compound selected from the group consisting of nickel oxide, nickel (II) oxalate, nickel (II) acetylacetonate, and hydrates thereof.

4,053,455

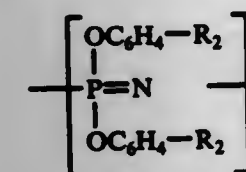
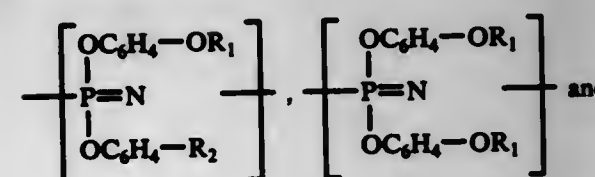
SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS
William Joseph Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Feb. 14, 1977, Ser. No. 770,168
Int. Cl.² C08K 5/34

U.S. Cl. 260—45.75 R 22 Claims
1. A smoke retarded composition comprising a vinyl chloride or vinylidene chloride polymer together with a smoke retardant amount of at least one amine molybdate, the amine used in preparing said amine molybdate containing from 1 to 40 carbon atoms and from 1 to 10 primary, secondary or tertiary amine groups or a mixture thereof.

4,053,456

POLY(ARYLOXYPHOSPHAZENE) COPOLYMERS
Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.
Filed Feb. 27, 1976, Ser. No. 661,862
Int. Cl.² C08J 9/06

U.S. Cl. 260—47 P 13 Claims
1. A copolymer having randomly distributed repeating units represented by the formulas:



wherein R₁ is C₁-C₄ linear or branched alkyl, and R₂ is hydrogen, C₁-C₁₀ linear or branched alkyl or C₁-C₄ linear or branched alkoxy, with the proviso that when R₂ is alkoxy, OR₁ and R₂ are different, the ratio of (OC₆H₄-OR₁): (OC₆H₄-R₂) being from about 1:6 to about 6:1.

4,053,457

MANUFACTURE OF POLYAMIDES
Claus Cordes, Weisenheim, and Franz Zahradnik, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Germany
Filed Dec. 29, 1975, Ser. No. 644,960
Claims priority, application Germany, Jan. 15, 1975, 2501348
Int. Cl.² C08G 69/46

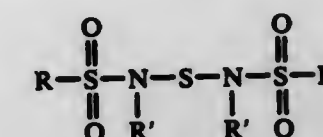
U.S. Cl. 260—78 L 9 Claims
1. In a process for the manufacture of polyamides from ε-caprolactam and/or other polyamide-forming starting compounds by polymerization and subsequent extraction of the polymer, the improvement comprising: concentrating the aqueous extract containing water, monomer and oligomers in the absence of atmospheric oxygen, wherein the surfaces which comes into contact with the extract are made of materials which are inert under the conditions of the concentration process, and polymerizing the concentrate, without further

purification or separation, by itself or together with other polyamide-forming starting materials.

4,053,458

VULCANIZABLE RUBBER FORMULATIONS WITH BIS(SULFONAMIDO)SULFIDE
Robert J. Arnold, Evanston, and Marion J. Gattuso, Hoffman Estates, both of Ill., assignors to UOP Inc., Des Plaines, Ill.
Continuation-in-part of Ser. No. 571,340, April 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 454,628, March 25, 1974, abandoned. This application May 27, 1976, Ser. No. 690,830
Int. Cl.² C08F 19/20

U.S. Cl. 260—79.5 A 9 Claims
1. A vulcanizable diene rubber formulation containing, as an inhibitor against premature vulcanization thereof, a compound having the formula:



in which R and R' are independently selected from the group consisting of alkyl of from 1 to about 6 carbon atoms, cycloalkyl having from 3 to about 8 carbon atoms in the ring, phenyl and tolyl radicals.

4,053,459

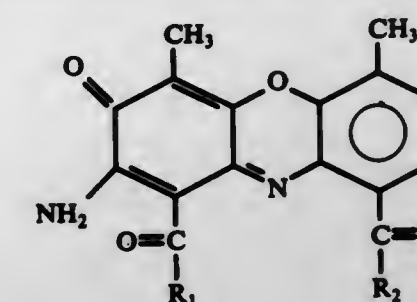
ANTIBODY SPECIFIC TO METHAQUALONE AND ITS METABOLITES
James Gordon Christenson, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Sept. 24, 1975, Ser. No. 616,451
Int. Cl.² A61K 37/06; C07D 239/00

U.S. Cl. 260—112 B 3 Claims
1. An antibody specific to methaqualone and its metabolites prepared by inoculating a host animal with an antigen consisting essentially of a methaqualone hapten having a methaqualone radical bonded to a spacing group through the tolyl ring of said methaqualone radical, said spacing group being selected from the group consisting of an amino carbonylalkylene carboxy, an oxyloweralkylene carboxy and a lower alkylene carboxy group and having from 2 to 7 carbon atoms in the linking chain, said hapten being covalently bonded to an immunogenic carrier material through the carboxyl group of said spacing group.

4,053,460

AZETOMICINS
Martin A. Apple, Daly City, Calif., and Joseph V. Formica, Richmond, Va., assignors to The Regents of the University of California, Berkeley, Calif.
Filed Aug. 18, 1975, Ser. No. 605,425
Int. Cl.² C07C 103/52; A61K 37/00

U.S. Cl. 260—112.5 R 6 Claims
1. A biologically active compound having the formula:



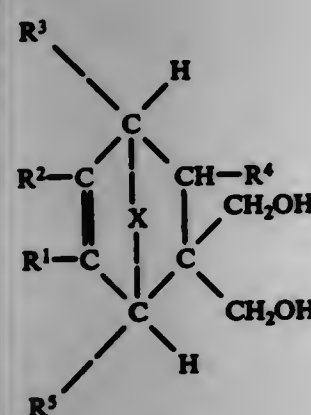
wherein R₁ and R₂ are five membered peptide lactones with the first peptide member counting from the multiple-ringed structure derived from threonine and the fifth peptide member

derived from methyl-valine or methyl-isoleucine and with the lactone linkage extending from the first to the fifth member on each said peptide and wherein the third member of at least one of said peptides is selected from the group consisting of an azetidine-2-carbonyl moiety.

4,053,461
REACTION PRODUCT OF
4,4-BIS-(HYDROXYMETHYL)-CYCLOHEXENE
COMPOUNDS WITH SULFUR

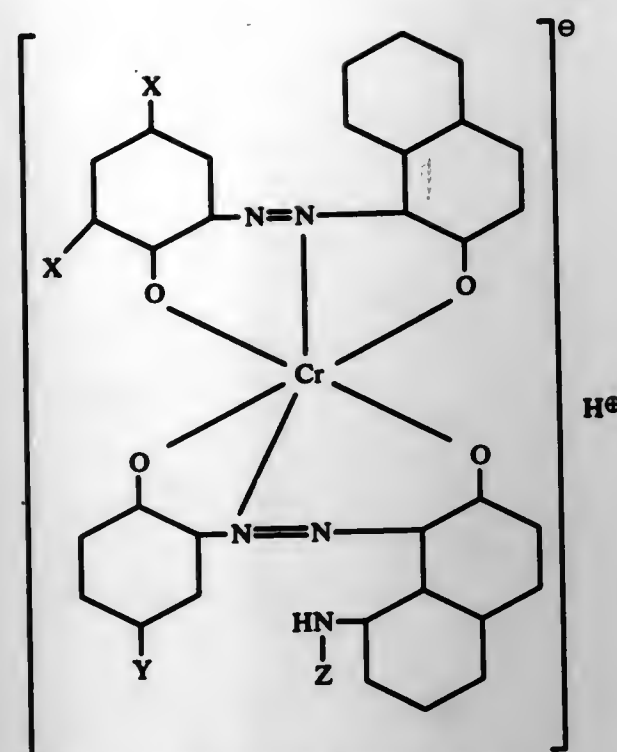
Werner Schwarz, Frankfurt, and Siegfried Wolff, Bornheim-Merten, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany Division of Ser. No. 548,218, Feb. 7, 1975, Pat. No. 3,968,074. This application Mar. 9, 1976, Ser. No. 665,446 Claims priority, application Germany, Apr. 22, 1974, 2419235 Int. Cl.² C07G 17/00

U.S. Cl. 260—125 17 Claims
1. The sulfur containing reaction products of (a) a 4,4-bis-(hydroxymethyl)-cyclohexane compound of the formula

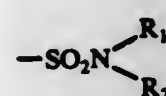


where R¹, R² and R⁴ are hydrogen, methyl or phenyl and there is also present either (1) X as the bridging member methylene or ethylene or (2) X is absent and there are present both R³ and R⁵ wherein R³ and R⁵ are hydrogen, methyl or phenyl with (b) 0.1 to 20 atoms of sulfur per mole of compound I.

4,053,462
UNSYMMETRICAL PHENYL AZO NAPHTHYL
CHROMIUM COMPLEX DYES
Fabio Belfa, Riehen, Switzerland, and Gerhard Beck, Lorrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y. Division of Ser. No. 479,918, June 17, 1974, Pat. No. 4,005,065. This application Aug. 4, 1976, Ser. No. 711,199 Claims priority, application Switzerland, June 22, 1973, 9184/73 Int. Cl.² C09B 45/16; D06P 1/10, 3/24, 3/32 U.S. Cl. 260—145 B 1 Claim
1. A chromium complex dye, which, in the form of its free acid, has the formula

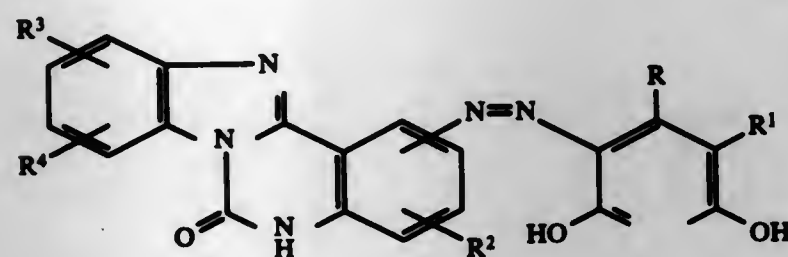


wherein one X is sulfo and the other X is nitro, Y is



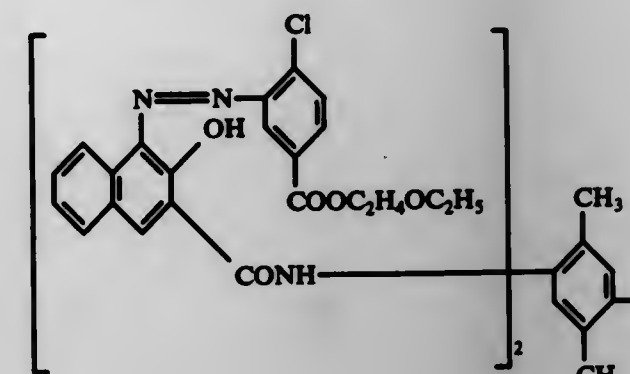
I where
R₁ and R₂ together with the nitrogen to which they are attached represent pyrrolidino, piperidino or morpholino; and
Z is lower alkanoyl, lower alkoxy, lower alkylsulfonyl, or is arylcarbonyl, aryloxy, carbonyl or arylsulfonyl wherein "aryl" is phenyl or phenyl substituted by chloro, bromo, nitro, lower alkyl or lower alkoxy.

4,053,463
HETEROCYCLIC AZO PIGMENTS
Helmut Junge, Wachenheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany Filed June 25, 1976, Ser. No. 699,968 Claims priority, application Germany, July 26, 1975, 2533529 Int. Cl.² C09B 29/36; D06P 1/04, 1/44, 2/79 U.S. Cl. 260—154 2 Claims
1. An azo compound of the formula:

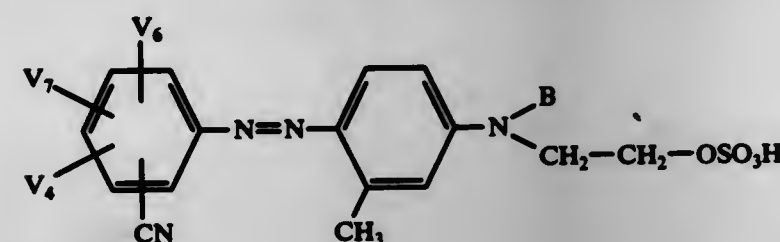


in which
R is hydrogen or methyl;
R¹ is cyano or carbamoyl;
R² is hydrogen, bromo, chloro, methyl, methoxy, ethoxy or cyano;
R³ is hydrogen, chloro, bromo, methyl, methoxy, ethoxy, cyano, carbomethoxy, carbamoyl, sulfamoyl or methylsulfonyl; and
R⁴ is hydrogen, chloro, bromo, methyl, methoxy or carbomethoxy.

4,053,464
DISAZO PIGMENTS CONTAINING ETHER
SUBSTITUTED ALKOXY CARBONYL GROUPS
Armand Roesche, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y. Filed June 17, 1974, Ser. No. 479,732 Claims priority, application Switzerland, June 26, 1973, 9326/73 Int. Cl.² C09B 33/14, 43/12 U.S. Cl. 260—174 1 Claim
1. Disazo pigment of the formula

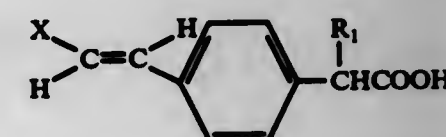


4,053,465
CYANOPHENYL-AZO-AMINOPHENYL DYESTUFFS
Winfried Kruckenberg, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany Filed Sept. 11, 1975, Ser. No. 612,431 Claims priority, application Germany, Sept. 11, 1974, 2443482 Int. Cl.² C09B 29/08, 29/26; D06P 1/06, 3/24 U.S. Cl. 260—207.3 2 Claims
1. Water-soluble dyestuff which in the form of the free acid corresponds to the formula

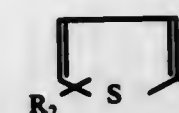
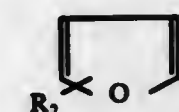


wherein
B is (CH₂)_x-H or propenyl where x is 1, 2, or 3;
V₄ is hydrogen, chlorine, or cyano;
V₆ is hydrogen or methyl; and
V₇ is hydrogen, chlorine, or methyl.

4,053,466
(E)-2-[P-(β-SUBSTITUTED-VINYLPHENYL)ALKANOIC
ACIDS
Shoji Yoshimura, Chofu; Susumu Takahashi, Hachioji; Motonobu Ichino, and Tokuro Nakamura, both of Mitaka, all of Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan Continuation-in-part of Ser. No. 594,461, July 9, 1975, abandoned. This application Sept. 28, 1976, Ser. No. 727,484 Claims priority, application Japan, July 9, 1974, 49-77782 Int. Cl.² C07D 307/26, 307/28, 333/10, 333/12 U.S. Cl. 542—454 10 Claims
1. An (E)-2-[p-(β-substituted-vinyl)phenyl]alkanoic acid represented by the formula (I):

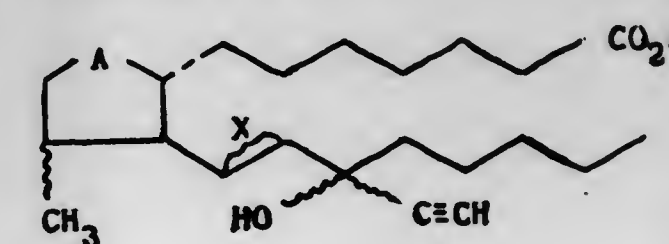


wherein R₁ represents a hydrogen atom, a methyl group or an ethyl group; and X represents a



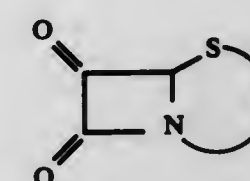
group, wherein R₂ represents a hydrogen atom, a nitro group, an amino group, a hydroxyl group, a halogen atom, an alkyl group having 1 to 4 carbon atoms or an alkoxy group having 1 to 4 carbon atoms, and the pharmaceutically acceptable salts thereof.

4,053,467
PROSTAGLANDIN DERIVATIVES
Wenling Kao, Devon, and Donald P. Strike, St. Davids, both of Pa., assignors to American Home Products Corporation, New York, N.Y. Continuation-in-part of Ser. No. 485,411, July 3, 1974, abandoned. This application July 25, 1974, Ser. No. 491,711 Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976 Int. Cl.² C07D 309/22; C07C 61/36 U.S. Cl. 260—240 R 12 Claims
1. A compound of the structure:

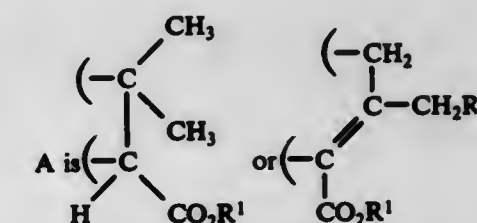


wherein A is CHOH or C=O; R is H or alkyl of from 1 to 6 carbon atoms, and
i. X is a single bond; or
ii. X is a trans double bond.

4,053,468
PROCESS FOR PREPARING 7-OXO CEPHALOSPORINS
AND 6-OXO PENICILLINS
Kenneth G. Holden, Haddonfield, N.J., assignor to SmithKline Corporation, Philadelphia, Pa. Filed Feb. 25, 1976, Ser. No. 661,230 Int. Cl.² C07D 501/04 U.S. Cl. 544—30 15 Claims
1. A process for preparing a compound of the formula:

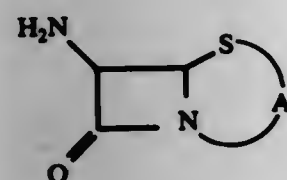


in which:



R¹ is hydrogen or an easily removable conventional penicillin or cephalosporin ester protecting group; and

R² is hydrogen, acetoxy or SHet where Het is a five or six membered heterocyclic ring containing carbon and one to four atoms selected from the group consisting of N, O and S, each such ring being unsubstituted or substituted with one or two groups selected from alkyl, alkoxyalkyl and trifluoromethyl, each alkyl or alkoxy group having from one to four carbon atoms, comprising reacting, in the presence of a non-hydroxylic solvent, a 7-amino cephalosporin or 6-amino penicillin of the formula:



in which A, R¹ and R² are defined as above, with a carbonyl containing oxidizing agent selected from the group consisting of:

mesitylglyoxal,
3-nitromesitylglyoxal,
3,5-dinitromesitylglyoxal,
benzothiazole-2-carboxaldehyde,
6-nitrobenzothiazole-2-carboxaldehyde,
3,5-di-*i*-propyl-1,2-benzoquinone,
3-methyl-5-*i*-propyl-1,2-benzoquinone,
tetrachloro-1,2-benzoquinone,
tetrabromo-1,2-benzoquinone,
2,6-di-*t*-butyl-1,4-benzoquinone and
3,5-di-*t*-butyl-1,2-benzoquinone,
said reaction being carried out with removal of water.

4,053,469

INTERMEDIATES FOR THE PREPARATION OF 7-ACYLAMINO-3-OXYIMINOMETHYL-3-CEPHEM-4-CARBOXYLIC ACIDS

Mitsuru Yoshida, Toyonaka; Masayuki Murakami, Itami, and Yuji Sando, Nishinozaki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 446,112, Feb. 26, 1974, Pat. No. 3,987,039.

This application Apr. 5, 1976, Ser. No. 673,882

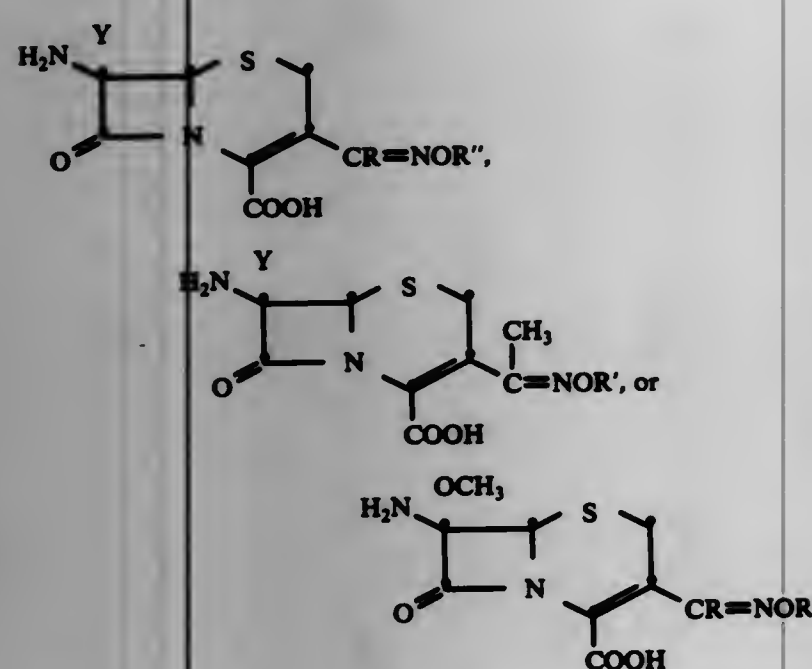
Claims priority, application Japan, Feb. 28, 1973, 48-24512

Int. Cl.² C07D 501/18

U.S. Cl. 544-21

2 Claims

1. A compound selected from the group consisting of (1) a compound of the formula:



wherein

Y is hydrogen or methoxy
R is hydrogen or methyl;
R' is a member selected from the group consisting of hydrogen, methyl, ethyl, *n*-propyl, *isopropyl*, *n*-butyl, *isobutyl*,

secondary butyl, tertiary butyl, *n*-pentyl, secondary pentyl, neopentyl, *n*-hexyl, 2-chloroethyl, 2-bromoethyl, 2-chloropropyl, 3-chloropropyl, 2,3-dichloropropyl, 4-bromobutyl, 2-chlorohexyl, methoxymethyl, methoxyethyl, methoxypropyl, ethoxyethyl, norbornyloxymethyl, propoxypropyl, methylthiomethyl, methylthioethyl, methylthiopropyl, *N,N*-dimethylaminoethyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, 4-methylcyclohexyl, benzyl, 4-nitrobenzyl, 4-methoxybenzyl, phenyl, tolyl, xylol, mesityl, 4-ethylphenyl, α -naphthyl, β -naphthyl, vinyl, allyl, hexenyl, cyclohexenyl, ethynyl, propargyl, carboxymethyl, methoxycarbonylmethyl, ethoxycarbonylmethyl, propoxycarbonylmethyl, hexyloxycarbonylmethyl, butoxycarbonylmethyl, carbamoylmethyl, α -carboxyethyl, α -carbethoxyethyl, α -carbamoyl, and α -(*N*-methylcarbamoyl) ethyl; and

R'' is a member selected from the group consisting of allyl, ethynyl, propargyl, benzyl, *p*-methoxybenzyl, carbamoylmethyl, and *N*-methylcarbamoyl, and (2) a derivative thereof bearing a protective grouping at the carboxyl group, said grouping being a member selected from the group consisting of a haloalkyl ester, a tertiary alkyl ester of 4-6 carbon atoms, a tertiary alkenyl ester of 5-7 carbon atoms, a tertiary alkynyl ester of 5-7 carbon atoms, benzyl ester, methoxybenzyl ester, nitrobenzyl ester, 3,5-di-(*tert*-butyl)-4-hydroxybenzyl ester, acetoxymethyl ester, pivaloyloxy-methyl ester, benzhydryl ester, phenacyl ester, trimethylsilyl ester, succinimidomethyl ester, phthalimidomethyl ester, and the 1,2-di-*isopropylhydrazide*.

4,053,470

SUBSTITUTED-1,2-DIHYDRO-2-OXONICOTINYL-CEPHALOSPORINS

Leonard Doub, James S. Kaltenbronn, and Dieter Schweiss, all of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

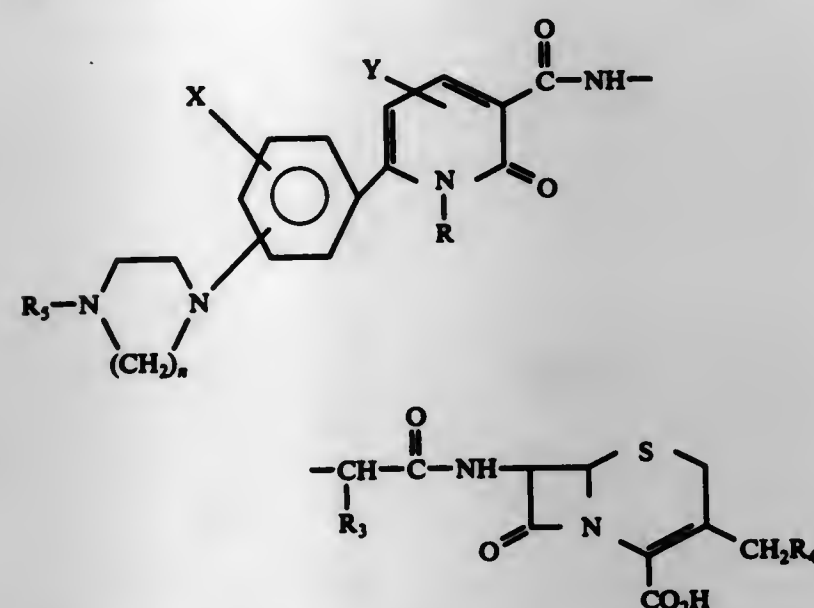
Division of Ser. No. 534,031, Dec. 23, 1974, Pat. No. 3,954,734, which is a continuation-in-part of Ser. No. 434,763, Jan. 21, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,098

Int. Cl.² C07D 501/20; A61K 31/545; C07D 499/44

U.S. Cl. 544-25

4 Claims

1. A member of the class consisting of amido compounds of the formula



and pharmaceutically acceptable salts thereof; wherein R is hydrogen or methyl; R₃ is phenyl, *p*-hydroxyphenyl; 2-thienyl and cyclohexa-1,4-dien-1-yl, R₄ is hydrogen, acetoxy or 1-pyridyl with the proviso that when R₄ is 1-pyridyl, the CO₂H is -CO₂-, and R₅ is a lower alkyl group of from one to six carbon atoms, cyclohexyl, benzyl, phenyl and halophenyl wherein halo represents chlorine, fluorine, bromine or iodo, X

is hydrogen, chlorine or bromine; Y is hydrogen or bromine and *n* is two or three with the proviso that when *n* is three R₂ is methyl.

4,053,471

4-THIAZOLIDINONE DERIVATIVES

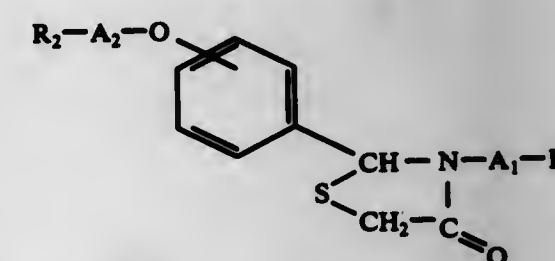
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 11, 1976, Ser. No. 740,705

Int. Cl.² C07D 295/14, 277/14

U.S. Cl. 544-133

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R₁ is alkyl, cycloalkyl or aryl; R₂ is alkylamino, dialkylamino, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl, or 4-alkyl-1-piperazinyl; A₁ is a saturated bond or an alkylene group having 1 to 4 carbon atoms; and A₂ is an alkylene group having 2 to 5 carbon atoms; wherein the term aryl refers to phenyl or phenyl substituted with a halogen, alkyl, alkoxy, trifluoromethyl, nitro or amino group; alkyl and alkoxy refer to groups having 1 to 6 carbon atoms; and cycloalkyl refers to a group having 3 to 7 carbon atoms.

4,053,472

2-(5-NITRO-2-IMIDAZOLYL)-BENZIMIDAZOLES

Clemens Rufer, Eberhard Schroder, and Hans-Joachim Kessler, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Continuation-in-part of Ser. No. 29,705, April 17, 1970, abandoned. This application Sept. 11, 1972, Ser. No. 287,852

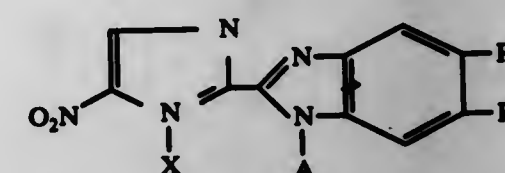
Claims priority, application Germany, Apr. 19, 1969, 1920635

Int. Cl.² C07D 403/04, 405/14

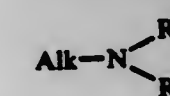
U.S. Cl. 544-139

14 Claims

1. A 2-(5-nitro-2-imidazolyl)-benzimidazole of the formula



wherein R₁ and R₂ each are hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro, trifluoromethyl or carboxy; A is hydroxyalkyl of 2 to 5 carbon atoms or an acyl ester thereof of an alkanic acid of up to 12 carbon atoms or of a physiologically acceptable benzoic or naphthoic acid of up to 12 carbon atoms which is unsubstituted or monosubstituted by lower *n*-alkyl, lower *n*-alkoxy, hydroxy or amino, disubstituted by lower *n*-alkyl, lower *n*-alkoxy or mono-amino-mono-hydroxy or tri-substituted by lower *n*-alkyl or lower *n*-alkoxy, haloalkyl of 2 to 5 carbon atoms, or aminoalkyl of the formula



wherein Alk is alkyl of 2 to 5 carbon atoms and R₃ and R₄ each are alkyl of 1 to 5 carbon atoms, or, together with the N-atom, pyrrolidino, piperidino, homopiperidino, piperazino, morpholino, or one of said heterocyclic groups substituted on a ring

carbon atom by alkyl of 1 to 5 carbon atoms, or piperazino substituted on the 4-position nitrogen atom by piperazino substituted on the 4-position nitrogen atom by alkyl of 1-5 carbon atoms, hydroxyalkyl of 2-5 carbon atoms or an alkanoyloxy ester thereof of 1-5 carbon atoms; and X is alkyl of 1 to 5 carbon atoms; or a physiologically acceptable salt thereof.

4,053,473

PHARMACOLOGICALLY ACTIVE THIOUREA AND UREA COMPOUNDS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 451,333, March 14, 1974, Pat. No. 3,950,353, which is a continuation-in-part of Ser. No. 290,584, Sept. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Dec. 5, 1975, Ser. No. 638,005

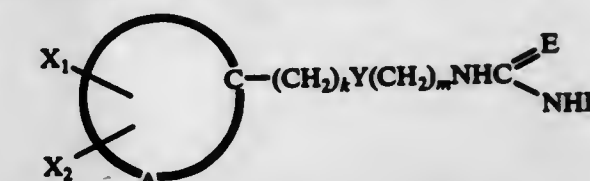
Claims priority, application United Kingdom, Mar. 9, 1975, 6352/71; July 22, 1971, 34334/71; Aug. 8, 1972, 37015/72; Ireland, Feb. 3, 1972, 136/72

Int. Cl.² C07D 241/04

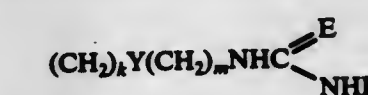
U.S. Cl. 260-250 BN

8 Claims

1. A compound of the formula:



wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, said unsaturated heterocyclic nucleus being a pyrimidine, pyrazine or pyridazine ring; X₁ is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or



X₂ is hydrogen or when X₁ is lower alkyl, lower alkyl or halogen; *k* is 0 to 2 and *m* is 2 or 3, provided that the sum of *k* and *m* is 3 or 4; Y is oxygen, sulphur or NH; E is oxygen or sulphur; and R₁ is hydrogen, lower alkyl, benzoyl or di-lower alkylamino-lower alkyl or a pharmaceutically acceptable addition salt thereof.

4,053,474

PYRAZOLO[4,3-E][1,2,4]TRIAZOLO[4,3-C]PYRIMIDINE

Uwe D. Treuner, and Hermann Breuer, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

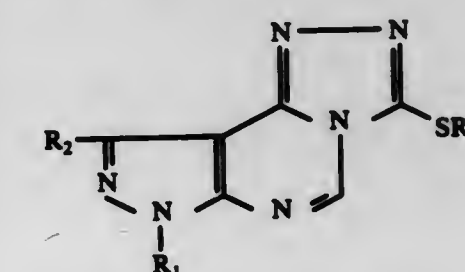
Filed Apr. 21, 1976, Ser. No. 678,832

Int. Cl.² A61K 31/415; C07D 487/14, 401/14, 403/14

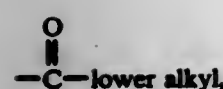
U.S. Cl. 260-256.5 R

10 Claims

1. A compound of the formula



wherein R₁ and R₂ each are hydrogen or lower alkyl; R₃ is hydrogen, alkali metal, alkaline earth metal,



4,053,482

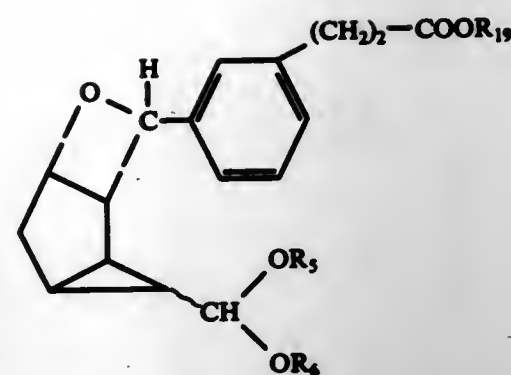
1-METHYL-2-(SUBSTITUTED
THIOMETHYL)-5-NITRO-IMIDAZOLES

Erhardt Winkelmann, Kelkheim, Tannus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed Apr. 7, 1976, Ser. No. 674,423

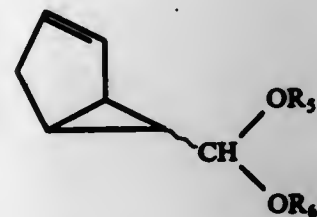
Claims priority, application Germany, Apr. 9, 1975, 2515522; Apr. 9, 1975, 2515515

Int. Cl.² C07D 233/94, 405/12, 409/12; A61K 31/415
U.S. Cl. 544—336 4 Claims

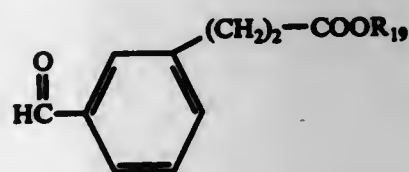
- 1-Methyl-2-(5-nitro-furyl-2-thiomethyl)-5-nitro-imidazole.
- 1-Methyl-2-(5-nitro-thienyl-2-thiomethyl)-5-nitro-imidazole.
- 1-Methyl-2-(methoxy-thiocarbonyl-thiomethyl)-5-nitro-imidazole.



or a racemic mixture of that compound and the enantiomer thereof, wherein R_{19} is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein R_5 and R_6 taken together are $-\text{CH}_2-\text{C}(\text{CH}_3)_2-\text{CH}_2-$; and wherein \sim indicates attachment to the cyclopropane ring in endo or configuration configuration, which comprises reacting an optically active compound of the formula

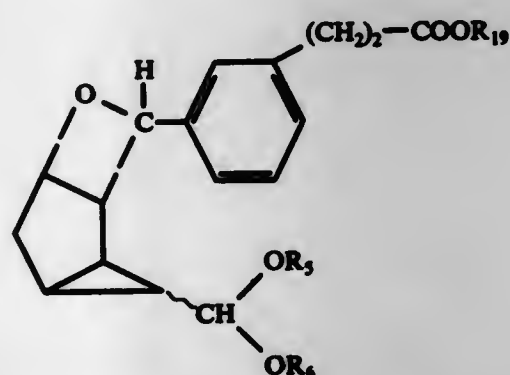


or a racemic mixture of that compound and the enantiomer thereof, wherein R_5 and R_6 are as defined above, with a compound of the formula



wherein R_{19} is as defined above.

2. An optically active compound of the formula



or a racemic mixture of that compound and the enantiomer thereof, wherein R_{19} is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein R_5 and R_6 taken together are $-\text{CH}_2-\text{C}(\text{CH}_3)_2-\text{CH}_2-$; and wherein \sim indicates attachment to the cyclopropane ring in endo or exo configuration.

4,053,483

DERIVATIVES OF

3,3-BIS-(4-HYDROXYPHENYL)-2-INDOLINONE AND
PROCESS FOR THE PREPARATION THEREOF

Alfonso Horta Pajol, and Salvador Brossa Rabassa, both of Barcelona, Spain, assignors to Doctor Andreu S.A., Spain
Filed May 1, 1975, Ser. No. 573,406

Claims priority, application Spain, May 18, 1974, 426436
Int. Cl.² C07D 209/34

U.S. Cl. 260—325 R 4 Claims

1. A compound selected from the group consisting of 3,3-bis-(4-sulphoxyphenyl)-7-methyl-2-indoline, and the alkali metal or alkaline earth metal salts thereof.
4. 3,3-bis-(4-oxicarboethoxyphenyl)-7-methyl-2-indolinone.

4,053,484

1-BENZOYL-3-(4,5,6,7-TETRAHYDROBENZO
[b]THIEN-4-YL)UREAS AND1-BENZOYL-3-(4,5,6,7-TETRAHYDRO-7-OXOBENZO
[b]THIEN-4-YL)UREAS, NOVEL INTERMEDIATES FOR
THE PREPARATION OF ANIMAL GROWTH
PROMOTING AGENTS

Goro Amano, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 532,449, Dec. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 436,827, Jan. 25, 1974, abandoned. This application June 1, 1976, Ser. No. 691,801

Int. Cl.² C07D 333/16; A01N 9/00

U.S. Cl. 260—332.3 P 6 Claims

1. d1-1-Benzoyl-3-(4,5,6,7-tetrahydrobenzo-[b]-thien-4-yl)urea.
4. d1-1-Benzoyl-3-(4,5,6,7-tetrahydro-7-oxobenzo[b]thien-4-yl)urea.

4,053,485

TRICYCLIC PROSTAGLANDIN INTERMEDIATES

Douglas R. Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 604,199, Aug. 13, 1975, Pat. No. 3,997,566, which is a continuation-in-part of Ser. No. 552,707, Feb. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 488,295, July 12, 1974, abandoned. This application July 26, 1976, Ser. No. 708,407

Int. Cl.² C07D 319/04

U.S. Cl. 260—340.7 2 Claims

1. A process for preparing an optically active compound of the formula

4,053,486

STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA
SUBSTITUTED C/D-TRANS INDANONES

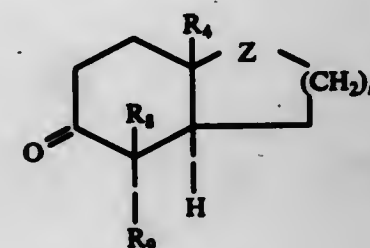
Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 482,711, June 24, 1974, Pat. No. 3,984,473, which is a division of Ser. No. 765,023, Oct. 4, 1968, Pat. No. 3,897,460. This application July 14, 1976, Ser. No. 705,235
Int. Cl.² C07D 309/06; C07C 143/68

U.S. Cl. 260—345.9 S

1 Claim

1. A compound of the formula



wherein Z is $\text{CH}(\text{OR}_2)$; R_2 tetrahydropyranyl, benzoyl, nitrobenzoyl, carboxylower alkanoyl, carboxy-benzoyl or camphorsulfonyl; R_4 is hydrogen or lower alkyl; m is an integer having the value of 1 or 2; R_5 is hydrogen and R_3 is methylene-X, where X is lower-alkylarylsulfonyloxy, arylsulfonyloxy or lower alkylsulfonyloxy.

its optical enantiomer and the racemate thereof.

4,053,487

15-OXAANDROSTANES AND 15-OXOPREGNANES

Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

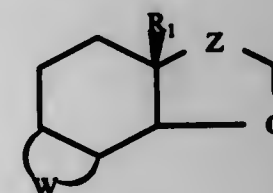
Division of Ser. No. 528,115, Nov. 29, 1974, Pat. No. 3,987,066, which is a division of Ser. No. 217,956, Jan. 14, 1972, Pat. No. 3,872,076. This application July 2, 1976, Ser. No. 702,244

Int. Cl.² C07D 307/92

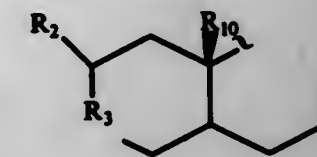
U.S. Cl. 260—346.71

7 Claims

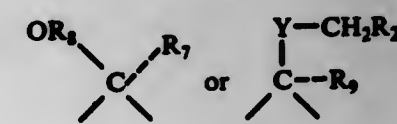
1. A compound of the formula



wherein R_1 is lower alkyl of from 1 to 5 carbon atoms; W is



where R_2 is hydrogen; R_3 is a 3-hydroxymethylene, 3-lower alkanoyloxymethylene, 3-carbonyl or 3-carbonyl- Δ^4 group; R_{10} is hydrogen or methyl; and Z is one of the groups carbonyl, di(lower alkyl)ketal, 1,2-ethylene ketal, 1,3-propylene ketal, 2,3-butylene ketal, 1,2-phenylene ketal, lower alkyl-substituted-1,2-phenylene ketal, 1,2-naphthalene ketal, 2,3-naphthalene ketal,



where Y is carbonyl or

CHR₂₀

R_7 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl; R_8 is hydrogen, lower alkyl, lower cycloalkyl, lower alkanoyl or benzoyl; R_9 is hydrogen, hydroxy, or lower alkanoyloxy; R_{20} is hydroxy or lower alkanoyloxy; and R_{21} is hydrogen, hydroxy, lower alkanoyloxy or halogen.

4,053,488

SEPARATION OF 1,5-DINITROANTHRAQUINONE AND
1,8-DINITROANTHRAQUINONE

Hilmar Bruenemann, Ludwigshafen; Heinz Ellingsfeld, Frankenthal, and Dietrich Lach, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sept. 16, 1976, Ser. No. 723,915

Claims priority, application Germany, Oct. 11, 1975, 2545699
Int. Cl.² C07C 76/00; C09B 1/00

U.S. Cl. 260—369

9 Claims

1. A process for separating 1,5-dinitroanthraquinone and 1,8-dinitroanthraquinone which comprises heating a dinitroanthraquinone mixture, in a mixture of (a) from 5 to 85 percent by weight of N-methylpyrrolidone and (b) from 95 to 15 percent by weight of at least one aromatic benzenehydrocarbon, aromatic chlorohydrocarbon, aromatic-aliphatic ether, aromatic-aliphatic ketone, monohydric aliphatic alcohol of 3 to 10 carbon atoms, alkanediol of 2 or 3 carbon atoms, aliphatic carboxylic acid of 2 to 6 carbon atoms or mixtures thereof, the boiling points of the respective constituents of (b) being from 80° to about 210° C and said constituents (b) being miscible in all proportions with N-methylpyrrolidone, at from 60° to 180° C and when the solution equilibrium has been reached, separating the undissolved material from the liquid phase at the extraction temperature.

4,053,489

OESTRADIENE DIETHERS

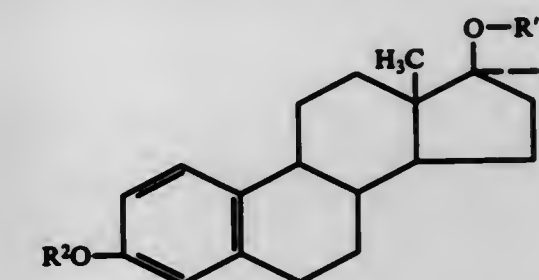
Pierre Charles Wirth, 23, rue Francois 1er, Paris 8eme, France
Continuation of Ser. No. 473,313, May 24, 1974, abandoned, which is a continuation of Ser. No. 242,138, April 7, 1972, abandoned. This application Feb. 11, 1976, Ser. No. 657,381
Claims priority, application United Kingdom, Apr. 21, 1971, 10496/71

Int. Cl.² C07J 1/00

U.S. Cl. 260—397.5

7 Claims

1. a compound of the formula



wherein R^1 is a methyl or ethyl group and R^2 is an alkyl group having 3 to 5 carbon atoms.

4,053,490

PROCESS FOR PRODUCTION OF AMMONIUM
N-ACETYSULFANILYL CYANAMIDE

John Edson Gordon, Martinsville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 26, 1976, Ser. No. 745,500

Int. Cl.² C07C 143/80

U.S. Cl. 260—397.7 R

17 Claims

1. A process for the preparation of a highly pure, concen-

trated aqueous solution of ammonium N⁴-acetylsulfanylcyanamide in good yield which comprises:

- vigorously contacting an essentially neutral aqueous mixture of an alkali or alkaline earth metal salt or mixtures thereof of N⁴-acetylsulfanylcyanamide with an inorganic acid and a solution of a water-immiscible organic solvent containing a high molecular weight, aliphatic amine, acid-binding extractant to form a two-phase mixture consisting of an organic phase and an aqueous phase, the amount of said acid being at least equal to the number of moles of acid-binding sites in said amino extractant and the amount of said alkali or alkaline earth metal salt of N⁴-acetylsulfanylcyanamide being sufficient to convert from about 70% to 100% of said acid-binding sites to an amine salt of N⁴-acetylsulfanylcyanamide,
- separating the aqueous phase therefrom and vigorously contacting the organic phase with a dilute aqueous alkali in an amount essentially equal to the number of moles of acid-binding sites in said amine extractant not bound to N⁴-acetylsulfanylcyanamide,
- separating the aqueous phase therefrom and vigorously contacting the organic phase with ammonium hydroxide in an amount substantially equal to the molecular equivalents of said alkali or alkaline earth metal salt of N⁴-acetylsulfanylcyanamide used, and
- recovering the aqueous phase therefrom comprising ammonium N⁴-acetylsulfanylcyanamide in good yield and purity.

4,053,491

BRANCHED-CHAIN ALIPHATIC ESTER OILS

Karlheinz Koch, Hans, Rhineland, and Hermann Kroke, Erkrath-Unterbach, both of Germany, assignors to Heinkel Kommanditgesellschaft auf Aktien, Düsseldorf, Germany

Continuation-in-part of Ser. No. 428,887, Dec. 27, 1973, abandoned. This application Aug. 7, 1975, Ser. No. 602,825

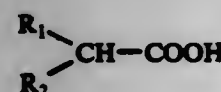
Claims priority, application Germany, Jan. 22, 1973, 2302918

Int. Cl.² C09F 5/08; C10M 1/24

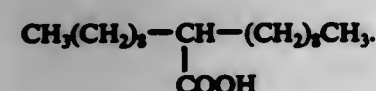
U.S. Cl. 260—410.6

10 Claims

1. A branched-chain aliphatic ester oil consisting essentially of a full ester of a branched-chain aliphatic polyol having only from 2 to 6 primary hydroxyl groups selected from the group consisting of alkanepolyols having from 3 to 6 carbon atoms and alkoxyalkanepolyols having from 6 to 12 carbon atoms with α -branched-chain alkanic acids having the formula



wherein R₁ and R₂ are straight-chained alkyl having from 1 to 19 carbon atoms and the total number of carbon atoms in the acid is from 14 to 22, said acids being selected from the group consisting of (1) acids derived from the oxidation of α -branched alcohols formed from normal alcohols by the Guerbet synthesis and (2) an acid of the formula



4,053,492

EXTRACTION OF OIL FROM OATS

John Roger Brooke Boocock, Kingston, and Richard Walton Oughton, Odessa, both of Canada, assignors to Du Pont of Canada Ltd., Montreal, Canada

Filed Feb. 2, 1976, Ser. No. 654,162

Claims priority, application United Kingdom, Feb. 6, 1975, 5056/75

Int. Cl.² C11B 1/10

U.S. Cl. 260—412.4

3 Claims

1. A process for the extraction of oil from comminuted dehulled oats comprising the steps of:

- extracting oil from said comminuted dehulled oats by treating said oats with 2-propanol, said 2-propanol containing a minor amount of from about 0.1 weight percent to about 1.0 weight percent of hydrogen peroxide, at a temperature of from about 10° C to about 75° C whereby oil in the oats is extracted by said 2-propanol,
 - separating the resultant solution comprising 2-propanol and extracted oil from the thus deoiled oats, and
 - separating the oil from the 2-propanol.
2. The process of claim 1 in which the 2-propanol contains less than 1% by weight of hydrogen peroxide.
3. The process of claim 1 in which the temperature of the 2-propanol during said extraction is in the range of from 10° C to 40° C.

4,053,493

LAYERED TETRAALKYL PHOSPHONIUM CLAYS

Alexis A. Oswald, Mountainside, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 402,465, Oct. 1, 1973, Pat. No. 3,929,849. This application Dec. 29, 1975, Ser. No. 644,810

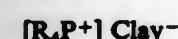
The portion of the term of this patent subsequent to Dec. 30, 1992, has been disclaimed.

Int. Cl.² C07F 5/06

U.S. Cl. 260—448 C

30 Claims

1. Tetra-alkyl phosphonium clays of the formula



wherein the four R groups are C₁ to C₁₀₀ substituted aliphatic hydrocarbyl radicals selected in such a manner that at least one of the R groups has a minimum of eight carbon atoms.

4,053,494

PREPARATION OF ORGANOPOLYSILOXANES

Jürgen Burkhardt, Halsbach, Germany, assignor to Wacker-Chemie GmbH, Munich, Germany

Filed Aug. 16, 1976, Ser. No. 714,740

Claims priority, application Germany, Sept. 1, 1975, 2538818

Int. Cl.² C07F 7/08

U.S. Cl. 260—448.2 E

16 Claims

1. A process for preparing an organopolysiloxane, which comprises polymerizing an organosilicon compound having the general formula



in which R is selected from the class consisting of an unsubstituted monovalent hydrocarbon radical and a substituted monovalent hydrocarbon radical and m represents a positive integer up to 1000, in the presence of a phosphoronitrile chloride and a hydroxyaryl compound in which one or two hydroxy groups are bonded to an aryl radical.

4,053,495

PROCESS FOR PREPARING METHYLCHLOROSILANES

Wolfgang Deinhammer, Volker Frey, both of Burghausen; Manfred Wick, Munich, and Rudolf Riedle, Burghausen, all of Germany, assignors to Consortium für Elektrochemische Industrie GmbH, Munich, Germany

Filed Sept. 16, 1976, Ser. No. 723,871

Claims priority, application Germany, Oct. 20, 1975, 2546919

Int. Cl.² C07F 7/12

U.S. Cl. 260—448.2 E

6 Claims

1. An improved process for preparing methylchlorosilanes by reacting tetramethylsilane with hydrogen chloride in the presence of a Friedel-Crafts catalyst, the improvement which comprises contacting tetramethylsilane with hydrogen chloride in a gaseous state with a solid Friedel-Crafts catalyst for from 1 to 100 seconds.

4,053,496

PRODUCTS FROM THE HYDROLYSIS OF β -HALOGENOETHYL-SILANES AND THEIR USE AS AGENTS FOR THE REGULATION OF PLANT GROWTH

Werner Föry, Basel; Hanspeter Fischer, Bottmingen; Dieter Lohmann, Pratteln, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 415,081, Nov. 12, 1973, abandoned. This application Jan. 8, 1976, Ser. No. 647,484

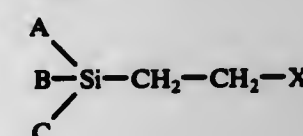
Claims priority, application Switzerland, Nov. 15, 1972, 16601/72

Int. Cl.² C07F 7/04, 7/18

U.S. Cl. 260—448.8 R

7 Claims

1. Partially polymerised products from the hydrolysis of beta-halogenoethylsilanes, with a degree of polymerisation of at most 3, which are obtained by hydrolysis of beta-halogenoethyl-silanes of formula I



wherein

X represents chlorine or bromine,

A represents a radical $-O-R_4$, chlorine or the methyl group,

B represents a radical $-O-R_4$ or chlorine, and

C represents a radical $-O-R_4$ or chlorine,

wherein the radicals

R₄, R₅ and R₆ each independently represent C₁-C₁₈ alkyl; C₁-C₆ alkyl substituted by halogen; C₁-C₁₈ alkyl substituted by C₃-C₁₂ cycloalkyl; C₃-C₁₈ alkenyl; C₃-C₁₂ cycloalkenyl; C₃-C₁₈ alkenyl; C₃-C₆ alkynyl or C₃-C₁₂ cycloalkyl substituted by phenyl or halogen; phenyl optionally mono- or polysubstituted by C₁-C₆ alkyl or C₁-C₆ halogenoalkyl; benzyl radicals optionally mono- or polysubstituted by C₁-C₆ alkyl or halogen.

4,053,497

AGENT FOR THE REGULATION OF PLANT GROWTH

Werner Föry, Basel; Hanspeter Fischer, Bottmingen; Dieter Lohmann, Pratteln, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 341,447, March 15, 1973, abandoned. This application July 29, 1976, Ser. No. 709,828

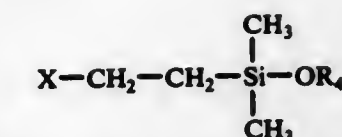
Claims priority, application Switzerland, Mar. 29, 1972, 4671/72; Mar. 29, 1972, 4733/72

Int. Cl.² C07F 7/18

U.S. Cl. 260—448.8 R

6 Claims

1. A beta-halogenoethyl silane corresponding to the formula



in which X is chlorine or bromine; and R₄ is C₁-C₁₈ alkyl; C₁-C₁₈ alkyl substituted by halogen, phenyl, or C₃-C₁₂ cycloalkyl; C₃-C₁₈ alkenyl; C₃-C₁₈ halogenoalkenyl; C₃-C₆ alkynyl; C₃-C₁₂ cycloalkyl; C₃-C₁₂ cycloalkenyl; phenyl; phenyl mono- or poly- substituted by C₁-C₆ alkyl, or C₁-C₆ halogenoalkyl; benzyl; or benzyl mono- or polysubstituted by C₁-C₆ alkyl or halogen.

4,053,498

PERFLUOROALKYLENE ETHER-IMIDATE AND -THIOIMIDATE ESTERS

Robert C. Evers, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

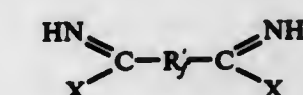
Filed July 30, 1976, Ser. No. 710,089

Int. Cl.² C07C 83/10

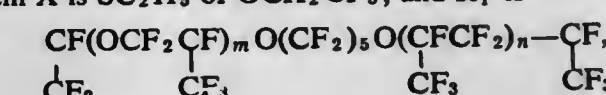
U.S. Cl. 260—453 RW

6 Claims

1. A compound having the following formula:



wherein X is SC₂H₅ or OCH₂CF₃; and R₁ is



where m + n equals 4 or 5.

4,053,499

O,S-DIALKYL O-SULFONYLOXYPHENYL PHOSPHOROTHIOATES AND PHOSPHORODITHIOATES

William S. Hurt, Collegeville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

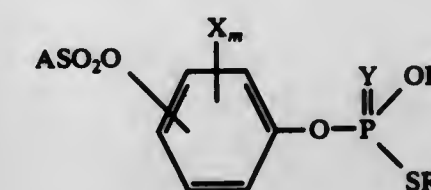
Division of Ser. No. 576,838, May 12, 1975, Pat. No. 3,975,420, which is a continuation-in-part of Ser. No. 519,448, Oct. 31, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,626

Int. Cl.² C07C 143/68; A01N 9/36

U.S. Cl. 260—456 P

8 Claims

1. A compound of the formula



wherein

R is a (C₁-C₄)alkyl group;

R' is a (C₃-C₆)alkyl group;

Y is an oxygen atom or a sulfur atom;

X is a halogen atom, a (C₁-C₃)alkyl group, or a (C₁-C₃)alkoxy group;

m is an integer from 0 to 3; and

A is

a. a (C₁-C₃)alkyl group substituted with up to three halogen atoms;

b. a (C₃-C₆)cycloalkyl group;

c. a (C₇-C₁₀) unsubstituted aralkyl group, or a (C₇-C₁₀) substituted aralkyl group, the aryl portion of which is substituted with up to three nitro groups, halogen atoms, (C₁-C₃) alkyl groups, or (C₁-C₃) alkoxy groups or

d. an aryl group of the formula

- phthalic acid crystals in hot, fresh acetic acid and (b) the removal of the displaced acetic acid mother liquor and the small crystals suspended therein for recycle to the reaction zone;
- quenching said new suspension of crystalline phthalic acid by the addition thereto of cold, fresh acetic acid in an amount to cool the suspension to a temperature at or below the boiling point of acetic acid at atmospheric pressure;
 - depressuring said new suspension of crystalline phthalic acid in fresh acetic acid to atmospheric pressure;
 - separating the crystalline phthalic acid from the fresh acetic acid by means for solid-liquid separation at atmospheric pressure;
 - recycling the separated fresh acetic acid to the reaction zone; and
 - drying the separated crystalline product.

4,053,507

METHOD OF RECOVERING UNREACTED MATERIALS AND HEAT IN UREA SYNTHESIS

Shigeru Inoue, Kamakura, and Katsumi Kagechika, Yokohama, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

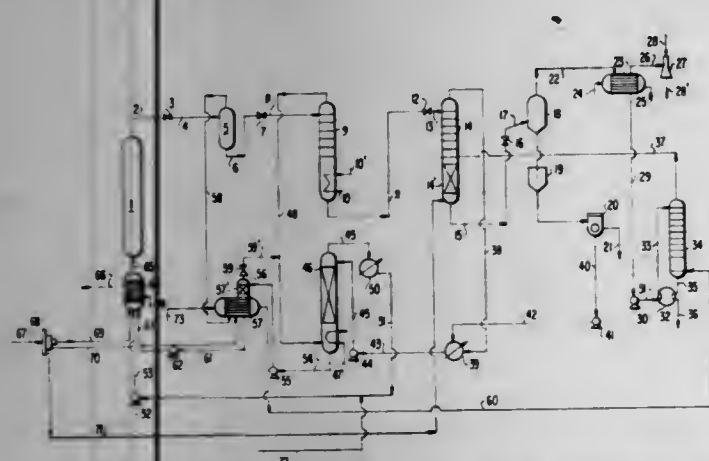
Filed Dec. 2, 1976, Ser. No. 746,893

Claims priority, application Japan, Dec. 5, 1975, 50-143858

Int. Cl.² C07C 126/02

U.S. Cl. 260—555 A

14 Claims



1. In a process for recovering unreacted materials and heat from a urea synthesis which includes the steps of: reacting carbon dioxide with ammonia under urea synthesis conditions to produce a urea synthesis effluent containing urea, unreacted ammonium carbamate, an excess of ammonia and water; treating said urea synthesis effluent in a plurality of pressure decomposition stages wherein the pressure is stepwise reduced thereby to decompose said ammonium carbamate into ammonia and carbon dioxide in each stage; separating a mixed gas of ammonia and carbon dioxide from said urea synthesis effluent at each decomposition stage; contacting in turn the mixed gas separated in each decomposition stage with an absorbent under substantially the same pressure as the decomposition pressure in said stage to absorb said mixed gas in said absorbent in stages; recycling the final resulting absorbate containing ammonium carbamate to the urea synthesis zone; concentrating the aqueous urea solution discharged from the final decomposition stage and still containing a small amount of ammonium carbamate thereby to obtain a concentrated aqueous urea solution; condensing water vapor generated upon said concentration to obtain a condensate containing small amounts of ammonia and carbon dioxide; and stripping said condensate to separate and recover said ammonia and carbon dioxide therefrom, the improvement which comprises absorbing the off-gas from a high pressure decomposition stage in an absorbent in a high pressure absorption zone, said absorbate being obtained by absorbing in an absorbent the off-gas from at least one medium pressure decomposition stage, recovering the heat of absorption liberated upon said absorption by an indirect heat exchange in the form of steam having a pressure of 2-4 kg/cm² (gauge), contacting said steam with said condensate

containing small amounts of ammonia and carbon dioxide in a stripping zone to strip off substantially all of the ammonia and carbon dioxide from said condensate, and introducing the discharged steam containing the ammonia and carbon dioxide into the rectification zone of a low pressure decomposition stage to directly heat the urea synthesis effluent, thereby recovering said mixed gas separated from said urea synthesis effluent in said low pressure decomposition stage together with the ammonia and carbon dioxide contained in said steam.

4,053,508

PROCESS AND INSTALLATION FOR PREPARING UREA FROM AMMONIA AND CARBON DIOXIDE

Mathieu Bongard, Rotterdam, Netherlands, assignor to Stamicarbon, N.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 135,991, Sept. 6, 1961, abandoned. This application Mar. 23, 1966, Ser. No. 547,116

Claims priority, application Netherlands, Sept. 5, 1960, 60255601

Int. Cl.² C07C 126/00

U.S. Cl. 260—555 A

4 Claims

1. In a process for the preparation of urea from ammonia and carbon dioxide in a urea synthesis zone at a pressure of at least 160 atmospheres and a temperature of at least 150° C wherein ammonia and carbon dioxide which have not been converted into urea are separated from the reaction product and recirculated back to the urea synthesis in the form of ammonium carbamate by steps including discharging the reaction mixture from the synthesis zone, expanding the thus discharged reaction mixture in a plurality of pressure stages operated at sequentially lower pressures and separating the gas and liquid phases after the expansion in each of said stages to yield a urea solution which is practically free of unreacted ammonia and carbon dioxide in the last stage, condensing the gas comprising ammonia, carbon dioxide and water from each pressure stage, the condensate formed in a lower pressure stage serving as condensation agent for the gas from a preceding pressure stage, and feeding back the condensate obtained in the first pressure stage to the urea synthesis, the improvement whereby a minimum amount of water is included in the condensate returned to said synthesis, said improvement comprising the steps of taking the expanded gas-liquid mixture from a pressure stage and directly separating the gas and liquid phases (A) and (B), respectively, in said mixture without any application of heat thereto, thereafter heating the separated liquid phase (B) to vaporize part of the liquid therein, subjecting the resulting gas-liquid mixture to gas-liquid separation thereby obtaining gas phase (C) and liquid phase (D) and condensing the gas phases (A) and (C) obtained from both of said separations.

4,053,509

SUBSTITUTED ARYL AND ARALKYL AMIDES

Hans-Peter Faro, Munich, Germany, and Samson Symbowicz, Livingston, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 198,974, Nov. 15, 1971, abandoned. This application Mar. 15, 1973, Ser. No. 341,624

Int. Cl.² C07C 103/737

U.S. Cl. 260—557 R

3 Claims

1. N-[β-(3,4-dihydroxyphenyl)-ethyl]-1-adamantanecarboxamide.
2. N-(3,4-difluorophenyl)-1-adamantanecarboxamide.
3. N-[β-(3,4-dihydroxyphenyl)-ethyl]-cyclopropanecarboxamide.

4,053,510

PROCESS FOR THE PRODUCTION OF AROMATIC AND CYCLOALIPHATIC DICARBOXYLIC ACID DIAMIDES

Hans Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach, both of Germany, assignors to Akzo N.V., Arnhem, Netherlands

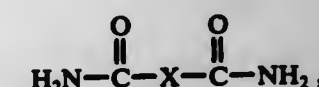
Filed Dec. 30, 1974, Ser. No. 537,120

Claims priority, application Germany, Mar. 6, 1974, 2410537
Int. Cl.² C07C 102/04

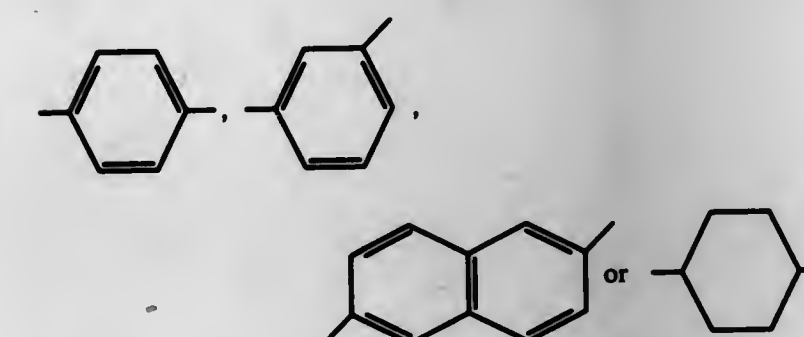
U.S. Cl. 260—557 R

9 Claims

1. A process for the production of a diamide of the formula

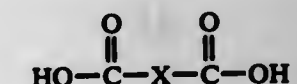


in which X is



each of which is unsubstituted or substituted by a member selected from the group consisting of alkyl of 1 to 5 carbon atoms, alkoxy of 1 to 5 carbon atoms and halogen, which process comprises:

reacting a dicarboxylic acid of the formula



in which X has the same meaning given above, with urea at a temperature of about 60° C to 150° C in chlorosulfonic acid or an at least 10% by weight oleum as the reaction medium.

4,053,511

NOPINYLAMINES

Werner Hoffmann, Neuhausen; Norbert Mueller, Mutterstadt, and Joachim Paust, Neuhausen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

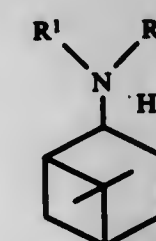
Filed Oct. 1, 1976, Ser. No. 728,528

Claims priority, application Germany, Oct. 11, 1975, 2545657
Int. Cl.² C07C 85/00, 87/00

U.S. Cl. 260—563 P

2 Claims

1. Nopinylamines of the general formula I



where R¹ and R² are identical or different and are hydrogen or alkyl of 1 to 5 carbon atoms, and the salts of these amines with mineral acids and with alkylcarboxylic acids of 1 to 4 carbon atoms.

4,053,512

PROCESS FOR PREPARING POLY(ALLYLTRIALKYLAMMONIUM) SALT FLOCCULANTS

Hans Peter Panzer, and Dinshaw Framroze Bardoliwalla, both of Fairfield County, Conn., assignors to American Cyanamid Company, Stamford, Conn.

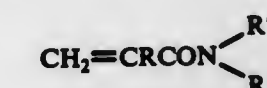
Filed Aug. 2, 1976, Ser. No. 710,530

Int. Cl.² C07C 85/00

U.S. Cl. 260—567.6 P

10 Claims

1. A process for preparing a polyquaternary flocculant which process comprises: (1) preparing a preliminary free-radical polymer of a monomer selected from (i) the group consisting of N,N-dimethylacrylamide, N,N-dimethylmethacrylamide, N-methyl, N-ethylacrylamide, N-methyl, N-ethylmethacrylamide, N,N-diethylacrylamide, N,N-diethylmethacrylamide, N-methyl, N-isopropylacrylamide, N-methyl, N-isopropylmethacrylamide, N-methyl, N-n-propylacrylamide, and N-methyl, N-n-propylmethacrylamide and (ii) mixtures thereof of a dialkylacrylamide of the structure:



wherein R is hydrogen or methyl, R' and R'' are alkyl groups such that the number of carbons provided by R' and R'' is from 2 to about 4, said polymer having a molecular weight of at least about 5,000; (2) reducing the amide groups of the preliminary polymer to complete absence of carbonyl absorption in the infrared so as to provide the corresponding intermediate allyldialkylamine polymer; and (3) quaternizing the intermediate polymer using a stoichiometric excess of quaternization agent to ensure complete quaternization to provide the corresponding final poly(allyltrialkylammonium) flocculant in the form of a water-soluble salt, said polymer containing a total of 3 to about 5 carbons in said trialkyl groups.

4,053,513

BARIUM NITRIDE CATALYSTS FOR THE PREPARATION OF DIAMINO-DIPHENYLMETHANES

Edward T. Marquis, and Lewis W. Watts, Jr., both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Jan. 19, 1977, Ser. No. 760,613

Int. Cl.² C07C 85/145

U.S. Cl. 260—570 D

4 Claims

1. A method of preparing diaminodiphenylmethane and higher homologues thereof which comprises the step of condensing aniline and formaldehyde in the presence of a barium nitride catalyst.

4,053,514

2-[DIALKYLAMINOALKOXYPHENYL]-METHYLENE-2,3-DIHYDRO-1H-INDEN-1-ONES AND THE SALTS THEREOF

John Krapcho, and Joseph Schwartz, both of Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

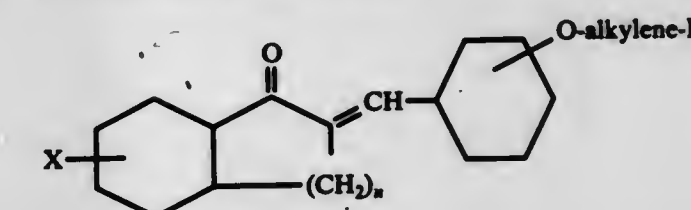
Division of Ser. No. 599,732, July 28, 1975, Pat. No. 3,969,527. This application May 3, 1976, Ser. No. 682,695

Int. Cl.² C07C 93/06

U.S. Cl. 260—570 R

11 Claims

1. A compound of the formula



wherein X is a member selected from the group consisting of

4,053,523

PROCESS FOR THE HYDROXYLATION OF PHENOL
Hermann Seifert, Cologne; Helmut Waldmann; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal-Gloebsch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 28, 1975, Ser. No. 554,048

Claims priority, application Germany, Mar. 6, 1974, 2410742
Int. Cl.² C07C 39/10

U.S. Cl. 260—621 G

14 Claims

1. A process for preparing pyrocatechol and hydroquinone, wherein phenol is reacted at the start of the reaction with substantially anhydrous hydrogen peroxide obtained by distilling off hydrogen peroxide which is in the form of non-aqueous solution whose solvent boils at a higher temperature than the phenol, together with the phenol from the higher boiling solvent, and reacting, before or after condensation, the vapors containing hydrogen peroxide which distill over, optionally following the addition of a stabilizer, wherein the reaction is carried out in the presence of a strong acid selected from the group consisting of sulfuric acid, perchloric acid, nitric acid, trifluoromethanesulfonic acid, perfluorobutanesulfonic acid, a fluorinated acid ion exchanger of a sulfonated polymeric fluorine-substituted hydrocarbon and fluorosulfonic acid at a temperature of 20°–150° C and recovering pyrocatechol and hydroquinone.

4,053,524

HYDROGENATION PROCESS AND CATALYST
Paul R. Stapp, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 28, 1975, Ser. No. 608,599

Int. Cl.² C07C 29/20, 27/04

U.S. Cl. 260—631 H

3 Claims

1. A process for the hydrogenation of phenol which comprises admixing said phenol and an aqueous alkaline solution diluent having an alkali concentration such that the mol ratio of alkaline agent to phenol is in the range of 0.001 to about 2 mols per mol of phenol and treating the resulting admixture with hydrogen at a temperature in the range of 75° to about 200° C. and a pressure of about 225 to about 5000 psig in the presence of from 1 to about 10 parts by weight per 100 parts by weight of said phenol of a catalyst consisting essentially of 0.1 to 1.0 weight percent ruthenium on Cr₂O₃ whereby the hydrogenation is effected.

4,053,525

PROCESS FOR PRODUCTION OF GLYCERINE
David I. Salzman, LaPorte; Reginald S. Yeung, Houston, and William R. Pledger, Pearland, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 1, 1976, Ser. No. 737,627

Int. Cl.² C07C 29/00

U.S. Cl. 260—635 E

11 Claims

1. A process for the production of glycerine from a chlorohydrin reactant mixture containing epichlorohydrin and glycerol mono- and dichlorohydrins which comprises hydrolyzing the chlorohydrin reactant mixture at a temperature of about 50° to about 70° C by contact with an aqueous phase containing at least 0.5% by weight alkali metal carbonate catalyst in the presence of an organic solvent phase having less than about 0.5% weight solubility in water and a dielectric constant of less than about 10, said aqueous phase being about 0.5 to about 10 times the volume of the organic solvent phase, for a period of from about 20 to about 150 hours.

4,053,526

PROCESS FOR ISOLATING DINITRONAPHTHALENES
Heinz Ulrich Blank, Odenthal; Friedrich Durholz, Remscheid, and Guido Skipka, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 1, 1976, Ser. No. 672,689

Claims priority, application Germany, Apr. 19, 1975, 2517437
Int. Cl.² C07C 79/10

U.S. Cl. 260—645

16 Claims

1. Process for isolating 1,5- and 1,8-dinitronaphthalene from mixtures of isomeric dinitronaphthalenes at least containing the same which comprises treating the mixture of isomers successively with a more polar solvent and a less polar aromatic solvent for dinitronaphthalenes thereby dissolving the mixture of isomers except for 1,5-dinitronaphthalene which remains largely undissolved in the more polar solvent, and subsequently treating the residual mixture of isomers, after removal of the more polar solvent, with a less polar aromatic solvent at elevated temperature in which 1,8-dinitronaphthalene remains as a largely insoluble residue.

4,053,527

MANUFACTURE OF HALONITROBENZENES
Ulrich Jersak, and Horst Scheuermann, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

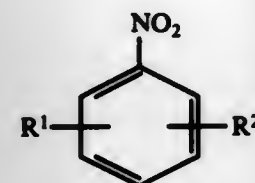
Continuation-in-part of Ser. No. 737,723, Nov. 1, 1976. This application Feb. 25, 1977, Ser. No. 772,283

Claims priority, application Germany, Dec. 11, 1975, 2555736
Int. Cl.² C07C 79/12

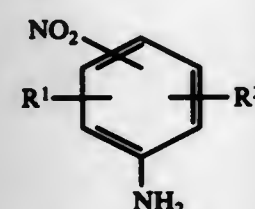
U.S. Cl. 260—646

14 Claims

1. A process for the manufacture of halonitrobenzenes of the formula



where R¹ and R² may be identical or different and each is halogen, and R² may also be hydrogen, by reacting halonitroanilines with alcohols and nitrosating agents at elevated temperatures in the presence of an acid, wherein halonitroanilines of the formula



where R¹ and R² have the above meanings, are reacted with aliphatic, cycloaliphatic or araliphatic alcohols, which may be partly or wholly combined with the nitrosating agent, at not less than 35° C, in the presence of water.

4,053,528

PROCESS FOR THE PREPARATION OF DIELS-ALDER ADDUCTS OF HALOGENATED CYCLOPENTADIENES
Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 429,454, Dec. 28, 1973, abandoned. This application Apr. 9, 1975, Ser. No. 566,487

Int. Cl.² C07C 17/00

U.S. Cl. 260—648 C

16 Claims

1. In a process for the preparation of a Diels-Alder adduct by carrying out the Diels-Alder reaction of a halogenated cyclo-

pentadiene, wherein the carbon atoms of the carbon-to-carbon double bonds are perhalogenated, with a mono-olefin or diolefin capable of reacting with said halogenated cyclopentadiene to form a solid adduct, the improvement which comprises carrying out the addition reaction with the reactants emulsified in an aqueous reaction medium employing about 0.9 to about 2.2 mole of the halogenated cyclopentadiene per mole of the olefin, the proportion of the halogenated cyclopentadiene and olefin reactants in said aqueous emulsion being about 10 to about 60 weight percent of the emulsion and the reaction temperature being about 20° Centigrade to about 160° Centigrade to obtain the solid adduct in particulate form having substantially no particles with a maximum size greater than about 200 microns.

4,053,529

PROCESS FOR THE MANUFACTURE OF VINYLIDENE FLUORIDE

Guy Martens, Jemeppe, Belgium, assignor to Solvay & Cie, Brussels, Belgium

Filed July 13, 1976, Ser. No. 704,798

Claims priority, application Luxembourg, July 18, 1975, 73023

Int. Cl.² C07C 17/34

U.S. Cl. 260—653.5

5 Claims

1. Process for the manufacture of vinylidene fluoride by pyrolysis of 1-chloro-1,1-difluoroethane at temperatures of between 500° and 610° C, comprising conducting the pyrolysis in the simultaneous presence of from 0.01 to 10 mol % of carbon tetrachloride and from 0.01 to 10 mol % of chlorine, relative to the 1-chloro-1,1-difluoroethane.

4,053,530

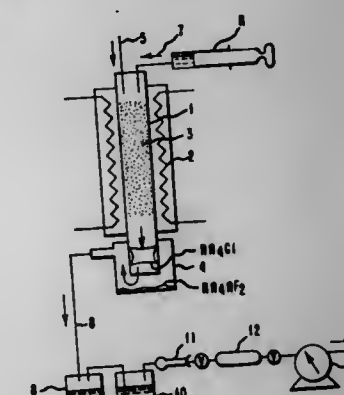
CATALYZED FLUORINATION OF CHLOROCARBONS
Wesley Gerald Schindel, Pennsville, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 29, 1976, Ser. No. 709,818

Int. Cl.² C07C 17/10

U.S. Cl. 260—653.8

10 Claims



1. The process of fluorinating carbon tetrachloride or chloroform which comprises reacting, at a temperature of around 300°–550° C. and in vapor phase, at least one of the same with ammonium bifluoride in the presence of at least one catalyst of the group consisting of calcium, magnesium, barium, strontium, ferric and chromic fluorides and chromic phosphate.

4,053,531

STEAM REFORMING OF POLYCYCLIC HYDROCARBONS

Edwin R. Kerr; Tanukhlal G. Dorawala, both of Wappingers Falls, and Russell R. Reinhard, Hopewell Junction, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,911

Int. Cl.² C07C 3/34, 3/58

U.S. Cl. 260—672 R

19 Claims

1. The process for converting a charge polycyclic aromatic

hydrocarbon to an aromatic product containing a lesser number of aromatic rings than said charge hydrocarbon which comprises

passing a mixture of steam and a charge polycyclic aromatic hydrocarbon at 850° F–1500° F and 0–400 psig into contact with an activated supported catalyst containing oxides of (i) a Group VIB metal, (ii) a Group I A metal, and (iii) an after-deposited Group VIII metal, said supported catalyst containing Group VIII metal, expressed as metal oxide, in amount of at least about 0.5 wt % when said Group VIII metal is a noble metal and in amount of at least about 6 wt % when said Group VIII metal is iron, cobalt, or nickel, and at least about 15% by weight of said Group VIII metal, expressed as oxide, being in the form of metal thereby forming an aromatic product containing a lesser number of aromatic rings than said charge hydrocarbon; and recovering said product.

4,053,532

METHOD FOR IMPROVING THE FISCHER-TROPSCH SYNTHESIS PRODUCT DISTRIBUTION

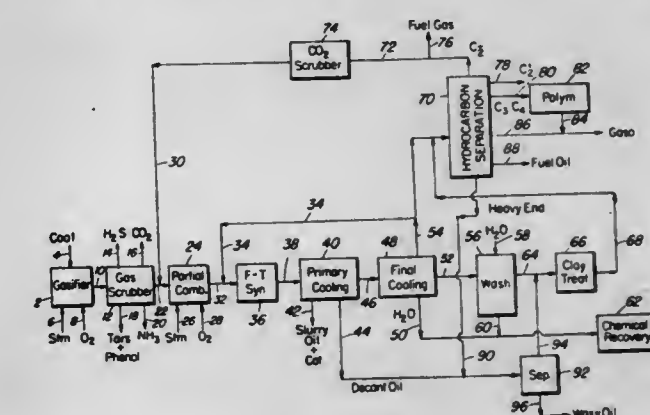
Henry R. Ireland, Woodbury, and Thomas R. Stein, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 601,753, Aug. 4, 1975. This application Dec. 5, 1975, Ser. No. 638,217

Int. Cl.² C07C 1/04

U.S. Cl. 260—676 R

5 Claims



1. In a process for hydrowaxing a Fischer-Tropsch decant oil fraction boiling in the range of 400° F to about 1000° F wherein the heavy oil fraction is contacted in the presence of hydrogen with a crystalline zeolite catalyst having a pore diameter greater than about 5 Angstroms; a silica-to-alumina ratio of at least 12; a constraint index within the range of 1 to 12; the method for improving the catalyst selectivity and aging rate during said operation which comprises preconditioning said catalyst by,

a. heating the catalyst gradually with hydrogen at 800° F for two hours at a pressure of about 500 psig,
b. sulfiding the hydrogen treated catalyst at a temperature within the range of 500° to 750° F.,
c. contacting the sulfided catalyst with a steam-hydrogen mixture at 800° F for 24 hours, and
d. reducing the temperature of the steam treated catalyst to about 500° F before initially contacting the oil charge therewith under hydrowaxing conditions.

4,053,533

OXIDATION OF ACETYLENIC IMPURITIES WITH
COPPER MANGANITE CATALYST

Lewis E. Drehman; Floyd Farha, Jr., and Arlo J. Moffat, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 15, 1975, Ser. No. 622,591
Int. Cl.² C07C 7/01; B01J 23/34, 23/84

U.S. Cl. 260—681.5 R 7 Claims

1. A process for the selective removal of acetylenic contaminants or impurities present in hydrocarbon streams which comprises contacting oxygen and a hydrocarbon-containing mixture contaminated with acetylenic compounds with a catalyst consisting essentially of copper, manganese, and oxygen in which the atomic ratio of copper to manganese varies from about 0.2:1 to about 4:1 under oxidation conditions including a temperature and a mol ratio of oxygen to hydrocarbon sufficient to selectively remove a substantial portion of said acetylenic compounds present in said mixture.

4,053,534

ORGANIC COMPOUND CONVERSION

Thomas Owen Mitchell, Trenton, and Darrell Duayne Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 681,883, April 30, 1976, which is a continuation-in-part of Ser. No. 443,557, Feb. 19, 1974, Pat. No. 3,980,543. This application Dec. 27, 1976, Ser. No. 754,209
Int. Cl.² C07C 3/14

U.S. Cl. 260—683.15 R 29 Claims

1. A method for olefin dimerization which comprises contacting said olefin under conditions effective for dimerization with a catalyst comprised of a substrate or a porous refractory oxide, said substrate having surface hydroxyl groups, a minimum surface area of about 10 m²/g and pores with a minimum pore diameter of about 5 Angstrom Units, said substrate being modified by at least one amine functional member, containing the element silicon, coordinated to a metal function of a transition metal selected from the group consisting of Group VIII metals of the Periodic Table of Elements, said amine functional member acting as a bridging member between said substrate and said metal function, as a ligand covalently bonded to said substrate.

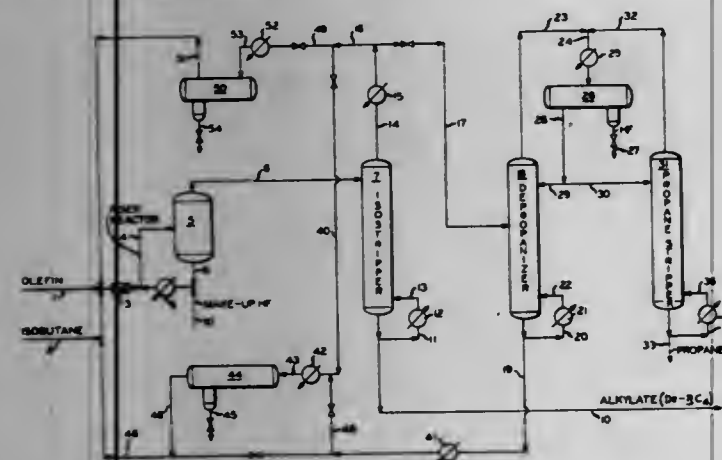
4,053,535

PROCESS FOR PRODUCING ISOPARAFFIN-OLEFIN
ALKYLATE HAVING IMPROVED OCTANE NUMBER

Thomas Hutson, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 25, 1976, Ser. No. 689,760
Int. Cl.² C07C 3/54

U.S. Cl. 260—683.49 2 Claims



1. A process for producing alkylate having an improved octane number which comprises:

- passing total hydrocarbon reactants comprising isoparaffin and olefin through a static mixing zone and therein subjecting said isoparaffin and olefin to thorough mixing;
- introducing the mixture of isoparaffin and olefin after

passing through said static mixing zone to a riser-reactor in admixture with HF acid catalyst at liquid phase and reaction conditions to convert at least a substantial portion of isoparaffin and olefin into alkylate;

- passing the reaction effluent of step (b) to a first settling zone and allowing the reaction effluent to separate into an upper phase comprising hydrocarbons and a lower phase comprising HF;
- passing said upper phase to a fractionation zone and therein subjecting same to distillation conditions to separate said upper phase into a fraction comprising alkylate and a fraction comprising isoparaffin;
- withdrawing the isoparaffin fraction from step (d) and refrigerating same to a sufficiently low temperature to allow separation of traces of HF still remaining in the isoparaffin fraction;
- passing the refrigerated isoparaffin stream to a second settling zone and allowing same to separate therein into an upper isoparaffin phase and a lower HF phase;
- recycling a substantially HF-free isoparaffin stream separated in (f) to said mixing zone; and
- withdrawing the alkylate separated in step (d) as product, said alkylate having a higher octane value than alkylate produced by the same process, but without step (a).

4,053,536

DEHYDRATION OF OLEFINICALLY UNSATURATED
ALCOHOLS

William B. Hughes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 25, 1976, Ser. No. 689,759
Int. Cl.² C07C 1/20

U.S. Cl. 260—681 20 Claims

1. A process which comprises contacting at least one unsaturated alcohol with at least one molybdenum-containing compound under reaction conditions suitable to convert at least a portion of said at least one unsaturated alcohol to at least one conjugated diene, said at least one unsaturated alcohol being selected from the group consisting of α -olefinic alcohols and β -olefinic alcohols, said at least one molybdenum-containing compound being selected from the group consisting of molybdenum β -diketonates and molybdenum(II) carboxylates.

4,053,537

PROCESS FOR THE PRODUCTION OF ELASTIC
COMPOSITES

Hans Dieter Ruprecht, and Paul Heinrichs, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 6, 1975, Ser. No. 629,346

Claims priority, application Germany, Nov. 25, 1974, 2455679
Int. Cl.² C08L 75/08

U.S. Cl. 260—859 R 5 Claims

1. A process for the production of an elastic composite comprising:
- coating rubber and/or elastomeric plastic granulates with a paste of
 - a hydroxyl containing polyether and
 - mineral fillers and/or pigments,
 - subsequently mixing a polyisocyanate binder therewith, and
 - hardening the resultant mixture.

4,053,538

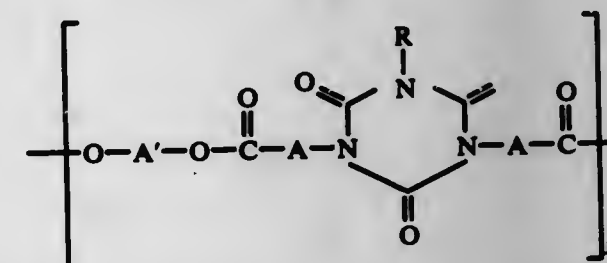
BLOCK POLYMERS FROM ISOCYANURATE-BASED
POLYESTERS AND CONVENTIONAL POLYESTER
SEGMENTS

John E. Herweh, Lancaster, and William Y. Whitmore, Hellam, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Apr. 9, 1976, Ser. No. 675,453
Int. Cl.² C08L 67/00; C08G 63/68

U.S. Cl. 260—860 8 Claims

1. A substantially linear segmented copolymer having the formula (MX)_n, wherein n is an integer greater than 0 and M is a bivalent organic radical segment of the formula



wherein R is hydrogen, C₁ to C₄ alkyl, aryl or C₁ to C₄ alkyl substituted aryl; A is C₁ to C₄ alkylene; A' is C₁ to C₄ alkylene the same or different from A, phenylene or alkyl substituted phenylene; and y is an integer greater than 0, said segment M of molecular weight from 1,000 to 20,000; and X is a bivalent organic radical segment of the formula



wherein G is a long chain radical segment of recurring linkages selected from the group consisting of ester and ether; and z is an integer greater than 0 the same or different than said segment X of molecular weight 1,000 to 20,000; wherein the difference between the glass transition temperature of said segment M and said segment X is from about 50° to about 200° C.

4,053,539

PROCESS FOR THE PREPARATION OF GRAFTED
COPOLYMERS

Jacques Delsarte, Villers Saint Sepulcre, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 30, 1976, Ser. No. 653,948

Claims priority, application France, Feb. 3, 1975, 75.03229
Int. Cl.² C08F 255/04, 255/06

U.S. Cl. 260—878 R 15 Claims

1. A method of preparing grafted polymers by mass polymerizing a mixture of polymerizable vinyl monomers in the presence of an elastomer on which the vinyl monomers are to be grafted, the elastomer being soluble in at least one of the vinyl monomers and also insoluble in at least one of the vinyl monomers, which comprises:

- dissolving an elastomer in at least one monomer in which it is soluble;
- initiating a mass prepolymerization reaction;
- introducing the monomer or monomers in which the elastomer is insoluble during the prepolymerization reaction;
- completing the addition of the monomer or monomers during the prepolymerization reaction prior to the phase inversion of the reaction medium; and
- completing the polymerization.

4,053,540

SELF-SEALING FILMS

Federico Argurio, Brussels; Mario Borasatti, Overijse, and Jan Heindrijckx, Berg, all of Belgium, assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 585,882, June 11, 1975, abandoned.

This application Aug. 16, 1976, Ser. No. 714,894

Claims priority, application United Kingdom, July 5, 1974, 29970/74

Int. Cl.² C08K 5/11

U.S. Cl. 260—897 B 3 Claims

1. A composition suitable for fabricating into a self-sealing film consisting essentially of

- 95.0 to 99.9 wt. % of a mixture of thermoplastic polyethylene and a copolymer of ethylene and vinyl acetate, the copolymer containing 3 to 10 wt. % of polymerized vinyl acetate, the proportion of polymerized vinyl acetate in the mixture being from 0.10 to 1.95 wt. %; and
- 0.01 to 5.0 wt. % of a partial ester, the partial ester being glycerol monooleate or a monoester of sorbitol or sorbitan and a C₁₀ to C₂₄ carboxylic acid.

4,053,541

ACETOACETIC ACID PENTAERYTHRITOL PHOSPHITE
ESTER

Edgar Fischer, Frankfurt am Main; Otto Mauz, Liederbach, Taunus; Norbert Mayer, and Gerhard Pfahler, both of Augsburg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

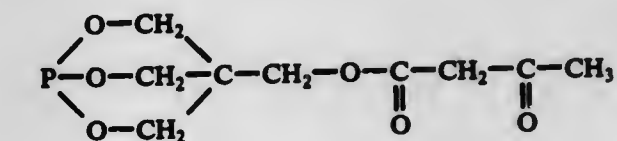
Filed Feb. 3, 1976, Ser. No. 654,853

Claims priority, application Germany, Feb. 7, 1975, 2505152

Int. Cl.² C07F 9/14

U.S. Cl. 260—937 1 Claim

1. Acetoacetic acid pentaerythritol phosphite ester of the formula



4,053,542

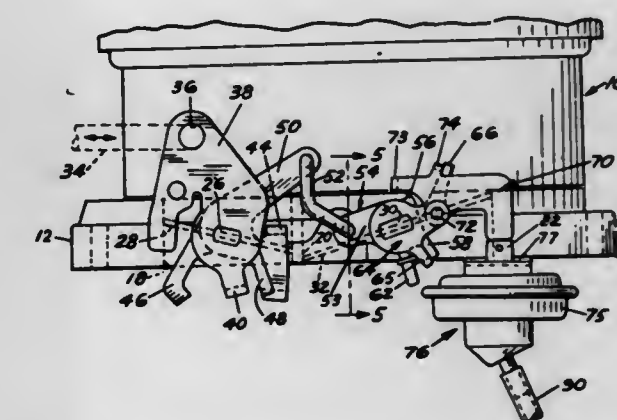
CONTROL MEANS FOR SECONDARY THROTTLE

John L. Niebrzydowski, Florissant, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed July 22, 1976, Ser. No. 707,859

Int. Cl.² F02M 11/02

U.S. Cl. 261—23 A 3 Claims



- In a multiple stage carburetor for an internal combustion engine, a primary mixture conduit having a primary throttle valve therein and a secondary mixture conduit having a secondary throttle valve therein, primary and secondary throttle shafts on which the primary and secondary throttle valves are mounted, a linkage releasably connecting the primary and secondary throttle shafts for rotation including a latch member

for the linkage movable to a latched position to connect the linkage for sequential opening of the secondary throttle valve; the improvement comprising a diaphragm motor operatively connected to the latch member to move the latch member to a latched position, a vacuum line connected to the diaphragm motor and in fluid communication with the intake manifold vacuum, an air bleed in the vacuum line including an air bleed valve member, and a temperature responsive bimetallic element operatively connected to the air bleed valve member to control the amount of air bled into the vacuum line, said bimetallic element responsive to a predetermined high engine operating temperature and being actuated upon reaching the desired engine operating temperature to increase the amount of air bled into the vacuum line and effect movement of the latch member to latched position to permit opening of the secondary throttle valve.

4,053,543

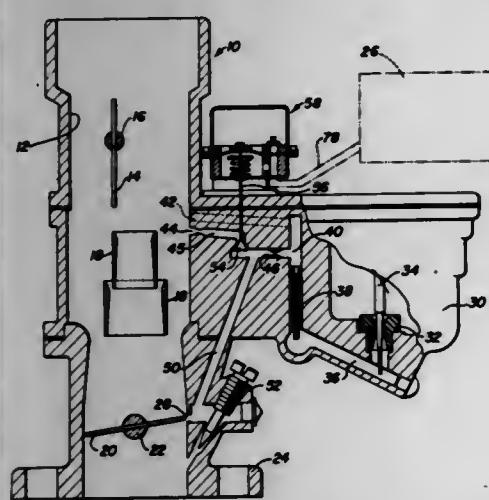
AIR BLEED CONTROL FOR CARBURETOR IDLE SYSTEM

James H. Pettitt, Woodhaven, Mich., assignor to ACF Industries, Inc., New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,661
Int. Cl.² F02M 3/04

U.S. Cl. 261—121 B

3 Claims



1. In a carburetor for an internal combustion engine having a fuel bowl, an air and fuel mixture conduit, a throttle valve mounted within said conduit, an idle port in the mixture conduit adjacent the closed position of the throttle valve, an idle fuel passage between the idle port and the fuel bowl, an air bleed port in said carburetor in fluid communication with the idle fuel passage, and an air bleed valve member to control the amount of air flow through said air bleed port, the improvement of air bleed valve control means integral with said carburetor to control the movement of said valve member, said control means comprising a body having an air chamber therein, a diaphragm in said body having one side thereof facing the air chamber,

a vacuum chamber adjacent the other side of said diaphragm in fluid communication with an intake manifold of the internal combustion engine, a check valve member between the vacuum chamber and the air chamber and having a restricted opening of a predetermined size to permit fluid communication between the vacuum and air chambers in a seated position of the check valve member, spring means urging the diaphragm in a direction toward the said air chamber, an operating stem operatively connected between the air bleed valve member and diaphragm and positioned within the vacuum chamber to move with the diaphragm, said diaphragm being responsive to manifold vacuum and upon rapid engine deceleration said diaphragm and operating stem in response to the relatively large pressure differential between the said vacuum chamber and the said air chamber to move said air bleed valve member in one direction to provide maximum air flow to said idle fuel passage, said pressure differential

being reduced upon the flow of air through the restricted opening in said check valve member whereby after a predetermined time said air bleed valve member moves in an opposite direction to reduce the air flow to said idle fuel passage.

4,053,544

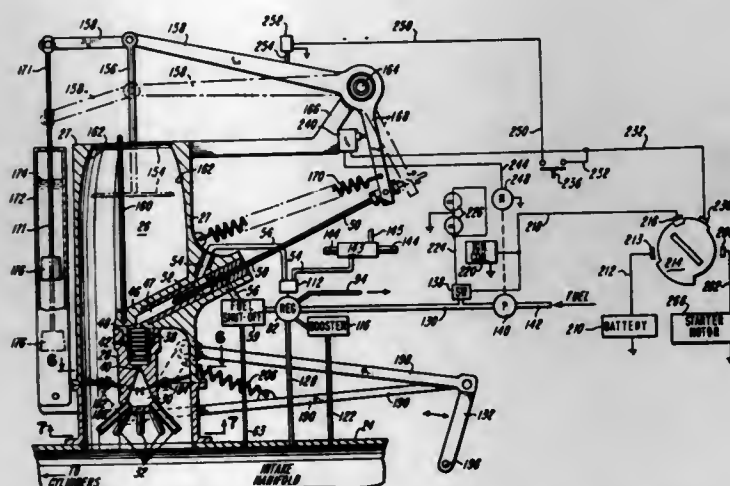
FUEL INDUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Jesse C. Moore, Celina, Ohio, assignor to J. C. Moore Research, Inc., Celina, Ohio

Filed Apr. 15, 1974, Ser. No. 460,915
Int. Cl.² F02M 31/14

U.S. Cl. 261—145

19 Claims



1. Mechanism for introducing fuel into an internal combustion engine having an intake manifold, comprising:
a housing having a vacuum chamber in communication with the intake manifold,
a vaporizer within the vacuum chamber, the vaporizer having a vaporizer chamber and an expansion vaporizer cavity in communication with the vaporizer chamber,
a plurality of nozzles extending from the vaporizer cavity into the vacuum chamber,
a plurality of parallel aligned discs within the vaporizer chamber and extending across the vacuum chamber, each of the discs having at least one aperture therethrough,
a fuel conduit in communication with the vaporizer chamber,
a metering rod having a portion axially movable within the fuel conduit and axially movable to close the fuel conduit, the metering rod having a groove extending along a portion of the length thereof, the groove having a gradually increasing dimension along the length thereof,
fuel pump means joined to the fuel conduit for urging flow of fuel therethrough,
and control means for controlling the axial position of the metering rod with respect to the fuel conduit to control the volume of fuel which flows through the fuel conduit to the vaporizer chamber.

4,053,545

PROCESS FOR MANUFACTURING LAMINATED STRUCTURAL FOAM ARTICLES

Clifford Charles Fay, St. Paul, Minn., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 464,543, April 26, 1974, abandoned.
This application July 29, 1975, Ser. No. 599,984

Int. Cl.² B29D 27/00; B32B 5/18
U.S. Cl. 264—46.4

4 Claims

1. A process for preparing a laminated article comprising a thermoplastic sheet bonded to and supported by a thermoplastic foam which comprises: introducing by injection a foamable thermoplastic resin composition into a mold containing a thermoplastic sheet preheated to a first temperature, said thermoplastic sheet having substantially the contours of at least a portion of a surface of said mold and being fitted to said por-

tion of a surface of said mold, said foamable thermoplastic resin being at a second temperature such that said foamable thermoplastic resin composition foams in said mold and a thermal bond at the interface is created between the resulting thermoplastic foam and said thermoplastic sheet by facial melting of said thermoplastic sheet caused by said foam, wherein said first and second temperatures are selected such as to result in substantially the same linear shrinkage of said thermoplastic foam and said thermoplastic sheet upon cooling the resultant laminate to room temperature.

2. A process for preparing a laminated article comprising a thermoplastic sheet bonded to and supported by a thermoplastic foam which comprises: introducing by injection a foamable thermoplastic resin composition into a mold containing a thermoplastic sheet preheated to a first temperature, said sheet



being provided with a coating of a heat activated adhesive on at least a portion of a first surface and said sheet having a second surface to be contacted with said foamable thermoplastic resin composition opposite said first surface with substantially the contours of at least a portion of a surface of said mold and having said second surface fitted to said portion of a surface of said mold, said foamable thermoplastic resin being at a second temperature such that said foamable thermoplastic resin composition foams in said mold and a bond is created between the resulting thermoplastic foam and said thermoplastic sheet upon reaction of said adhesive caused by the heat of said foamable thermoplastic resin composition, said first and second temperatures being selected so as to result in substantially the same linear shrinkage of said thermoplastic sheet and said thermoplastic foam upon cooling the resultant laminate to room temperature.

4,053,546

METHOD OF MAKING A LEATHER-LIKE SHEET MATERIAL BY COAGULATING TWO POLYMERS

Tsuyoshi Yamasaki, and Kunio Kogame, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Dec. 24, 1975, Ser. No. 644,120

Claims priority, application Japan, Dec. 25, 1974, 49-4082
Int. Cl.² B29D 27/04; B05D 5/00

U.S. Cl. 264—49

4 Claims

1. A method for producing a leather-like sheet material having a good sponge structure and low bounce impact elasticity, which comprises,

- preparing a composite solution by mixing (i) a solvent solution of a polymer (A) consisting mainly of an elastomer having an initial modulus of less than 5×10^2 Kg/cm² and (ii) a dispersion in a liquid dispersing medium of a polymer (B) consisting mainly of an elastomer having an initial modulus of less than 5×10^2 Kg/cm² and having a particle size less than 5μ , said said solvent for (A) not completely dissolving (B), thereby resulting polymer (B) being dispersed but not completely dissolved in said composite solution, the ratio of (A) to (B) being in the range of 95 : 5 to 30 : 70 parts by weight;
- coating a supporting sheet in a given thickness or impregnating a fibrous mat with the composite solution;
- immersing the coated supporting sheet or the impregnated fibrous mat in a liquid coagulation bath for coagulating said polymers (A) and (B); thereby depositing and coagulating said polymers on said supporting sheet or in said fibrous mat; and sheet or said;
- drying said sheet or said mat.

4,053,547

METHOD FOR PRODUCING A POSITIVE DRIVE BELT

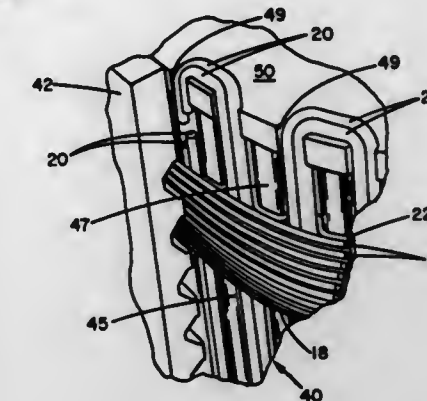
John D. Redmond, Jr., Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 189,440, Oct. 14, 1971, Pat. No. 3,772,929.
This application June 21, 1973, Ser. No. 372,124

Int. Cl.² B29D 29/02

U.S. Cl. 264—102

19 Claims



- A method for casting cog-type power transmission belts from flowable elastomeric material comprising the steps of:
 - forming a mold cavity defined by a mold mandrel and an outer mold shell, one of said mandrel or shell having a plurality of notches therein disposed substantially parallel to the axis of the mold;
 - wrapping an extensible fabric about the surface of the notched mold portion;
 - placing loading members upon the extensible fabric and positioned opposite of and extending in the same direction as said notches;
 - forcing said loading members and the extensible fabric ahead of the loading into the bottom members of said notches;
 - introducing a substantially liquid elastomeric material into said mold cavity; and
 - polymerizing the resultant formed product to form one or more unitary endless belt members.

4,053,548

FABRICATION PROCESS FOR MULTIPHASED PLASTICS

Robert D. Lundberg, Somerville, and Henry S. Makowski, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

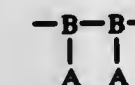
Filed Nov. 17, 1971, Ser. No. 199,799

Int. Cl.² B29B 3/02; B29C 25/00

U.S. Cl. 264—230

7 Claims

1. A process for fabricating an article from a thermoplastic composition, said thermoplastic composition being a multiphase copolymer of the A-B-A,



or (AB)_n type, wherein n is greater than 1 and wherein polymer blocks, A and B, are thermoplastic resins, each comprising at least 10 monomer units and having softening points of at least 35° C., with B being the lower softening block and being present in at least about 50% to about 97% by weight % of the total polymer, and the A block having a softening point at least 10° C. higher than said B block which comprises:

- forming said thermoplastic composition in a first desired shape at a temperature above both softening points;
- reforming to a second desired shape the formed thermoplastic of step (a) at a temperature between that of the softening point of the A and B blocks; and
- cooling the reformed thermoplastic to a temperature

below both softening points while retaining said new desired shape.

4,053,549
METHOD OF EMBOSSED FOAM POLYSTYRENE TO PREVENT WARPING UPON REMOVAL FROM MOLD
Robert Joseph Vandro, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 6, 1975, Ser. No. 538,660
Int. Cl.² B29B 3/00; B29F 5/00

U.S. Cl. 264—293

3 Claims



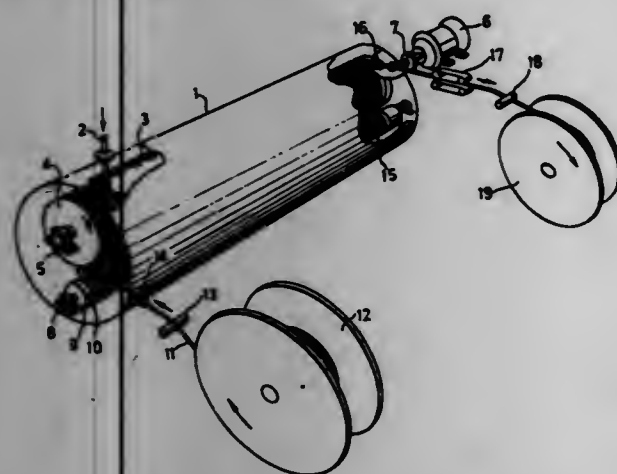
1. In a method of thermoforming a flat foam polystyrene sheet to make a substantially flat article free from integral upstanding wall elements by preheating a flat polystyrene sheet and embossing one side said sheet by pressing said sheet between a pair of mold members, the improvement to eliminate warpage of said article upon removal of said article from said mold members, comprising: forming, by surface embossing at least two spaced apart parallel grooves in a surface of a second side only of the preheated said sheet.

4,053,550
VULCANIZATION METHOD
Challen E. Taylor, Portadown, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Continuation-in-part of Ser. No. 506,386, Sept. 16, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,606
Claims priority, application United Kingdom, Oct. 29, 1973, 50138/73

Int. Cl.² B29H 5/01

U.S. Cl. 264—347

3 Claims



1. A method of vulcanizing continuous lengths of unsheathed and unvulcanized elastomeric or plastomeric hose comprising feeding in the absence of significant tension a continuous length of such hose without internal support in a helical path around a pair of rolls mounted on horizontal axis in a vulcanizing chamber, the surface of at least one of said rolls being contoured to position the convolutions of hose thereon and one of said rolls being of a substantially larger diameter than and mounted above and spaced from the other roll so that a substantial portion of the length of the hose is free of any contact with the roll surfaces and also self-supporting, provid-

ing sufficient pressure and temperature within said chamber to cause vulcanization of the elastomeric or plastomeric material and driving one of said rolls to continuously feed the hose through said vulcanizing chamber in said helical path from one end of the chamber to the other whereby the length of hose is vulcanized as it passes through said chamber.

4,053,551
METHODS OF RECOVERING TERBIUM OXIDE FROM A GLASS

James E. Brug, Toledo, Ohio, and Eric X. Heidelberg, Lambertville, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Sept. 2, 1976, Ser. No. 719,769
Int. Cl.² C01F 17/00

U.S. Cl. 423—21

6 Claims

1. A method of recovering Tb_4O_7 from a glass containing terbium oxide, the method comprising the steps of:
I. fusing the glass containing SiO_2 , Li_2O , Al_2O_3 and terbium oxide with NaOH to provide a solid fusion product;
II. slurrying in water the fusion product of Step I to disperse solid particles of Tb_4O_7 and Li_2SiO_3 and dissolving the Al_2O_3 , NaOH and Na_2SiO_3 to thereby separate said Tb_4O_7 , NaOH and Na_2SiO_3 from the solid particles of Tb_4O_7 ;
III. reacting the solid particles of Tb_4O_7 separated from the slurry of step II with HNO_3 to provide $Tb(NO_3)_3$;
IV. reacting $Tb(NO_3)_3$ with oxalic acid to form $Tb_2(C_2O_4)_3$; and
V. firing $Tb_2(C_2O_4)_3$ to form Tb_4O_7 and CO_2 to thereby recover solid Tb_4O_7 .

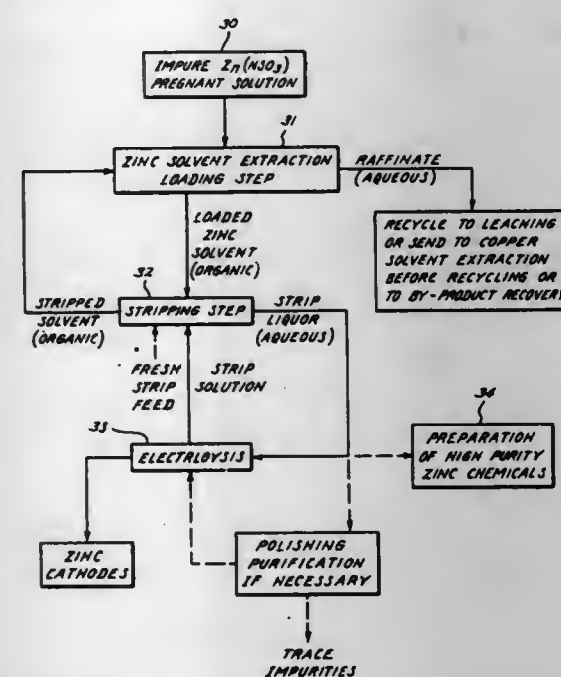
4,053,552
SOLVENT EXTRACTION OF ZINC FROM SULFITE-BISULFITE SOLUTION
Jay B. Clitheroe, Salt Lake City, Utah, and Robert Brantley Sudderth, Tucson, Ariz., assignors to General Mills Chemicals Co., Tucson, Ariz. and Mineral & Chemical Resource Co., Houston, Tex.

Filed Mar. 15, 1976, Ser. No. 666,694

Int. Cl.² C01G 9/00

U.S. Cl. 423—100

8 Claims



1. In a process for hydrometallurgical purification of zinc, the steps consisting essentially of:
forming an aqueous feed solution containing zinc values and a concentration of available bisulfite ions stoichiometrically in excess of the concentration of all metal values in said feed solution;
contacting said aqueous feed solution with an organic phase containing an ion exchange reagent selected from the group consisting of organo acid phosphates at a pH of from about 4.5 to about 1.5, whereby the pH of said con-

tacting step is maintained throughout extraction within said pH range and at least a portion of said zinc values are extracted into said organic phase;
and, contacting said organic phase with an inorganic mineral acid strip solution, thereby stripping said zinc values from said organic stage into said strip solution.

4,053,553
METHOD FOR SELECTIVE RECOVERY OF CADMIUM FROM CADMIUM-BEARING WASTE

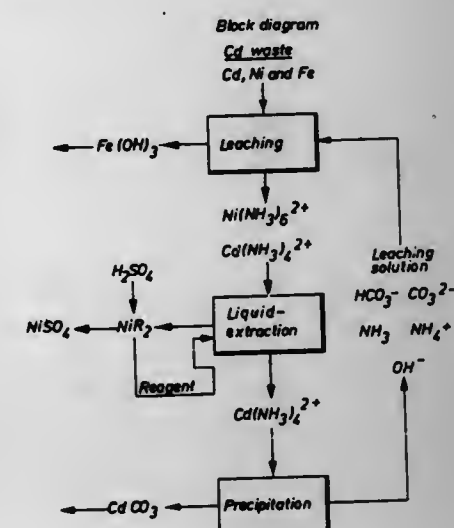
Hans Reinhardt, Vastra Frolunda; Harald Daniel Ottertun, Molndal, and Jan Helge Arnold Rydberg, Vastra Frolunda, all of Sweden, assignors to Nife Jungner AB, Oskarshamn, Sweden

Filed Jan. 14, 1976, Ser. No. 648,999

Claims priority, application Sweden, Jan. 28, 1975, 7500877
Int. Cl.² C01G 11/00, 51/04, 53/10

U.S. Cl. 423—105

6 Claims



1. A method for the selective recovery of cadmium, nickel and cobalt from a nickel-cadmium battery waste which comprises:

- leaching the waste with an ammoniacal carbonate solution wherein the sum of ammonia and ammonium ions ranges from 1 to 10 molar and the sum of hydrogen carbonate ions and carbonate ions ranges from 0.2 to 5 molar, thus forming an aqueous ammoniacal carbonate solution containing cadmium, nickel and cobalt(II) ammine complexes and a leaching residue, wherein any iron in the waste remains in the undissolved leaching residue;
- adding air to the aqueous ammoniacal carbonate solution from step (a) to thereby oxidize the cobalt (II) ammine complex to cobalt (III) ammine complex;
- contacting the resulting aqueous ammoniacal carbonate solution with an organic solution substantially insoluble in water which contains a hydroxyoxime with which nickel forms a nickel compound readily soluble in the organic solution, but which does not affect cadmium and cobalt (III) in the aqueous ammoniacal carbonate solution to thereby remove nickel therefrom;
- precipitating the cadmium in the form of a carbonate by removing ammonia from the aqueous ammoniacal carbonate solution and removing said cadmium in the form of a carbonate;
- withdrawing a portion of the aqueous ammoniacal carbonate solution resulting from step (d) after the precipitation of cadmium as a carbonate and precipitating the cobalt from the thus withdrawn solution by the removal of ammonia therefrom;
- returning the ammonia resulting from step (e) to the aqueous ammoniacal carbonate solution which has been freed from cadmium in step (d) and replacing the loss of carbonate ions due to any precipitations by the addition of carbon dioxide in gaseous form, whereafter the resulting aqueous

ammoniacal carbonate solution is reused in the leaching of step (a);
g. stripping the nickel compound readily soluble in the organic solution generated in step (c) by washing the organic solution with an aqueous solution of sulphuric acid containing 10–800 g/l of free sulphuric acid, whereby the nickel is stripped into the aqueous solution in the form of nickel sulphate, and thereafter reusing the organic solution stripped of nickel in step (c).

4,053,554
REMOVAL OF CONTAMINANTS FROM GASEOUS STREAMS

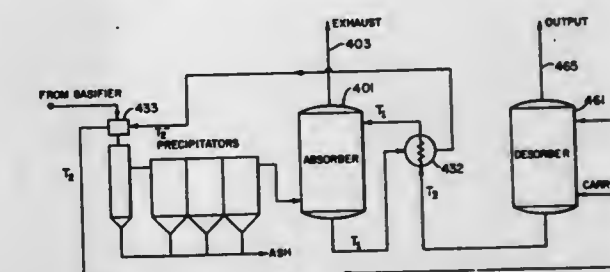
Richard S. Reed, Millington, and Alan R. Glueck, Lawrenceville, both of N.J., assignors to Catalox Corporation, Millington, N.J.

Division of Ser. No. 467,938, May 8, 1974, Pat. No. 3,917,797.
This application Oct. 31, 1975, Ser. No. 627,655

Int. Cl.² B01D 53/34

U.S. Cl. 423—210.5

9 Claims



1. The method of removing hydrogen sulfide from a mixture of gases comprising the steps of:
a. passing the mixture of gases through an absorber;
b. contacting the mixture of gases with a molten salt complex of vanadium oxide and alkali metal compound in said absorber at a temperature in the range from about 500° to about 700° F to absorb the hydrogen sulfide;
c. recovering said mixture of gases from said absorber absent said hydrogen sulfide.

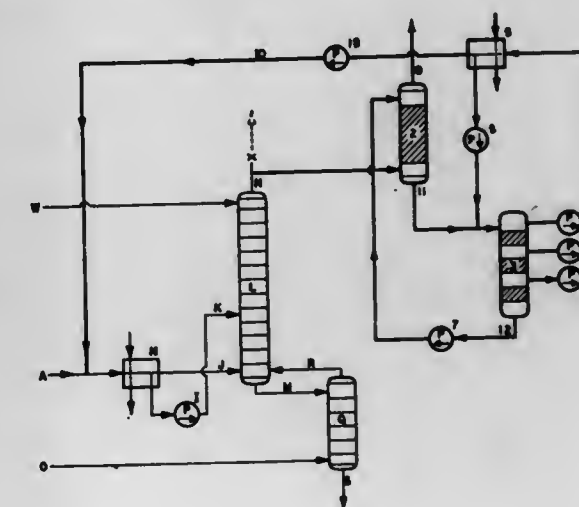
4,053,555
REMOVAL OF NITROGEN OXIDES FROM INDUSTRIAL GASES BY USE OF OXIDIZING SOLUTIONS IN WHICH NITRATES ARE THE OXIDANTS

Donald W. Bolme, c/o Donald W. Bolme & Associates, 10655 NE. 4th St., Bellevue, Wash. 98004

Continuation-in-part of Ser. No. 259,402, June 5, 1972, abandoned. This application Feb. 7, 1975, Ser. No. 548,104
Int. Cl.² B01D 53/34

U.S. Cl. 423—235

19 Claims



nitric oxide from industrial waste gases comprising an admixture of said nitric oxide and at least one other gas which includes the steps of: oxidizing the nitric oxide to the soluble trivalent state by so contacting it with an aqueous, nitrate ion containing solution as to effect the reaction



and dissolving the trivalent material in the water present in said solution to thereby separate the trivalent material from said gases; the concentration of nitrate ion in said solution being maintained in the range of 1-11.5 normal during the aforesaid steps to inhibit the decomposition of the dissolved trivalent material and the oxidation of the nitric oxide past the trivalent state, thereby maximizing the separation of the nitric oxide from the admixture.

4,053,556 CATALYSIS

Gary James Keith Acres, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Continuation-in-part of Ser. No. 617,161, Sept. 26, 1975, abandoned, which is a division of Ser. No. 262,363, June 13, 1972, Pat. No. 3,909,452. This application Mar. 18, 1976, Ser. No. 668,035

Claims priority, application United Kingdom, June 16, 1971, 28283/71; June 16, 1971, 28314/71

Int. Cl.² B01D 53/34

U.S. Cl. 423-239

13 Claims

1. In a process for the reduction with a reducing fuel of an oxide of nitrogen which comprises passing the gas mixture at an elevated temperature through a supported catalyst, the improvement which comprises using as the supported catalyst, one consisting essentially of an inert rigid porous refractory honeycomb structure having a first coating thereon containing at least one oxide selected from the group constituted by the oxides of titanium, zirconium, hafnium and thorium and a second coating of a mixture or alloy of platinum, rhodium and base metal in which the rhodium constitutes from 1 to 50 weight % and the base metal constitutes from 0.01 to 25 weight % of the total metal content.

4,053,557 METHOD OF DECOMPOSING CHLOROHYDROCARBONS

Yoichi Kageyama, Yokohama, Japan, assignor to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Division of Ser. No. 469,804, May 14, 1974, Pat. No. 3,972,979. This application Jan. 8, 1976, Ser. No. 647,565

Claims priority, application Japan, May 14, 1973, 48-53292; May 29, 1973, 48-60107

Int. Cl.² B01D 53/34

U.S. Cl. 423-240

6 Claims

1. A method of oxidatively decomposing a chlorohydrocarbon having from 1 to 10 carbon atoms to carbon dioxide, water, hydrogen chloride and free chlorine which comprises contacting an exhaust gas containing from 10 - 10,000 ppm of said chlorohydrocarbon of from 1 - 10 carbon atoms and molecular oxygen with a catalytic amount of chromium oxide catalyst at a temperature of from 200°-500° C.

4,053,558 PURIFICATION OF GAS STREAMS CONTAINING FERRIC CHLORIDE

Ramsey G. Campbell, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 595,464, July 14, 1975, Pat. No. 4,000,205. This application Dec. 6, 1976, Ser. No. 747,677

Int. Cl.² B01D 53/34

U.S. Cl. 423-240

5 Claims

1. A process for removing ferric chloride from a gaseous stream containing the same by passing said stream through a bed comprising activated alumina impregnated with a member

selected from the group consisting of potassium chloride and sodium chloride.

4,053,559 PRODUCTION OF URANIUM DIOXIDE

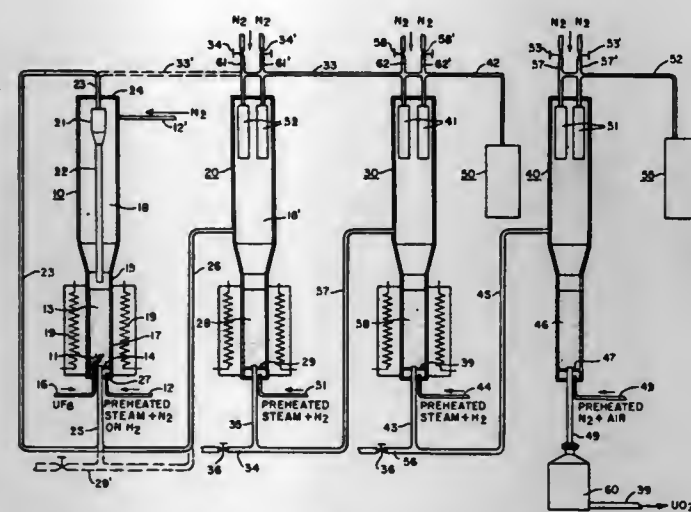
James E. Hart, Columbia, S.C.; David L. Shuck, Littleton, Colo., and Ward L. Lyon, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 14, 1976, Ser. No. 695,346

Int. Cl.² C01G 43/02; G21C 3/00

U.S. Cl. 423-261

8 Claims



1. A continuous process for converting uranium hexafluoride (UF₆) to ceramic-grade uranium oxide product having a low residual fluoride content, comprising the steps of:

- establishing and maintaining in contact with a first fluidized bed a mixture consisting essentially of uranium hexafluoride (UF₆) and steam (H₂O) the proportion of from about 1 to 8 mols of steam per mol of uranium;
- concurrently heating the first fluidized bed to a temperature within the range from about 475° C to about 600° C to produce a first intermediate reaction product including solid particles of uranyl fluoride (UO₂F₂) and the oxide U₃O₈ and an off-gas including hydrogen fluoride (HF);
- conveying the first solid intermediate reaction product to a second fluidized bed reactor;
- controlling the mole fraction of hydrogen fluoride in the second reactor to minimize the formation of uranium tetrafluoride UF₄;
- maintaining the second fluidized bed comprising a mixture of the first solid intermediate reaction product and additional steam and hydrogen in the proportions of from about 4 to 12 mols of steam and from about 1 to 6 mols of hydrogen per mol of uranium;
- concurrently heating the second fluidized bed to a temperature within the range from about 575° C to about 675° C to produce a second intermediate reaction product including uranium dioxide (UO₂);
- conveying the second intermediate reaction product to a third fluidized bed;
- maintaining the third fluidized bed comprising a mixture of the second intermediate reaction product and additional steam and hydrogen in the proportions of from about 2 to 11 mols of steam and from about 0.5 to 6 mols of hydrogen per mol of uranium;
- concurrently heating the third fluidized bed to a temperature within the range from about 575° C to about 675° C to produce a third intermediate reaction product consisting essentially of uranium dioxide (UO₂) having an oxygen-uranium ratio of about 2 and a low residual fluoride content;
- conveying the third intermediate reaction product to a fourth fluidized bed; and
- maintaining the fourth fluidized bed comprising the third intermediate reaction product and a mixture of air and nitrogen to further reduce the fluoride content and in-

crease the oxygen-uranium ratio to about 2.2 to about 2.3 to produce ceramic-grade uranium oxide product suitable for use in the manufacture of fuel pellets for nuclear reactors.

6. A continuous process for converting uranium hexafluoride (UF₆) to ceramic-grade uranium dioxide (UO₂) having low residual fluoride content, comprising the steps of:

- establishing and maintaining in contact with a first fluidized bed a mixture consisting essentially of uranium hexafluoride, steam (H₂O) and hydrogen (H₂) in the proportions of from about 2 to 8 mols of steam and from about 1 to 8 mols of hydrogen per mol of uranium;
- concurrently heating the first fluidized bed to a temperature within the range from about 475° C to about 600° C to produce a first intermediate reaction product including solid uranyl fluoride (UO₂F₂) and an off-gas including hydrogen fluoride (HF);
- diverting the off-gas from the first reactor including the hydrogen fluoride to a gas scrubber system and conveying the solid intermediate reaction product including the uranyl fluoride to a second fluidized bed reactor using steam as a transport medium;
- maintaining the second fluidized bed comprising a mixture of the uranyl fluoride and additional steam and hydrogen in the proportions of from about 4 to 12 mols of steam and from about 1 to 6 mols of hydrogen per mol of uranium;
- concurrently heating the second fluidized bed to a temperature within the range from about 575° C to about 675° C to produce a second intermediate reaction product including uranium dioxide (UO₂);
- conveying the second intermediate reaction product to a third fluidized bed;
- maintaining the third fluidized bed comprising a mixture of the second intermediate reaction product and additional steam and hydrogen in the proportions of from about 2 to 11 mols of steam and from 0.5 to 6 mols of hydrogen per mol of uranium;
- concurrently heating the third fluidized bed to a temperature within the range from about 575° C to about 675° C to produce a third intermediate reaction product consisting essentially of uranium dioxide (UO₂) having an oxygen-uranium ratio of about 2 in a low residual fluoride content;
- conveying the third intermediate reaction product to a fourth fluidized bed; and
- maintaining the fourth fluidized bed comprising the third intermediate reaction product and a mixture of air and nitrogen to further reduce the fluoride content and increase the oxygen-uranium ratio to about 2.25 to produce ceramic-grade uranium dioxide suitable for use in the manufacture of fuel pellets for nuclear reactors.

4,053,560

FLAME RETARDANT

Albert Y. Garner, Yellow Springs, Ohio, assignor to Monsanto Research Corporation, St. Louis, Mo.

Division of Ser. No. 490,609, July 22, 1974, Pat. No. 3,955,029. This application Nov. 17, 1975, Ser. No. 632,540

Int. Cl.² C01B 21/00, 21/10

U.S. Cl. 423-302

1 Claim

1. A product comprising Cl₃P=N-N=PCl₃ reacted with anhydrous ammonia in excess over that required to combine with all the chlorine atoms.

4,053,561 REMOVAL OF FLUORINE FROM PHOSPHATIC SOLUTIONS

Mazin R. Irani, Tarrytown, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 14, 1975, Ser. No. 604,572

The portion of the term of this patent subsequent to Nov. 23, 1992, has been disclaimed.

Int. Cl.² C01B 15/16, 25/26, 25/16

U.S. Cl. 423-313

16 Claims

1. A method for removing fluoride ions from phosphoric acid comprising the steps of neutralizing said acid to a pH between about 5 and about 9, separating precipitated impurities, contacting the neutral salt solution thereby formed with an insoluble alkaline earth metal phosphate salt, and separating the neutral salt solution.

4,053,562 PRODUCTION OF ALKALI METAL PHOSPHATE SOLUTIONS OF LOW VANADIUM CONTENT

Heinz Harnisch, Cologne-Lövenich; Klaus-Peter Ehlers, Erftstadt-Lechenich, and Klaus Schröder, Cologne, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed June 22, 1976, Ser. No. 698,332

Claims priority, application Germany, June 28, 1975, 2528895

Int. Cl.² C01B 15/16, 25/26, 25/16

U.S. Cl. 423-313

3 Claims

1. In a process for making alkali phosphate solutions of low vanadium content from wet-processed phosphoric acids contaminated with vanadium and iron, wherein the acids containing vanadium and iron in the highest stage of oxidation are treated with a reductant to effect conversion of the vanadium and iron contaminants to a lower stage of oxidation, the resulting acids are neutralized by means of an alkaline liquor or alkali metal carbonate or mixture thereof down to a pH of at least 3, and the resulting precipitate is separated, the improvement which comprises using the sodium salt of hydroxymethanesulfonic acid as the reductant.

4,053,563 HYBRID PHOSPHORIC ACID PROCESS

Robert L. Somerville, Rte. 1, Box 256, Old Amwell Road, Newsham, N.J. 08853

Continuation of Ser. No. 630,363, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 511,315, Oct. 1, 1974, abandoned, which is a continuation of Ser. No. 320,087, Jan. 2, 1973, abandoned. This application July 23, 1976, Ser. No. 708,077

Int. Cl.² C01B 25/16

U.S. Cl. 423-320

3 Claims

- A method of producing phosphoric acid 45-50% P₂O₅ content which comprises establishing two processes for the manufacturing of phosphoric acid,
 - a first gypsum process and
 - a second hemihydrate process, each producing product phosphoric acid and each having a product stage, filtration stages including wash stages and means for recycling acid,
 - interconnecting said two processes from the product stage of the first to filtration stage of the second and from filtration stage of the second to the recycling means of the first, and
 - in the simultaneous operation thereof, reacting, in each process, phosphate rock with concentrated sulfuric acid,
 - passing said reaction mixture of rock and said sulfuric acid to a filtration stage in each process wherein filtration is accomplished in a sequence of stages,
 - removing filtrate in said sequence of stages of said filters and employing first filtrate product from the first stage of said sequence of stages of said first process as wash acid for the second stage of said sequence of stages of

filtration in said second process and simultaneously employing a third stage filtrate from said second process as recycle acid in said first process.

4,053,564 EXTRACTION PROCESS FOR PURIFICATION OF PHOSPHORIC ACID

James L. Bradford, Ives, and Fernando Ore', Whittier, both of Calif., assignors to Occidental Petroleum Company, Los Angeles, Calif.

Filed May 20, 1976, Ser. No. 688,265
Int. Cl.² C01B 25/16

U.S. Cl. 423—321 S 18 Claims
1. A process for the purification of phosphoric acid which comprises:

- a contacting an aqueous phosphoric acid phase containing from 1% to about 55% P_2O_5 by weight and dissolved ionic metallic impurities selected from the group consisting of calcium, magnesium, aluminum and iron (II and III) with an organic extractant phase comprising a water immiscible organic solvent containing at least one water immiscible organic sulfonic acid having at least 12 carbon atoms and at least one water immiscible mono- or di-substituted organic acid phosphate, phosphonate, or half-ester thereof dissolved therein to form:
- i. a purified phosphoric acid phase; and
- ii. a loaded organic extractant phase containing ionic metallic impurities extracted from said aqueous phosphoric acid and selected from the group consisting of calcium, magnesium, aluminum and iron (II and III) and P_2O_5 values; and
- b. separating the loaded organic extractant phase from the purified aqueous phosphoric acid phase.

4,053,565

SILICA XEROGELS

Jerome H. Kreiner, Cincinnati, Ohio; William Kirch, Clinton, Iowa, and Henri A. Aboutbol, Brussels, Belgium, assignors to National Petro Chemicals Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 294,270, Oct. 10, 1972, abandoned, Ser. No. 326,645, Jan. 26, 1973, abandoned, Ser. No. 311,579, Dec. 4, 1972, abandoned, and Ser. No. 383,203, July 27, 1973, abandoned, said Ser. No. 294,270, is a continuation of Ser. No. 70,632, Aug. 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 750,733, Aug. 6, 1968, Pat. No. 3,652,214, Ser. No. 750,734, Aug. 6, 1968, Pat. No. 3,652,215, and Ser. No. 766,693, Oct. 11, 1968, Pat. No. 3,652,216, said Ser. No. 326,645, is a continuation of Ser. No. 148,117, May 28, 1971, abandoned, which is a division of Ser. No. 750,734, said Ser. No. 311,579, is a continuation of Ser. No. 122,502, March 9, 1971, abandoned, which is a continuation of Ser. No. 750,467, Aug. 6, 1968, abandoned, said Ser. No. 383,203, is a continuation of Ser. No. 122,503, March 9, 1971, abandoned, which is a division of Ser. No. 750,467. This application Jan. 28, 1974, Ser. No. 437,274

Int. Cl.² C01B 33/16

U.S. Cl. 423—338 2 Claims

- A silica xerogel having the following characteristics:
- a. a nitrogen pore volume greater than 1.96 cc/g. and up to 2.90 cc/g., said pore volume being equal to the volume of the pores in said gel having pore diameters of up to 600 Å and being determined as that volume of nitrogen adsorbed by and condensed in the pores of said gel per gram of the dry gel at the normal boiling point of liquid nitrogen and at a relative pressure P/P_0 equal to 0.967 wherein P is the pressure of the nitrogen vapor over the gel and P_0 is the vapor pressure of liquid nitrogen;
- b. the major portion of said nitrogen pore volume being provided by pores having pore diameters within the range of from 300–600 Å; and
- c. a surface area within the range of from 200–500 m^2/g .

4,053,566 METHOD OF MAKING DIAMMONIUM HYDRAZINIUM TETRAPERCHLORATE

Theodore C. Crawford, Yuma, Ariz., assignor to Thiokol Corporation, Newtown, Pa.

Filed Sept. 30, 1975, Ser. No. 618,017
Int. Cl.² C01B 21/20, 21/52

U.S. Cl. 423—386 9 Claims

- A method of making diammonium hydrazinium tetraperchlorate which comprises reacting an ammonium compound selected from the ammonium halide, ammonium hydroxide and ammonium perchlorate and a hydrazinium compound selected from the hydrazinium halides and hydrazinium hydroxide with perchloric acid in an aqueous perchloric acid solution containing from about 60% to 70% by weight of perchloric acid to form diammonium hydrazinium tetraperchlorate and recovering the diammonium hydrazinium tetraperchlorate from said solution.

4,053,567

ALUMINUM AND MAGNESIUM PERCHLORATE-HYDRAZINE COMPLEXES

Gerhard Franz, Toms River, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Apr. 21, 1965, Ser. No. 450,576
Int. Cl.² C01B 21/20

U.S. Cl. 423—386 16 Claims

- A compound of the formula



wherein x is a member selected from the group consisting of 0 and 1, y is a member selected from the group consisting of 6 and 8 and when x is 0, y is 6; when x is 1, y is 8.

- The compound $Al(ClO_4)_3 \cdot 6N_2H_4$
- The compound $Al(ClO_4)_3 \cdot Mg(ClO_4)_2 \cdot 8N_2H_4$

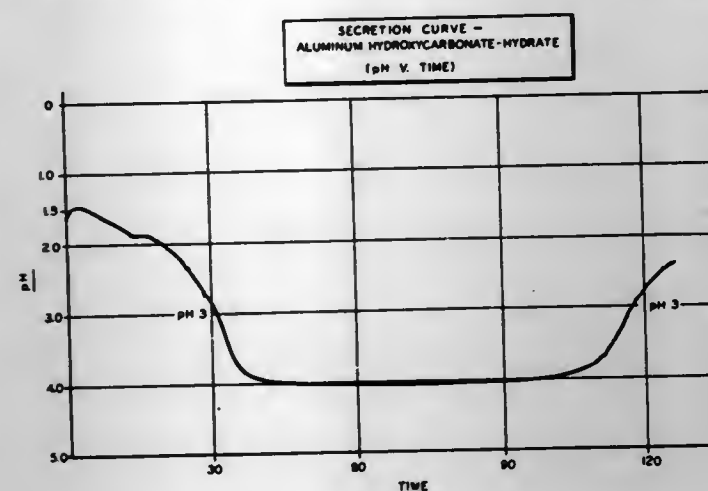
4,053,568

PROCESS FOR THE PREPARATION OF ANTACID ALUMINUM HYDROXYCARBONATE HYDRATE

Rolf Hermann Heinrich Madans, Cologne-Bruck, and Klaus Gorler, Bensberg-Refrath, both of Germany, assignors to Dr. Madans & Co., Cologne, Germany

Filed Mar. 28, 1975, Ser. No. 563,416

Claims priority, application Germany, May 4, 1974, 2421703
Int. Cl.² C01B 31/24; A01N 11/00; A61K 33/10; C01F 7/02
U.S. Cl. 423—419 P 17 Claims



- Process for the preparation of basic aluminum hydroxycarbonate hydrate which comprises simultaneously adding aqueous solutions of aluminum sulfate and alkali metal hydrogen carbonate or carbonate to water while maintaining an initial pH-value of from 6.8 to 7.8, permitting the resulting precipitation to run to completion, and then in a subsequent step, adding an aluminum salt of a strong acid to adjust the pH-value of the reaction mixture to about 6.0.

4,053,569 UPGRADING COAL FOR COKING PURPOSES

Hans Helmut Hahn, 38 Marais St., Bailey's Muckleneuk, Pretoria, South Africa

Filed June 15, 1976, Ser. No. 696,221
Claims priority, application South Africa, June 20, 1975, 75/3956

Int. Cl.² C01B 31/02; C01C 1/00; C10B 53/04, 55/02

U.S. Cl. 423—445 12 Claims

- Coke, being the product of carbonisation under coke-oven conditions of a blend of between 50 and 99% by weight (mass) of coal and between 1 and 50% by weight (mass) of an additive comprising a pitch-like, high-boiling fraction or distillation residue boiling above 270° C of a tar formed as a by-product of the pressure-gasification of coal in the presence of steam and oxygen to yield a gas comprising carbon monoxide, hydrogen and carbon dioxide.

4,053,570

ALUMINUM HALOHYDRATE

George G. Merkl, 46 Sunset Court, Haworth, N.J. 07641
Division of Ser. No. 439,628, Feb. 4, 1975, Pat. No. 4,038,373, which is a continuation-in-part of Ser. No. 45,527, June 11, 1970, abandoned, and Ser. No. 127,351, March 23, 1971, abandoned, said Ser. No. 45,527, is a continuation-in-part of Ser. No. 859,703, Sept. 22, 1969, said Ser. No. 127,351, is a continuation-in-part of Ser. No. 859,703, and Ser. No. 45,527.

This application Jan. 10, 1977, Ser. No. 758,344
Int. Cl.² C01F 7/00, 7/48

U.S. Cl. 423—462 5 Claims

- A method of preparing a polymeric aluminum halohydrate having a ratio of aluminum to halogen of from 2:1 to 2.7:1 and a stable pH of from about 4.2 to about 4.3 which comprises: reacting, in an aqueous medium, a gaseous halogen selected from chlorine, bromine and iodine with mercury permeated aluminum of a purity of at least 99.98% by weight, the mercury content of said mercury permeated aluminum ranging from about 0.1 percent to about 5 percent by weight; and collecting the formed aluminum halohydrate.

4,053,571

PROCESS FOR PURIFYING LITHIUM HEXAFLUOROARSENATE

Walter B. Ebner, Hartsville, and Charles Richard Walk, Collegeville, both of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 31, 1977, Ser. No. 764,488
Int. Cl.² C01B 27/02; C01D 15/00

U.S. Cl. 423—464 5 Claims

- A process for purifying lithium hexafluoroarsenate containing inorganic acidic impurities including $LiAsF_6 \cdot OH$ and HF , which comprises contacting a solution of the impure lithium hexafluoroarsenate in an inert organic solvent with activated alumina to effect removal of said inorganic acidic impurities including $LiAsF_6 \cdot OH$ and HF , and recovering the solution of purified lithium hexafluoroarsenate.

4,053,572

PROCESS FOR PREPARING ESSENTIALLY PURE BARIUM FLUORIDE CRYSTALS

Robert H. Moss, Cleveland Heights, and William F. Spicuzza, Eastlake, both of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed May 17, 1976, Ser. No. 687,049
Int. Cl.² C01F 11/22, 11/36, 11/18, 11/38

U.S. Cl. 423—490 1 Claim

- A wet process for preparing essentially pure barium fluoride crystals comprising:

- dissolving barium nitrate in water to form an aqueous solution;
- adding nitric acid to said aqueous solution to form an acidic solution, the concentration of said acidic solution being in the range from about 1 percent to about 15 percent HNO_3 ;
- crystallizing barium nitrate crystals from said acidic solution, in which crystals either calcium or strontium element is coprecipitated as a salt in an amount less than 10 parts each per million parts by weight of said barium nitrate crystals;
- converting said barium nitrate crystals to barium carbonate;
- cleansing said barium carbonate by washing with water until the wash water gives no indication of nitrate or nitrite ions; and;
- converting said barium carbonate to said barium fluoride crystals having less than 10 parts each of calcium or strontium present as a fluoride per million parts by weight of barium fluoride.

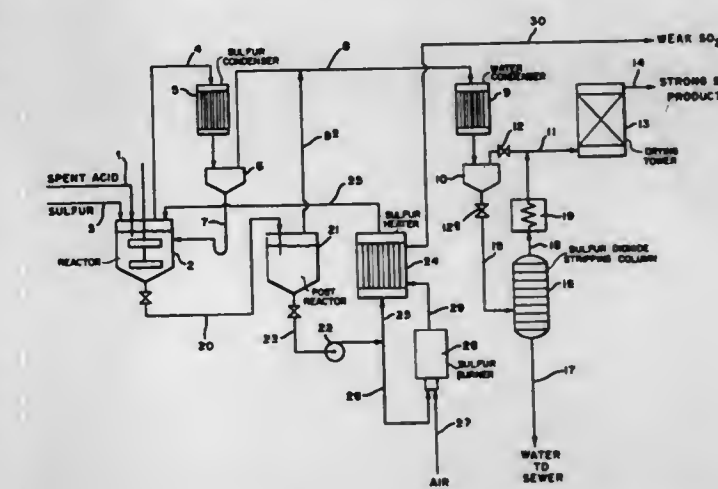
4,053,573

RECOVERY OF SULFUR VALUES FROM SPENT SULFURIC ACID

T. S. Harrer, deceased, late of Stratford, N.J. (by Eunice Harrer, executrix); Bela I. Karsay, DeWitt, and Robert L. Sturtevant, Baldwinville, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 20, 1975, Ser. No. 633,765
Int. Cl.² C01B 17/50, 17/72, 17/90

U.S. Cl. 423—540 19 Claims



- In the method for recovering sulfur values from spent sulfuric acid by decomposing it at elevated temperature in the presence of elemental sulfur to generate a sulfur dioxide-containing gas stream, the improvement which comprises:
- a. introducing spent sulfuric acid into a pool of molten sulfur maintained at temperature of at least about 250° C, wherein said pool of molten sulfur furnishes both the reaction medium as well as the reductant for said sulfuric acid, to thereby generate a gaseous stream comprising sulfur dioxide, vaporous elemental sulfur, and water;
- b. cooling said gaseous stream comprising sulfur dioxide, vaporous elemental sulfur, and water to temperature above the melting point of the sulfur but below about 160° C. to condense elemental sulfur therefrom, separating said condensed elemental sulfur and returning it to said pool of molten sulfur; followed by
- c. further cooling the gaseous stream from which elemental sulfur has been condensed to condense water therefrom, and separating the condensed water from the gaseous stream.

4,053,574

GAS DESULFURIZATION PROCESS

Neville L. Call, Baker, and Paul E. Eberly, Jr., Baton Rouge, both of La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed July 6, 1976, Ser. No. 703,056
Int. Cl.² C01B 17/04

U.S. Cl. 423—573 G 13 Claims

1. A process for removing at least a portion of hydrogen sulfide from a gaseous mixture containing the same, which comprises contacting said gaseous mixture with a particulate tellurium dioxide reactant at reaction conditions and recovering a gaseous mixture having a reduced content of hydrogen sulfide.

4,053,575

SULFUR RECOVERY FROM H₂S AND SO₂-CONTAINING GASES

Larry A. Haas, Burnsville, and Sanaa E. Khalafalla, Minneapolis, both of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 498,790, Aug. 19, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,060
Int. Cl.² C01B 17/04

U.S. Cl. 423—573 1 Claim

1. A process for recovery of sulfur comprising the steps of (1) loading of an absorbent selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, and propylene glycol with a mixture of hydrogen sulfide and sulfur dioxide by absorbing hydrogen sulfide, sulfur dioxide, or mixtures thereof from waste gases that additionally contain carbon dioxide, oxygen or nitrogen and (2) reacting the hydrogen sulfide and sulfur dioxide, in solution in the absorbent, in contact with a solid catalyst, the active ingredient of which is alumina.

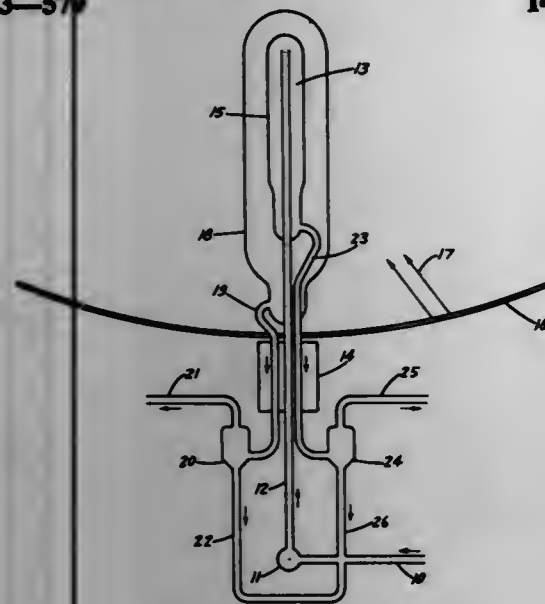
4,053,576

SYSTEM FOR OBTAINING HYDROGEN AND OXYGEN FROM WATER USING SOLAR ENERGY

Edward A. Fletcher, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed May 19, 1975, Ser. No. 578,404
Int. Cl.² C01B 13/00

U.S. Cl. 423—573 14 Claims



1. Apparatus for obtaining hydrogen and oxygen from water utilizing solar energy, said apparatus comprising:

- A. a water-dissociation chamber having a wall preferentially permeable to the passage of lower molecular weight dissociation components including hydrogen,
- B. means connected to the dissociation chamber for supplying water to said chamber,
- C. solar energy concentrating means focused on said dissociation chamber for heating said chamber to a temperature at which water is dissociated into steam, molecular hydrogen, molecular oxygen, atomic hydrogen, atomic oxygen and hydroxyl,
- D. means connected to the dissociation chamber for withdrawing oxygen enriched dissociation products from said chamber,
- E. a non-permeable casing saced from and enclosing said dissociation chamber wall and forming a hydrogen enriched dissociation product collection chamber,
- F. means connected to said collection chamber for withdrawing hydrogen enriched dissociation product from said chamber,
- G. cooling means for cooling said oxygen enriched dissociation products and partially liquefying the same, and
- H. gas-liquid separation means for separating gaseous oxygen from the cooled oxygen enriched dissociation products.

ation chamber for heating said chamber to a temperature at which water is dissociated into steam, molecular hydrogen, molecular oxygen, atomic hydrogen, atomic oxygen and hydroxyl,

D. means connected to the dissociation chamber for withdrawing oxygen enriched dissociation products from said chamber,

E. a non-permeable casing saced from and enclosing said dissociation chamber wall and forming a hydrogen enriched dissociation product collection chamber,

F. means connected to said collection chamber for withdrawing hydrogen enriched dissociation product from said chamber,

G. cooling means for cooling said oxygen enriched dissociation products and partially liquefying the same, and

H. gas-liquid separation means for separating gaseous oxygen from the cooled oxygen enriched dissociation products.

9. A method for obtaining hydrogen and oxygen from water utilizing solar energy, said method comprising:

A. supplying water to a dissociation zone, having a wall preferentially permeable to the passage of lower molecular weight dissociation components, including hydrogen

B. causing said water within said zone to dissociate into steam, molecular hydrogen, molecular oxygen, atomic hydrogen, atomic oxygen and hydroxyl by heating by means of concentrated solar energy to a temperature at which water is dissociated,

C. separating hydrogen enriched dissociation product from said dissociation zone by preferential diffusion through said wall, and collecting said hydrogen enriched product,

D. withdrawing said hydrogen enriched dissociation product,

E. withdrawing oxygen enriched dissociation products remaining in said dissociation zone and cooling to liquefy a portion of the same, and

F. separating gaseous oxygen from the resulting mixture.

4,053,577

PROCESS FOR THE GASEOUS PHASE PRODUCTION OF METAL OXIDE PARTICLES

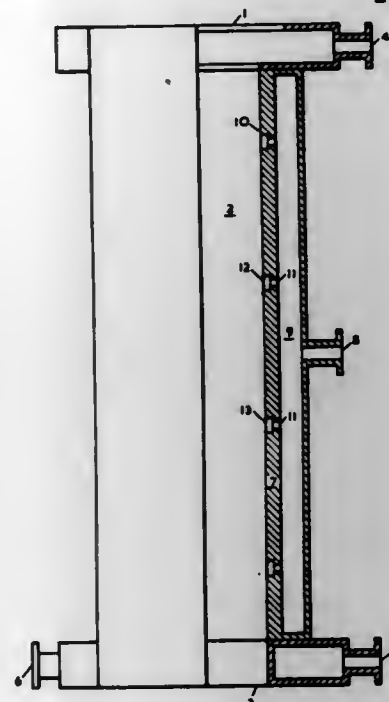
Kenneth Arkless, Stockton-on-Tees, England, assignor to Tioxide Group Limited, Billingham, England

Continuation of Ser. No. 308,497, Nov. 21, 1972, abandoned.
This application Aug. 11, 1975, Ser. No. 603,785

Claims priority, application United Kingdom, Feb. 18, 1972, 7570/72

Int. Cl.² C01G 1/03, 23/04

U.S. Cl. 423—592 17 Claims



1. In a process for the production of finely-divided metal

oxides which comprises oxidizing the corresponding metal halide with an oxidizing gas by introducing into one end of a reaction zone a hot stream of primary gas selected from an inert gas, the oxidizing gas or the metal halide, introducing a secondary gas selected from the oxidizing gas, the metal halide or mixtures thereof into the primary gas stream through an injection device surrounding at least part of the reaction zone, said injection device comprising a wall having a plurality of separate apertures therethrough, each aperture having an inlet end and an outlet end and each aperture connecting the reaction zone to a secondary gas jacket, said wall dividing said reaction zone from said jacket, the inlet end of said aperture being at the interface of said wall and said reaction zone, the secondary gas being supplied to the reaction zone through said jacket in such a manner that it cools the wall of the injection device and is thereby preheated before it passes through the apertures into the primary gas stream, the improvement comprising forming said apertures with at least two segments of different cross-sectional areas along their length, the segment of smaller cross-sectional area being at the inlet end of the apertures for the secondary gas, and the segment of larger cross-sectional area being at the outlet end of said apertures, said segment of larger cross-sectional area being of sufficient cross-section and extending for a sufficient length of said apertures to preclude substantial accretion of metal oxide around the edge of the aperture.

4,053,578

PROCESS FOR OXIDIZING PRIMARILY NICKEL POWDERS

Brian Hill, Ramsey, N.J., and William Herbert Elwood, Jr., Warwick, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 425,202, Dec. 17, 1973, abandoned. This application Dec. 10, 1975, Ser. No. 639,486
Int. Cl.² C01G 53/04

U.S. Cl. 423—592 10 Claims

1. A process for producing nickel oxide (NiO) which is both readily friable and of high purity which comprises forming a blend of nickel powder and water, the water content being present in an amount of about 2% and sufficient to prevent the occurrence of deleterious sintering during subsequent heat treatment with the upper level being about 20%, subjecting the blend to a preheat treatment in which the blend is exposed to air and a temperature within the range of about 700° F. to about 1350° F. such as to form an outer oxide shell substantially about the powder particle surfaces, whereby undesirable sintering during firing is greatly inhibited, the preheating temperature not exceeding that at which excessive exothermic reaction occurs, and thereafter firing the preheat treated product at a temperature of about 1500° F. to about 1850° F. to complete the oxidation process.

4,053,579

METHOD FOR MANUFACTURE OF SINTERED ALUMINA FROM AMMONIUM ALUMINUM CARBONATE HYDROXIDE

Shuzo Kato; Takeo Iga, both of Nagoya; Shogo Hatano, Minami-Minowa, and Yuichi Isawa, Takato, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 17, 1975, Ser. No. 623,489

Claims priority, application Japan, May 29, 1975, 50-65076
Int. Cl.² C01F 7/02; C01C 1/26; A61K 33/10

U.S. Cl. 423—630 2 Claims

1. A method for the manufacture at low temperatures, of a compactly sintered high-purity alumina having a bulk density greater than 3.8 g/cc, which comprises:

adding to a solution of ammonium hydrogen carbonate having a concentration of from 40 g/l. to 270 g/l. a solution of at least one aluminum salt selected from the group consisting of aluminum chloride, aluminum nitrate, aluminum sulfate, ammonium aluminum sulfate and basic salts thereof having a concentration of from 5 g/l. to

150g/l. computed as aluminum oxide, the amount added being not less than 0.07 and not more than 0.75 of the equivalent weight computed as Al/NH₄, the rate of addition of said solution being from 0.03 l./hr. to 1.8 l./hr. per 1000 cc of said solution of ammonium hydrogen carbonate and the resulting addition reaction being conducted at a temperature of from 30° to 35° C and a pH of from 7.5 to 9.0,

allowing the resultant solution to stand to permit growth of crystals of ammonium aluminum carbonate hydroxide, filtering said solution containing grown crystals of ammonium aluminum carbonate hydroxide to obtain crystals of ammonium aluminum carbonate hydroxide,



drying the crystals, subjecting the dried crystals of ammonium aluminum carbonate hydroxide to thermal decomposition at temperatures in the range of from 1,250° to 1,300° C to afford α-alumina capable of being readily sintered, adding to said α-alumina an organic binder, molding the resultant mixture under pressure and sintering the molded mixture at temperatures in the range of from 1600° to 1700° C to obtain a compactly sintered high-purity alumina having a bulk density greater than 3.8 g/cc.

4,053,580

MICROSEALED PHARMACEUTICAL DELIVERY DEVICE

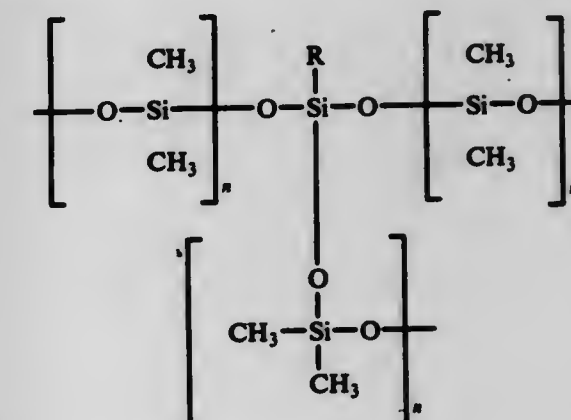
Yie W. Chien, Skokie, and Howard J. Lambert, Deerfield, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 617,542, Sept. 29, 1975, Pat. No. 3,992,518, which is a division of Ser. No. 517,454, Oct. 24, 1974, Pat. No. 3,946,106. This application Sept. 20, 1976, Ser. No. 724,688

Claims priority, application Argentina, Oct. 23, 1975, 260899
Int. Cl.² A61K 9/00; 9/52, 47/00

U.S. Cl. 424—15 26 Claims

1. A microsealed pharmaceutical delivery device comprising a sectioned length of flexible medical grade silicone polymer hollow tubing as a biologically acceptable polymer container with as many perforations in the wall of the tubing when unsealed at each end as to expose up to 40% of an inner biologically acceptable silicone polymer matrix contained within the biologically acceptable polymer container, said biologically acceptable silicone polymer matrix having the formula



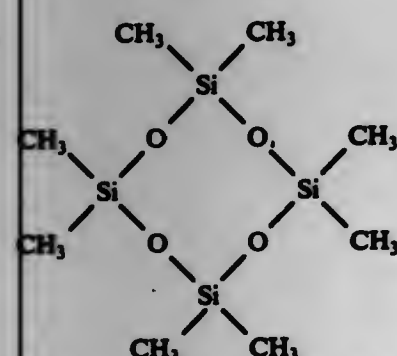
wherein R is alkoxy having 1-7 carbon atoms, alkyl having 1-10 carbon atoms, phenyl, vinyl, or allyl, wherein n is about 100-5000 and having 10-200 micron microsealed compartments throughout, said microsealed compartments containing pharmaceutical saturated 20-70 w/v% polyethylene glycol molecular weight 450-6000, 20-70 v/v% propylene glycol, or 20-70% 1,3-butanediol in water as hydrophilic solvent system.

4,053,581

ANTIPERSPIRANT SOLUTION CONTAINING A MIXTURE OF SUBSTANTIALLY VOLATILE AND SUBSTANTIALLY NON-VOLATILE SILOXANE LIQUIDS
Morton Pader, Teneck; John J. Miles, Jr., Lake Intevale, and William Netzbandt, Dumont, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,377
Int. Cl.² A61K 7/34, 7/38

U.S. Cl. 424—68 15 Claims
1. An antiperspirant solution suitable for pump spray or roll-on application consisting essentially of an alcohol soluble aluminum chlorohydrate complex; a sufficient amount of a mixture of a volatile cyclic polydimethyl siloxane of the structural formula



and a non-volatile silicone selected from the group consisting of polyalkyl siloxane, polyalkylaryl siloxane, polyether siloxane copolymer and mixtures thereof, to substantially reduce the tackiness of said complex during drying; and a sufficient amount of alcohol to result in said solution; said composition being characterized by having substantially reduced tackiness and giving a perception of quick drying when applied from a pump spray or a roll-on applicator and a substantially reduced tendency to malfunction when applied from said pump spray or roll-on applicator.

4,053,582

ATTENUATED FOWL POX VIRUS PREPARATION FOR THE TREATMENT OF INFECTIOUS DISEASES, METHOD FOR THE MANUFACTURE THEREOF, AND ITS USE

Holmut Anton Stieckl, Stareweg 6., 8033 Krailling B. Munich, Germany

Filed July 28, 1975, Ser. No. 599,533

Claims priority, application Germany, Aug. 1, 1974, 2437166
Int. Cl.² A61K 39/12; C12K 7/00

U.S. Cl. 424—49 14 Claims
1. Preparation useful for the treatment of interferonsensitive infectious diseases for use in human and veterinary medicine, characterized by the fact that it contains as active principle an effective amount of fowl pox virus, which has been attenuated by 420 to 800 cell culture passages, together with a pharmaceutical excipient or adjuvant.

2. A method of producing a preparation useful for the endogenous treatment of interferon-sensitive infectious diseases for use in human and veterinary medicine, characterized by (1) applying an original fowl pox virus to a cell culture of embryonated fowl eggs, (2) attenuating it by about 420 to 800 cell culture passages, (3) harvesting the medium with the remaining cells, (4) digesting the cells, (5) separating the coarse cell components from the virus, and (6) recovering the virus from the

virus-containing supernatant material by centrifuging, precipitation, or freeze-drying.

4,053,583

LIVE NEWCASTLE DISEASE VIRUS VACCINES
Jacqueline Gits, La Hulpe, and Nathan Zygraich, Bruxelles, both of Belgium, assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Mar. 1, 1976, Ser. No. 662,770
Int. Cl.² A61K 39/32, 41/00

U.S. Cl. 424—90 5 Claims
1. An improved vaccine against Newcastle disease comprising a pharmaceutical diluent for aerosol administration and an effective dose of an attenuated cold and temperature-sensitive strain obtained from a Newcastle disease virus strain by ultraviolet mutagenesis thereof, said strain showing a significantly higher growth at 26° C than its parent strain and having a significantly inhibited growth at 41° C.

4,053,584

PRE-FARROWING PREGNANT SOW PIGLET COLIBACILLOSIS VACCINES AND PROCESS FOR THEIR ADMINISTRATION TO PREGNANT SOWS BEFORE FARROWING

Lucia Dobrescu, Brussels, and Constant Huygelen, Huidenberg, both of Belgium, assignors to Recherche et Industrie Therapeutiques, Belgium

Continuation of Ser. No. 549,237, Feb. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 311,998, Dec. 4, 1972, abandoned. This application Mar. 29, 1976, Ser. No. 671,463
Int. Cl.² A61K 39/02, 39/40

U.S. Cl. 424—92 8 Claims
1. A pre-farrowing pregnant sow piglet colibacillosis vaccine for intramuscular or subcutaneous administration to pregnant sows 3 to 6 weeks before farrowing comprising a unit dosage or multidose integer of the dosage of an effective amount of at least 5 to 150 mg. lipopolysaccharide- and cell-free heat labile (LT) *E. coli* enterotoxin isolated from a culture of an *E. coli* serotype which is capable of causing piglet colibacillosis and protective against the actions of heat stable and heat labile enterotoxins produced by heterologous as well as homologous enteropathogenic *E. coli* serotypes, and an effective amount of an adjuvant selected from the group consisting of aluminium hydroxide, aluminium phosphate, peanut oil emulsified by the addition of monooleate and stabilized by the addition of aluminium monostearate or Freund's adjuvant.

4,053,585

IMMUNOLOGICAL PREPARATIONS
Anthony Clifford Allison, London, and Gregory Gregoriadis, Kenton, both of England, assignors to National Research Development Corporation, England

Filed June 25, 1975, Ser. No. 590,270

Claims priority, application United Kingdom, June 25, 1974, 28131/74

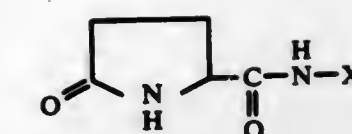
Int. Cl.² A61K 39/00, 39/02, 39/12, 39/18
U.S. Cl. 424—92 16 Claims
1. A pharmaceutical preparation for administration in vivo to effect immunization comprising an immunologically effective agent selected from bacterial toxoids which agent is incorporated essentially entrapped liposomes, said liposomes having a negative charge.

4,053,586

PREPARATION FOR TREATING SQUAMOUS CELL CARCINOMA AND METHOD FOR MAKING SAME
George T. Manilla, Elko, Nev., assignor to Intermountain Laboratories, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 187,866, Oct. 8, 1971, abandoned. This application Nov. 1, 1976, Ser. No. 737,549
Int. Cl.² A61K 35/12, 35/44

U.S. Cl. 424—95 11 Claims
1. A method for preparing a biological preparation for treatment of squamous cell carcinoma, comprising the steps of: homogenizing squamous cell carcinoma cells in a one to five molar hypertonic metallic chloride salt solution containing an adsorbing agent and a suspending agent at a temperature below about 60° C.; extracting the cells in the suspension for at least about 12 hours at a temperature of at least about 26° C.; separating the liquid extract from the solid material to produce a liquid containing the cell extract; contacting the liquid containing the cell extract with an aqueous metallic chloride salt solution and a low carbon chain alcohol for at least about 12 hours at a temperature of from about 4° C to about 25° C to strip the cell extract from the liquid and to form a precipitate containing the extract; dissolving the precipitate in an organic extraction medium, and allowing the solution to stand for a sufficient amount of time to purify the extract; and reducing the presence of the extracting medium to precipitate the purified cell extract.



wherein X is branched or unbranched alkyl having 2 to 6 carbon atoms, or branched or unbranched alkyl having 2 to 6 carbon atoms substituted by carboxy or carboxamido.

4,053,589

METHOD OF TREATING NUTRITIONAL DEFICIENCY DURING CARDIAC CACHEXIA, DIABETES, HYPOGLYCEMIA, GASTROENTEROLOGY, LIPID, CELL GLYCOGEN AND KERATIN-RELATED SKIN CONDITIONS AND ALCOHOLISM

Arnold M. Gans, Closter, N.J.; Alvin J. Goren, North Bergen, N.J., and Eli M. Gorenberg, Fair Lawn, N.J., assignors to Control Drug Inc., Port Redding, N.J.

Division of Ser. No. 634,857, Nov. 24, 1975. This application June 22, 1976, Ser. No. 698,353
Int. Cl.² A01N 9/20; A61K 37/00

U.S. Cl. 424—177 4 Claims
1. A method of treating nutritional deficiency during cardiac cachexia, diabetes, hypoglycemia, gastroenterology, skin conditions related to lipid, cell glycogen and keratin deficiencies, and alcoholism which comprises administering by ingestion to a patient having such a deficiency a nutritionally effective amount of a composition comprising about 5 to about 75 parts by weight of hydrolyzed gelatin, about 0.02 to about 0.75 parts by weight of tryptophan, about 0.1 to about 2 parts by weight of a sweetener, and about 5 to about 100 parts by weight of an ingestible carrier, said nutritional composition containing essentially the following amino acids in parts by weight: about 13 parts L-alanine, about 12 parts L-arginine, about 9 parts L-aspartic acid, about 0.1 parts L-cystine, about 15 parts L-glutamic acid, about 35 parts glycine, about 1.1 parts L-histidine, about 10 parts L-hydroxyproline, about 4.5 parts L-leucine, about 2 parts L-isoleucine, about 6.5 parts L-lysine, about 1.5 parts hydroxylysine, about 1.1 parts L-methionine, about 3.5 parts L-phenylalanine, about 23 parts L-proline, about 10 parts L-serine, about 3 parts L-threonine, about 0.65 parts L-tryptophan, about 1 part L-tyrosine, and about 3.5 parts L-valine.

4,053,587

METHOD OF TREATING VIRAL INFECTIONS
James P. Davidson, Lansing; Barnett Rosenberg, Holt, both of Mich., and Ronald W. Hinz, Avoca, Iowa, assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 350,924, April 13, 1973, abandoned. This application Jan. 10, 1975, Ser. No. 540,109

Int. Cl.² A61K 33/24 5 Claims
U.S. Cl. 424—131
1. A method for treating an animal afflicted with a viral infection comprising administering to said animal an effective anti-viral amount of a platinum coordination compound of the formula:
[Pt(II)A_mB_{(4-m)/2}]
or
cis or trans [Pt(IV)A_nB_{(6-n)/2}]
wherein:
A represents the monodenate ligands Cl, NH₃ or a mixture thereof;
B represents an aliphatic diamine ligand;
m is 0, 2 or 4, and
n is 0, 2, 4 or 6

4,053,588

PHARMACEUTICAL PREPARATIONS HAVING PSYCHOTROPIC ACTIVITY AND PROCESS FOR THEIR MANUFACTURE

Wolfgang Koulg, Hofheim, Taunus; Rolf Geiger, Frankfurt am Main; Hans Wissmann, Bad Soden, Taunus; Hansjörg Kruse, Kelkheim, Taunus, all of Germany, and Michel Peterfalvi, Paris, France, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 12, 1975, Ser. No. 576,715

Claims priority, application Germany, May 14, 1974, 2423389
Int. Cl.² A61K 31/40, 37/00, 37/02

U.S. Cl. 424—177 1 Claim
1. A method for treating depression in a patient suffering therefrom, which comprises administering to said patient an effective amount of a compound of the formula

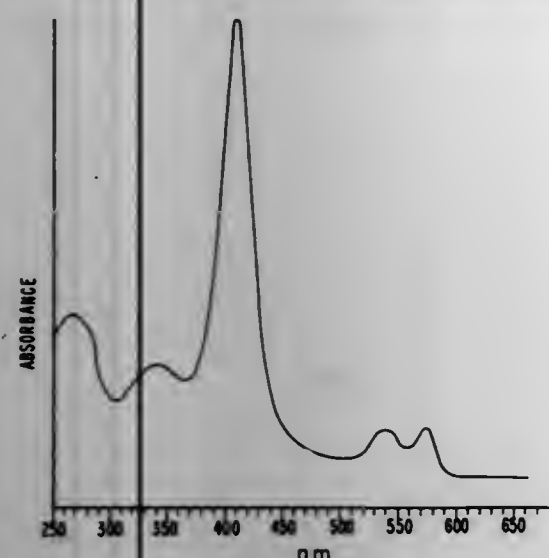
4,053,590
COMPOSITIONS OF MATTER COMPRISING MACROMOLECULAR HEMOGLOBIN

Pieter Bensen, Los Altos, Calif.; Myron B. Laver, Weston, Mass., and Kent C. Morris, Mountain View, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 554,051, Feb. 27, 1975, Pat. No. 4,001,200. This application Oct. 12, 1976, Ser. No. 731,704
Int. Cl.² C07C 103/52; A61K 37/00

U.S. Cl. 424—177 8 Claims
1. A composition of matter comprising a macromolecular hemoglobin capable of reversibly binding a gaseous ligand and selected from the group consisting of intermolecularly cross-linked, stromal-free deoxyhemoglobin and intermolecularly cross-linked, stromal-free oxyhemoglobin which macromolecular hemoglobin is intermolecularly cross-linked with a covalent cross-linking member having at least two cross-linking groups and selected from the members consisting of heterocyclic triazines, bis(diazobenzidines), halogenated aromatics,

cycloalkanes, dialdehydes, sulfones, diisocyanates and diepoxides, and wherein the macromolecular hemoglobin is mixed



with an acceptable carrier to form the composition useful as a blood substitute and as a plasma expander.

4,053,591

5-DEOXY-4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS, METHODS FOR THEIR MANUFACTURE, METHOD FOR THEIR USE AS ANTIBACTERIAL AGENTS AND COMPOSITIONS USEFUL THEREFOR

Peter J. L. Daniels, Cedar Grove, and Stuart W. McCombie, East Orange, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed June 30, 1976, Ser. No. 701,387

Int. Cl.² A61K 31/71; C07H 15/22

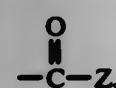
U.S. Cl. 424—180

15 Claims

14. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection which comprises administering to said animal a non-toxic, antibacterially effective amount of a member selected from the group consisting of a 5-deoxy-4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitol selected from the group consisting of

5-deoxygentamicin B,
5-deoxygentamicin B₁,
5-deoxygentamicin C_{1a},
5-deoxygentamicin C₂,
5-deoxygentamicin C_{2a},
5-deoxygentamicin X₁,
5-deoxygentamicin X₂,
5-deoxy-Antibiotic 66-40B,
5-deoxy-Antibiotic 66-40D,
5-deoxy-Antibiotic G-418,
5-deoxy-Antibiotic JI-20A,
5-deoxy-Antibiotic JI-20B,
5-deoxyverdamycin,
5-deoxykanamycin B,
5-deoxykanamycin C,
5,3',4'-trideoxykanamycin B,
5-deoxy-Aminoglycoside XK-88-5,
5-deoxytobramycin;

the 1-N-X derivatives thereof wherein X is a substituent selected from the group consisting of —CH₂Z and



wherein Z is a member selected from the group consisting of hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkylalkyl, hydroxyalkyl, aminoalkyl, alkylaminoalkyl, aminohydroxyalkyl, alkylaminohydroxyalkyl, phenyl, benzyl, and tolyl, said substituent Z having up to 7 carbon atoms and, when substituted by

amino and hydroxy, bearing the substituents on different carbon atoms;
the 2'-N-CH₂Z, 6'-N-CH₂Z, 1,2'-di-N-CH₂Z and the 1,6'-di-N-CH₂Z derivatives thereof wherein Z is as hereinabove defined;
5-deoxy-Antibiotic G-52 and the 1-N-X derivatives thereof wherein X is as hereinabove defined;
and the pharmaceutically acceptable acid addition salts thereof.

4,053,592

ANIMAL GROWTH PROMOTANT

Irvin Darrow Smith, Waukegan, and Eugene Wesley Seymour, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 16, 1973, Ser. No. 341,819

Int. Cl.² A61K 31/71

U.S. Cl. 424—181

6 Claims

1. A method of increasing the rate of growth of warm-blooded vertebrate animals including pigs, comprising orally administering to said warm-blooded vertebrate animals a feed composition containing an amount of 2-100 grams of anhydroerythromycin per ton of said feed composition, whereby growth of said animals is accelerated.

4,053,593

MEDICAL PRODUCT COMBINING ANTIMICROBIAL, ANTIPARASITIC AND VITAMIN COMPLEX

Lew Frumoff, D-145 Monaco Way, Delray Beach, Fla. 33446

Filed Nov. 26, 1975, Ser. No. 635,610

Int. Cl.² A61K 31/71, 31/68, 31/345

U.S. Cl. 424—181

12 Claims

1. A medical product for use in preventing and curing diseases in fish, comprising effective amounts an antimicrobial agent, a chemically compatible antiparasitic agent and a chemically compatible vitamin complex.

4,053,594

O-ALKYL-O-[4,6-DIMETHYL-5-CHLOROPYRIMIDIN-(2)-YL]-(THIONO) (THIOL) PHOSPHORIC ACID ESTERS

Hans-Jochem Riebel, Wuppertal; Bernhard Homeyer, Leverkusen, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 20, 1975, Ser. No. 624,219

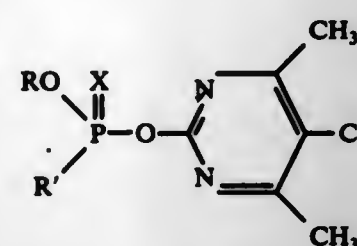
Claims priority, application Germany, Oct. 26, 1974, 2450951

Int. Cl.² A01N 9/36; C07D 239/34

U.S. Cl. 424—200

10 Claims

1. An O-alkyl-O-[4,6-dimethyl-5-chloropyrimidin(2)yl]-(thiono) (thiol)phosphoric acid ester of the formula



in which

R is alkyl with 1 to 6 carbon atoms,
R' is alkoxy or alkylthio with 1 to 6 carbon atoms in each alkyl chain, and
X is oxygen or sulfur.

8. An insecticidal, acaricidal or nematocidal composition containing as active ingredient an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1 in admixture with a diluent.

9. A method of combating insects, acarids or nematodes which comprises applying to the insects, acarids or nematodes or to a habitat thereof an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1.

4,053,595

SYNERGISTIC COMPOSITION FOR THE CONTROL OF INSECTS

Walter Maria Zeck; August Cesar deMarshall, and André Prosper Wybon, all of Vero Beach, Fla., assignors to Mobay Chemical Corporation, Pittsburgh, Pa. and Bayer Aktiengesellschaft, Leverkusen, Germany

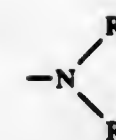
Filed Dec. 11, 1975, Ser. No. 639,957

Int. Cl.² A01N 9/02, 9/20, 9/36

U.S. Cl. 424—216

9 Claims

3. A method for combating insects which comprises applying to such insects or an insect habitat an insecticidally effective amount of a composition comprising O-ethyl-O-[4-(methylthio)-phenyl]-S-propyl phosphorodithioate and N'-(4-chloro-o-tolyl)-N,N-dimethylformamidine in a weight ratio of about 1 : 0.125 - 0.5.



taken together contain 5-, 6- or 7-members in the heterocyclic ring, the ring being pyrrolidine, piperidine, morpholine, thiamorpholine, piperazine or homopiperazine provided that one of said rings is always present, and n is 1 to 3; m is 0, 1 or 2; stereoisomers thereof, physiologically acceptable acid salts thereof, physiologically acceptable quaternary salts thereof and N-oxides thereof.

17. A hypertensive composition comprising an effective amount of compound as defined in claim 1 and a pharmaceutically acceptable carrier thereof.

4,053,596

INDANPENTOL DERIVATIVES

Frederic Peter Hauck; Somerville; Joyce Reid, Highland Park; Venkatachala L. Narayanan, Hightstown; Christopher M. Cimarusti, Hamilton; Rudiger D. Haugwitz, Titusville, all of N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

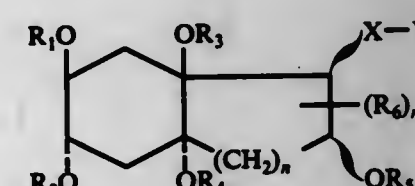
Filed Jan. 14, 1976, Ser. No. 649,116

Int. Cl.² C07D 211/14; A61K 31/445

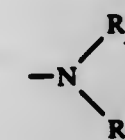
U.S. Cl. 424—244

18 Claims

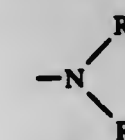
1. A compound of the structure



wherein R₁, R₂, R₃, R₄ and R₅ are the same or different and are selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, mono-halo-lower alkyl wherein the halogen is F, Cl, Br or I, acyl radical of a hydrocarbon carboxylic acid of less than 12 carbon atoms, amido, lower alkoxyalkylene and lower alkoxy carbonyl, X is a single bond or a straight or branched chain alkylene group of the structure (CH₂)_n wherein n' is 0 to 10, Y is



wherein R₇ and R₄ are the same or different and are selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, monocyclic cycloalkyl having 3 to 6 ring members, monocyclic cycloalkyl lower alkyl, wherein the cycloalkyl has 3 to 6 ring members, hydroxy-lower alkyl, phenyl, lower alkyl-phenyl, acyl radical of a hydrocarbon carboxylic acid of less than 12 carbon atoms, di(lower alkyl)phenyl, halophenyl, mono-, di- or tri-nitrophenyl, phenyl lower alkyl, monocyclic heterocyclic, wherein lower alkyl contains 1 to 8 carbons, R₆ is lower alkyl or cycloalkyl having 3 to 6 ring members, and



can be taken together to form a heterocyclic radical; wherein the heterocyclic radicals represented by R₇, R₄ or

4,053,597
HYDROXY-PHENYLACETAMIDO CEPHALOSPORIN COMPOSITIONS AND METHOD OF USE

Jacques Martel, Bondy; Rene Heymes, Romainville, and Andre Lutz, Strasbourg, all of France, assignors to Roussel-UCLAF, Paris, France

Division of Ser. No. 436,502, Jan. 25, 1974, Pat. No. 3,940,354.

This application Nov. 25, 1975, Ser. No. 635,383

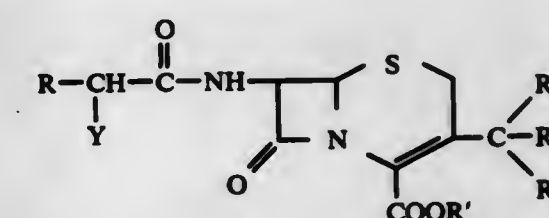
Claims priority, application France, Jan. 31, 1973, 73.03315

Int. Cl.² A61K 31/545; C07D 5.1/22

U.S. Cl. 424—246

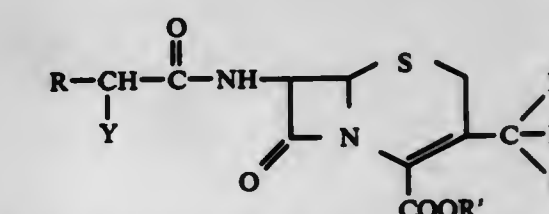
6 Claims

1. an antibiotic composition comprising an effective amount of a compound of the formula



in the form of racemic mixtures or optically active isomers or in form of their cis or trans isomers or mixtures thereof wherein R is phenyl substituted with one hydroxyl, R' is selected from the group consisting of hydrogen and R'', R'' is selected from the group consisting of alkyl of 1 to 6 carbon atoms optionally substituted with one to three chlorine and aralkyl of 7 to 15 carbon atoms, R₁ and R₂ are alkyl of 1 to 3 carbon atoms, R₃ is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, Y is selected from the group consisting of amino and Y', Y' is hydrogen and NHCOOZ, Z is straight or branched alkyl of 1 to 5 carbon atoms and their non-toxic pharmaceutically acceptable addition salts with organic and inorganic acids and bases where appropriate with the proviso that when Y is amino, R' is hydrogen and when Y is amino or NHCOOZ, R is phenyl, and a pharmaceutical carrier.

4. A method of combatting bacterial infections in warm-blooded animals comprising administering to warm-blooded animals a bactericidally effective amount of (at least one) a compound of formula



in the form of racemic mixtures or optically active isomers or in form of their cis or trans isomers or mixtures thereof wherein R is phenyl substituted with one hydroxyl, R' is selected from the group consisting of hydrogen and R'', R'' is selected from the group consisting of alkyl of 1 to 6 carbon

atoms optionally substituted with one to three chlorine and aralkyl of 7 to 15 carbon atoms, R_1 and R_2 are alkyl of 1 to 3 carbon atoms, R_3 is selected from the group consisting of hydrogen and alkyl of 1 to 3 carbon atoms, Y is selected from the group consisting of amino and Y', Y' is hydrogen and NHCOOZ, Z is straight or branched alkyl or 1 to 5 carbon atoms and their non-toxic, pharmaceutically acceptable addition salts with organic and inorganic acids and bases where appropriate with the proviso that when Y is amino, R' is hydrogen and when Y is amino or NHCOOZ, R is phenyl.

4,053,598

PREPARATION OF

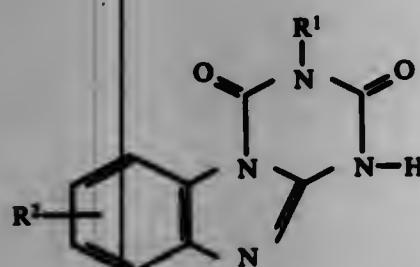
2,4-DIOXO-1,2,3,4-TETRAHYDRO-2-TRIAZINO-[1,2-a]-BENZIMIDAZOLES

Werner Daum, Krefeld, and Paul-Ernest Frohberger, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 9, 1976, Ser. No. 694,418

Claims priority, application Germany, June 21, 1975, 2527677 Int. Cl.² C07D 413/14; A61K 31/53; C07D 487/04; A61K 31/535 U.S. Cl. 424-248.56 23 Claims

16. A 2,4-dioxo-1,2,3,4-tetrahydro-2-triazino-[1,2-a]-benzimidazole of the formula



in which

R^1 represents alkyl with up to 11 carbon atoms which is substituted in the ω -position by chlorine, cyano, alkoxy, carbonyl with up to 4 carbon atoms in the alkoxy part, alkenoxycarbonyl with up to 3 carbon atoms in the alkenoxy part or N-morpholino, or represents dialkylamino, with up to 4 carbon atoms in each alkyl group and R^2 represents hydrogen or methyl.

22. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim 16 in admixture with a diluent.

4,053,599

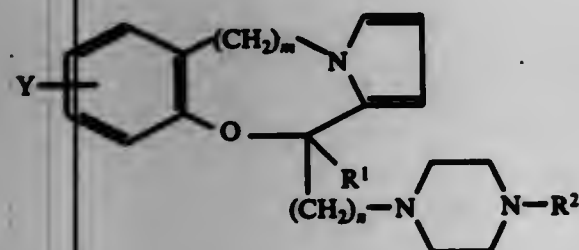
PIPERAZINALKYLPYRROLOBENZOXAZALKANES
Richard C. Eiland, Bridgewater; Larry Davis, Flemington, both of N.J., and Wolfgang Schaub, Kelkheim, Germany, assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Feb. 26, 1976, Ser. No. 661,534

Int. Cl.² A61K 31/495; C07D 295/10

U.S. Cl. 424-250

1. A compound of the formula



wherein Y is hydrogen, halogen, lower alkoxy, lower alkyl, trifluoromethyl, nitro or amino; R^1 is hydrogen or lower alkyl; R^2 is lower alkyl, phenyl, halophenyl, lower alkoxyphenyl, lower alkylphenyl, trifluoromethylphenyl or nitrophenyl; m is the integer 1 or 2 and n is the integer 1, 2 or 3; and the physiologically tolerable acid addition salts thereof.

10. A method of treating hypertension which comprises

administering to a patient a pharmaceutically effective amount of a compound defined in claim 1.

4,053,600

TRICYCLIC 1,2,4-TRIAZOLO-QUINAZOLINES

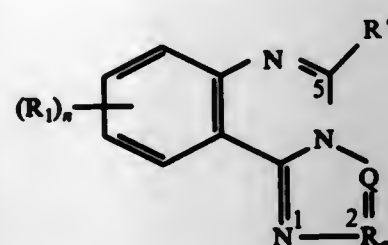
Goetz E. Hardtmann, Morristown, and Faizulla G. Kathawala, West Orange, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 339,177, March 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 209,425, Dec. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 72,799, Sept. 16, 1970, abandoned. This application June 25, 1975, Ser. No. 590,041

Int. Cl.² C07D 487/04; A61K 31/505

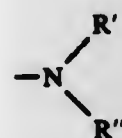
U.S. Cl. 424-250

1. A compound of the formula



wherein

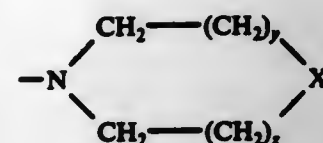
Q and R_2 are different and either a nitrogen atom or a $=CR'''$ -function, R' represents



R' represents hydrogen, and

R'' represents hydrogen; lower alkyl of 1 to 5 carbon atoms; allyl; methylallyl; propargyl; cycloalkyl of 3 to 6 carbon atoms; or di(lower of 1 to 3 carbon atoms)alkylamino-(lower of 1 to 4 carbon atoms)alkyl; or lower alkoxy of 1 to 4 carbon atoms (lower of 1 to 4 carbon atoms)alkyl; or R' and R'' together with the nitrogen attached to the ring represent di(lower of 1 to 3 carbon atoms)alkylamino; dialkylamino; di(methylallyl)amino; or dipropargylamino; or

R' and R'' together with the nitrogen attached to the tricyclic ring system form a 3 to 6 membered saturated heterocyclic group represented by:



wherein X is (a) a direct bond or (b) methylene, and y and z are 0 or 1, provided that X is a direct bond when either y or z is 0;

R''' represents hydrogen or lower alkyl of 1 to 4 carbon atoms;

R_1 represents fluoro, chloro, bromo, lower alkyl of 1 to 3 carbon atoms, lower alkoxy of 1 to 3 carbon atoms, nitro, trifluoromethyl or, when n is 2, the two R_1 's together form methylenedioxy, and

n is 0, 1, 2 and 3, and when 2, then R_1 may be the same or different, and when 3, then all R_1 's are alkoxy; provided that n is 1 when R_1 is nitro or trifluoromethyl.

4,053,601
3-SUBSTITUTED-PHENYL-6-HYDRAZINE
PYRIDAZINES

William John Coates, Welwyn Garden City; Anthony Maitland Roe, Hatfield; Robert Antony Slater, Letchworth, and Edwin Michael Taylor, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed June 3, 1975, Ser. No. 583,379

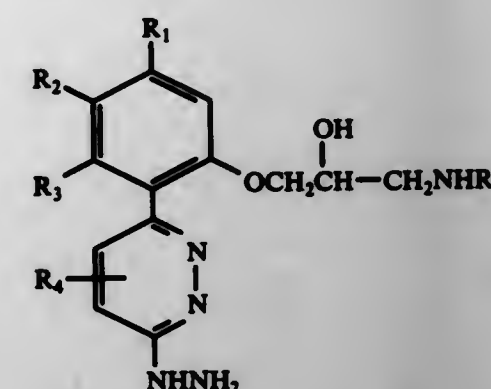
Claims priority, application United Kingdom, June 18, 1974, 26864/74

Int. Cl.² A61K 31/50; C07D 237/20

U.S. Cl. 424-250

25 Claims

1. A compound of the formula:



wherein two of the groups R_1 , R_2 and R_3 are hydrogen and the third group is hydrogen, lower alkyl, fluoro, chloro, bromo, trifluoromethyl, hydroxy, lower alkoxy, lower alkenyloxy, lower alkoxy carbonyl, cyano, $-\text{CONH}_2$, $-\text{CH}_2\text{CONH}_2$, nitro, amino, lower alkanoylamino, lower alkylamino or di(lower alkyl)amino; R_4 is hydrogen or methyl; R^5 is isopropyl, tertiary butyl or phenylethyl; or a pharmaceutically acceptable salt thereof.

17. A method of concomitantly inhibiting β -adrenergic receptors and producing vasodilatation which comprises administering a compound of claim 1 internally to an animal in need thereof in an amount sufficient to block said receptors and produce vasodilatation.

18. A method of treating hypertension which comprises administering a compound of claim 1 internally to an animal in need thereof in an amount sufficient to alleviate said condition.

19. A method of treating angina pectoris which comprises administering a compound of claim 1 internally to an animal in need thereof in an amount sufficient to alleviate said condition.

4,053,602
COMPOSITIONS FOR TREATING COCCIDIOSIS
CONTAINING 5-DEAZARIBOFLAVIN AND ITS
DERIVATIVES

Donald W. Graham, Mountainside; Edward F. Rogers, Middletown, and Wallace T. Ashton, Clark, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

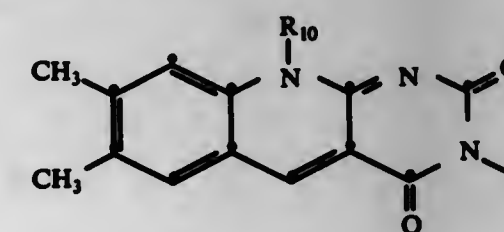
Filed Nov. 2, 1976, Ser. No. 737,890

Int. Cl.² A61K 31/505, 31/675

U.S. Cl. 424-251

11 Claims

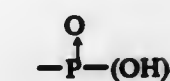
1. A composition useful against coccidiosis that comprises a solid nutritive poultry feed having intimately dispersed therein an effective amount of 5-deazariboflavin or a derivative thereof having the structure:



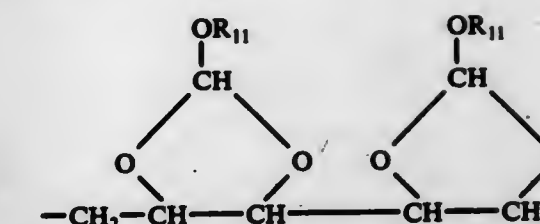
wherein R_{10} is:



wherein R_3 is H or



and non-toxic salts thereof; or R_{10} is:



wherein R_{11} is an alkyl group containing 1 to 5 carbon atoms.

4,053,603
BENZYLISOQUINOLINE DERIVATIVES, AND USE AS
ANTI-ARRHYTHMIC DRUGS

John Leopold Neumeyer, Wayland, and Paul Andre Tenthorrey, Holden, both of Mass., assignors to Astra Pharmaceutical Products, Inc., Worcester, Mass.

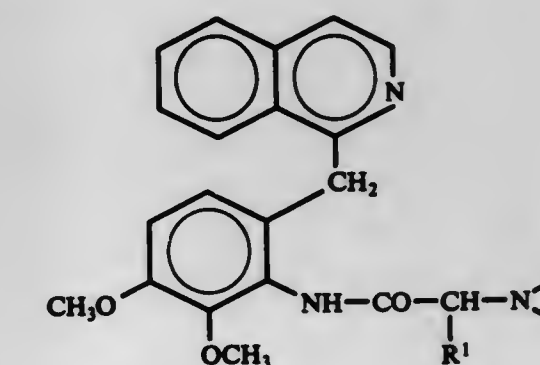
Filed July 9, 1976, Ser. No. 704,096

Int. Cl.² A61K 31/485; C07D 217/20

U.S. Cl. 424-258

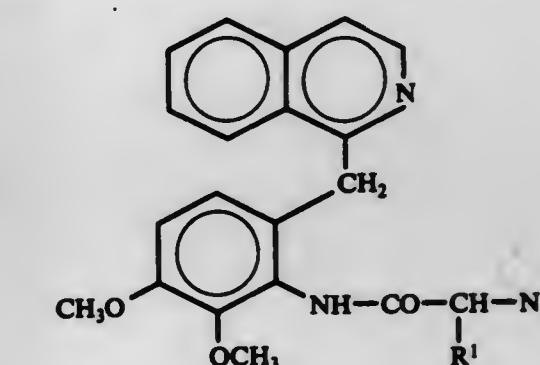
27 Claims

1. A compound having the formula



wherein R^1 is selected from the group consisting of hydrogen and methyl, and R^2 is selected from the group consisting of methyl, ethyl, n-propyl, and isopropyl, and therapeutically acceptable acid addition salts thereof.

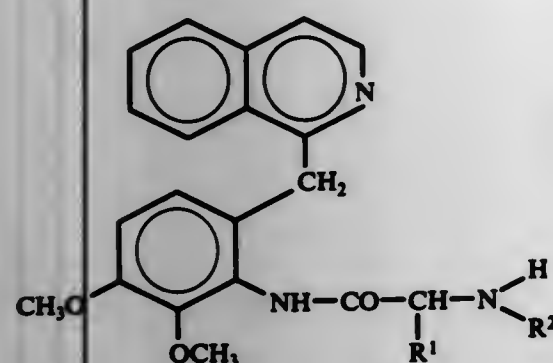
10. A pharmaceutical preparation for the suppression of cardiac arrhythmias comprising as an active ingredient an amount effective for the suppression of cardiac arrhythmias of a compound having the formula



wherein R^1 is selected from the group consisting of hydrogen and methyl, and R^2 is selected from the group consisting of methyl, ethyl, n-propyl, and isopropyl, and therapeutically acceptable acid addition salts thereof, in association with a pharmaceutically and therapeutically acceptable carrier.

19. A process for the suppression of cardiac arrhythmias in

mammals comprising administering to the mammal an amount effective for the suppression of cardiac arrhythmias of a compound having the formula



wherein R^1 is selected from the group consisting of hydrogen and methyl, and R^2 is selected from the group consisting of methyl, ethyl, n-propyl, and isopropyl, and therapeutically acceptable salts thereof.

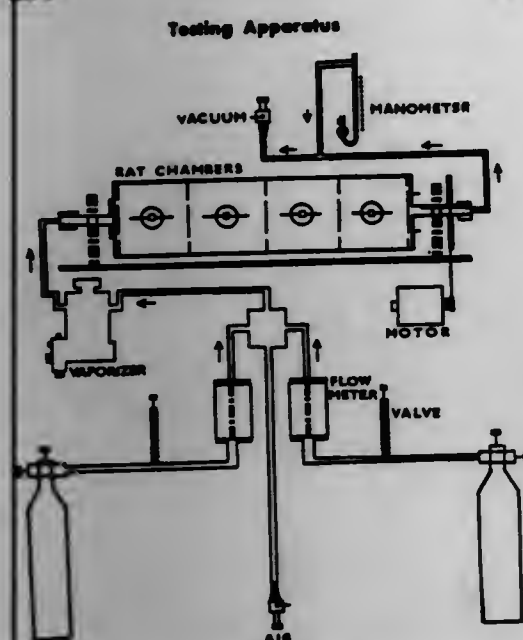
4,053,604

METHOD FOR IMPROVING ANESTHESIA AND COMPOSITIONS THEREFOR

Jorge Jaramilla, Dollard des Ormeaux, Canada, assignor to Ayerst, McKenna & Harrison Limited, Montreal, Canada
Filed Nov. 26, 1975, Ser. No. 635,540
Int. Cl.² A61K 31/47, 31/535, 31/02

U.S. Cl. 424—258

14 Claims



1. A method for preventing painful conditions and providing psychic indifference to pain and stress in an animal subject comprising:

administering concomitantly or sequentially to said subject a neuroleptanesthetically effective dose comprising (+)(4a, 13b-trans)-3-hydroxy-13b-trans-3-isopropyl-2,3,4,4a,8,9,13b,14-octahydro-11H-benzo[6,7]cyclohepta[1,2,3-de]pyrido[2,1-a]isoquinolin-3-ol, or a therapeutically acceptable acid addition salt thereof, and less than a normally effective amount of a therapeutically acceptable analgesic agent or a therapeutically acceptable acid addition salt thereof, in a ratio ranging from 1:1 to 100:1 on a weight to weight basis, respectively.

4,053,605

ESTERIFIED-2(3-LOWER-ALKYL-AMINO-PROPOXY)-3-CYANO-PYRIDINES AND DERIVATIVES

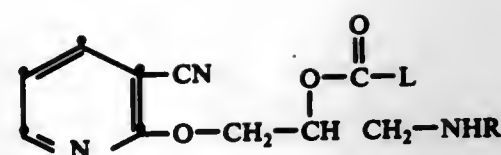
John J. Baldwin, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed June 15, 1976, Ser. No. 696,236
Int. Cl.² C07D 213/57; A61K 31/395

U.S. Cl. 424—263

14 Claims

1. A compound having the formula:



wherein

R is C_3 - C_4 branched alkyl

L is selected from C_1 - C_{10} alkyl, phenyl, mono- and disubstituted phenyl wherein said substituents are independently selected from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and halo, and pharmaceutically acceptable salts thereof.

13. A method of treating hypertension in hypertensive humans which comprises oral, inhalation, suppository or parenteral administration of an effective amount of a compound of claim 1.

4,053,606

MERCAPTOALKYLPYRIDINE DISULFIDES

Tsung-Ying Shen, Westfield; Howard Jones, Holmdel, and Conrad P. Dora, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

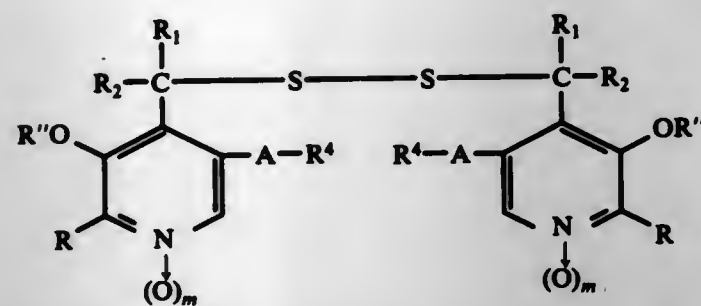
Continuation of Ser. No. 578,692, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 464,011, April 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 368,772, June 15, 1973, abandoned. This application July 16, 1976, Ser. No. 706,034

Int. Cl.² C07D 213/32; A61K 31/44

U.S. Cl. 424—263

12 Claims

1. A compound of structural formula:

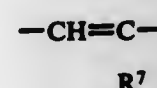


or pharmaceutically acceptable salt thereof wherein

m is 0 or 1;

R'' is H or C_{2-4} alkanoyl;

A is



or $-C\equiv C-$,

where

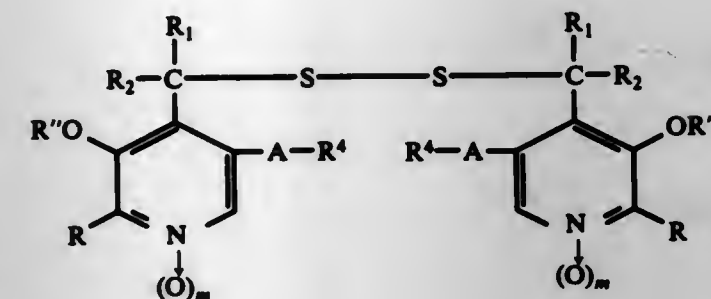
R^7 is hydrogen, chloro or fluoro;

R is C_{1-3} alkyl, hydroxy, C_{2-4} alkanoyloxy or hydroxy- C_{1-3} alkyl;

R^1 and R^2 are hydrogen or C_{1-3} alkyl; and

R^4 is hydrogen, C_{1-3} alkyl, phenyl, chloro or fluoro

9. A method of treating rheumatoid arthritis which comprises the administration, to a warm-blooded animal or human in need of such treatment, an effective amount of a compound of structural formula:



4,053,607 ARYLOXYPYRIDINE FOR TREATING HYPERGLYCAEMIA

David Edward Thorne, Cranleigh, England, and Kurt Engel, Basel, Switzerland, assignors to Beecham Group Limited, England

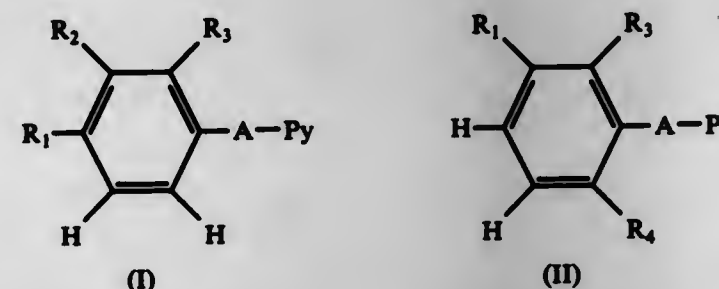
Continuation of Ser. No. 481,985, June 24, 1974, abandoned, which is a division of Ser. No. 346,252, March 30, 1973, abandoned. This application June 13, 1975, Ser. No. 586,817
Claims priority, application United Kingdom, Apr. 4, 1972, 15280/72

Int. Cl.² A61K 31/44

U.S. Cl. 424—263

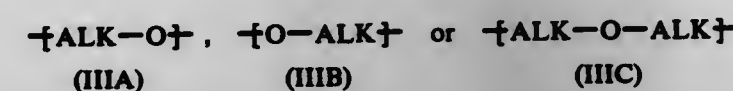
47 Claims

1. A pharmaceutical composition for the treatment of hyperglycaemia in humans in the form of a beverage, foodstuff, tablet, linguet, powder, capsule, slurry, troche, lozenge or syrup or in a form suitable for administration to humans which comprises a blood sugar lowering amount of a compound of the formula



or a pharmaceutically-acceptable, non-toxic acid addition salt thereof, wherein Py is 2-, 3- or 4-pyridyl unsubstituted or substituted by lower alkyl;

A is a group of the formula



wherein ALK is straight or branched chain alkylene of 1 to 6 carbon atoms; R_1 is a carboxylic acid group or a group which is converted in the human body to a carboxylic acid group; and R_2 , R_3 , and R_4 are each hydrogen, a carboxylic acid group, a group which is converted in the human body to a carboxylic acid group, lower alkanoyl, hydroxyl, lower alkoxy, hydroxymethyl, nitro, halo or amino, provided that R_1 is not methyl, cyano, or methoxycarbonyl when Py is 2-pyridyl or 5-ethylpyridyl-2-yl and A is $-O-CH_2-$ and R_2 , R_3 and R_4 are hydrogen or halo, in combination with a pharmaceutically-acceptable non-toxic, inert diluent or carrier therefor.

4,053,608

COMPOSITIONS AND METHODS FOR THE TREATMENT OF COCCIDIOSIS

Yasuhiro Morisawa; Mitsuru Kataoka; Noritoshi Kitano, and Tohiaki Matsuzawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Aug. 7, 1975, Ser. No. 602,574

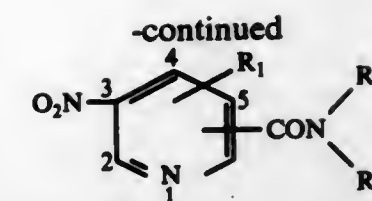
Claims priority, application Japan, Aug. 14, 1974, 49-93011; Aug. 14, 1974, 49-93012; Aug. 24, 1974, 49-97258; Dec. 26, 1974, 50-1695; Jan. 11, 1975, 50-5676; Feb. 27, 1975, 50-24207; Mar. 12, 1975, 50-29940; Apr. 12, 1975, 50-44518

Int. Cl.² A61K 31/455, 31/44

U.S. Cl. 424—266

26 Claims

1. An anticoccidial composition containing a minor amount, sufficient for the treatment of coccidiosis, which comprises a compound having the formula



intimately dispersed in an inert edible carrier, wherein

R_1 is hydrogen atom, a halomethyl group or methyl group; R_2 is hydrogen atom or an alkyl group of 1-3 carbon atoms; R_3 is hydrogen atom, an alkyl group of 1-3 carbon atoms, allyl group, an alkyl group having 2 or 3 carbon atoms and alkoxy of 1 or 2 carbon atoms as a substituent; an alkyl group having 1-3 carbon atoms and hydroxy as a substituent, an alkanoyl group of 1-18 carbon atoms, a haloacetyl group, an alkenoyl group of 3-11 carbon atoms, an aromatic acyl group selected from the group consisting of benzoyl, 2,3-dimethoxybenzoyl, 3,4-dimethoxybenzoyl, 3,5-dimethoxybenzoyl, o-, m-, p-toluoyl, o-, m-, p-chlorobenzoyl, o-, m-, p-bromobenzoyl, p-methoxybenzoyl, o-, m-, p-acetylamino benzoyl, o-, m-, p-cyanobenzoyl, 2-ethoxy-4-acetylamino benzoyl, 2-ethoxy-4-dimethylaminobenzoyl, 2-methoxy-4-acetylamino benzoyl, 3,5-dimethylbenzoyl, and 3,4-dimethylbenzoyl, a heterocyclic acyl group selected from the group consisting of 2-furoyl, 2-thenoyl, isonicotinoyl, nicotinoyl, 5-nitronicotinoyl and 2-methyl-5-nitronicotinoyl, an N-alkylcarbamoyl group of 1-4 carbon atoms in the alkyl moiety or hydroxy group; or an inorganic acid addition salt thereof;

provided that when R_2 is said alkyl group of 1-3 carbon atoms, R_3 is said alkyl group of 1-3 carbon atoms, and provided that the compound of formula (I) is not defined by a methyl group at the 6-position and a $-CONH_2$ group at the 5-position.

4,053,609

PENICILLINS AND PROCESSES FOR PREPARING THE SAME

Mitsutaka Kawazu; Mitsuyoshi Wagatsuma, both of Urawa; Masahiko Seto, Asaka; Toshikazu Miyagishima, Wako; Totaro Yamaguchi, Yono, and Satoshi Ohshima, Iwatsuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Aug. 5, 1976, Ser. No. 711,858

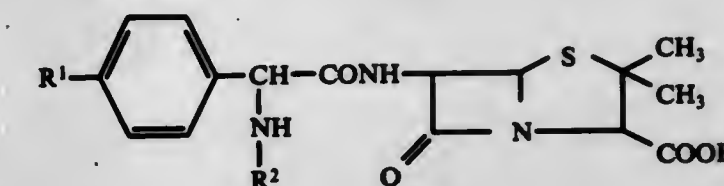
Claims priority, application United Kingdom, Sept. 12, 1975, 37525/75; Japan, Dec. 27, 1975, 50-157873; Dec. 27, 1975, 50-157874; Dec. 29, 1975, 50-157920

Int. Cl.² C07D 499/68; A61K 31/43

U.S. Cl. 424—271

43 Claims

1. A compound of the formula:



wherein R^1 is hydrogen or hydroxy, R^2 is a group of the formula: $-CO-CH(NH_2)-CH_2COR^3$ or $-COCH_2-CH(NH_2)-COR^3$, and R^3 is selected from the group consisting of hydroxy, lower alkylamino, di-lower alkylamino, lower alkoxy and hydroxy-lower alkylamino, or R^3 is amino when R^1 is hydroxy, or a pharmaceutically acceptable salt thereof.

4,053,610

1,2-DIALKYL-3-(OR 3,5)-N-HETEROCYCLIC
PYRAZOLIUM SALTS OR DERIVATIVES THEREOF AS
FUNGICIDAL AGENTS

Bryant Leonidas Walworth, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 556,748, March 10, 1975, Pat. No. 3,970,754. This application June 9, 1976, Ser. No. 694,268
Int. Cl.² A01N 9/22

U.S. Cl. 424-273 P

2 Claims

1. A method for protecting plants from attack by fungi comprising applying to said plants a fungicidally effective amount of 1,2-dimethyl-3-phenyl-5-(1-pyrrolidinyl)pyrazolium methyl sulfate.

4,053,611

SUBSTITUTED PHENOXYALKYL QUATERNARY
AMMONIUM COMPOUNDS AS ANTIARRHYTHMIC
AGENTS

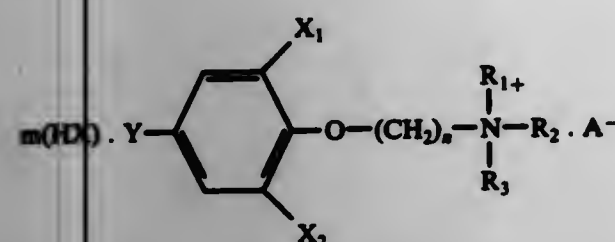
Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 484,525, July 1, 1974, Pat. No. 3,932,664, which is a division of Ser. No. 164,086, July 19, 1971, Pat. No. 3,875,215. This application Jan. 12, 1976, Ser. No. 648,548
Int. Cl.² A61K 31/40

U.S. Cl. 424-274

8 Claims

5. A method for combatting cardiac arrhythmias which comprises administering to an animal a cardiac antiarrhythmic amount of a quaternary ammonium compound corresponding to the formula



wherein Y represents amino, loweralkylamino or diloweralkylamino; R₁ and R₂ taken together represent an aliphatic hydrocarbon moiety of 4 carbon atoms substituted with zero, one or two lower alkyl substituents; R₃ independently is selected from the group consisting of lower alkenyl, phenacyl, mono-, di-, or trihalophenacyl, lower alkynyl, substituted lower alkyl, substituted lower alkenyl and substituted lower alkynyl substituted with a substituent selected from the group consisting of halogen, phenyl, halophenyl, dihalophenyl, trihalophenyl, nitrilo, and hydroxy; X₁ and X₂ both represent halogen; A⁻ represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable anion; n represents one of the integers 2, 3 or 4; HX represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable acid; and m represents one of the integers zero and one.

4,053,612

STABILIZED FORMULATIONS OF
2-ALKOXYIMINO-N-CARBAMOYL-2-CYANOACETAMIDES

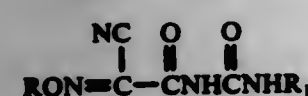
Frederic John Bunde, and Willis Eli Capery, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 545,605, Jan. 30, 1975, abandoned. This application Dec. 12, 1975, Ser. No. 639,581
Int. Cl.² A01N 9/02, 9/12, 9/20

U.S. Cl. 424-286

11 Claims

9. A fungicidal composition consisting essentially of a. 10 parts of a compound of the formula



wherein

R is methyl or ethyl, and

R₁ is hydrogen, alkyl of 1 to 4 carbon atoms or allyl;

b. a fungicidally effective amount of a fungicide selected from the group consisting of maneb and mancozeb;

c. from 1 to 100 parts of an acidulent having a pH of 2 to 5.7 in a 1% distilled water mixture and a free acidity of from 2.5 millimoles per gram to 22 millimoles per gram of acidulent when titrated in a 1% distilled water mixture to a pH of 7

with the proviso that when the composition contains maneb, said acidulent includes a zinc salt selected from the group consisting of zinc chloride, zinc sulfate and zinc nitrate in which the mole ratio of zinc salt to maneb is from 2 to 15 percent.

4,053,613

1,3,4,5,15-THIAZOLINYL AND 1,3 THIAZINYL
SUBSTITUTED INDOLINONES

George C. Rovnyak, Hopewell; Venkatachala Lakshmi Narayanan, Hightstown, and Rudiger D. Haugwitz, Titusville, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

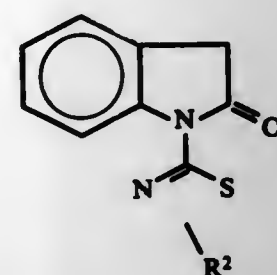
Filed Sept. 17, 1975, Ser. No. 614,393

Int. Cl.² A61K 31/425, 31/54; C07D 417/04, 417/14

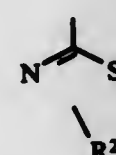
U.S. Cl. 424-246

16 Claims

1. A compound having the formula



wherein R₂ is hydrogen, and the radical

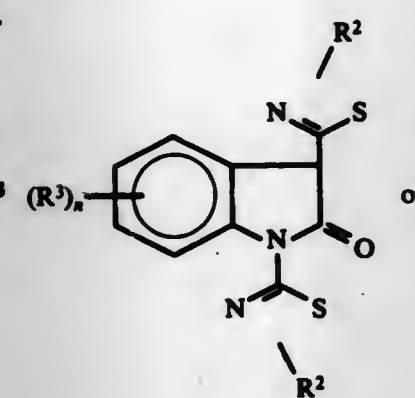


represents a 5- or 6-membered ring containing three or four carbons and one double bond; and pharmaceutically acceptable acid-addition salts thereof.

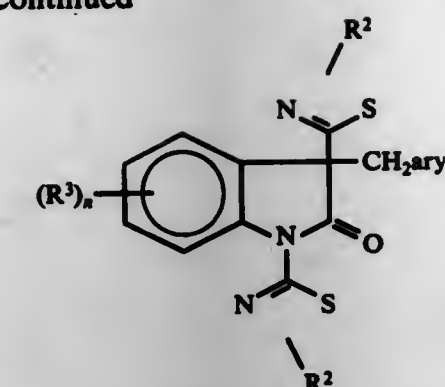
3. A pharmaceutical composition comprising a compound as defined in claim 1 and a pharmaceutically acceptable carrier therefor.

4. A method of treating inflammation in mammalian species, which comprises orally administering to a mammalian host a therapeutic amount of a composition as defined in claim 3.

5. A compound having the formula



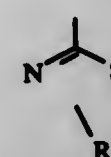
-continued



wherein R₂ is selected from the group consisting of hydrogen, lower alkyl, phenyl or lower alkylphenyl; R₃ is selected from the group consisting of hydrogen, lower alkyl, trifluoromethyl, halo, lower alkoxy, nitro, cyano, amino, di-lower alkylamino or



wherein R contains less than 11 carbons and is selected from the group consisting of lower alkyl, lower alkenyl, phenyl, phenyl-lower alkyl, cycloalkyl, cycloalkenyl, cycloalkyl-lower alkyl, and cyclo-lower alkenyl, however where n is 2, and adjacent R₃ groups are present, at least one of the R₃ groups is other than t-butyl, trifluoromethyl or nitro; aryl is phenyl or phenyl mono-substituted with a member selected from the group consisting of halogen, lower alkyl, nitro, trifluoromethyl, and lower alkoxy; n is 1 or 2; the radical



represents a 5- or 6-membered ring having three or four carbons and one double bond; and pharmaceutically acceptable acid-addition salts thereof.

15. A pharmaceutical composition comprising a compound as defined in claim 5 and a pharmaceutically acceptable carrier therefor.

4,053,614

1,2-PENTAMETHYLENE-1,4-DIHYDROPYRIDINE
DERIVATIVES

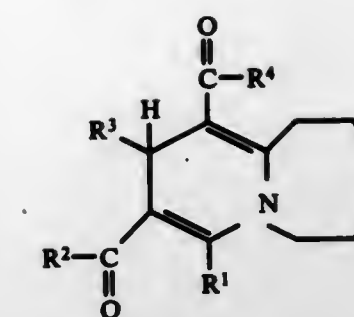
Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 468,664, May 10, 1974, Pat. No. 3,951,988, which is a division of Ser. No. 336,477, Feb. 28, 1973, Pat. No. 3,856,798. This application Aug. 13, 1975, Ser. No. 604,352
Claims priority, application Germany, Mar. 6, 1972, 2210633
Int. Cl.² A61K 31/455

U.S. Cl. 424-266

35 Claims

18. A method of producing coronary vessel dilation and an antihypertensive effect in humans and other animals which comprises administering to said human or other animal a compound of the formula:



wherein R₁ is hydrogen or lower alkyl; each of R₂ and R₄, independently of the other, is lower alkoxy or alkynyl of 2 to 4 carbon atoms; and R₃ is lower alkyl; phenyl; phenyl substituted by one to three substituents selected from the group consisting of lower alkyl, trifluoromethyl, cyano, halo, nitro and carbo(lower alkoxy); pyridyl; furyl; thienyl; or naphthyl; in an amount sufficient to produce coronary vessel dilation and an antihypertensive effect.

4,053,615

PHTHALIMIDOPYPERIDINES AND

ANTI-CONVULSANT COMPOSITIONS THEREOF

John Terence Arnott Boyle, and John Christopher Saunders, both of Maidenhead, England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 543,397, Jan. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 405,332, Oct. 11, 1973, abandoned. This application Jan. 21, 1976, Ser. No. 650,828

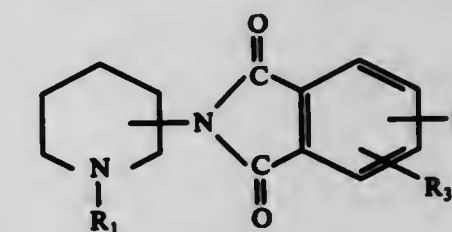
Claims priority, application United Kingdom, Oct. 21, 1972, 48594/72; Jan. 23, 1975, 2923/75

Int. Cl.² C07D 401/04

U.S. Cl. 424-267

21 Claims

1. A compound selected from those having the formula



and their pharmaceutically acceptable acid addition salts, wherein R₁ is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl of 5 to 7 carbon atoms, phenyl(lower)alkyl, pyridyl(lower)alkyl, furyl(lower)alkyl and thienyl(lower)alkyl, and R₂ and R₃ are independently selected from the group consisting of hydrogen, halogen, lower alkyl, nitro, amino and di(lower alkyl)amino.

4,053,616

COMBATING RUST FUNGI WITH

1-[1',2',4'-TRIAZOLYL-(1')]-1-(4'-PHENYL-PHENOXY)-3,3-DIMETHYL-BUTAN-2-ONE

Karl Heinz Büchel; Wolfgang Krämer, both of Wuppertal; Wilhelm Brandes, Cologne, and Paul-Ernst Frohberger, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

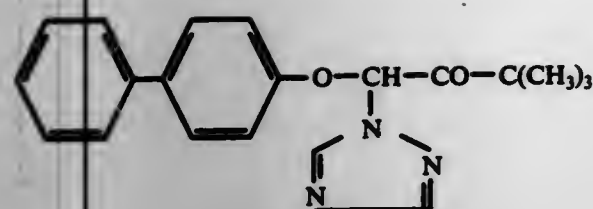
Filed June 11, 1975, Ser. No. 586,122

Claims priority, application Germany, June 28, 1974, 2431073
Int. Cl.² A01N 9/22

U.S. Cl. 424-269

5 Claims

1. A method of combating rust fungi of the genus Uromyces and Puccinia which comprises applying to the rust fungi or to seed a rust fungicidally effective amount of the compound of the formula



4,053,617

2,1,3-BENZOTHIADIAZOLES AS MYOLONYTICS
Erwin Eichenberger, Gumligen, and Peter Neumann, Berne, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed July 26, 1976, Ser. No. 708,621

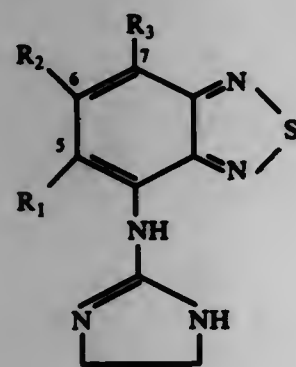
Claims priority, application United Kingdom, July 28, 1975, 31585/75

Int. Cl.² A61K 31/425

U.S. Cl. 424-270

16 Claims

1. A method of treating spastic conditions which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of the formula



wherein each of R₁, R₂ and R₃ independently, is hydrogen, halogen, alkyl, alkoxy, nitro, cyano, hydroxy or alkylthio, or a pharmaceutically acceptable acid addition salt form thereof.

4,053,618

THIAZOLE ALKANOIC ACIDS, HYPOLIPEMIANT COMPOSITIONS CONTAINING THEM AND METHODS OF INDUCING HYPOLIPEMIC ACTIVITY UTILIZING THEM

Andre Pottier, Vaires-sur-Marne, and Vesperto Torelli, Maisons-Alfort, both of France, assignors to Roussel-UCLAF, Paris, France

Filed Feb. 2, 1976, Ser. No. 654,514

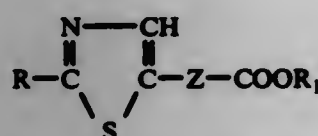
Claims priority, application France, Dec. 12, 1975, 75.38061

Int. Cl.² A61K 31/425; C07D 277/30; C07F 5/06

U.S. Cl. 424-270

15 Claims

1. A compound selected from the group consisting of thiazoles of the formula



wherein R is alkyl of 1 to 5 carbon atoms, Z is selected from the group consisting of -CH=CH-, -CH=CH-CH=CH- and -(CH₂)_n, n is an integer of 2, 4, or 6 and R₁ is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, -NH₂ and alkali metal, alkaline earth metal and aluminum cations and the non-toxic, pharmaceutically acceptable acid addition salts.

10. A hypolipemiant composition comprising an effective amount of at least one compound of claim 1 and a pharmaceutical carrier.

11. A method of inducing hypolipemic activity in warm-

blooded animals comprising administering to warm-blooded animals an hypolipemically effective amount of at least one compound of claim 1.

4,053,619

2-SUBSTITUTED-2-(ACETOXYETHYL) ESTERS OF (1-METHYL-2-IMIDAZOLIDINYLIDENE) NITROACETIC ACID

Willy D. Kollmeyer, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

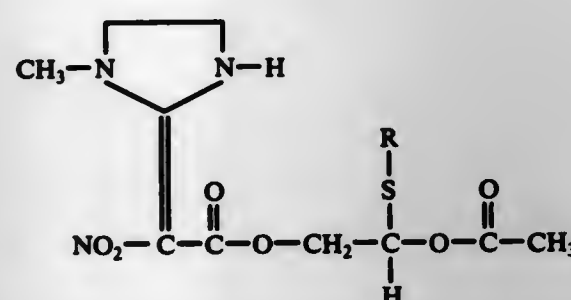
Filed Mar. 2, 1977, Ser. No. 773,452

Int. Cl.² C07D 233/26; A61K 31/415

U.S. Cl. 424-273 R

4 Claims

1. A compound of the formula:



wherein R is alkyl of one to four carbon atoms, or is phenyl or phenyl substituted by from one to three halogen atoms or by one of nitro, cyano, alkyl, mono- and polyhaloalkyl, alkoxy or alkylthio, wherein the alkyl moiety contains from one to six carbon atoms.

4. A method for killing insects which comprises contacting them with a lethal dosage of a compound of claim 1.

4,053,620

COMBATING FUNGI WITH

1-ARYL-5-ALKYLIDENE-2,4-DIOXO-IMIDAZOLIDINES
Edgar Enders, Cologne, and Paul-Ernest Frohberger, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 19, 1976, Ser. No. 668,547

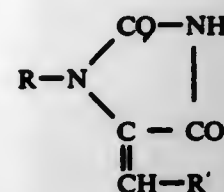
Claims priority, application Germany, Apr. 5, 1975, 2514992

Int. Cl.² A01N 9/22

U.S. Cl. 424-273 R

11 Claims

1. A method of combating fungus pests which comprises applying to the pests or a habitat thereof a fungicidally effective amount of a compound of the formula



in which

R is phenyl or naphthyl; or phenyl or naphthyl substituted by nitro; by halogen; by alkyl, alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl each with up to 6 carbon atoms; by haloalkyl with up to 5 halogen atoms and 1 or 2 carbon atoms; by cycloalkyl with 5 or 6 carbon atoms; by hydroxyl; by cyano; by thiocyanato; by acetyl; by formyl; by phenyl or phenoxy each optionally carrying halogen or nitro as substituents; by phenylthio; by phenylsulfonyl; by halosulfonyl; by benzyl; by anilino; by monoalkylamino or dialkylamino, each with up to 4 carbon atoms in each alkyl moiety; or by

4,053,623
PHENYL ESTERS OF (1-METHYL-2-IMIDAZOLIDINYLIDENE)NITROACETIC ACIDS

Paul E. Porter, and Willy D. Kollmeyer, both of Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

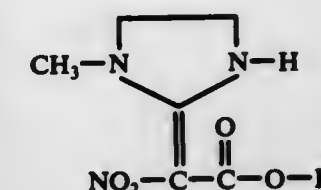
Filed Jan. 14, 1977, Ser. No. 759,599

Int. Cl.² A61K 31/415; C07D 233/22

U.S. Cl. 424-273 R

3 Claims

1. A compound of the formula:



(I)

4,053,621

1-[2-(β-NAPHTHYLOXY)ETHYL]-3-METHYLPYRAZOLONE-(5) AND ANTITHROMBOTIC AND ANTITHROMBOLYTIC COMPOSITIONS AND METHODS UTILIZING THEM

Elke Moller, Wuppertal, Germany; Karl Meng, deceased, late of Wuppertal, Germany, by Ilse Heide Frieda Meng, heir; Harald Horstmann, Wuppertal, Germany; Friedel Seuter, Germany, and Egbert Wehinger, both of Neviges, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed June 2, 1975, Ser. No. 582,773

Claims priority, application Germany, June 6, 1974, 2427272
Int. Cl.² A61K 31/295, 31/415; C07D 231/08; C07F 15/02

U.S. Cl. 424-273 P

16 Claims

1. 1-[2-(β-naphthylthio)ethyl]-3-methylpyrazolone-(5) or a pharmaceutically acceptable nontoxic salt thereof.

4. A pharmaceutical composition useful for inhibiting thrombus formation and for reducing or redissolving a thrombus in humans and animals which comprises an antithrombotically effective amount or an antithrombolitically effective amount of a compound according to claim 1 in combination with a pharmaceutically acceptable carrier or diluent.

5. An alkali metal, alkaline earth metal, aluminum, iron or organic base salt of 1-[2-(β-naphthylthio)ethyl]-3-methylpyrazolone-(5) according to claim 1.

4,053,622

PHENYL ESTERS OF

3-METHYL-2-(1-NITRO-2-OXO-2-PHENOXYETHYLIDENE)-1-IMIDAZOLIDINECARBOXYLIC ACIDS
Willy D. Kollmeyer, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

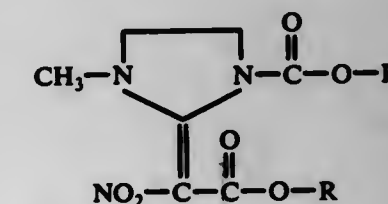
Filed Jan. 14, 1977, Ser. No. 759,596

Int. Cl.² A61K 31/415; C07D 233/40

U.S. Cl. 424-273 R

3 Claims

1. A compound of the formula:



wherein both of R are the same and are phenyl or phenyl substituted by from one to three halogen atoms or by one of nitro, cyano, alkyl, mono- and polyhaloalkyl, alkoxy, alkylthio, alkylsulfinyl, alkylsulfonyl and alkanoyl, wherein the alkyl moiety contains from one to six carbon atoms.

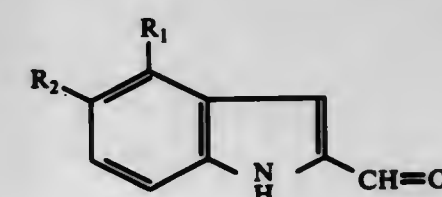
3. A method for killing insects which comprises contacting them with a lethal dosage of a compound of claim 1.

963 O.G.-25

wherein

R₁ is lower alkyl of up to 5 carbon atoms and R₂ is hydrogen, halogen or lower alkyl or alkoxy with the proviso that when R₂ is ethyl, R₁ may be hydrogen and the physiologically compatible aldehyde derivatives thereof.

12. Method of depressing blood sugar in the subject which method comprises administering to such subject an effective (I) amount of indole-2-carbaldehyde compound of the formula:



(I)

wherein

R₁ is lower alkyl or hydrogen and R₂ is hydrogen, halogen or lower alkyl or alkoxy with the proviso that when R₂ is other than halogen or ethyl, R₁ is alkyl,

and the physiologically compatible aldehyde derivatives thereof.

4,053,625 INSECTICIDES

Isao Ono, Kawanishi; Yoshitoshi Okuno, Toyonaka; Toshio Nishio, Takarazuka, and Nobushige Itaya, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 24, 1975, Ser. No. 634,850

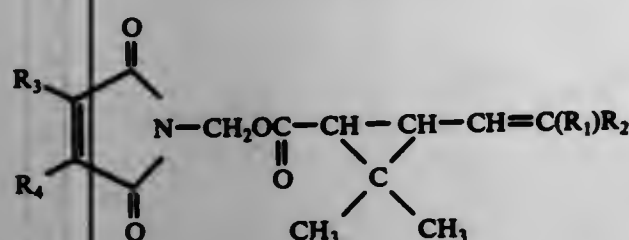
Claims priority, application Japan, Dec. 5, 1974, 49-140657

Int. Cl.² A01N 9/22

U.S. Cl. 424-274

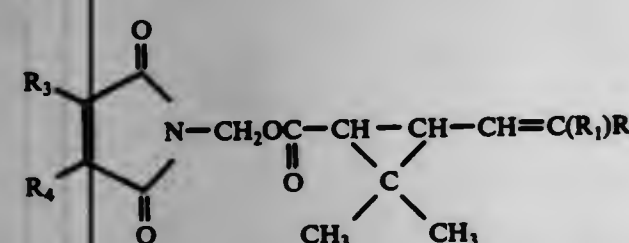
9 Claims

1. A cyclopropanecarboxylic acid ester of the formula (I),



wherein R₁ is a hydrogen atom, methyl group or a fluorine, chlorine or bromine atom, R₂ is a fluorine, chlorine or bromine atom, and each of R₃ and R₄ is independently a hydrogen atom, a C₁-C₃ alkyl, C₂-C₃ alkenyl or C₂-C₃ alkynyl group, an alkyl- or halogen-substituted C₆-C₈ aryl, unsubstituted C₆-C₈ aryl group or a C₇-C₉ aralkyl group.

7. An insecticidal composition comprising an inert carrier and as the active ingredient an insecticidally effective amount of a cyclopropanecarboxylic acid ester of the formula (I),



wherein R₁ is a hydrogen atom, methyl group or a fluorine, chlorine or bromine atom, R₂ is a fluorine, chlorine or bromine atom, and each of R₃ and R₄ is independently a hydrogen atom, a C₁-C₃ alkyl, C₂-C₃ alkenyl or C₂-C₃ alkynyl group, an alkyl- or halogen-substituted C₆-C₈ aryl or unsubstituted C₆-C₈ aryl group or a C₇-C₉ aralkyl group.

9. A method of killing insect or acarid, which comprises applying thereto an insecticidally effective amount of a compound as claimed in claim 1 alone or together with an inert carrier.

4,053,626

CHOLESTEROL LEVEL-LOWERING PHENOXYACETIC ACIDS

Erich Schacht; Werner Mehrhof; Herbert Nowak; Zdenek Simane, and Detlev Kayser, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Germany

Division of Ser. No. 449,332, March 8, 1974, Pat. No. 3,992,386. This application Sept. 17, 1976, Ser. No. 724,232

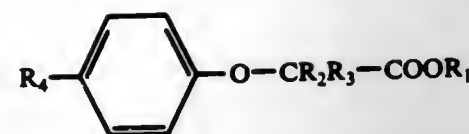
Claims priority, application Germany, Mar. 13, 1973, 2312344; Apr. 18, 1973, 2319642; May 18, 1973, 2325184

Int. Cl.² C07D 311/04; A61K 31/38

U.S. Cl. 424-275

8 Claims

1. A compound of the formula



wherein R₁ is H or alkyl of 1-4 carbon atoms, R₂ is H or alkyl of 1-4 carbon atoms, R₃ is methyl, phenyl or chlorophenyl and R₄ is 4-chromanyl or 4-thiochromanyl, or a physiologically acceptable salt thereof.

7. A pharmaceutical composition comprising in unit dosage form a cholesterol blood-level lowering amount of at least one compound of claim 1 in admixture with a pharmaceutically acceptable carrier.

8. A method for lowering the cholesterol blood levels in mammalian patients having abnormally high cholesterol levels which comprises administering to the patient doses of a compound of claim 1 effective to significantly lower cholesterol level of the patient.

4,053,627

CONTROLLED RELEASE SYSTEM FOR JUVENILE HORMONES IN AQUEOUS ENVIRONMENT

Herbert B. Scher, Moraga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sept. 10, 1975, Ser. No. 612,129

Int. Cl.² A01N 9/28

U.S. Cl. 424-278

3 Claims

1. A method for the controlled release and protecting of an insect juvenile hormone from chemical degradation when said hormone is applied to an aqueous environment employing gel discs, said discs comprising a water soluble algin, a calcium salt which yields cations which gelatinize alginates, a solubilizing agent to control gel formation, a biocidally effective amount of a biocide to protect said discs from attack by microorganisms and an insect juvenile hormone.

4,053,628 COMPOSITION

Neil Arthur Stevenson, and George Wardell, both of Loughborough, England, assignors to Fisons Limited, London, England Division of Ser. No. 471,141, May 17, 1974, Pat. No. 3,975,536, which is a continuation-in-part of Ser. No. 443,521, Feb. 19, 1974, abandoned, which is a continuation of Ser. No. 251,198, May 8, 1972, abandoned. This application Apr. 15, 1976, Ser. No. 677,274

Claims priority, application United Kingdom, May 12, 1971, 14529/71; Dec. 9, 1971, 57169/71; May 25, 1973, 25237/73; May 25, 1973, 25238/73; June 5, 1973, 26649/73; July 12, 1973, 33325/73

Int. Cl.² A61K 31/35

U.S. Cl. 424-283

6 Claims

1. A method of treatment of conditions of the eye or nose, in which conditions allergy or immune reactions play a contributory part, which method comprises administration of 1,3-bis(2-carboxychromon-5-yloxy)propan-2-ol, or a pharmaceutically acceptable salt thereof, topically or by sub-conjunctival injection to a patient having such a condition.

4,053,629 INSECTICIDAL METHOD UTILIZING CERTAIN COUMARANOL ESTERS OF CYCLOPROPANE CARBOXYLIC ACIDS

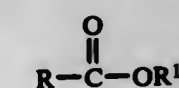
Wayne I. Fanta, Colerain Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio and a continuation-in-part of Ser. No. 208,040, Dec. 9, 1971, Pat. No. 3,976,663, which is a continuation-in-part of Ser. No. 2,443, Jan. 12, 1970, abandoned. This application June 28, 1976, Ser. No. 700,425

Int. Cl.² A01N 9/28

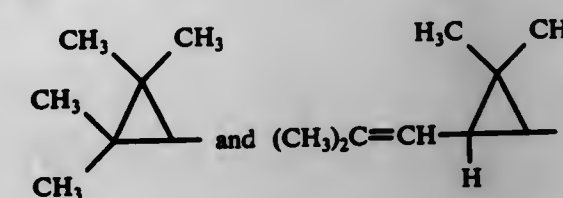
U.S. Cl. 424-285

5 Claims

1. A method for combatting insects comprising applying to said insects, or to an insect habitat, an insecticidal amount of cyclopropanecarboxylic acid ester of the formula



wherein R is a cyclopropane moiety selected from the group consisting of



and wherein R¹ is a 3-coumaranyl moiety of the formula



wherein R² is selected from the group consisting of hydrogen, halogen, nitro, thiomethyl, alkyl, alkoxy, sulfonylmethyl, phenyl and benzyl.

4,053,630

TREATMENT OF BODY ODOR AND DISTURBED KERATINIZATION

Ruey J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128, and Eugene J. Van Scott, 1138 Sewell Lane, Rydal, Pa. 19046

Filed July 7, 1976, Ser. No. 703,188

Int. Cl.² A61K 31/315

U.S. Cl. 424-289

11 Claims

1. A method for treating acne, dandruff and ichthyotic skin conditions, said method comprising topically applying to the involved skin are as a symptom alleviating and therapeutically effective amount of a medicinal composition containing from about 1 to about 30 percent by weight of at least one compound selected from the group consisting of cysteic acid, cysteinesulfonic acid and homocysteic acids and chelates of said compound with at least one metallic compound selected from the group consisting of ferric chloride, copper sulfate, copper carbonate, zinc sulfate, zinc oxide, zinc chloride, aluminum chlorohydrate and aluminum zinc sulfate.

4,053,631

SYSTEMIC CONTROL OF ECTOPARASITES WITH α-CYANO-M-PHENOXYBENZYL α-C1-C4 ALKYL-2-NAPHTHALENEACETATES

Michael Stanley Schrider, South Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

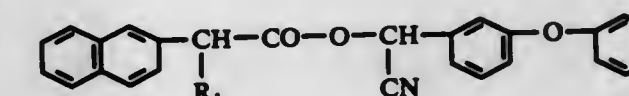
Filed Apr. 2, 1976, Ser. No. 673,246

Int. Cl.² A61K 31/275

U.S. Cl. 424-304

10 Claims

1. A method for the systemic control of ectoparasites which attack warm-blooded animals, comprising administering to the warm-blooded animals a systemically effective amount against the ectoparasites of a compound having a formula:



wherein R₁ is alkyl C₁-C₄.

4,053,632

COMPOUNDS OF SPIRO-AMINE TYPE AND METHODS FOR THEIR USE

Bernt Sigfrid Emanuel Carnmalm, Sodertalje; Tomas De Paulis, Gnesta; Svante Bertil Ross, Sodertalje; Sten Ingvar Rimsby, Sodertalje; Nils-Erik Stjernström, Sodertalje, and Sven-Ove Ögren, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Continuation-in-part of Ser. No. 256,945, May 25, 1972, Pat. No. 3,904,691. This application Dec. 27, 1974, Ser. No. 536,810

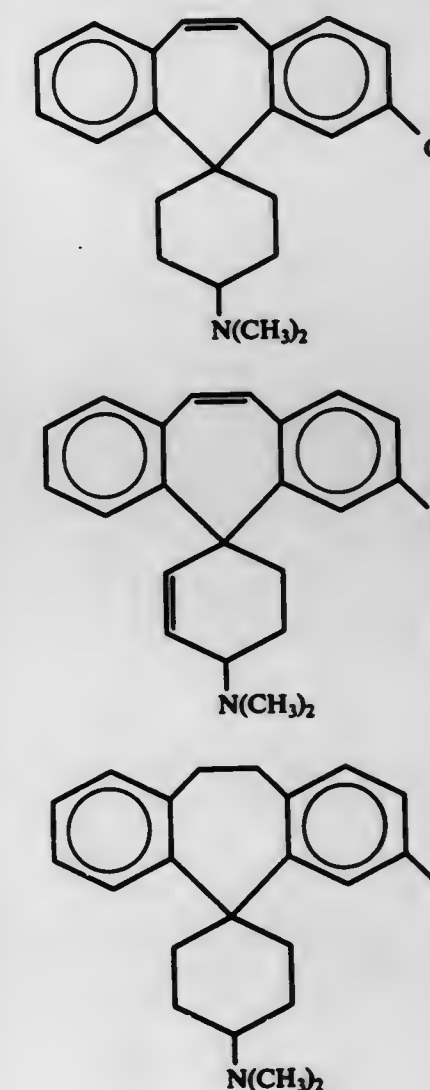
Claims priority, application Sweden, June 11, 1971, 717630 The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

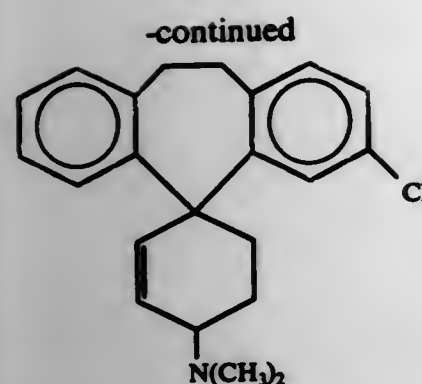
Int. Cl.² A01N 9/20

U.S. Cl. 424-316

19 Claims

1. A compound selected from the group consisting of





and pharmaceutically acceptable salts thereof.

4,053,633

ARYL DIBROMONITROMETHYL SULFONES

Christian T. Goralski, and Thomas C. Klingler, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 24, 1976, Ser. No. 699,546
Int. Cl.² A01N 9/00; C07C 147/06

U.S. Cl. 424—337

6 Claims

1. A method for controlling bacteria and fungi by applying to them and to their habitats a cidal amount of a solution containing at least 100 parts per million of an aryl dibromonitromethyl sulfone, wherein aryl represents phenyl or C₁₋₄ alkyl-substituted phenyl.

4,053,634

MITICIDAL AND APHICIDAL METHOD UTILIZING 2-HIGHER

ALKYL-3-HYDROXY-1,4-NAPHTHOQUINONE CARBOXYLIC ACID ESTERS

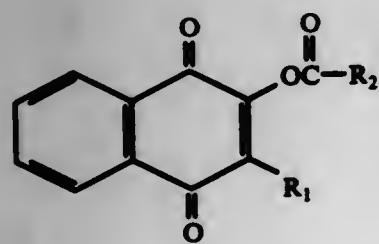
Russell Frank Bellina, and Dennis Lynn Post, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 613,553, Sept. 15, 1975, which is a continuation-in-part of Ser. No. 531,483, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 494,294, Aug. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,992, May 10, 1974, abandoned. This application Sept. 13, 1976, Ser. No. 722,513
Int. Cl.² A01N 9/24

U.S. Cl. 424—312

7 Claims

1. A method for protecting plants from mites or aphids comprising applying to the plant locus to be protected a miticidally or aphicidally effective amount of a compound of the formula:



wherein

R₁ is alkyl of 8-14 carbon atoms which are branched, cyclic, or straight chain and
R₂ is alkyl of 7-17 carbon atoms either branched or straight chain or cycloalkyl of 3-6 carbon atoms.

4,053,635

SUBSTITUTED AMIDES OF 3-METHYL-4-PHENYL-3-BUTENOIC ACID, WITH A HIGH HYPOLIPEMIZING ACTIVITY

Sergio Gorini, and Umberto Valcavi, both of Milan, Italy, assignors to Istituto Biochimico Italiano di Loredana Lorenzini S.a.s., Milan, Italy

Filed June 6, 1975, Ser. No. 584,490

Claims priority, application Italy, June 10, 1974, 23797/74
Int. Cl.² C07C 103/76; A61K 31/165

U.S. Cl. 424—324

2 Claims

1. A method of treating hypolipemia in a hypolipemic patient which comprises administering to said patient an effective amount of the diethylamide of 3-methyl-4-phenyl-3-butenic acid.

2. Diethylamide of 3-methyl-4-phenyl-3-butenic acid.

4,053,636

DICHLOROCYCLOPROPYLPHENYL BISBIGUANIDE COMPOUNDS, PROCESSES AND COMPOSITIONS

Frederic A. Eustia, III, Portsmouth, Va.; William G. Gorman, East Greenbush, and Frederick C. Nachod, Kinderhook, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

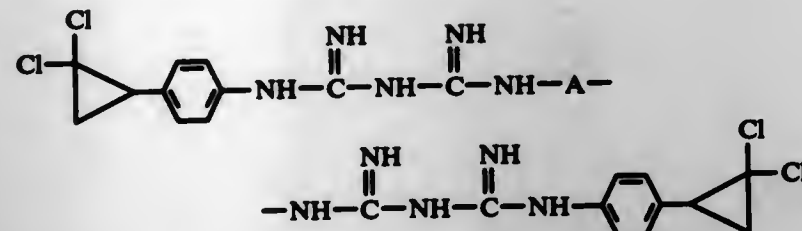
Filed May 24, 1976, Ser. No. 689,260

Int. Cl.² C07C 129/16; A61K 31/155

U.S. Cl. 424—326

8 Claims

1. 1,1'-A-bis(5-(p-(2,2-dichlorocyclopropyl)phenyl)biguanide) having the structural formula



wherein A is alkylene of two to twelve carbon atoms having the valence bonds attached to different carbon atoms or an acid addition salt thereof.

4,053,637

COMPOUNDS OF DIPHENYLCYCLOPENTYLAMINE TYPE AND METHODS FOR THEIR USES

Bernt Sigfrid Emanuel Carnmalin; Ulf Henrik Anders Lindberg, both of Sodertalje; Tomas de Paula, Gnesta; Svante Bertil Ross, Sodertalje; Nils-Erik Stjernstrom, Sodertalje; Carl Bengt Johan Ulf, Sodertalje, and Sven-Ove Ogren, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Continuation of Ser. No. 257,707, May 30, 1973, abandoned.

This application May 20, 1975, Ser. No. 579,049

Claims priority, application Sweden, June 11, 1971, 7631/71
Int. Cl.² A01N 9/20, 9/24

U.S. Cl. 424—330

18 Claims

1. A pharmaceutical preparation for selectively blocking noradrenaline uptake by adrenergic nerve terminals, said preparation containing as an active ingredient an effective amount of a compound having the structural formula

4,053,639

THERAPEUTICALLY ACTIVE PHENYLALKANE DERIVATIVES

Stewart Sanders Adams; Bernard John Armitage; John Stuart Nicholson, all of Nottingham, England, and Antonio Ribera Blancafort, Madrid, Spain, assignors to The Boots Company Limited, Nottingham, England

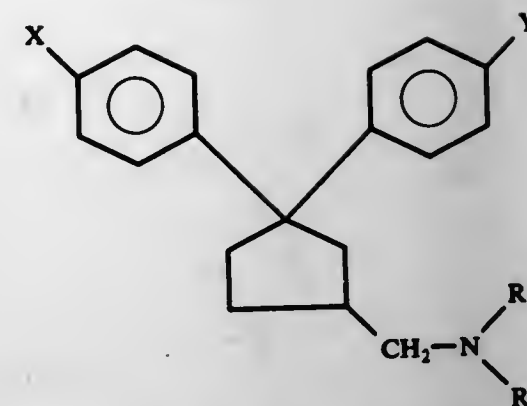
Continuation-in-part of Ser. No. 308,558, Nov. 12, 1972, Pat. No. 3,793,457, which is a division of Ser. No. 845,033, July 25, 1969, Pat. No. 3,755,427, which is a continuation-in-part of Ser. No. 425,624, Jan. 14, 1965, abandoned. This application Oct. 4, 1973, Ser. No. 391,759

Int. Cl.² C07C 31/34; A01N 9/24; A61K 31/045

U.S. Cl. 424—343

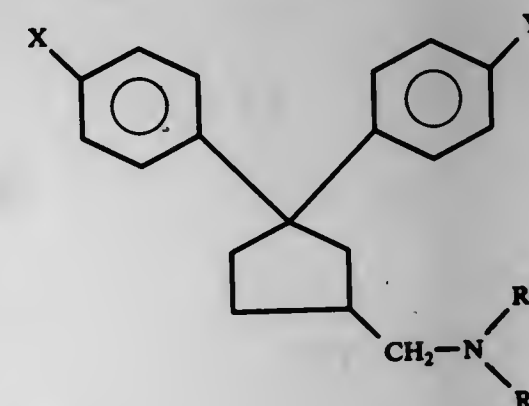
8 Claims

1. A compound selected from the group consisting of 2-(2-fluoro-4-biphenyl)propan-1-ol, 2-(2'-fluoro-4-biphenyl)propan-1-ol and 2-(2,2'-difluoro-4-biphenyl)propan-1-ol



or a pharmaceutically acceptable acid addition salt thereof, wherein X and Y are the same or different and each represents a member selected from the group consisting of a hydrogen atom, a chloro group and a methoxy group; and R¹ and R² are the same or different and each represents a member selected from the group consisting of a hydrogen atom and a methyl group, together with a pharmaceutically acceptable carrier.

9. A compound of the formula



wherein X and Y are the same or different and each represents a member selected from the group consisting of a hydrogen atom, a chloro group or a methoxy group; and R¹ and R² are the same or different and each represents a member selected from the group consisting of a hydrogen atom and a methyl group, and pharmaceutically acceptable acid addition salts thereof.

4,053,640

FISHING BAIT AND METHOD OF MAKING SAME

Tadashi Takasugi, No. 30-18 Kita Shinjuku 1-chome, Shinjuku, Tokyo, Japan

Filed June 30, 1975, Ser. No. 582,397

Claims priority, application Japan, May 26, 1975, 50-066002
Int. Cl.² A23L 1/325

U.S. Cl. 426—1

4 Claims

1. A fishing bait for attracting fish, said bait being made by (a) pulverizing raw bait to a micronized bait form, (b) mixing the micronized bait of (a) with an anionic surface active agent derived from fish oil in an amount necessary to promote dispersing said micronized bait in water, (c) vacuum freeze drying said micronized bait, and (d) again pulverizing the dried bait from (c) to micronized form.

4,053,641

METHOD OF MAKING YEAST FOOD PRODUCTS

Homer R. Elling, Seattle, Wash., assignor to Homer R. Elling, Seattle, Wash.

Filed Oct. 23, 1975, Ser. No. 625,027

Int. Cl.² A21D 8/02

U.S. Cl. 426—19

5 Claims

1. A quick method of making yeast-raised bread products which eliminates sticky doughs and the requirements of kneading and multiple yeast fermentation periods, comprising: preparing a yeast containing underdeveloped flour dough without the addition of any fat, incorporating fat uniformly throughout the dough and developing the gluten of the dough by
a. placing the dough between a flexible sheet material whose surfaces contacting the dough have been previously coated with a liquid fat,
b. flattening the dough between the sheets of flexible material, and in contact with the surfaces of the sheet material coated with the liquid fat,
c. removing the flexible sheet to expose the flattened dough,
d. folding the dough on itself,
e. repeating steps (b), (c) and (d) to develop the gluten of the flour and until the dough has a uniform color, indicating proper development thereof, allowing the dough to rise, and baking the dough.

4,053,638

ANTICARIES CONFECTIONERIES AND ORAL HEALTH PRODUCTS

John H. Litchfield, Worthington, and Victor G. Vely, Columbus, both of Ohio, assignors to William Wrigley Jr. Company, Chicago, Ill.

Division of Ser. No. 35,246, May 6, 1970, which is a continuation-in-part of Ser. No. 855,763, Sept. 5, 1969, Pat. No. 3,679,792, which is a continuation-in-part of Ser. No. 855,764, Sept. 5, 1969, Pat. No. 3,629,395, which is a continuation-in-part of Ser. No. 855,770, Sept. 5, 1969, Pat. No. 3,749,766, and Ser. No. 858,996, Sept. 18, 1969, Pat. No. 3,651,206,

Continuation-in-part of Ser. No. 790,314, Jan. 10, 1969, abandoned. This application June 30, 1976, Ser. No. 701,189
Int. Cl.² A61K 7/16, 31/11

U.S. Cl. 424—333

40 Claims

1. A confectionery food composition having anticaries activity comprising an effective amount of pyruvaldehyde to inhibit the acid production and growth of oral microorganisms and a food vehicle including a substantial amount of sugar.

4,053,642

STARTER CULTURE PRODUCTION

Gerhard Hap, Ede, and Jacobus Josephus Stadhouders, Bennekom, both of Netherlands, assignors to Stichting Bedrijven Van Het Nederlands Instituut voor Zuivelonderzoek, Ede, Netherlands

Continuation-in-part of Ser. No. 356,179, May 1, 1973, abandoned. This application June 12, 1975, Ser. No. 586,363
Claims priority, application Netherlands, May 2, 1972, 7205909

Int. Cl.² A23C 9/12, 19/02, 21/00

U.S. Cl. 426—36

14 Claims

1. A method of producing a composition for use as an inoculant material in the preparation of starters and fermented milk products, comprising (a) cultivating a culture of at least one strain of milk sugar fermenting bacteria in a culture medium consisting essentially of (1) undemineralized whey, (2) an aqueous dispersion of added non-whey protein selected from the group consisting of soya protein and milk casein in such an amount that the culture medium contains about 0.1 to 0.5 weight percent non-whey protein, and (3) a buffer mixture, said culture medium being prepared by separately pasteurizing said whey, said aqueous dispersion of non-whey protein and said buffer and mixing together the resultant pasteurized whey, aqueous dispersion of non-whey protein and buffer, (b) centrifuging the culture medium after said cultivating to concentrate more than 90% of the bacteria into a volume of about 2% of that of the culture medium prior to centrifuging and (c) freeze drying the bacteria concentrate to produce a composition which can be added directly to milk.

4,053,643

PROCESS FOR INCREASING CHEESE CURD YIELD

Edgar A. Corbin, Jr., Manchester, Mo., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Aug. 4, 1976, Ser. No. 711,606

Int. Cl.² A23C 19/02

U.S. Cl. 426—40

11 Claims

1. An acid cheese curd making process consisting essentially of
A. adding a condensed phosphate salt in sufficient amount to increase cheese curd yield to milk before or after acidification, the pH after acidification being from about 4.95 to about 5.3 and the temperature before and after acidification being from about 5° C to about 40° C to obtain an acidified milk and condensed phosphate salt mixture; then
B. maintaining the milk and salt mixture at about 26° C to about 40° C, with the proviso that if the milk and salt mixture is below 26° C, the mixture is heated to about 26° C to about 40° C, thereafter
C. adding to the acidified milk and salt mixture to about 26° C to about 40° C from about 0.01 to about 0.05 parts by weight of proteolytic enzyme and, optionally, an acidogen in an amount up to about 0.5 parts by weight per 100 parts by weight of the acidified milk and salt mixture; and thereafter
D. allowing the acidified milk and salt mixture to remain quiescent at a temperature of from about 26° C to about 40° C for from about 45 minutes to about 2 hours to form an acid cheese curd suitable for making cottage cheese, bakers' cheese, quark cheese, cream cheese and Neufchâtel cheese.

4,053,644

PROCESS OF REMOVING THE COOKED FLAVOR FROM MILK

Harold E. Swaisgood, Raleigh, N.C., assignor to Research Triangle Institute, Research Triangle Park, N.C.

Filed Oct. 10, 1975, Ser. No. 621,631

Int. Cl.² A23C 3/02, 9/12; C07G 7/02

U.S. Cl. 426—42

4 Claims

1. A process of treating fluid milk having a cooked flavor which has been heated in excess of 155° F for a period of time

sufficient to produce a cooked flavor which comprises substantially removing the cooked flavor from said fluid milk by contacting said fluid milk having a cooked flavor with immobilized sulfhydryl oxidase enzyme.

4,053,645

PROCESS OF INCREASING THE DIGESTIBILITY OF CELLULOSIC MATERIAL USING NITRIC ACID

James W. Jelks, Route 1, Box 461, Sand Springs, Okla. 74063
Filed Feb. 2, 1976, Ser. No. 654,555

Int. Cl.² A23K 1/00

U.S. Cl. 426—53

15 Claims

1. A process of treating cellulosic plant material to increase the digestibility thereof by animals comprising:
chopping the cellulosic plant material into particles;
mixing the chopped cellulose material with water to thoroughly wet the same;
mixing nitric acid with the wet cellulosic material to reduce the pH of the mixture to 0.5 to 3.5; and
cooking the mixture at about 100 to 125 psig steam pressure for about 30 to 60 minutes to break lignin cellulose bonds and to convert at least a portion of the cellulose for use as a digestible material suitable as animal feed.

4,053,646

WATER STABLE STARCH-LIPID COMPOSITION AND METHOD FOR PREPARING SAME

Walton Reid Wright, and Albert E. Purcell, both of Raleigh, N.C., assignors to Walton Reid Wright, Raleigh, N.C.

Continuation-in-part of Ser. No. 262,735, June 14, 1972,

abandoned. This application May 8, 1975, Ser. No. 575,603

Int. Cl.² A23K 1/00

U.S. Cl. 426—62

22 Claims

1. A composition in solid state comprising the water-insoluble solids portion of vegetable starch and lipid-containing material from the class consisting of vegetable and animal oils and fats suitable for use in an animal food composition characterized by immobility of the lipid in water.

4,053,647

PET FOOD PRODUCT AND PROCESS OF PRODUCING SUCH

Samuel Prussin, General Delivery, Carmel, Calif. 93921

Filed Dec. 12, 1975, Ser. No. 640,163

Int. Cl.² A23K 1/18, 1/16

U.S. Cl. 426—92

11 Claims

1. A process of producing a gustatory response inducing product which comprises comminuting an effective proportion of a proteinaceous substrate; forming an aqueous mass containing said comminuted substrate; cooking said aqueous mass under mild cooking conditions of about 220° F to 300° F, but insufficient to substantially liquify and substantially hydrolyze said proteinaceous substrate, thereby resulting in an aqueous mass having cooked, solid proteinaceous particles of a size sufficient to enable settling thereof; homogenizing said cooked aqueous mass to further comminute said protein particles and to form a substantially colloidal suspension of said cooked, solid proteinaceous material; adjusting the solids content thereon to about 1 to 20 weight percent; and admixing said colloidal suspension with an aerosol propellant in a container suitable for spraying.

4,053,648

BOTTLE FOR STERILE DISPENSING OF FLOWABLE CONTENTS

Manfred Carl Schmid, Anspacher Strasse 39, and Rolf Richard Wilhelm Reiss, Obernhäuser Weg 8, both of Bad Homburg, Germany

Filed Nov. 20, 1974, Ser. No. 525,441

Int. Cl.² A61J 11/00, 15/00

U.S. Cl. 426—117

21 Claims



1. The combination of a bottle closure device having an interior chamber and an internally threaded lower neck, dispensing means carried on and extending through an opening in the upper end of said closure device and in dispensing communication with said interior chamber, closure means mounted in sealed engagement to the upper end of said closure device and covering said dispensing means; a bottle containing flowable contents having a bottle top with complementary external threads along a portion of its length and received within the lower end of said closure device for the sterile storage and dispensing of said flowable contents and having a continuous unbroken integrally formed top wall on said bottle top effective to maintain sterile conditions in said bottle; cutting means mounted in the interior chamber of and carried by said closure device in axial proximity to said top wall such that the cutting means can be displaced into cutting engagement with said top wall by axial advance of said closure device in its threaded engagement on said bottle top; screen means carried within said interior chamber of said device to retain any chips produced by said cutting means from being dispensed through said dispensing means; and a pair of closely spaced annular beads with a fillet therebetween on said bottle top axially spaced from said external threads and received within said closure device and a cooperative annular bead on said neck of said closure device axially spaced from the internal threads thereon, said cooperative annular bead received within said fillet to provide restraining and microbiological sealing means, yieldably restraining said axial displacement of said device on said bottle top to prevent inadvertent rotation of and axial displacement of closure device and displacement of said cutting means toward said top wall, and microbiologically sealing said interior chamber to the environment.

4,053,649

PREPARATION OF SLICED DRIED BEEF PRODUCT

Joseph T. Svacik, Phoenix, Ariz., assignor to Armour and Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 360,049, March 29, 1973, Pat. No. 3,914,444. This application Aug. 7, 1975, Ser. No. 602,812

The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.

Int. Cl.² A22C 11/02

U.S. Cl. 426—266

4 Claims

1. In a process for preparing a dried beef product including stuffing pieces of beef which has been frozen and thawed along with curing ingredients into a preformed fibrous casing, curing said beef in said casing, subjecting the cured beef to a drying procedure to remove moisture therefrom, and chilling and slicing the dried beef, the improvement comprising conducting said drying procedure by immersing said casing containing the

cured beef in a solution of common salt having a concentration of from 8 to 26 percent at a temperature of from 120° to 190° F for a period of time sufficient to remove a substantial amount of moisture from the meat.

4,053,650

BAKED CONFECTIONS AND PROCESS FOR THE PREPARATION THEREOF

Jiro Chino, and Kazuhiko Nakada, both of Yokohama, Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 523,494, Nov. 13, 1974,

abandoned. This application Apr. 28, 1976, Ser. No. 681,042

Claims priority, application Japan, Nov. 13, 1973, 48-126806

Int. Cl.² A21D 2/00, 10/00, 8/00

U.S. Cl. 426—304

3 Claims

1. A process for the preparation of mold-baked confections, comprising the steps of:

coating edible particles alternately with an aqueous viscous solution selected from the group consisting of a corn syrup, a sugar solution, a gum solution and a dextrin solution and mixtures thereof, and a leavening agent selected from the group consisting of ammonium carbonate and sodium bicarbonate, and with an edible flour composition comprising more than 40% of self-nonexpandable cereal flour or starches selected from the group consisting of wheat flour, rice flour, maize starch and potato starch and less than 60% of selfexpandable cereal flours or starches selected from the group consisting of α -waxy rice flour and α -waxy maize starch, in a rotating coating device, said coating operation being repeated until the coated particles reach about 60 to 90% of the size of the inner cavity of a baking mold, the moisture of the coated layer of said coated particles being in an amount of about 15 to 22% by weight of the coated layer;
placing said coated particles in the baking mold consisting of upper and lower matching units and having a cavity of a desired shape; and
after joining together said upper and lower parts of said baking mold, baking said coated particles in said mold at a temperature in the range of from 150° C to 200° C for a period of time sufficient to cause the coated compositions of said coated particles to expand so that the cavity of said baking mold is filled with the expanding materials.

4,053,651

COMPOUNDS AND METHOD FOR ALLEVIATING ANGIOTENSIN RELATED HYPERTENSION

Miguel Angel Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

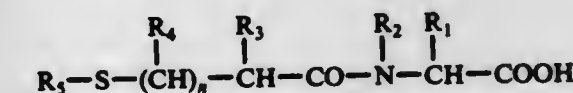
Filed May 10, 1976, Ser. No. 684,606

Int. Cl.² A61K 31/40, 31/195, 31/415

U.S. Cl. 424—319

11 Claims

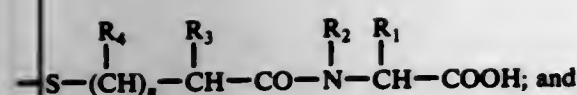
1. A method for alleviating angiotensin related hypertension in hypertensive mammals which comprises administering an effective dose of an angiotensin converting enzyme inhibitor having the formula



or salt thereof, wherein

R_1 is hydrogen, lower alkyl, phenyl, lower alkylene, hydroxy-lower alkylene, hydroxyphenyl-lower alkylene or guanidinolower alkylene; R_2 , R_3 and R_4 each is hydrogen, lower alkyl or phenyl-lower alkylene;

R_3 is hydrogen, lower alkanoyl, benzoyl or



n is 0, 1 or 2.

4,053,652 ROASTED AND GROUND COFFEE PRODUCT AND METHOD

James P. Mahlmann, Wayne, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,320
Int. Cl.² A23F 1/04

U.S. Cl. 424—388 8 Claims
1. A method for producing a roasted and ground coffee product comprising the steps of:

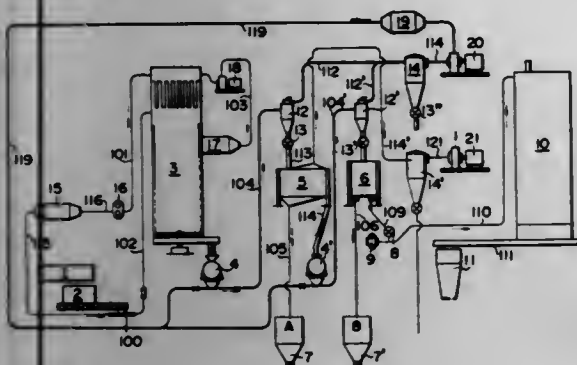
- a. separately roasting a first fraction of green coffee beans,
- b. quenching the first roasted bean fraction to a moisture content of 0% to 4% by weight,
- c. separately roasting a second coffee bean fraction,
- d. quenching the second roasted bean fraction to a moisture content of 7% to 20% by weight, thereafter,
- e. combining the fractions of steps b) and d) to obtain a roast coffee bean blend comprised of at least 10% by weight of each fraction, and
- f. grinding said roast coffee bean blend, whereby a ground coffee product having a non-uniform particle size distribution is obtained, the average particle size of the first or low-moisture fraction being at least 300 microns smaller than that of the second or high-moisture fraction.

4,053,653 METHOD OF OBTAINING LUPULIN-RICH PRODUCTS FROM HOPS

Junjiro Miyata, and Yasushi Kikuchi, both of Fukushima, Japan, assignors to Asahi Breweries, Ltd., Tokyo, Japan
Filed Mar. 24, 1976, Ser. No. 669,872

Claims priority, application Japan, Mar. 4, 1976, 51-23509
Int. Cl.² C12C 3/00; A23L 1/22

U.S. Cl. 426—481 8 Claims



1. A method for obtaining a lupulin-rich product from hop cones, comprising the steps of: feeding hop cones into a first stream of cold air having a temperature of from -10° to -40° C and thereby freezing and conveying said hop cones into a storage tank; feeding cold air into the storage tank to complete the freezing of the hop cones therein; continuously feeding frozen hop cones at a controlled rate from the storage tank into a first crusher having mechanical impact elements therein and having a discharge screen whose openings are of a size in the range of from 6 to 15 mm and therein subdividing the frozen hop cones by said mechanical impact elements to reduce the size of the frozen hop cones so that they pass through said discharge screen; continuously flowing a second stream of cold air past said discharge screen to aspirate particles of said frozen hop cones from said first crusher into said second cold air stream and flowing said second stream containing said particles into a first cyclone and therein separating the cold air and dust from the particles; feeding the particles into a shaking sieve

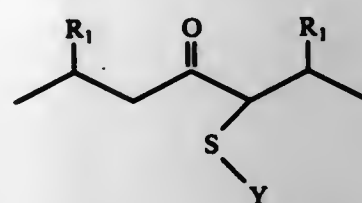
having a 60-mesh screen and therein separating the particles into a fine lupulin-rich fraction that passes through the 60-mesh screen and a coarse fraction and recovering the fine fraction as a first lupulin-rich product; feeding the coarse fraction into a second crusher having mechanical impact elements therein and having a discharge screen whose openings are of a size in the range of from 3 to 6 mm and are from 2 to 10 mm smaller than the openings in the discharge screen of said first crusher and therein subdividing the particles of the coarse fraction by said mechanical impact elements to reduce the size thereof so that they pass through said discharge screen of the second crusher; continuously flowing a third stream of cold air past said discharge screen of said second crusher to aspirate subdivided particles of said coarse fraction from said second crusher into said third stream and flowing said third stream containing said subdivided particles into a second cyclone and therein separating the cold air and dust from the subdivided particles; feeding the subdivided particles into a second shaking sieve having a 60-mesh screen and therein separating the subdivided particles into a second fine lupulin-rich fraction that passes through the 60-mesh screen and a second coarse fraction and recovering said second fine fraction as a second lupulin-rich product; the foregoing steps of the method being carried out so as to maintain the hop cones and particles thereof in a frozen condition throughout and with the cold air streams being air locked so as to prevent ingress of ambient air thereinto.

4,053,654 USES OF α -OXY(OXO) SULFIDES AND ETHERS IN FOODSTUFFS AND FLAVORS FOR FOODSTUFFS

William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Division of Ser. No. 730,537, Oct. 7, 1976. This application Feb. 4, 1977, Ser. No. 765,633

Int. Cl.² A23L 1/226, 1/235

U.S. Cl. 426—535 4 Claims
1. A process for augmenting or enhancing the taste or aroma of a foodstuff comprising the step of adding to said foodstuff from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of an alpha oxosulfide compound having the structure:



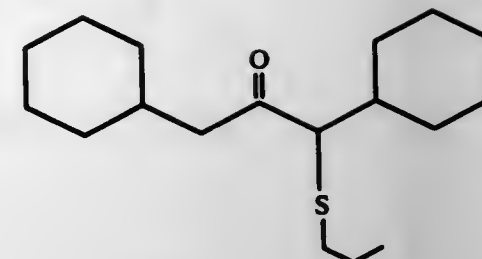
wherein R_1 is hydrogen or methyl and Y is methoxycarbonylmethyl.

4,053,655 USES OF α -OXY(OXO) SULFIDES AND ETHERS IN FOODSTUFFS AND FLAVORS FOR FOODSTUFFS

William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Division of Ser. No. 730,537, Oct. 7, 1976. This application Feb. 4, 1977, Ser. No. 765,865

Int. Cl.² A23L 1/226, 1/235

U.S. Cl. 426—535 2 Claims
1. A process for augmenting or enhancing the taste or aroma of a foodstuff comprising the step of adding to said foodstuff from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of an alpha oxosulfide compound having the structure:

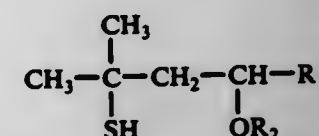


4,053,656 FOODSTUFF FLAVORED WITH NEW MERCAPTO ALCOHOLS AND MERCAPTOALKYL ESTERS

Jan Stoffelsma, Hoevelaken, and Jacob Pypker, Bilthoven, both of Netherlands, assignors to Polak's Frutal Works B.V. and Douwe Egberts Koninklijke Tabaksfabriek-Koffiebrandierij-Theehandel N.V., both of Amersfoort, Netherlands
Division of Ser. No. 347,624, April 4, 1973, Pat. No. 3,970,689.
This application May 6, 1976, Ser. No. 683,753

Int. Cl.² A23L 1/226, 1/234, 1/235

U.S. Cl. 426—535 3 Claims
1. A foodstuff which has added thereto about 10^{-12} to 10^{-2} gram per gram of a compound having the formula



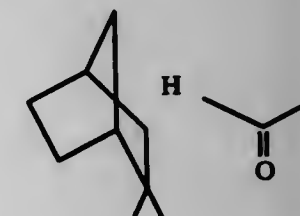
where R_1 is hydrogen or methyl and R_2 is hydrogen, formyl, or acetyl, to develop or fortify a fruity, green, burnt, roasted, or smoked flavor note.

4,053,657 FOODS AND FLAVOR USE OF 1-(3,3-DIMETHYL-2-NORBORNYL-2-PROPANONE

William L. Schreiber, Jackson; James N. Siano, Keyport; Manfred Hugo Vock, Locust, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Filed Dec. 3, 1976, Ser. No. 747,308

Int. Cl.² A23L 1/226

U.S. Cl. 426—538 2 Claims
1. A process for augmenting or enhancing the flavor of a foodstuff comprising the steps of adding to a foodstuff from 0.5 parts per million up to about 100 parts per million of compound having the structure



wherein the wavy lines are representative of exo or endo configurations.

4,053,658 METHOD FOR TREATING MUSHROOMS

Verne E. Wilken, 601 S. Dixie Highway, Lot 38, Stuart, Fla. 33494
Filed Dec. 9, 1976, Ser. No. 748,900

Int. Cl.² A23L 1/212

U.S. Cl. 426—615 8 Claims
1. A method for cleaning and preserving mushrooms and improving the flavor thereof, which comprises:

- a. soaking at least one mushroom in an edible vegetable oil

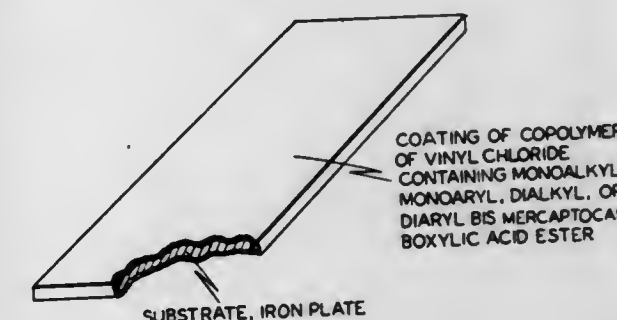
- for a time period sufficient for the oil to be absorbed into the tissues of the mushroom;
- b. subjecting the mushroom to a water rinse step to remove accumulations of soil and the vegetable oil on the surface of the mushroom; and
- c. allowing the mushroom to dry.

4,053,659 ADHERENT POWDER COATINGS ON A BASIS OF PVC COPOLYMERS

Peter Gebauer, and Peter Unrath, both of Troisdorf, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany
Filed Feb. 12, 1974, Ser. No. 441,787

Claims priority, application Germany, Feb. 17, 1973, 2308202
Int. Cl.² B05D 3/02, 1/24

U.S. Cl. 427—27 25 Claims



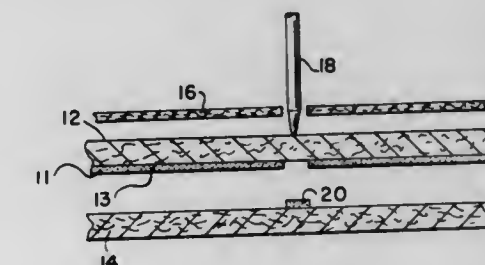
1. Process of producing an article coated with a vinyl chloride polymer which comprises depositing a powder directly on the surface of a substrate which is a body portion of the article, and which is free of adhesivizing agent and forming a coating film of the surface of the substrate by melting the powder thereon, and hardening the film to form said coated article, said powder being a composition comprising a copolymer of vinyl chloride admixed with monoalkylmonary, dialkyl, or diaryl tin bismercaptocarboxylic acid ester of polyvalent alcohol in an amount sufficient to improve adhesion of the copolymer to the substrate and provide a self-adherent coating, said composition being free of plasticizer.

4,053,660 LOW COST TRANSFER INK COATING

Harold S. Hurwitz, Downers Grove, and Harold E. Dyas, Hillside, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 10, 1975, Ser. No. 639,524
Int. Cl.² B41M 5/10

U.S. Cl. 427—153 2 Claims



1. A process for producing a transfer sheet having a transferable coating on said transfer sheet, said transfer sheet for use in producing master sheets by localized, patterned pressure against said transfer sheet, from which master sheets multiple copies may be made by pressure against the surface thereof, said process comprising: agitating a mixture of polyhydroxy alcohol, a non-drying oil, and a wax; heating to and maintaining said agitating mixture at approxi-

mately 180°, whereby said agitating mixture is rendered completely in the liquid state;
 adding a kaolinite clay to said agitating mixture;
 maintaining agitation thereof for at least approximately 15 minutes;
 slowly sifting a dye soluble therein into said agitating mixture;
 further agitating said mixture until said soluble dye has completely dissolved in said mixture;
 grinding said mixture to a particle diameter size of between approximately 0.0002 and 0.0004 inches; and
 coating said mixture on said transfer sheet surface.

4,053,661

PARTICLE CLOUD COATING METHOD AND APPARATUS

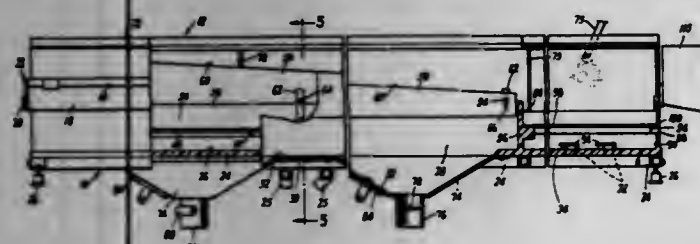
William C. Goodridge, Branford, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.
 Division of Ser. No. 454,566, March 25, 1974, Pat. No. 3,937,179, which is a continuation-in-part of Ser. No. 254,472, May 18, 1972, Pat. No. 3,828,729. This application Jan. 29, 1976, Ser. No. 653,468

The portion of the term of this patent subsequent to Oct. 21, 1992, has been disclaimed.

Int. Cl.² B05B 15/04; B05C 11/06; B05D 1/24

U.S. Cl. 427—185

5 Claims



1. In a method for coating an object, the steps comprising: generating a cloud of particles adjacent one side of a generally upstanding baffle having an elongated edge portion permitting ready passage thereacross of said particles from said cloud, and passing at least an axial portion of an object to be coated laterally adjacent the other side of said baffle along a predetermined travel path which traverses the imaginary, laterally-extending projection surface of said edge portion at a non-perpendicular angle thereto, said baffle initially blocking from contact by said particles at least said axial portion of the object, and causing exposure of progressively lower vertical portions thereof for contact by said particles during passage of the object along said travel path thereby, so as to develop a coating on said axial portion along an axis that is angularly displaced from the axis of said travel path.

4,053,662

METHOD OF PROCESSING POROUS METAL FILTERS

Pierre Barget, Asnières; Roger Lacroix, Suresnes; Pierre Plurien, Palaiseau, and Jean-Paul Touboul, Paris, all of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Filed June 7, 1974, Ser. No. 478,744

Claims priority, application France, July 26, 1973, 73.27357

Int. Cl.² C23C 13/02, 13/04

U.S. Cl. 427—250

7 Claims

1. A method of processing porous metal filters used for separating isotopes of uranium hexafluoride, so as to improve the mechanical strength and resistance to corrosion of the filters, characterized in that the filters are placed in the presence of an aluminum-based cement in a closed heat-resistant and oxidation-resistant vessel, the interior of the vessel is disposed in an inert gas atmosphere and the vessel is heated to between 800° and 1000° C in a furnace for about 1 hour.

4,053,663
METHOD OF TREATING FERROUS STRAND FOR COATING WITH ALUMINUM-ZINC ALLOYS

Laurence B. Caldwell; Robert W. Helman, both of Bethlehem, Pa., and Leonard P. Pellatiro, Glen Arm, Md., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

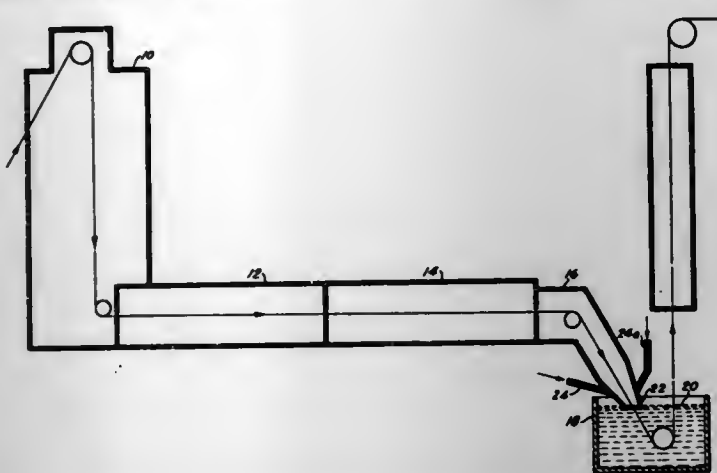
Continuation of Ser. No. 278,304, Aug. 9, 1972, abandoned. This

application May 27, 1976, Ser. No. 690,749

Int. Cl.² C23C 1/02

U.S. Cl. 427—320

8 Claims



1. A method of coating a ferrous strand with an alloy coating comprising, by weight, about 25 to 70% aluminum, balance essentially zinc, wherein said ferrous strand is caused to move from a heating furnace through a protective hood into a molten metal bath composed of said aluminum-zinc alloy, into which said protective hood extends in a manner to enclose a small portion of the surface of said molten metal bath within said protective hood, comprising the steps of:

- introducing into said protective hood a reducing gas preheated to a temperature of at least about 750° F. and composed of at least 20% by volume of hydrogen, balance essentially nitrogen, said reducing gas having a dew point no greater than about 0° F. and being introduced in such a manner as to sweep across the surface of the molten metal bath;
- correlating the hydrogen content of said reducing gas with the dew point thereof so as to control bath surface oxidation within said protective hood to avoid bath oxide particle pickup on the strand, and
- continuing to introduce such correlated preheated reducing gas into said protective hood and causing said reducing gas to flow countercurrent to the movement of the ferrous strand, whereby to bathe and maintain said strand within said protective hood and heating furnace under reducing conditions.

4,053,664

LOW TEMPERATURE GLAZING METHOD

Douglas W. Dill, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Division of Ser. No. 491,589, July 24, 1974, Pat. No. 3,983,060.

This application July 14, 1976, Ser. No. 705,203

Int. Cl.² B05D 1/38, 3/02

U.S. Cl. 427—379

10 Claims

1. A method for coating ceramic articles comprising:

- Priming the surface of said article with a coating of an aqueous dispersion of a first acrylic resin having a monomer composition of 40-85% by weight methyl methacrylate, 45-15% by weight butyl acrylate and 0-15% by weight of methacrylic acid, said dispersion having 15-25% non-volatiles and a pH of 8.5-10.5;
- Coating said primed surface with at least 1 coating of a mixture of 25-75% by weight of an aqueous dispersion of a second acrylic resin having a monomer composition of 40-85% by weight methyl methacrylate, 45-15% by weight butyl acrylate and 0-15% by weight of methacrylic acid, said dispersion having 15-25% non-volatiles and a pH of 8.5-10.5, and 75-25% by weight of a pow-

dered resin composition having a particle size of about 100 to about 400 mesh consisting essentially of 96-80% by weight of a third acrylic resin having a monomer composition of 60-85% methyl methacrylate and 40-15% by weight butyl acrylate having a weight average molecular weight of 10,000-20,000 and a Tg of greater than 45° C and 4-20% by weight of a pigment; and
 c. Baking said coated article for 30 minutes to 4 hours at a temperature of 275°-450° F.

4,053,665

MOLDED PLASTIC BEARING ASSEMBLY

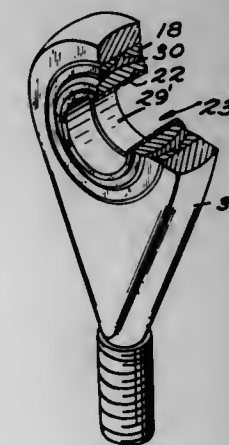
Stanley S. Orkin, Rockville, and Edward John Nagy, Windsor, both of Conn., assignors to Kamatics Corporation, Bloomfield, Conn.

Division of Ser. No. 601,956, Aug. 4, 1975, which is a division of Ser. No. 452,359, March 18, 1974, Pat. No. 3,929,396, which is a continuation-in-part of Ser. No. 241,007, April 4, 1972, Pat. No. 3,806,216. This application Apr. 27, 1976, Ser. No. 680,879. The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.² B05D 3/02; F16C 33/12

U.S. Cl. 427—385 C

3 Claims



2. A method of producing a molded bearing assembly comprising two coengaging members movable relative to one another, the first of said members having a bearing surface selected from the group consisting of metal and ceramic and the bearing surface of said other member comprising a molded mixture of an acrylate composition and particulate solid lubricant, the bearing surface of said first member being coated with a thin film of a parting agent to prevent adhesion thereof to said molded bearing surface, the steps comprising coating said first bearing member with a thin film of a parting agent, applying a curable mixture of said acrylate composition and particulate solid lubricant to the parting agent coated first bearing member and curing said mixture in the absence of an oxygen-containing gas at a temperature ranging from ambient temperature to 325° F. thereby producing said other member and said molded bearing assembly, said acrylate composition being selected from the group consisting of:

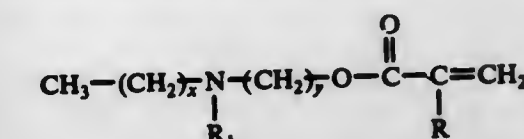
- a mixture of a major amount of liquid acrylic ester selected from the group consisting of di-, tri- and tetraesters of an acrylic acid and a polyhydric alcohol, a minor amount of a low molecular weight prepolymer of an ester of a low molecular weight alcohol having a terminal vinyl group and an aromatic polycarboxylic acid in solution in said acrylic ester and an organic amide of the formula



wherein R is selected from the group consisting of hydrogen and aliphatic hydrocarbon of 1-20 carbon atoms in an amount sufficient to copolymerize said acrylic ester and prepolymer,
 b. a mixture of acrylic ester monomer, a peroxidic initiator in an amount sufficient to initiate polymerization of said

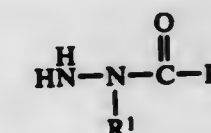
monomer and an aminoalkoxyalkylamine of the formula $\text{R}_1-\text{N}(\text{H})\text{R}_2[\text{OR}_3]_x\text{N}(\text{H})\text{R}_4$ wherein x is an integer of 1-6 inclusive, each of R₁ and R₄ is selected from the group consisting of hydrogen and lower alkyl each of R₂ and R₃ is a lower alkyl linking bridge between N and O, in an amount sufficient to accelerate the polymerization of said monomer,

c. a mixture of an acrylic ester of an alkyl amino alcohol and an effective amount of a hydroperoxide catalyst, said acrylic ester having the formula



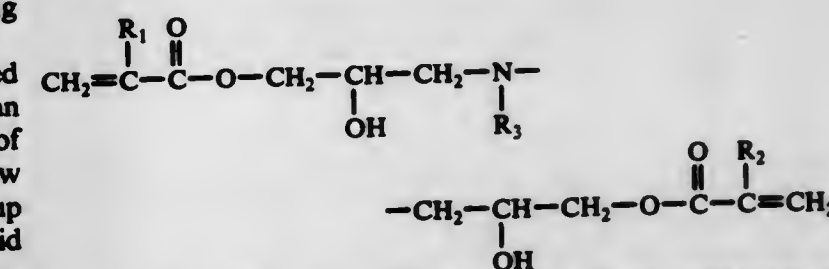
wherein x is an integer of 0-5 inclusive, y is an integer of 1-6 inclusive, R is selected from the group consisting of hydrogen, halogen, hydroxy, cyano and lower alkyl and R₁ is selected from the group consisting of hydrogen and alkyl having 1-6 carbon atoms,

- a mixture of a liquid acrylic ester monomer selected from the group consisting of diesters of an acrylic acid and a polyhydric alcohol, acrylic esters of cyclic ether alcohols, acrylic esters of amino alcohols and mixtures thereof, a peroxidic initiator and an oxyalkylamine of the formula $(\text{H})_m\text{N}[(\text{CH}_2)_x(\text{OR}_1)_y(\text{OR}_2)_z]$ wherein m and n are each integers of 1 to 2 inclusive, the total of m and n is 3, x is an integer of 1 to 6 inclusive, y is an integer of 0 to 6 inclusive, R₁ is lower alkyl and R₂ is hydrogen or lower alkyl;
- a mixture of an acrylic ester monomer selected from the group consisting of di-, tri- and tetraesters of an acrylic acid and a polyhydric alcohol, acrylic esters of cyclic ether alcohols, acrylic esters of amino alcohols and mixtures thereof, a peroxidic initiator of an amount sufficient to initiate polymerization of said monomer and a member selected from the group consisting of rhodanine and a hydrazide of the formula



wherein R and R¹ are selected from separate groups and an interconnected group forming a cyclic ring, R is further selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl and alkoxy and R¹ is selected from the group consisting of hydrogen, alkyl, cycloalkyl, acyl and dithiocarbonyl in an amount sufficient to accelerate the polymerization of said monomer; and

- a mixture of a monomer of the formula



wherein R₁ and R₂ are selected from the group consisting of hydrogen and lower alkyl and R₃ is selected from the group consisting of lower alkyl, lower hydroxyalkyl, cyano and lower cyanoalkyl; at least one equivalent of an acid for each equivalent of said monomer, said acid being selected from the group consisting of acrylic acid and lower alkyl acrylic acids; an initiator selected from the group consisting of t-butyl perbenzoate, t-butyl peracetate and di-t-butyl diperphthalate, said initiator being present in an amount sufficient to initiate the polymerization of said monomer; a trihydroxy benzene inhibi-

tor and an accelerator selected from the group consisting of benzhyrazide and N-aminorhodanine.

4,053,666

RECOVERABLE, RECYCLABLE, AND REUSABLE COMPOSITE CONTAINER

Lynn J. Taylor, and Neal Troy, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 189,450, Oct. 14, 1971, abandoned. This application Jan. 16, 1975, Ser. No. 541,416 Int. Cl.² B65D 11/16; B08B 7/04; B05B 1/40

U.S. Cl. 428-35

12 Claims

1. As an article of manufacture, a previously annealed glass container having at least a portion of its annealed, external surface coated with a protective, decorable film consisting essentially of a water removable, film-forming, thermoplastic organic polymer, said polymer being water soluble or dispersible and being selected from the group consisting of poly(ethylene oxide); poly(propylene oxide); ethylene oxide-propylene oxide copolymers; polyvinylpyrrolidinone; polyethylencimine; poly(methyl vinyl ether); polyacrylamide; polymethacrylamide; poly(vinyl acetate); polyvinyl formal; poly(alkyl methacrylates); methyl cellulose; ethyl cellulose; hydroxyethyl cellulose; hydroxypropyl cellulose; sodium carboxymethyl cellulose; methyl hydroxypropyl cellulose; poly(acrylic acid) and salts thereof; poly(methacrylic acid) and salts thereof; ethylene-maleic anhydride copolymers; ethylene-vinyl alcohol copolymers; ethylene-acrylic acid copolymers; vinyl acetate-vinyl alcohol copolymers; methyl vinyl ether-maleic anhydride copolymers; and emulsifiable polyurethanes; said polymer being capable of removal by an aqueous medium such that the annealed glass container and polymer can be recovered, recycled, and reused, the film thickness being at least 0.002 inch and sufficient to provide scratch and shatter resistance for the container and to retain broken glass fragments upon fracture of the glass container so as to reduce the incidence of accidental injury.

6. In a process for the preparation of a coated glass container, the improvement which comprises applying a film consisting essentially of a water removable thermoplastic organic polymer which is water soluble or dispersible and is selected from the group consisting of poly(ethylene oxide); poly(propylene oxide); ethylene oxide-propylene oxide copolymers; polyvinylpyrrolidinone; polyethylencimine; poly(methyl vinyl ether); polyacrylamide; polymethacrylamide; poly(vinyl acetate); polyvinyl formal; poly(alkyl methacrylates); methyl cellulose; ethyl cellulose; hydroxyethyl cellulose; hydroxypropyl cellulose; sodium carboxymethyl cellulose; methyl hydroxypropyl cellulose; poly(acrylic acid) and salts thereof; poly(methacrylic acid) and salts thereof; ethylene-maleic anhydride copolymers; ethylene-vinyl alcohol copolymers; ethylene-acrylic acid copolymers; vinyl acetate-vinyl alcohol copolymers; methyl vinyl ether-maleic anhydride copolymers; and emulsifiable polyurethanes; to at least a portion of the external surface of a previously annealed glass container, said film having a thickness of at least 0.002 inch and sufficient to provide scratch and shatter resistance for the container and to retain broken glass fragments upon fracture of the glass container so as to reduce the incidence of accidental injury, and being capable of removal by an aqueous medium such that the glass container and the coating film can be recovered, recycled, and reused.

4,053,667
STIFFENED STRUCTURAL LAMINATE AND METHOD OF MOLDING LAMINATE WITH STIFFENER BEADS
Bruce W. Smith, Nipomo, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Sept. 9, 1974, Ser. No. 504,441

Int. Cl.² B32B 3/12

U.S. Cl. 428-36

6 Claims



1. A rib-stiffened laminate formed by: contacting a primary structure of at least one layer of a curable resin-impregnated fabric with at least one strip of cellular honeycomb core; disposing another piece of said fabric over said strip of core in engagement with said core and said primary structure to define at least one reinforcing rib upon said primary structure; and partially crushing said core and curing said resin under laminating conditions such that said core is bonded to said fabric and said fabric piece is bonded to said primary structure.

4,053,668

TUFTED CARPETING WITH UNITARY NEEDLEBONDED BACKING AND METHOD OF MANUFACTURING THE SAME

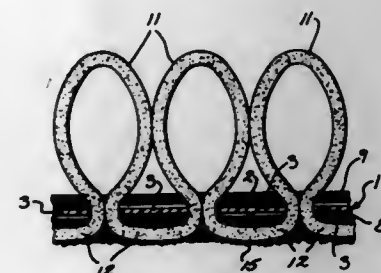
Richard Kimmel, Lake Forest, and Robert C. Pickens, Jr., Wildwood, both of Ill., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 494,797, Aug. 5, 1974, abandoned. This application May 14, 1976, Ser. No. 686,479

Int. Cl.² B32B 33/00

U.S. Cl. 428-95

4 Claims



1. A ribbon scrim tufted carpet having a unitary backing with two staple faces that does the job of both a primary backing and secondary backing, the carpet comprising:

- a. a unitary backing with two staple faces having:
 1. a woven ribbon scrim with a first scrim side and a second scrim side, and
 2. a deposit layer of staple fibers needled through the scrim to form a bottom fiber layer on one of the scrim sides and a subface fiber layer on the other scrim side, the bottom fiber layer being thicker than the subface fiber layer; and
- b. yarn tufted through the unitary backing from the side having the bottom fiber layer to develop tufts, the tufts so developed:
 1. being partially surrounded by fibers of bottom fiber layer to provide better tuft lock, and
 2. extending above the subface fiber layer.

4,053,669

IMITATION SHEET MATERIAL WITH SURFACE GRAIN APPEARANCE

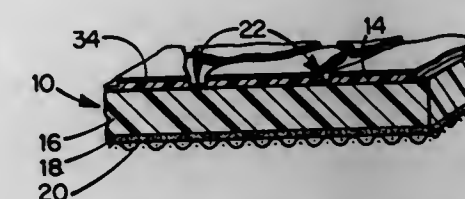
Vikram C. Kapasi, Chelmsford; Henry R. Lasman, Andover, both of Mass.; Robert J. Levenson, Northampton, N.H., and Reuben Wisotzky, Lexington, Mass., assignors to Pandel-Bradford, Inc., Lowell, Mass.

Continuation of Ser. No. 460,127, April 11, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,142

Int. Cl.² D06N 3/04

U.S. Cl. 428-151

11 Claims



1. A substitute leather sheet material characterized by an accentuated surface design effect thereon, which sheet material comprises:

- a. a flexible, fibrous, base-supporting sheet material;
- b. a continuous, flexible, first layer of a solid thermoplastic polymer characterized by a low modulus of elongation in psi at 100% elongation, the first layer secured to the base sheet material;
- c. a discontinuous second layer of a solid thermoplastic polymer characterized by a high modulus of elongation in psi at 100% elongation of from about 2000 to 8000 psi, the second layer secured to the first layer, and forming raised areas of a surface design on the surface of the continuous layer;
- d. the low and high-modulus polymers of the first and second layers having a difference of the modulus of elongation of at least 800 psi between the low and high-modulus polymers;
- e. the second layer disposed in a predetermined manner over the entire surface of the first layer, and forming valley areas between the respective discontinuous second layer, which valley areas represent a pattern imitation of a predetermined design; and
- f. the solid thermoplastic polymer of the first layer beneath the valley areas which form the surface pattern characterized by flexible, weak-hinge properties relative to the remaining portion of the solid first layer, said properties derived by repetitive flexing of the low-modulus polymer of the first layer in the areas beneath the valley areas to fracture and weaken the mechanical strength of the low-modulus polymer in such areas, thereby providing a material having an enhanced surface design effect thereon.

4,053,670

NON-WOVEN FABRICS

Roger LePoutre, Croix, France, assignor to Lantor International Limited, Bolton, England

Filed Oct. 31, 1975, Ser. No. 627,621

Int. Cl.² B31F 1/00

U.S. Cl. 428-156

14 Claims

1. A process for the manufacture of non-woven fabric which consists essentially of the following steps:

- a. impregnating a web of non-woven fibres with a chemical binder capable of thermal polymerisation and with a curing agent for the binder;
- b. coagulating but not drying the binder, to form a non-woven fabric;
- c. coating one face of the fabric with a layer of a waterproofing agent;
- d. drying the impregnated and coated fabric and
- e. heat embossing the non-coated face of the fabric.

4,053,671

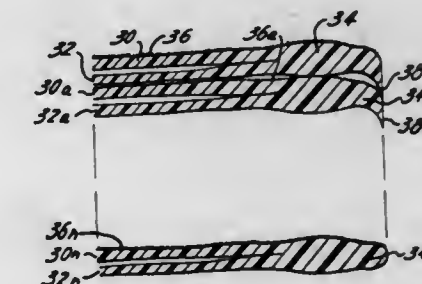
ARTICLE HAVING EDGE-SEALED FILMS

Richard S. Carlisle, 1051 Broadway, Thornwood, N.Y. 10594
Division of Ser. No. 326,278, Jan. 24, 1973, Pat. No. 3,933,563, and a continuation-in-part of Ser. No. 231,288, March 2, 1972, Pat. No. 3,815,794, and Ser. No. 256,850, May 25, 1972, abandoned. This application Sept. 22, 1975, Ser. No. 615,816 The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.² B32B 3/02, 3/26, 7/04, 31/20, 31/26

U.S. Cl. 428-157

9 Claims



1. An article comprising a set of thermoplastic films confronting each other over at least the major area thereof and having a marginal seal of greater thickness than the initial thickness of said set of films and said seal extending from the confronting area of the films to and along a common edge that forms at least part of the outline of the article, said seal resulting from thermally fusing the material of said films together by heating a blade above the fusion temperature of the films and pressing the blade against a set of confronting thermoplastic films and thereby severing the films and forming a common sealed margin across a markedly greater width than said greater thickness and fusing them together to form a seal of at least said greater thickness and enhancing the uniformity of the width of the seal by applying opposed pressure thereto while material of the films is at least partially molten and tacky so as to yield said marginal seal of said greater thickness and said greater thickness extending across the seal for a distance markedly greater than said greater thickness, the confronting films being disposed in essentially face-to-face contact adjacent the seal.

7. An article comprising a pair of laminated thermoplastic films, each film having a high-melting-temperature thermoplastic layer and a heat-sealable lower-melting-temperature thermoplastic layer, the lower-melting-temperature layers of the two films facing each other and the films confronting each other over at least the major area thereof and having a marginal seal of greater thickness than the initial thickness of said set of films and said seal extending from the confronting area of the films to and along a common edge that forms at least part of the outline of the article, said seal resulting from thermally fusing the material of said films together by heating a blade above the fusion temperature of the films and pressing the blade against a said pair of confronting thermoplastic films and thereby severing the films and forming a common sealed margin and heat-softening the films along the sealed margin across a markedly greater width than said greater thickness and fusing them together to form a seal of at least said greater thickness and enhancing the uniformity of the width of the seal by applying opposed pressure thereto while material of the films is at least partially molten and tacky so as to yield said marginal seal of said greater thickness and said greater thickness extending across the seal for a distance markedly greater than said greater thickness.

4,053,672

HOT STAMP TRANSFER PRESS PLATE

Ken Ando, Ikoma; Minoru Kamozaki, Ohimachi; Yoshinobu Ohya, Amagasaki, and Sigeru Asai, Ohimachi, all of Japan, assignors to Daicel, Ltd., Osaka, Japan

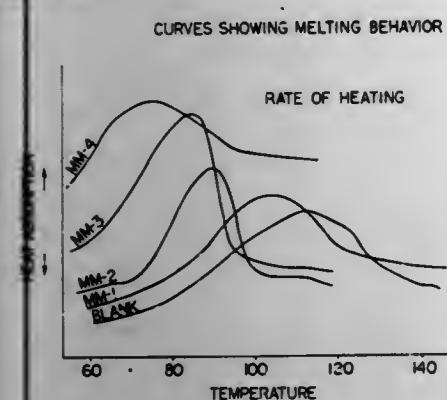
Filed Sept. 23, 1975, Ser. No. 616,112

Claims priority, application Japan, Sept. 24, 1974, 49-109786

Int. Cl.² B32B 3/00

U.S. Cl. 428—207

3 Claims



1. A hot stamp transfer press plate comprising a transfer substrate having a hot stamp ink applied thereon in a pattern, said hot stamp ink comprising a mixture of pigment and binder resin, said binder resin consisting essentially of a methoxymethylated nylon copolymer prepared by methoxymethylating an alcohol-soluble nylon copolymer of two or more members selected from the group consisting of nylon 6, nylon 11, nylon 12, nylon 66 and nylon 610, said nylon copolymer having a melting point of less than 150° C, said methoxymethylated nylon copolymer having a methoxymethylation ratio in the range of from 10 to 30%, wherein the methoxymethylation ratio is the ratio of nitrogen atoms bonded to methoxymethyl groups to the total number of nitrogen atoms contained in the methoxymethylated nylon copolymer.

4,053,673

GLOW-RESISTANT BATT AND PROCESS FOR PRODUCING SUCH

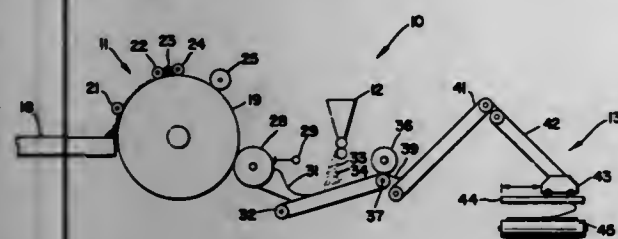
George Sumner Buck, Jr.; Robert George Weyker, both of Memphis, and Arthur Gerard Ward, Arlington, all of Tenn., assignors to Fiberlok, Inc., Memphis, Tenn.

Filed Sept. 12, 1975, Ser. No. 612,785

Int. Cl.² B32B 31/00

U.S. Cl. 428—283

10 Claims



1. A process for producing a batt comprising the steps of:
I. forming a thin web of fibers;
II. contacting the web with an adhesive amount of particles of a copolymer of vinyl chloride and vinylidene chloride;
III. contacting the web with an amount of diammonium phosphate wherein the eight ratio of copolymer to diammonium phosphate is 100:4 to 100:40;
IV. forming the web into a batt by laying the web transversely back and forth on a moving belt such that the batt comprises a plurality of webs; and then
V. heating the batt to a temperature above the sticking point of the copolymer but below the degradation point of the fibers

wherein the weight ratio of vinyl chloride to vinylidene chloride is 1:99 to 40:60 and wherein the weight ratio of the copolymer to the fibers is 1:99 to 30:70 and wherein the copolymer particles have a size range of from 1 to 200 microns.

4,053,674

GLOW-RESISTANT BATT AND PROCESS FOR PRODUCING SUCH

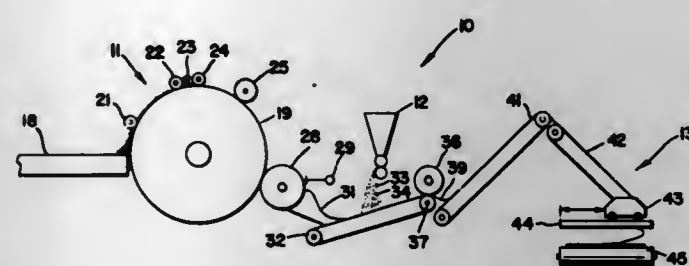
George Sumner Buck, Jr.; Robert George Weyker, both of Memphis, and Arthur Gerard Ward, Arlington, all of Tenn., assignors to Fiberlok, Inc., Memphis, Tenn.

Filed Sept. 12, 1975, Ser. No. 612,784

Int. Cl.² B32B 31/00

U.S. Cl. 428—283

10 Claims



1. A process for producing a batt comprising the steps of:
I. forming a thin web of fibers;
II. contacting the web with an adhesive amount of particles of a copolymer of vinyl chloride and vinylidene chloride;
III. contacting the web with a glow-resistance imparting amount of boric acid;
IV. forming the web into a batt by laying the web transversely back and forth on a moving belt such that the batt comprises a plurality of webs; and
V. heating the batt to a temperature above the sticking point of the copolymer but below the degradation point of the fibers
wherein the weight ratio of vinyl chloride to vinylidene chloride is 1:99 to 40:60 and wherein the weight ratio of the copolymer to the fibers is 1:99 to 30:70 and wherein the copolymer particles have a size range of from 1 to 200 microns and wherein the weight ratio of copolymer to boric acid is 5:10 to 200:10.

4,053,675

POLY(ARYLENE SULFIDE) COATED GLAZED SURFACE

Jennings P. Blackwell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 29, 1975, Ser. No. 581,614

Int. Cl.² B32B 17/06

U.S. Cl. 428—426

125 Claims

1. A coated article comprising:
a substrate having a glazed surface, and
a cured first coating adhered to said glazed surface, said first coating comprising poly(arylene sulfide) and an effective amount of a metal oxide suitable for improving adhesion of poly(arylene sulfide) to said glazed surface, said metal oxide having a particle size less than about 10⁻⁸ meters.

4,053,676

HANDLE GRIP MATERIAL

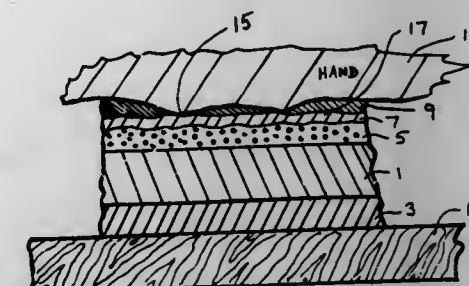
Bernard Kaminstein, Paramus, N.J., assignor to Litton Industries, Inc., Fitchburg, Mass.

Continuation-in-part of Ser. No. 597,392, July 18, 1975, abandoned. This application May 25, 1976, Ser. No. 689,830

Int. Cl.² B32B 3/26

U.S. Cl. 428—310

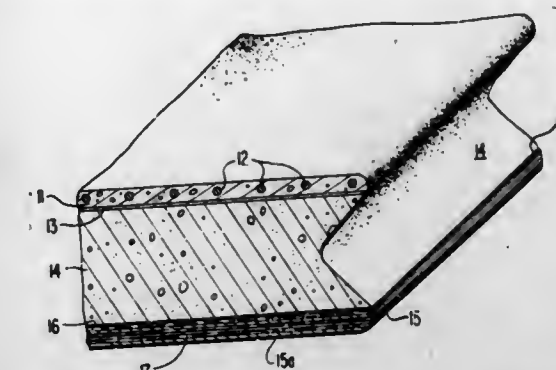
7 Claims



7. A non-slip material comprising:

- a substrate,
- a compressible coating on one surface of said substrate comprising a resinous binder having gas filled microspheres therein,
- a wear resistant and tacky coating on said compressible coating comprising a carboxy-modified butadiene acrylonitrile copolymer,
- a pressure sensitive adhesive coated on a surface of said substrate opposite the said on surface.

a first layer of solid, lightweight, foamed concrete, said first layer having first and second surfaces;
a second layer of regular weight concrete coextensive with said first surface, disposed on said first surface, and having a thickness substantially less than said first layer;
metal reinforcing members embedded in said second layer;



a third layer of regular weight concrete coextensive with said second surface, disposed on said second surface, and having a thickness substantially less than said first layer; and
an adhesive film composed of a mixture of granite, cement, and glass fibers interspersed between said first and second layers and between said first and third layers.

4,053,678

FIBER TOW FOR STUFFING PURPOSES AND PROCESS FOR PRODUCING IT

Helmut Betz; Geza Hidasi, both of Bobingen, and Hans-Otto Vom Orde, Augsburg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

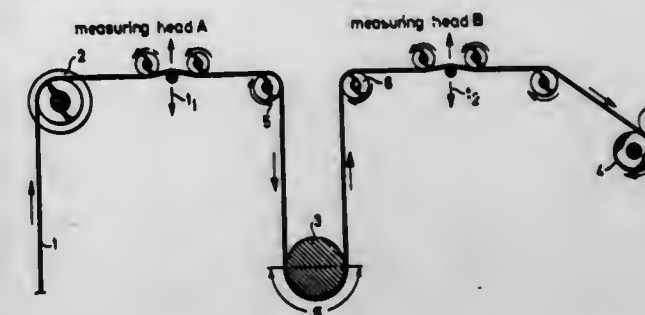
Filed Oct. 14, 1975, Ser. No. 623,303

Claims priority, application Germany, Oct. 17, 1974, 2449408

Int. Cl.² B32B 27/00; D02G 3/00

U.S. Cl. 428—369

2 Claims



1. A drawn, crimped and fixed fiber tow of synthetic high polymer fibers having an individual capillary titer of from 3 to 40 dtex, an ionic antistatic agent and 0.2 - 1% by weight of the fibers of the non-aqueous constituents of a conditioning agent consisting essentially of 0.1 - 0.4% by weight of a methyl hydrogen polysiloxane having a viscosity of 25 - 35 cP at 20° C, 0.2 - 0.8% by weight of an alpha, omega-hydroxy dimethyl polysiloxane of a viscosity of 600 - 1,000 cP at 20° C, 0.02 - 0.1% by weight of an emulsifier for the polysiloxanes, 0.01 - 0.5% by weight of an Sn(II) salt of a fatty acid having 8 - 18 carbon atoms and 40 - 95% of high molecular weight polyethylene.

4,053,677

LIGHT CONCRETE MONOLITHIC SLAB

Manuel J. Corao, Apartado Postale 4940, Caracas, Venezuela

Filed Apr. 17, 1975, Ser. No. 569,333

Int. Cl.² B32B 3/26, 13/00

U.S. Cl. 428—310

7 Claims

1. A building slab comprising:

4,053,679

CHEMICALLY STRENGTHENED OPAL GLASS

Dale W. Rinehart, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Continuation-in-part of Ser. No. 605,108, Aug. 15, 1975, Pat. No. 4,015,045, which is a continuation-in-part of Ser. No. 432,006, Jan. 9, 1974, abandoned. This application July 19, 1976, Ser. No. 706,661

Int. Cl.² B32B 17/00; C03C 21/00

U.S. Cl. 428—410

16 Claims

1. A spontaneously opalized glass capable of being strengthened by ion-exchange with potassium ions, comprising by weight on the oxide basis:

- 34 to 60 percent SiO₂
- 6 to 23 percent Na₂O
- 0 to 15 percent K₂O
- 18 to 26 percent (Na₂O + K₂O)
- 0 to 18 percent Al₂O₃
- 0 to 20 percent ZrO₂
- 4 to 21 percent (Al₂O₃ + ZrO₂)
- 7 to 20 percent P₂O₅
- 0 to 9 percent CaO
- 0 to 9 percent SrO
- 2 to 9 percent (CaO + SrO)
- less than 0.1 percent Li₂O

said constituents comprising at least 90 percent by weight of the glass and proportioned relative to one another so as to provide the glass with a viscosity of 100 poises at a temperature less than 2800° F. (1538° C.).

4. A chemically strengthened, spontaneously opalized glass article exhibiting a surface compressive stress after being subjected to surface abrasion composed of an interior portion which is in tension and surface compressive layer, said interior portion comprised of by weight on the oxide basis:

- 34 to 60 percent SiO₂
- 6 to 23 percent Na₂O
- 0 to 15 percent K₂O
- 18 to 26 percent (Na₂O + K₂O)
- 0 to 18 percent Al₂O₃
- 0 to 20 percent ZrO₂
- 4 to 21 percent (Al₂O₃ + ZrO₂)
- 7 to 20 percent P₂O₅
- 0 to 9 percent CaO
- 0 to 9 percent SrO
- 2 to 9 percent (CaO + SrO)
- less than 0.1 percent Li₂O

said constituents comprising at least 90 percent by weight of said interior portion and proportioned relative to one another so as to provide the glass with a viscosity of 100 poises at a temperature less than 2800° F. (1538° C.), and said surface layer having a higher content of K₂O and a lower content of Na₂O than the interior portion.

10. A method of strengthening an opal glass article comprising the steps of:

- a. contacting a source of potassium ions with the surface of a spontaneously opalized glass article comprising by weight on the oxide basis:

- 34 to 60 percent SiO₂
- 6 to 23 percent Na₂O
- 0 to 15 percent K₂O
- 18 to 26 percent (Na₂O + K₂O)
- 0 to 18 percent Al₂O₃
- 0 to 20 percent ZrO₂
- 4 to 21 percent (Al₂O₃ + ZrO₂)
- 7 to 20 percent P₂O₅
- 0 to 9 percent CaO
- 0 to 9 percent SrO
- 2 to 9 percent (CaO + SrO)
- less than 0.1 percent Li₂O

said constituents comprising at least 90 percent by weight of the glass article and proportioned relative to one another

- other so as to provide the glass with a viscosity of 100 poises at a temperature less than 2800° F. (1538° C.);
- b. heating said source of potassium ions while in contact with the glass to a temperature at which potassium ions from said source replace sodium ions in the glass, but essentially below the strain point of the glass, thereby creating a zone of compression at the surface of the glass which extends at least 5 microns into the glass; and
- c. removing the glass from contact with the potassium ion source.

4,053,680

PROCESS FOR BONDING POLYMERS

Bernard Wasserman, Ridgecrest, and Martin H. Kaufman, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

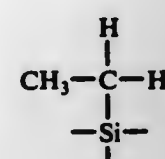
Filed Dec. 4, 1975, Ser. No. 637,507

Int. Cl.² B32B 27/40

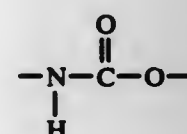
U.S. Cl. 428—423

2 Claims

1. An article of manufacture comprising at least two layers, one of which is a silicon rubber layer and the second of which is a layer containing isocyanate cured hydroxy terminated polybutadiene, the layers being chemically tied together by chemical strings, the strings being chemically knotted in the silicone rubber layer by



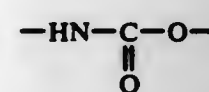
groups and in the isocyanate cured hydroxy terminated polybutadiene layer by



groups.

2. A method for chemically tying a layer of silicone rubber to a layer of material containing isocyanate groups, said method comprising the steps of:

1. forming a mixture by mixing uncured silicone rubber prepolymer which contains silane groups with a material containing vinyl groups which are compatible with and reactive with the silane groups and hydroxy groups which are incompatible with the prepolymer and forming said mixture into a layer;
2. curing the prepolymer to form silicone rubber whereby the vinyl groups react with the silane groups and the hydroxy groups migrate to the surface of the layer;
3. applying a layer of the material which contains isocyanate groups to the surface of the silicone rubber; and
4. allowing isocyanate groups to react with the hydroxy groups whereby the layers become chemically tied together by chemical strings, the strings being chemically knotted in the silicone rubber layer by $\text{CH}_3 - \text{CH}_2 - \text{Si} =$ groups and in the layer which contained isocyanate groups by



groups.

4,053,681

ADDITIVES FOR IMPROVED POLYESTER AND VINYL POLYMER COMPOSITIONS

Harold R. Edwards, Jr., Geneva, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 26, 1976, Ser. No. 661,485

Int. Cl.² B32B 17/10; C08K 5/12; C07C 69/76

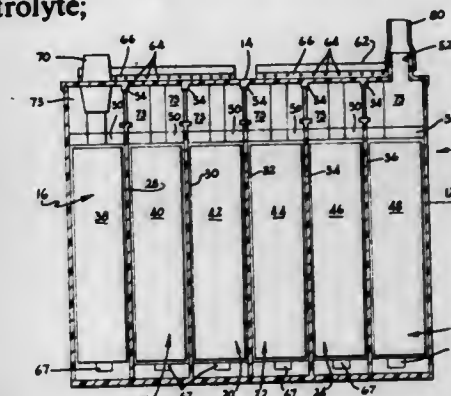
U.S. Cl. 428—431

11 Claims

1. A composition formed by reacting approximately equimolar amounts of (a) trimellitic acid or anhydride, (b) a dihydric alcohol containing from 2 to about 6 carbon atoms, and (c) an unsaturated acid or anhydride containing from 2 to about 6 carbon atoms and esterifying such reaction product with sufficient amounts of mono alcohol containing from 2 to about 18 carbon atoms to form a product with an acid number between about 0 and 30.

6. A composition prepared by (a) forming a first reaction product by reacting approximately equimolar amounts of trimellitic acid or anhydride and a dihydric alcohol containing from 2 to about six carbon atoms; (b) to such first reaction product adding sufficient amounts of monoalcohol containing from 2 to about 18 carbon atoms to form a second reaction product with an acid number between about 0 and 50; (c) to such second reaction product adding an approximately molar equivalent amount of an unsaturated acid or anhydride containing from 2 to about 6 carbon atoms; and (d) adding sufficient amounts of such monoalcohol to the resulting product to form a composition with an acid number between about 0 to 30.

the other end open below said electrolyte level in said cell, below said plates and being immersed in said electrolyte; a gas discharge port disposed on the top of said case above the electrolyte and adapted to be connected to a source of vacuum at the carburetor, each of said cell separating walls having an aperture above the electrolyte; means disposed within said separating wall apertures for permitting the gases collecting above said plates to pass to said gas discharge port while restraining passage of the electrolyte;



a plurality of intake shrouds positioned above said air tubes, said shrouds having a plurality of apertures communicating a plurality of said tubes with atmosphere; a gas discharge tube sealably connected at one end to said gas discharge port, said gas discharge tube adapted for connection to the carburetor of the engine; and a check valve inserted intermediate the ends of said discharge tube.

4,053,682

PROCESS FOR IMPROVING THE ADHESION OF HOT MELTS TO METAL SUBSTRATES

Donald D. Donermeyer, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed June 21, 1976, Ser. No. 698,241

Int. Cl.² B32B 15/08

U.S. Cl. 428—460

16 Claims

1. A process for adhering a filled copoly(esteramide) to a metal substrate which comprises:

- a. applying to the metal substrate a primer comprising an etherified methylolmelamine with a degree of methylolation in the range of about 5 to 6, a degree of etherification with a C₁ to C₆ alkanol or cycloalkanol in the range of about 3 to 6, and a degree of methylation of at least about 2 to provide a coating weight in the range of 1 to 166 g. per sq. meter;
- b. heating the substrate to a temperature in the range of about 150° to about 300° C. to convert the etherified methylolmelamine from the liquid to the solid state; and
- c. applying the filled copoly(ester-amide) as a hot melt to the formed surface at a temperature in the range of about 150° to 300° C.

4,053,683

SYSTEM FOR FUEL SUPPLEMENTATION

Charles E. Rounds, 109 S. Case, P.O. Box No. 6, Marion, Mich. 49665

Filed Mar. 4, 1976, Ser. No. 663,671

Int. Cl.² H01M 2/12; F02M 7/00

U.S. Cl. 429—8

3 Claims

1. An improved wet plate battery for use with an internal combustion engine carburetor and adapted to produce oxygen and hydrogen gas for enriching the air/fuel mixture inducted into the internal combustion engine, comprising:

- a case;
- a plurality of electrical generating cells separated by a plurality of separating walls within said case, each having positive and negative plates, said plates being immersed in a dilute electrolyte;
- a plurality of air tubes extending into said cells, each tube extending into one cell and said air tubes each having one end open to atmosphere exteriorly of said case and having

4,053,684

METHOD OF OPERATING A FUEL CELL

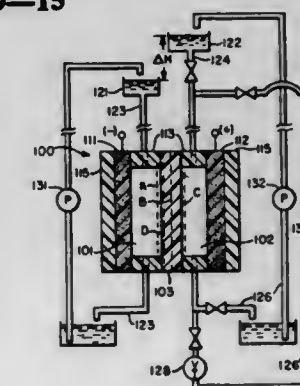
Ralph Zito, Jr., Westford, and Lawrence J. Kunz, Jr., Fitchburg, both of Mass., assignors to GEL, Inc., Durham, N.C.

Continuation of Ser. No. 296,243, Oct. 10, 1972, abandoned. This application Nov. 11, 1976, Ser. No. 741,134

Int. Cl.² H01M 8/04

U.S. Cl. 429—15

3 Claims



1. Method of operating a fuel cell comprising, means forming a first compartment and an anode therein, means forming a second compartment and a cathode therein, the second compartment being adjacent the first compartment, means forming a microporous ion diffusion membrane separating said compartments, a liquid electrolyte in said first compartment and a liquid electrolyte in said second compartment, and an interface between said electrolytes located within said membrane, one of said electrolytes comprising a fuel dissolved therein and the other of said electrolytes comprising an antifuel dissolved therein, through the step of establishing a pressure differential between said electrolytes so that there is a pressure gradient between the liquids in a direction to combat undesired transport, which would naturally occur in the absence of specific

establishment of such combating pressure differential, of an ionic species contained in one of the electrolytes which tends to poison the other electrolyte or electrode of the other electrolyte compartment, if transported thereto, or to poison the membrane if transported therein.

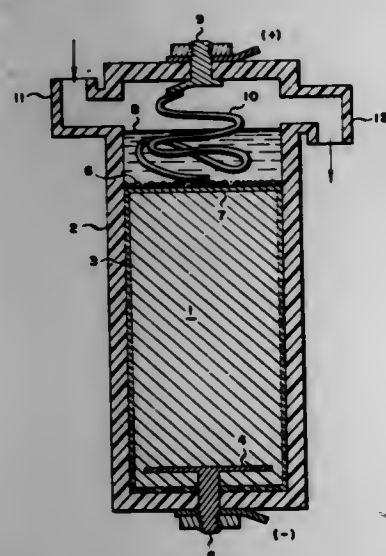
4,053,685

END-REACTING ELECTROCHEMICAL BATTERY
Leroy S. Rowley, San Jose, and Harry J. Halberstadt, Los Altos, both of Calif., assignors to Lockheed Missiles & Space Company Inc., Sunnyvale, Calif.

Filed May 15, 1974, Ser. No. 470,132
Int. Cl.² H01M 2/38

U.S. Cl. 429-68

1 Claim



1. In a reactive metal anode-aqueous electrolyte electrochemical battery wherein said anode is mounted in a battery casing and naturally forms on its surface a protective insulating film in the presence of water, the improvement wherein:
 - a. said protective insulating film includes at least a portion thereof comprising a reactive surface,
 - b. a cathode in direct contact with substantially the entire reactive surface,
 - c. means preventing said electrolyte from contacting any portion of said anode other than said reactive surface, thereby minimizing destructive erosion of said anode by said electrolyte in a non-power producing area of said electrolyte wherein said preventing means comprises said battery casing said battery case being in intimate and fixed direct contact with all surface portions of said anode other than said reactive surface, and
 - d. means for maintaining said cathode in direct contact with said anode as said anode is consumed, said cathode being freely movable with and following the receding anode reactive surface for maintaining direct contact between said reactive surface and said cathode.

4,053,686

EPOXY SEALED LEAD BATTERY PROBE

Terry Rafael Oxenreider, Wernersville, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 593,000, July 3, 1975, Pat. No. 4,010,537. This application Sept. 13, 1976, Ser. No. 722,567
Int. Cl.² H01M 10/48

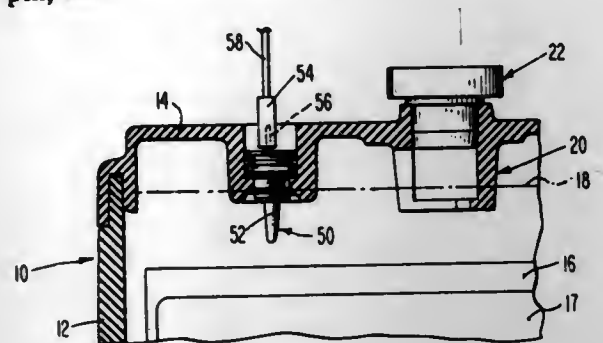
U.S. Cl. 429-91

4 Claims

1. An electric storage battery comprising:
 - a. a case to retain electrolyte up to a preferred level;
 - b. a cover means for retaining said electrolyte within said case, said cover means further having defined therein at least one bore; and
 - c. a probe means for sensing said preferred level of electro-

lyte, said probe means being disposed within said bore, said probe means comprising:

- i. a pin; and



- ii. a lead body comprising a plurality of substantially concentric annular projections of decreasing diameters.

4,053,687

ELECTROCHEMICAL CELL

Jean Coiblon, Tresses, and Jean Lafaye, Carbon Blanc, both of France, assignors to SAFT-Societe des Accumulateurs Fixes et de Traction, Romainville, France

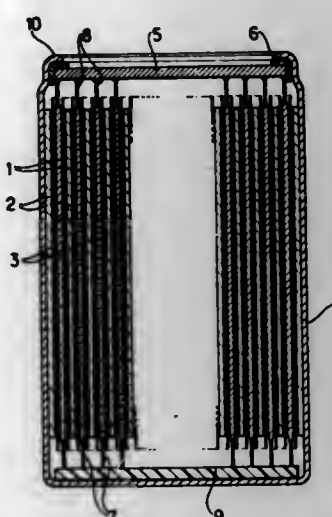
Filed Oct. 12, 1976, Ser. No. 731,773

Claims priority, application France, Oct. 17, 1975, 75.31839; Oct. 17, 1975, 75.31840

Int. Cl.² H01M 6/10

U.S. Cl. 429-94

22 Claims



1. An electrochemical cell comprising a metal container having a closed base, an open upper end having a rim, a cover, means for effecting a seal between the container and cover, and a compact block positioned within said container comprising an assembly of electrodes of opposite polarity and separator means between such electrodes, one of said electrodes having conductive borders respectively projecting outwardly from opposite ends of said block, said borders respectively bearing against the cover and base of said container, said borders providing supports for said block between the cover and base of said container.

4,053,688

BATTERY HOLDER

Carroll R. Perkins, 3400 Main St., Santa Ana, Calif. 92707; Jesse F. Cable, III, 4341 Rafael St., Irvine, Calif. 92714, and Joseph Link, 26752 Magdalena Lane, Mission Viejo, Calif. 92675

Filed Dec. 8, 1975, Ser. No. 638,312

Int. Cl.² H01M 2/10

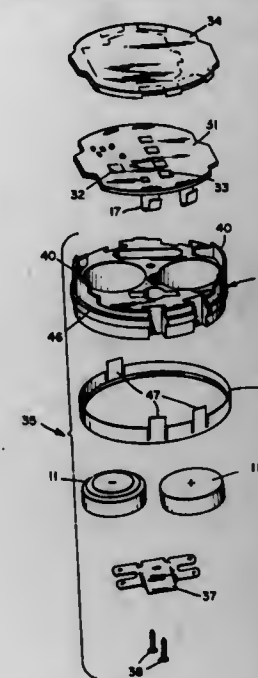
U.S. Cl. 429-98

7 Claims

1. In a modular electronic assembly which has a substrate, on which an integrated circuit is mounted, and a module cap, which is concentrically, slightly larger than the substrate, a

battery holder, which is adapted to be placed in a casing and which holds a plurality of batteries, comprising:

- a. a module frame formed from a non-conductive material having a front surface, a sidewall, and a back surface and being concentrically, slightly larger than the module cap, said front surface of said module frame being adapted to receive the substrate thereon, a portion of said sidewall



- extending above the periphery adjacent to said front surface of said module frame, and a plurality of holes perpendicular to said front surface adapted to receive the batteries; and
- b. means for securing the batteries within said holes coupled to said back surface of said module frame, formed from a conductive material.

4,053,689

CONTACT BETWEEN METAL CAN AND CARBON/GRAPHITE FIBERS IN SODIUM/SULFUR CELLS

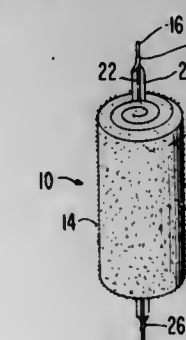
Manfred Wolfgang Breiter, Niskayuna, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 20, 1976, Ser. No. 752,489

Int. Cl.² H01M 2/30

U.S. Cl. 429-102

10 Claims



1. A conductor for transferring electricity to and from sulfur or mixtures of sulfur and sodium polysulfides comprising a mat of conducting carbon or graphite in electrically conducting contact with the chromium or molybdenum surface of a chromium or molybdenum coated aluminum substrate.

4,053,690

THERMAL CELLS

John R. Backlund, Bloomington, Ill., assignor to National Union Electric Corporation, Stamford, Conn.

Filed Jan. 27, 1954, Ser. No. 406,566

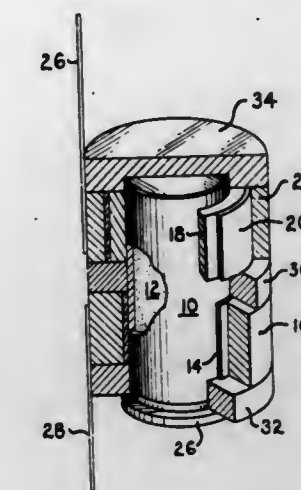
Int. Cl.² H01M 6/36

U.S. Cl. 429-112

5 Claims

1. Multiple thermal cell construction comprising a cylinder having heat source material therein and forming one electrode

of a cell, dry electrolyte in contact with the outer surface of said cylinder, a metal band enclosing said electrolyte and forming another electrode of said cell, a metal band on said cylinder in spaced and insulated relation with respect to said electrolyte



and forming an electrode of another cell in series with said first mentioned cell, dry electrolyte in contact with said band and an outer band contacting said last mentioned electrolyte and forming another electrode of said last mentioned cell.

4,053,691

POROUS LIGHT WEIGHT BATTERY FILLER

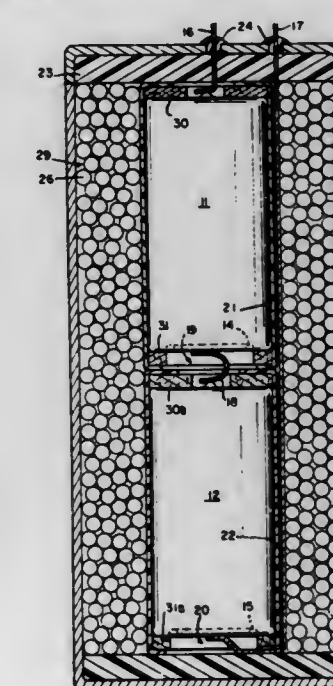
Frank L. Clibbert, Jr., Ossining, N.Y., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Oct. 1, 1976, Ser. No. 728,671

Int. Cl.² H01M 2/00

U.S. Cl. 429-163

5 Claims



1. A battery comprising an outer container, at least one electrochemical cell rigidly encapsulated within said container by a porous structure, said porous structure being comprised of a plurality of discrete pellets adhered to each other, said porous structure having a porosity of at least 20%.

4,053,692

HERMETICALLY SEALED CELLS

Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 314,316, Dec. 12, 1972, Pat. No. 3,945,846, and Ser. No. 664,780, March 8, 1976. This application Mar. 8, 1976, Ser. No. 664,781

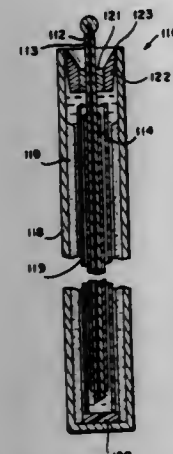
Int. Cl.² H01M 2/02

U.S. Cl. 429-171

13 Claims

1. An electrochemical cell having an hermetic seal assembly

for closing the open end of the container for said cell; said hermetic seal assembly comprising a metal rod, a ring shaped glass member permanently concentrically sealed to said metal rod at its upper end, and a metal member permanently sealed to said glass member; said metal rod extending axially within said cell, having liquid passage means therethrough and being an electrical terminal for said cell and an electrolyte fill port, with the upper end of said rod having been permanently closed after the introduction of said electrolyte to close said liquid passage;



said metal rod being in contact with an active electrode material of said cell and being formed of a metal which is different from but chemically compatible with said active electrode material; said glass member having a thermal coefficient of expansion substantially similar to said metal comprising said tube; and said glass member being inert with respect to material contained within said cell; and said metal member being hermetically permanently sealed to said container at said open end.

4,053,693

POLE BOLT SEAL FOR GALVANIC CELLS

Erich Münch, Frankfurt am Main, and Bernd Gaida, Fischbach, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Germany

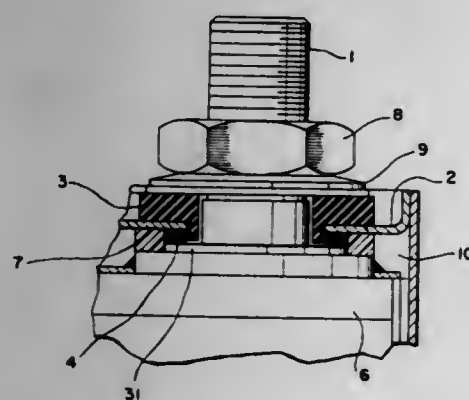
Filed Aug. 6, 1975, Ser. No. 602,393

Claims priority, application Germany, Aug. 19, 1974, 7428070(U)

Int. Cl.² H01M 2/06

U.S. Cl. 429-183

1 Claim



1. In a sealing arrangement for a galvanic cell having a cell cover, a pole bolt which protrudes through an aperture in the cell cover, and a pole bolt nut, the improvement comprising: a sealing ring of elastic material which encircles the bolt and which is positioned for compression in response to tightening of the nut, a spacer ring encircling the sealing ring and positioned to be subjected to pressure in response to tightening of the nut, said spacer ring being substantially inelastic, said cover, bolt, nut, sealing ring and spacer ring being so positioned and proportioned relative to each other that the spacer ring limits the tightening of the nut, whereby

the compression of the sealing ring is also limited by the spacer ring alone, and annular insulating means encircling the pole bolt between the bolt and the sealing ring.

4,053,694

NICKEL ACTIVATION BATTERY COMPONENT

Ian P. Gutridge, Brierley Hill, Staffs, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 520,258, Nov. 4, 1974, Pat. No. 3,997,364.

This application June 23, 1976, Ser. No. 699,055

Claims priority, application United Kingdom, Nov. 13, 1973, 52658/73

Int. Cl.² H01M 4/32

3 Claims

U.S. Cl. 429-223

1. As a battery component, an impervious electrically conductive nickel substrate having on the surface thereof in the as activated condition an adherent black deposit of porous beta nickel hydrate and having positioned in the pores of the beta nickel hydrate a deposit of green nickel hydroxide.

4,053,695

LEAD ACID CELLS AND BATTERIES

Kenneth Peters, Worsley; Sidney Fewster; Frank Wilson, both of Bolton, and Kevin David Nicolas Kearney, Chobham, all of England, assignors to Chloride Group Limited, London, England

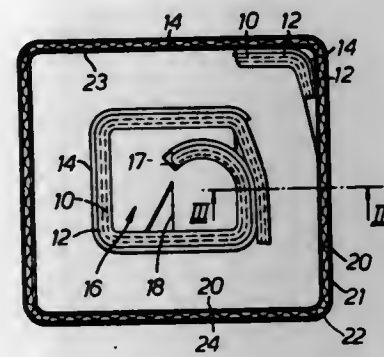
Filed Oct. 29, 1975, Ser. No. 626,778

Claims priority, application United Kingdom, Oct. 31, 1974, 47470/74; May 23, 1975, 22804/75

Int. Cl.² H01M 4/56

17 Claims

U.S. Cl. 429-225



1. A sealed lead acid cell characterized in that it has electrodes comprising metallic supports which minimize the evolution of hydrogen and resist deformation under their own weight, the supports for the electrodes being in the form of a mesh or grid affording an integral current collecting strip or bar along at least one edge which will be the top or bottom edge of the structure when assembled in a cell and the supports for the electrodes being made of a lead-calcium-tin alloy containing 0.04 to 0.08% by weight calcium and 0.1 to 0.5% tin, and which are separated by at least one layer of separator material, the support of the positive electrode or electrodes having positive active material deposited thereon, the deposited positive active material being formed from a positive active material paste composition consisting of from 23 to 57 parts by weight of liquids per 100 parts by weight of the lead content of the active material and from 0.01 to 1.0 parts by weight of silica calculated as SiO₂ per 100 parts by weight of active material (calculated at PbO₂) and the support of the negative electrode or electrodes having negative active material deposited thereon, the deposited negative active material being formed from a negative paste active material composition which includes at least 0.1% by weight of lignin derived lignosulphonate material, and in which the capacity of the negative electrodes is arranged to be at least as great as the capacity of the positive electrodes, the thickness of the electrodes is less than 3mm, the thickness of the separator is in the range of 10 to 200% of the thickness of the electrodes and the

volume, E, of electrolyte in the cell in relation to the sum of the pore volume of the separators, X, and the pore volume of the positive and negative active materials, Y, is not greater than 2X + Y.

4,053,696

MANUFACTURE OF VINYLPIRROLIDONE POLYMERS

Karl Herrle, Ludwigshafen; Hermann Gausepohl, Mutterstadt, and Wolfgang Schwarz, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 17, 1975, Ser. No. 632,653

Claims priority, application Germany, Nov. 30, 1974, 2456807

Int. Cl.² C08F 26/10

8 Claims

U.S. Cl. 526-65

1. A process for the continuous manufacture of polyvinylpyrrolidone having a K value of from 10 to 35 which comprises: continuously polymerizing a monomer consisting essentially of vinylpyrrolidone in at least one continuous polymerization zone at a temperature of from 100° to 300° C., in the presence of from 0.1 to 5% by weight, based on said monomer, of a free radical initiator selected from the group consisting of dicumyl peroxide, di-tert-butyl peroxide and 2,2-di-tert-butyl peroxybutane, and in an organic solvent selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, dioxane, tetrahydrofuran, chloroform, methylene chloride, tetrachloroethane, hexachloroethane, xylene, cumene, alkylbenzenes or mixtures thereof, said continuous polymerization being carried out at a pressure greater than 1 bar and within a residence time in the polymerization zone of about 3 to 120 minutes.

4,053,697

PROCESS FOR PRODUCING PROPYLENE HOMOPOLYMERS AND COPOLYMERS

Mamoru Asada; Akinobu Shiga, and Kiyoshi Matsuyama, all of Ehime, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

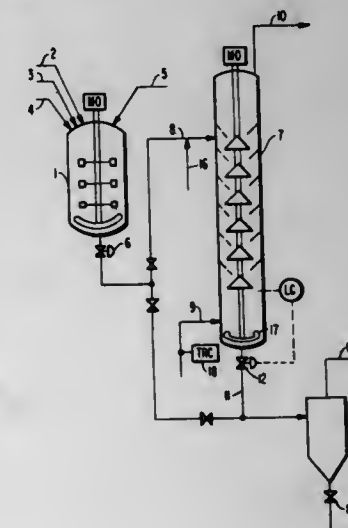
Filed Jan. 16, 1975, Ser. No. 541,554

Claims priority, application Japan, Jan. 16, 1974, 49-8070

Int. Cl.² C08F 4/16

5 Claims

U.S. Cl. 526-142



1. A bulk polymerization process for producing a homopolymer or a copolymer of propylene, which comprises polymerizing propylene or a mixture of propylene and another unsaturated hydrocarbon monomer in liquid propylene in the presence of a catalyst system consisting essentially of (a) an activated titanium compound obtained by (1) reducing titanium tetrachloride with an organoaluminum compound represented by the formula



wherein R represents a straight or branched chain alkyl group

having 1 to 18 carbon atoms, an alicyclic hydrocarbon group or an aromatic hydrocarbon group, X represents a halogen atom, an n is a value of from 1 to 3, inclusive to obtain a β-type titanium trichloride, (2) reacting the resulting β-type titanium trichloride with an ether, (3) reacting the solid catalyst thus obtained with (i) an organoaluminum compound represented by the formula



(II)

wherein R' represents a straight or branched chain alkyl group having 1 to 18 carbon atoms, an alicyclic hydrocarbon group or an aromatic hydrocarbon group, X represents a halogen atom, and m is a value of 0 < m < 1.5, followed by further reacting the resulting solid catalyst with an ether, or (ii) titanium tetrachloride and (b) an organoaluminum compound, withdrawing the obtained polymer slurry from the polymerization zone, introducing the polymer slurry into an upper part of a counter-current washing zone and counter-currently contacting the polymer slurry with liquid propylene introduced into a lower part of the washing zone, whereby the polymer and catalyst residue dissolved in the polymer slurry are removed.

4,053,698

ACYLATION OF PYRAZOFURIN

Gerald E. Gutowski, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 490,627, July 22, 1974, Pat. No. 3,960,836.

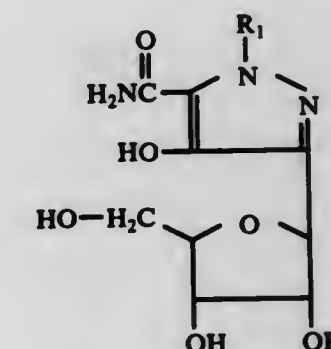
This application Feb. 23, 1976, Ser. No. 660,208

Int. Cl.² C07D 231/38, 231/40; C07H 7/06, 13/02

U.S. Cl. 536-1

1 Claim

1. A process for preparing a pyrazofurin mono-N₁-acylate of the formula



wherein R₁ is C₁-C₆ alkanoyl, comprising treating pyrazofurin with an acylating agent in an alcoholic solvent at a temperature of about 0° to about 30° C. for a period of time of about 30 to about 90 minutes.

4,053,699

FLASH DRYING OF XANTHAN GUM AND PRODUCT PRODUCED THEREBY

Patrick Thomas Cahalan, Champlin; John Allen Peterson, Coon Rapids, and Douglas Arthur Arndt, Champlin, all of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Mar. 31, 1976, Ser. No. 672,187

Int. Cl.² C08B 37/00

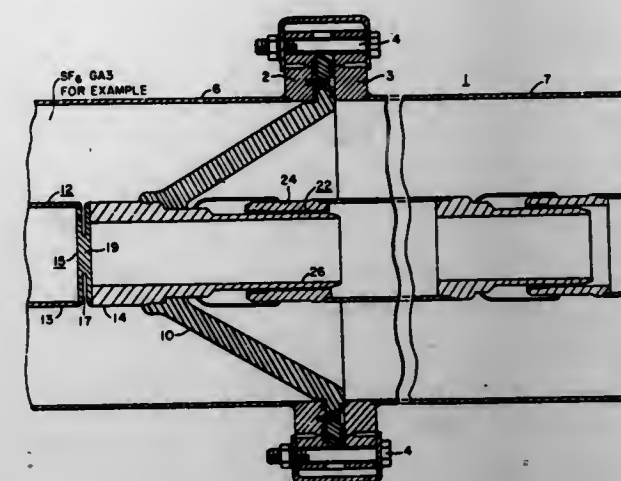
U.S. Cl. 536-114

3 Claims

1. In a method of making calcium-xanthomonas gum complex granules comprising the steps of precipitating xanthomonas gum with calcium ion at an alkaline pH to form a complex, adjusting the moisture content of the complex to from 70 to 80% by weight of the complex, the improvement consisting of flash drying the complex at an air temperature of 70° C to 250° C to a moisture content of no more than 12% by weight in a period of about no more than 30 seconds.

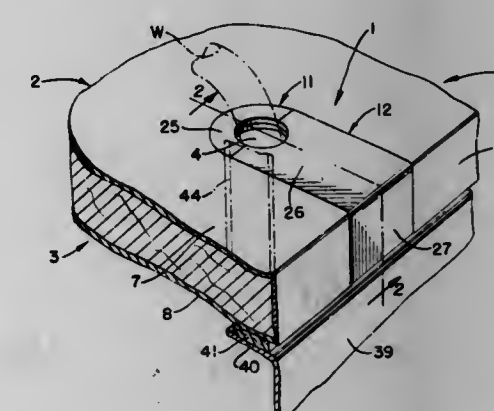
ELECTRICAL

4,053,700
COUPLING FLEX-PLATE CONSTRUCTION FOR GAS-INSULATED TRANSMISSION LINES
 Jeffrey R. Meyer, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
 Filed June 6, 1975, Ser. No. 584,432
 Int. Cl.² H01B 9/04
 U.S. Cl. 174-21 C



1. A high-voltage gas-insulated transmission-line capable of carrying relatively-heavy currents including a plurality of axially-aligned outer-disposed independent metallic grounded casing sections (6,7), means securing said independent metallic grounded casing sections (6,7) together in end-to-end axially-aligned fashion, a plurality of axially-aligned inner-disposed open-ended tubular high-voltage independent conductors (13,14) disposed centrally within said outer-disposed grounded axially-aligned casing sections (6,7), an insulating gas disposed within the annular space between the inner-disposed conductors (13,14) and the outer-disposed grounded metallic casing sections (6,7), a solid self-supporting flex-plate coupling member (15) interposed between the confronting open ends of two juxtaposed inner high-voltage conductors (13,14) and secured thereto to completely block the open confronting ends thereof, said solid self-supporting flex-plate coupling member (15) having a centrally-disposed, outer peripheral recess (17) thereby resulting in a substantially solid "H"-shaped cross-sectional configuration, whereby the solid inner central core position (19) of said solid self-supporting flex-plate coupling member (15) permits only lateral flexing motion of the inner-disposed conductors (13,14) yet nevertheless can carry relatively-heavy transmission-line currents.

4,053,701
GROMMET ASSEMBLY FOR FURNITURE ARTICLES
 LeRoy F. Ogilvie, Youngstown, and Henry F. Hartig, Poland, both of Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio
 Filed Apr. 27, 1976, Ser. No. 680,884
 Int. Cl.² A47B 13/00
 U.S. Cl. 174-48

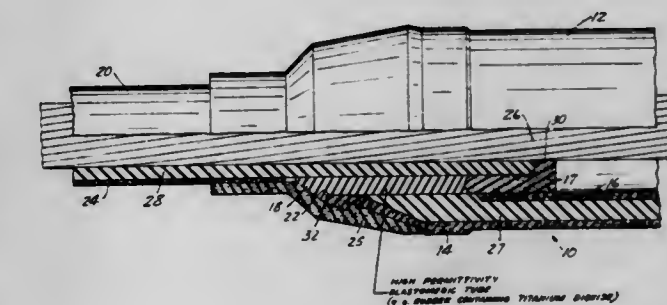


1. A grommet assembly providing a wiring access in a furni-

ture article top having an upper surface, lower surface and outer edge, said top including a cut-out communicating with said outer edge and having an end wall and two side walls, said assembly including a stationary grommet segment within said top cut-out adjacent said end wall and having a first partial wiring access cut-out, a removable grommet segment slidably insertable within said top cut-out into abutment with said stationary grommet segment and having a second partial wiring access cut-out mating with said first partial wiring access cut-out to provide a full wiring access, and mating guide means in said top cut-out and on said removable grommet segment to retain said removable grommet segment in alignment with said stationary grommet segment, said mating guide means including a retainer plate fixedly disposed within said top cut-out and having an intumed flange, and said removable grommet segment includes grooves engageable with said flange.

5 Claims

4,053,702
DIELECTRIC STRESS RELIEF AT A HIGH VOLTAGE CABLE TERMINATION
 Roy D. Erickson; Leonard A. Johnson, both of Woodbury, and Edward I. Porwit, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
 Filed July 14, 1975, Ser. No. 595,503
 Int. Cl.² H02G 15/08
 U.S. Cl. 174-73 R



1. Means for relieving dielectric stress at a termination of a shielded and insulated high voltage cable including a housing that defines an opening for receiving a said high voltage cable, which housing comprises a layer of insulative material having a generally cylindrical shape, a conductive high voltage electrode at the inner surface of the housing for making contact with the conductor of a said high voltage cable, and a conductive ground electrode at the outer surface of the housing for conductive coupling to the shielding of said high voltage cable, said ground electrode defining the mouth of the opening in the housing and diverging from the opening; and a tube of homogeneous insulative material having a relatively smooth geometry, being adapted for surrounding an exposed portion of the insulation of a said high voltage cable, and being adapted for positioning in the opening of the housing while surrounding said exposed portion with one end of the tube coaxially contacting the ground electrode at the mouth of the opening and the other end of the tube coaxially contacting the high voltage electrode; said housing characterized by the mouth of the opening being substantially the same diameter as the remainder of the opening; and said tube characterized by consisting of a nonrigid elastomeric material having a permittivity in a range from 10 to 25, characterized by having an outward extending ridge on one end that exceeds the diameter of the mouth of the opening to limit the relative insertion of the tube into the opening, and a conductive nonrigid elastomeric tubular extension integral with the other end of the tube for forming a part of said high voltage electrode, said conductive extension having a lip extending inwardly for contacting an exposed portion of the high voltage conductor of a said high voltage cable and at least a portion of the insulation adjacent said exposed portion of the high voltage conductor of a said high voltage cable.

13 Claims

4,053,703

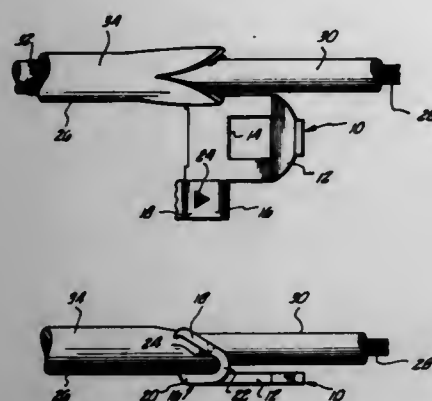
CLAMPING CONNECTOR

Donald J. Smith, Woodland Hills, Calif., assignor to Smith-Schreyer & Assoc., Inc., Woodland Hills, Calif.
Filed Aug. 12, 1976, Ser. No. 713,718

Int. Cl.² H01R 11/08, 5/08

U.S. Cl. 174-78

4 Claims



1. A clamping connector for receiving the ends of small service wires of the type having a conductor core, external insulation and a conductive shield, comprising a plurality of deformable clamps, each said clamp having a first jaw portion defining a first jaw of said clamp, a second jaw portion defining a second jaw of said clamp and an intermediate portion extending to said first and second jaw portions and holding said first and second jaw portions spaced one from the other for receipt of the external insulation and the conductive shield of the small service wire, each said jaw portion including means at an outer end thereof for increasing purchase on the small service wire when associated therewith, each said clamp being constructed and arranged to allow selective distortion of said clamp to bring said jaw portions permanently close together to hold the small service wire from association therewith and to electrically connect the conductive shield, each said jaw portion including an inwardly extending outer end thereof, said inwardly extending end of said first jaw portion extending outwardly of said second jaw portion to form an interlocking of said inwardly extending ends when said jaw portions are brought permanently close together; and an attachment plate rigidly fixed to and electrically associated with said deformable clamps.

4,053,704

PLUG AND KIT OF PARTS INCLUDING SAME FOR USE IN FORMING A MOISTURE-PROOF CABLE SPLICE ENCLOSURE

Donald J. Smith, Woodland Hills, Calif., assignor to Smith-Schreyer & Assoc., Inc., Woodland Hills, Calif.

Continuation-in-part of Ser. No. 307,593, Nov. 17, 1972, Pat. No. 3,934,076, which is a continuation-in-part of Ser. No. 171,570, Aug. 13, 1971, abandoned. This application Sept. 19, 1975, Ser. No. 614,912

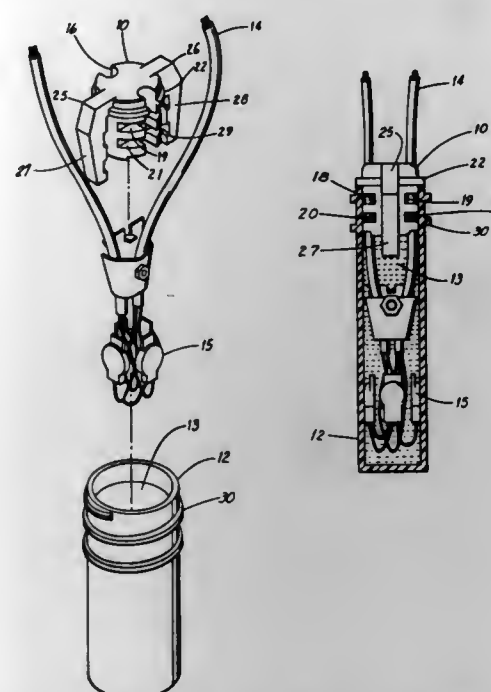
Int. Cl.² H02G 15/08

U.S. Cl. 174-87

7 Claims

1. A plug for use with a vial in a cable splice enclosure, comprising a body, said body including longitudinally extending grooves for receiving cables and transverse slots extending across said grooves and cutting deeper into said body than said grooves; and a pair of arms extending outwardly from said body, each of said arms having a depending portion bearing a plurality of teeth directed toward said body for engaging a vial.
6. A kit of parts for forming an enclosure for moisture-proofing cable splices and cable ends associated therewith, comprising

a vial, said vial having a mouth and an interior volume for accepting a cable splice;
a body of sealant contained in said vial for receiving a cable splice and the ends of cables to be positioned in said vial;
a plug having means for accepting a plurality of cables in the immediate proximity of a cable splice, said plug being for fitting within and enclosing the mouth of said vial, said



plug having a body capable of extending into said body of sealant to force said body of sealant to deform around said plug and cable ends to fill all passageways leading from the vial, said plug body including longitudinally extending grooves for receiving cables and transverse slots extending across said grooves and cutting deeper into said plug body than said grooves.

4,053,705

TERMINAL CAP

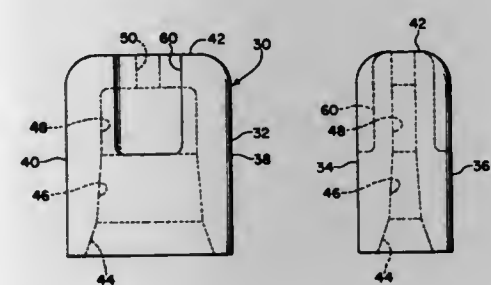
Bradley J. Schmidt, East Dundee, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 8, 1976, Ser. No. 731,070

Int. Cl.² H01R 5/12, 13/44

U.S. Cl. 174-138 F

5 Claims



1. A one-piece dielectric terminal straightening cap adapted for use with terminals in a terminal wiring block, said cap including a one-piece body having a double tapered generally rectangular bore open through one end thereof and terminating short of the opposite end, said cap including front, back and side walls forming said bore, the said walls forming said bore being tapered for a substantial portion of their extent relative to two perpendicular planes lying on the axis of said bore, said front, back and side walls forming a wide double tapered throat having a relatively large included angle between opposite wall which blends into a lower included angle portion of said bore, said lower included angle portion having a substan-

4,053,707

METHOD AND APPARATUS FOR HIGH VOLTAGE INSULATION

Cyril Harold Arthur Ely, Effingham; Peter John Lambeth, Bookham, and John Sidney Thomas Looms, East Molesey, all of England, assignors to Central Electricity Generating Board, London, England

Filed Mar. 29, 1976, Ser. No. 671,295

Claims priority, application United Kingdom, Apr. 7, 1975, 14244/75

Int. Cl.² H01B 17/50, 17/60, 17/32

U.S. Cl. 174-209

41 Claims

4,053,706

SUSPENSION BRACKET AND APPARATUS

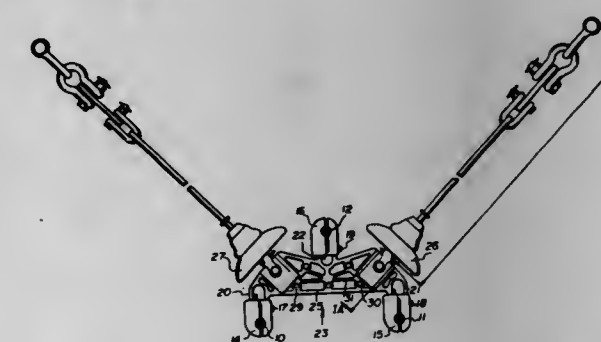
Herbert J. Houston, Oakville, and Kenneth D. Bolt, Burlington, both of Canada, assignors to Slater Steel Industries Limited, Hamilton, Canada

Filed June 18, 1976, Ser. No. 697,476

Int. Cl.² H01B 17/10; H02G 7/00

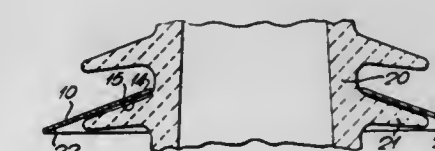
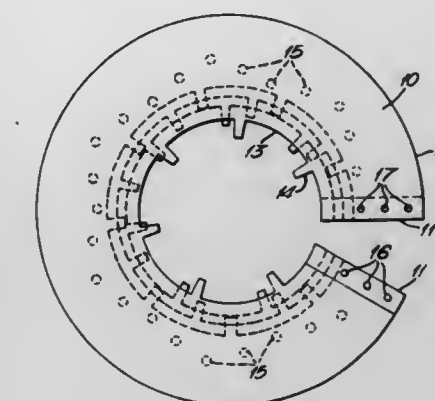
U.S. Cl. 174-149 R

11 Claims



1. A suspension apparatus for suspending a bundle of sub-conductors from a support, said suspension apparatus comprising: a suspension bracket comprising a yoke plate and defining a support plane; at least one pair of insulator assemblies, each having a major axis lying in said support plane, for suspending said suspension bracket at the lower ends of said insulator assemblies from said support; said yoke plate having first and second connection portions at opposite sides thereof connected to said insulator assemblies, respectively; a plurality of clamp means for securing said sub-conductors to said yoke plate; means pivotally connecting said clamp means to said yoke plate; at least one of said clamp means being located at the upper side of said yoke plate and between said insulator assemblies; and said yoke plate having attachment means associated with at least one of said insulator assemblies, in alignment with said major axis thereof, for attachment thereto of temporary suspension connector means for suspending said yoke plate upon uncoupling of said one insulator assembly.

11. A yoke plate for use in suspending a bundle of sub-conductors from a support, said yoke plate being generally planar and comprising first and second connector means for connecting first and second elongated insulator assemblies thereto, so as to lie in the plane thereof; a plurality of clamp means for securing said sub-conductors to said yoke plate; means pivotally connecting said clamp means to said yoke plate; at least one of said clamp means being located at the upper side of said yoke plate and between said connector means; wherein the improvement comprises: attachment means on said yoke plate in direct alignment with at least one of said connector means for attachment of temporary suspension connector means for suspending said yoke plate upon disconnecting of said at least one of said connector means from its respective insulator assembly.



1. A method of improving an insulator having a central portion or stem and one or more sheds comprising the step of putting a barrier of dielectric material over the upper surface of a shed but spaced away therefrom, the barrier extending radially outwardly to overhang the periphery of the shed by at least 5 mm around the whole of the shed, the barrier furthermore being spaced radially from the central portion or stem of the insulator over at least a substantial part of the inner periphery of the barrier.

4. An insulator having a central portion or stem and one or more sheds extending outwardly therefrom in combination with a discharge barrier comprising a sheet of dielectric material and positioned around the central portion or stem of the insulator above at least one shed, said sheet being spaced away from the upper surface of the shed, said sheet furthermore being arranged to overhang the shed by extending radially outwardly therefrom for a distance of at least 5 mm, said sheet furthermore being dimensioned to leave a gap between the insulator central portion or stem and the sheet over at least a substantial part of the inner periphery of the sheet.

39. A shed for an electrical insulator, comprising a flexible polymeric shed and a barrier of dielectric material, said barrier being spaced away from the upper surface of said flexible polymeric shed and having an inner periphery of greater diameter than the inner periphery of said flexible polymeric shed.

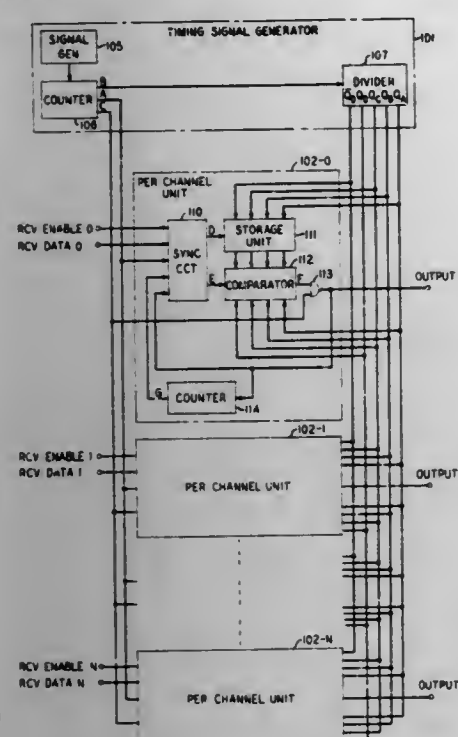
41. An annular barrier for fitting on a shed and about a stem of an electrical insulator, comprising an annular barrier sheet of flexible, dielectric, anti-tracking material, said annular barrier sheet having a substantially radial division, means for joining said barrier sheet to close said substantially radial division and a plurality of projections on one side of said annular barrier sheet to space said annular barrier sheet from the upper surface of the shed.

4,053,708

ASYNCHRONOUS SAMPLE PULSE GENERATOR
 LaVerne Charles Hotchkiss, Greensboro, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
 Filed June 17, 1976, Ser. No. 696,872
 Int. Cl.² H04L 7/00

U.S. Cl. 179-69.1

12 Claims



1. Apparatus for generating signals for sampling data signals asynchronously received at a prescribed bit rate on at least one channel which comprises:

means for generating a plurality of timing signals in predetermined phase relationship ordered from least significant to most significant and including a timing signal opposite in phase to said most significant timing signal, a first predetermined group of said timing signals including the least significant one through the next to most significant one of said timing signals and the signal opposite in phase to said most significant timing signal, and a second predetermined group of said timing signals including the least significant one through the most significant one of said timing signals; storage means associated with said at least one channel and being responsive to a first prescribed signal for sampling and storing signals representative of one of said predetermined groups of said timing signals; and means associated with said storage means and being supplied with said stored signals and with the other of said predetermined groups of said timing signals for generating output signals during intervals in which said first and second predetermined groups of said timing signals are in coincidence, wherein said first and second predetermined groups of said timing signals are in said predetermined phase relationship so that an output signal is generated substantially mid-interval of each data bit incoming on said at least one channel.

4,053,709

TELEPHONE CONNECTOR

Roger G. Véin, Franconville; Jean A. Picandet, Paris, and François M. Boullier, Saint-Ouen, all of France, assignors to Jeumont-Schneider, Puteaux, France

Filed Dec. 23, 1975, Ser. No. 643,806
 Claims priority, application France, Dec. 31, 1974, 74.43472
 Int. Cl.² H04M 7/12

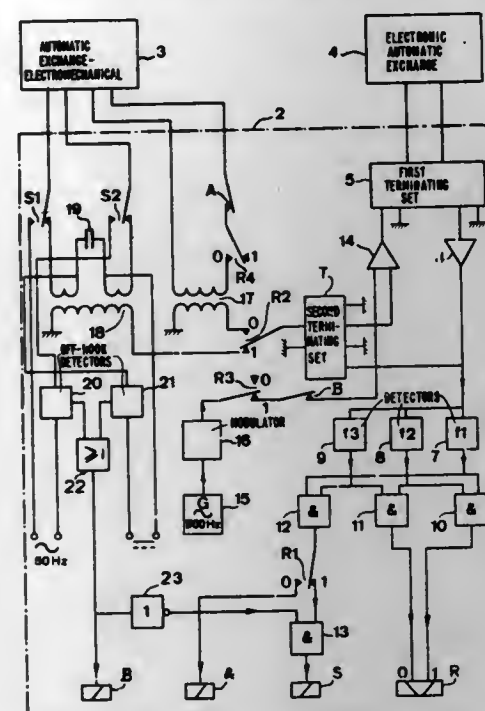
U.S. Cl. 179-18 AD

17 Claims

1. Telephone junctor for the direct inward dialing of a subscriber connected to a first automatic exchange having public network line equipment and extension subscriber equipment by a further subscriber connected to a second, distant automatic exchange capable of transmitting three-frequency signalling

towards the said junctor and of interpreting the changes of state of the latter, characterised in that it comprises:

a generator of single-frequency signaling the signals of which are modulated by "on-off keying,"
 a first terminating set for two wire to four wire conversion connected at the two-wire side to the second exchange and connected at the four-wire side by its first pair of wires to a circuit for receiving three-frequency signaling the signals of which are transmitted by the second exchange, the said receiving circuit controlling relays through intermediary of logic elements, and to the first channel of the four-wire circuit of a second terminating



set and, connected by its second pair of wires to the output of a two-input summing amplifier the first input of which is subjected to the single-frequency signaling and the second input of which is connected to the second channel of the four-wire circuit of the second terminating set the two-wire side of which is connected either to the extension subscriber equipment or to the public network line equipment of the first exchange, in accordance with the signaling transmitted by the second exchange, an off hook detecting circuit, an a.c. source supplying the ringing current, and a d.c. source feeding the public network line equipment of the first exchange.

4,053,710

AUTOMATIC SPEAKER VERIFICATION SYSTEMS EMPLOYING MOMENT INVARIANTS

Jeram G. Advani, Dayton; Bruno J. Paganini, Centerville, and William J. Hale, Kettering, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 1, 1976, Ser. No. 662,994
 Int. Cl.² G10L 1/04

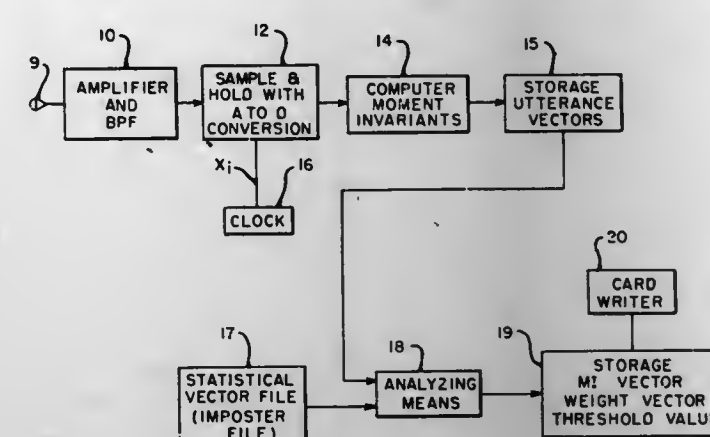
U.S. Cl. 179-1 SB

16 Claims

1. The method of verifying the identity of a person by the use of utterance comparisons comprising the steps of:

- computing an utterance vector from samples of the person's speech;
- computing an utterance vector from samples of an imposter's speech;
- analyzing the computed utterance vector of the person and the computed utterance vector of the imposter for deriving weighting factors indicative of the differences therebetween;
- recording the person's computed utterance vector and said weighting factors on a security card that is issued to said person;
- comparing the utterance vector recorded on said security card against a most recent computed utterance vector

from the person for determining the differences therebetween;
 f. comparing the differences determined in step (e) with said



recorded weighting factors and verifying the identity of said person if the comparison is within a first range and rejecting the identity of said person if the comparison is within a second range.

4,053,711

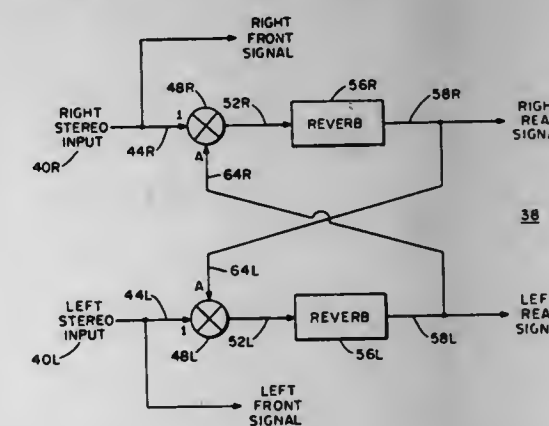
SIMULATION OF REVERBERATION IN AUDIO SIGNALS

Richard E. DeFreitas, Westford, and Samuel Wilensky, Concord, both of Mass., assignors to Audio Pulse, Inc., Bedford, Mass.

Filed Apr. 26, 1976, Ser. No. 680,475
 Int. Cl.² H04R 5/00

U.S. Cl. 179-1 GQ

19 Claims



19. A method of producing reverberation in a plurality of input signals comprising the step of:
 applying to the input of each of a like plurality of reverberation means a signal comprising the combination of a respective one of the input signals and the output signal from at least one of the other reverberation means.

4,053,712

ADAPTIVE DIGITAL CODER AND DECODER

Adolf Reindl, Ocean Township, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

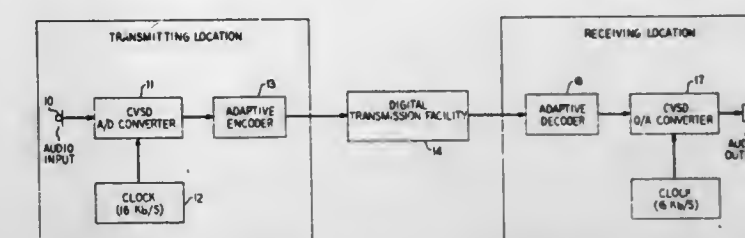
Filed Aug. 24, 1976, Ser. No. 717,732
 Int. Cl.² G10L 1/06; H04N 1/38

U.S. Cl. 179-15.55 T

12 Claims

1. A method of transmitting an analog information signal from a first to a second location, which comprises the steps of: converting said analog information into a digital information signal using delta modulation at a first bit rate; monitoring said digital information signal for idle bit patterns which are representative of momentary interruptions in the information content of said analog information signal; substituting at least one coded bit pattern for each idle bit

pattern so detected which exceeds a predetermined interval length with the coded bit patterns having idealized correlation properties and also indicating in which range the number of bits in the idle bit pattern falls, selected from predetermined ranges of unequal length which increase in a nonlinear manner;



buffering said digital signal and interspersed coded bit patterns; and then transferring said buffered digital signal and interspersed coded bit patterns at a second bit rate into a digital transmission facility operating at said second bit rate which is substantially lower than said first bit rate.

4,053,713

MULTI-CHANNEL MULTIPLEX DATA TRANSMISSION SYSTEM

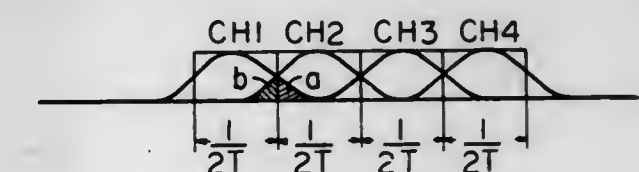
Kazuhiko Nitadori, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1976, Ser. No. 654,340

Claims priority, application Japan, Feb. 5, 1975, 50-14232
 Int. Cl.² H04J 11/00

U.S. Cl. 179-15 BC

10 Claims



1. A multi channel multiplex orthogonal VSB transmission system comprising a modulator, a demodulator and a transmission means arranged between the modulator and the demodulator; said modulator comprising at least a two-channel modulator, means for generating a plurality of carrier waves at the frequency interval f_c where f_c is the pulse repetition frequency in each channel; and wherein said two-channel modulator comprises; means connected to each input channel for obtaining the sum and the difference of PAM signals of each pair of input channels, a pair of roll-off filters connected to the output of said means for the sum and the difference respectively, said roll-off filters having the equal amplitude roll-off characteristic less than 50%, a predetermined equal fixed delay and the phase characteristics of 45° and -45° respectively in the amplitude roll-off region, a variable phase shifter for shifting the phase of said carrier waves, a fixed phase shifter for delaying the phase of the output of said variable phase shifter by 90°, a first multiplying means inputs of which being connected to the output of one of said roll-off filters and the output of said fixed phase shifter, a second multiplying means inputs of which being connected to the output of the other roll-off filter and the output of said variable phase shifter, and means for adding the outputs of said first and second multiplying means and providing the output of the two-channel modulator.

4,053,714

ELECTRICAL DATA COLLECTING DEVICE

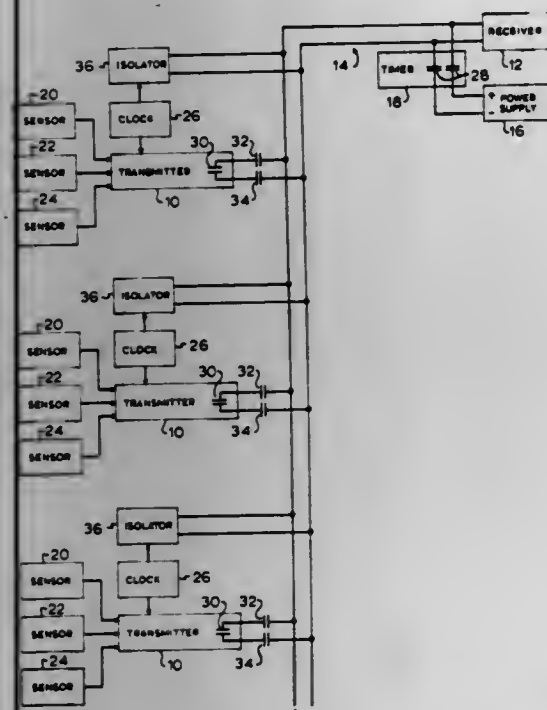
Robert G. Long, Toronto, Canada, assignor to Canadian PGL Electronics Inc., Scarborough, Canada

Filed Apr. 6, 1976, Ser. No. 674,130

Int. Cl.² H04J 3/08

U.S. Cl. 179—15 AL

6 Claims



1. An electrical data transmitting system for collection and transmission of data from a plurality of remote locations comprising:

- a plurality of data transmitting devices each having an input, an output and a rechargeable power source;
- a plurality of remotely-located data sensors electrically connected to the inputs of said data transmitting devices, said sensors being constructed to sense data at their respective locations and conduct a corresponding signal to the input of said data transmitting device;
- a plurality of transmitting device timers, each of which is electrically connected to a respective one of said data transmitting devices;
- a data receiving device having an input and being constructed to receive at said input data signals from the outputs of said data transmitting devices;
- a data transmission line for electrically connecting the input of said data receiving device and the outputs of said data transmitting devices;
- a recharging voltage source for recharging each of said rechargeable power sources through said data transmission line;
- means for setting the transmitting device timer of each of said data transmitting devices to connect for a time interval one of said data transmitting devices to said data transmission line whereby the plurality of data transmitting devices are connected to and disconnected from said data transmission line, one at a time, in a predetermined time sequence; and
- a master timer electrically connected to said data transmission line and constructed to be cyclically operable to dictate connection of said recharging voltage source to said data transmission line to recharge said rechargeable power sources for a time interval following sequential data transmission by said plurality of data transmitting devices, said means for setting the transmitting device timer being responsive to operation of said master timer.

4,053,715

STUFFING CHANNEL UNIT FOR TELEPHONE PCM SYSTEM

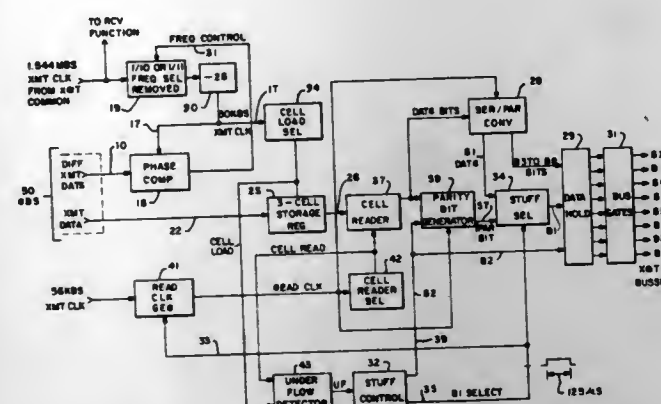
Paul E. Drapkin, Palo Alto, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed Mar. 22, 1976, Ser. No. 669,398

Int. Cl.² H04J 3/06

U.S. Cl. 179—15 AF

10 Claims



7. A time division transmission system for an asynchronous pulse train having means for converting the pulse repetition rate (PRR) to a higher PRR by the insertion of stuff pulses in a channel word of said time division system to a predetermined plurality of said channel words constituting a frame of said system comprising transmission means for inserting stuff pulses in said pulse train in one of said channel words and for inserting control bits in the same word, and means for receiving said pulse train and decoding a sequence of said control bits for framing said one channel and for detecting and removing said stuff pulses said decoding means sensing control bit sequences of two different lengths the long length corresponding to a low stuffing rate and the shorter length a higher stuffing rate.

4,053,716

SWITCHING NETWORK WITH A CROSSTALK ELIMINATION CAPABILITY

Osamu Enomoto, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

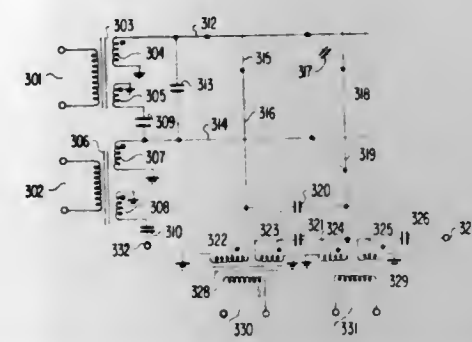
Filed July 26, 1976, Ser. No. 708,455

Claims priority, application Japan, July 28, 1975, 50-91787

Int. Cl.² H04Q 3/50, 1/36

U.S. Cl. 179—18 GF

7 Claims



1. A switching network with crosstalk elimination capability comprising:
- a group of incoming lines connected to subscribers;
 - a group of outgoing lines intersecting said incoming line group;
 - a plurality of switching elements provided at preselected crosspoints formed between said incoming lines and said outgoing lines for interconnecting a desired incoming line and a desired outgoing line in response to a call from a subscriber;
 - a plurality of transformers each having a primary winding connected to a selected incoming or outgoing line and at least a first secondary winding for generating a signal

reverse in phase to that supplied to the primary winding; and a plurality of first capacitors each having one end connected to each said first secondary winding of the transformers and the other end connected to an incoming or outgoing line adjacent to the selected incoming or outgoing line.

4,053,717

CORDLESS TELEPHONE

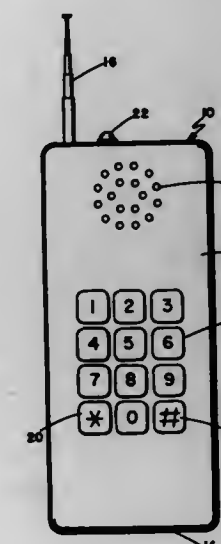
David Eugene Snider, 11046 Negley, San Diego, Calif. 92123

Filed Feb. 27, 1976, Ser. No. 662,035

Int. Cl.² H04M 7/04

U.S. Cl. 179—41 A

14 Claims



1. A cordless telephone system comprising:
- a. a base unit for connection to telephone lines, said unit including means for transmitting and receiving telephone switching signals and audio signals to and from a cordless telephone; and
 - b. a cordless telephone, including,
 - a speaker and a microphone,
 - means for transmitting and receiving telephone switching signals and audio signals to and from the base unit,
 - first control means for enabling and inhibiting energization of the cordless telephone to enable and inhibit the cordless telephone to receive and detect a "ring" signal from the base unit and to provide said ring signal to the speaker; and
 - second control means for enabling and inhibiting the transmitting means in the cordless telephone, and for enabling and inhibiting the receiving means in the cordless telephone to provide audio signals from the base unit to the speaker;

CHARACTERIZED BY

the cordless telephone comprising a touch-tone signal generator module for generating switching signals, said module including ten buttons for initiating the generation of signals representing ten numeric characters, and two additional buttons, wherein one of the two additional buttons is adapted for operating the first control means, and the second additional button is adapted for operating the second control means.

4,053,718

AUTOMATIC TELEPHONE CALL GENERATOR

Oscar Derveaux, Paris, France, assignor to Soprogaspar Societe de Promotion et de Gestion de Participations, Paris, France

Filed Oct. 28, 1975, Ser. No. 626,221

Claims priority, application France, Oct. 30, 1974, 74.36317

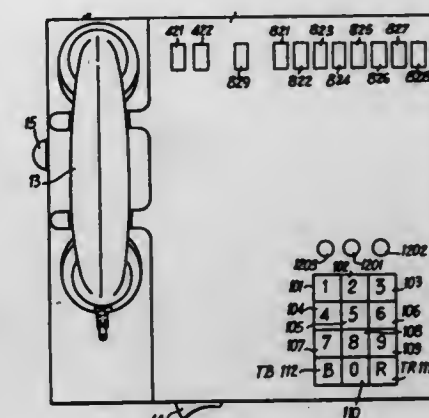
Int. Cl.² H04M 1/51

U.S. Cl. 179—90 B

16 Claims

1. An automatic telephone call generator comprising a keyboard having digital keys emitting digital signals and only two function keys each emitting a special signal, a memory store

comprising a plurality of memory location registers having a predetermined capacity, an addressing device for the said memory location registers of the said store, means for writing the digits of the coded call numbers in binary coded form in the said store, a reading register of the digital signals read in the store, a call pulse emitter and a control circuit of the said call pulse emitter, wherein each memory location register can contain one or two call numbers each having a random number of digits, whereby the total number of digits is equal to or less than the memory location register capacity less one unit, wherein the two call numbers of one and the same memory



location register are on recording, separated by a first special signal upon actuating one of said function keys, wherein the final part of the memory location register beyond the first number, if there is only one, or beyond the second number if there are two is filled by second special signals upon actuating the other of said function keys, and wherein the apparatus comprises detectors of the first and second special signals, means for commencing the reading of the store either at the start of a selected memory location register or at the first special signal detected by the said first special signal detector and for stopping this reading when a second special signal is detected by said second special signal detector.

4,053,719

CONNECTOR BLOCKS FOR TELECOMMUNICATIONS LINES

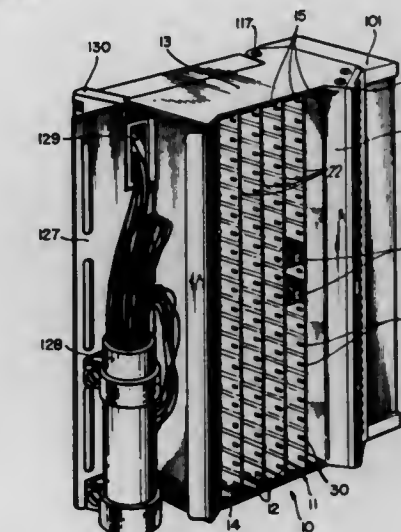
George Debortoli, and Detlef Zimmermann, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 27, 1976, Ser. No. 736,174

Int. Cl.² H04M 3/22

U.S. Cl. 179—98

13 Claims



1. A connector block for telecommunications lines, comprising three sections in a unitary structure, including a protector field, a cross-connect field and a test field, said protector field comprising a rectangular housing having opposed sides, top and bottom, a plurality of partitions

extending longitudinally in said housing in spaced apart parallel array and means on said partitions to define a plurality of protector positions extending in a column between each two adjacent partitions, a back member in said housing, and terminals extending through said back member and each terminal including front portions for connection to a protector inserted in a protector position and rear portions for connection of conductors thereto, said terminals including two outside plant terminals for connections to outside plant equipment and two central office terminals for connection to central office equipment;

said cross-connect field extending down one side of said protector field and extending parallel to said side, and comprising an electrically insulated terminal block spaced from and parallel to said side of said protector field and extending longitudinally down said side, and a plurality of terminals extending through said terminal block, and including a terminal for each outside plant terminal and a terminal for each central office terminal in said protector field, each terminal including a forward part for connection of a jumper wire connection to a central office and a rearward part for connection of a conductor from a central office terminal in said protector field;

said test field attached at one side to said one side of said protector field at a forward edge thereof and comprising an insulating member extending longitudinally of said protector field and inclined outwardly and rearwardly thereof to connect at its other side to said terminal block of said cross-connect field, and terminals extending through said member, a terminal for each outside plant terminal of said protector field, each terminal including a rear portion for connection of a conductor from a related outside plant terminal and a front portion for acceptance of a test lead.

4,053,720

AUTOMATIC EXCLUSION CIRCUIT

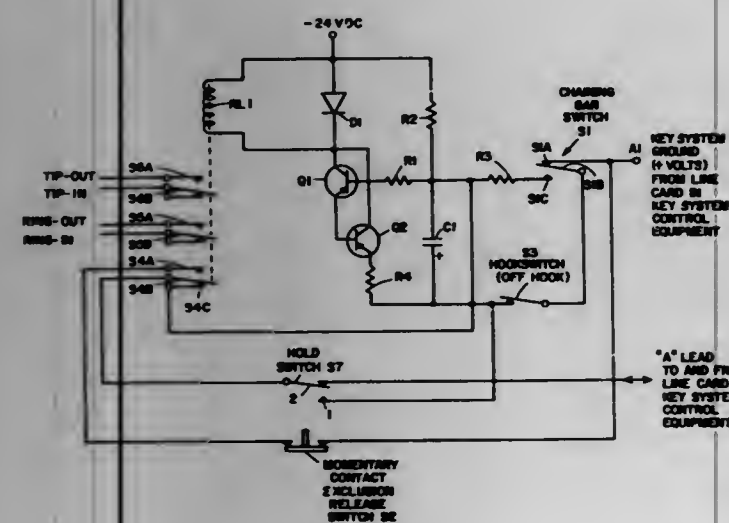
Thomas Joseph Wycheck, and George Edward Leiblich, both of Harrisburg, Pa., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 2, 1975, Ser. No. 636,855

Int. Cl.² H04M 1/68

U.S. Cl. 179-99

11 Claims



1. An automatic exclusion circuit for a subset of a key telephone system comprising:
a relay to connect said subset to a selected line of said key telephone system when said relay is activated;
a first source of key system positive ground;
a control circuit coupled to said relay and said first source to control the operation of said relay; and
an "A" lead coupled to said control circuit, said "A" lead disabling said control circuit and, hence, said relay when said key system positive ground is coupled into said subset on said "A" lead and enabling the operation of said con-

trol circuit and, hence, activation of said relay when said key system positive ground is not coupled into said subset on said "A" lead;

said control circuit including

a pair of transistors each having base, emitter and collector electrodes interconnected to form a Darlington pair circuit,

a second source of operation potential,

said relay being connected between the collector electrodes of said pair of transistors and said second source, a diode connected in shunt relation to said relay,

a first resistor having one terminal coupled to the base electrode of one of said pair of transistors,

a second resistor having one terminal connected to the emitter electrode of the other of said pair of transistors,

a capacitor having one terminal connected to the other terminal of said second resistor and the other terminal connected to the other terminal of said first resistor, and

a third resistor having one terminal connected to the other terminal of said capacitor and the other terminal connected to said second source,

said capacitor and said third resistor provide a time delay circuit for said control circuit.

4,053,721

PIEZOELECTRIC TYPE PICKUP CARTRIDGE FOR STEREO WITH PRESSING AND INTERMEDIATE MEMBERS FOR COUPLING

Kazuo Nishikawa, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

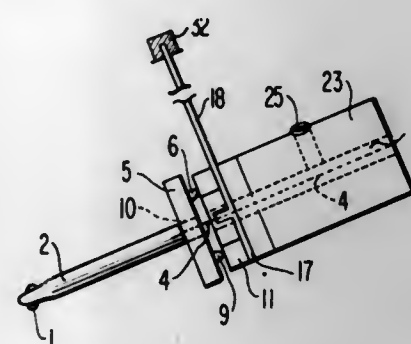
Filed Feb. 18, 1976, Ser. No. 659,064

Claims priority, application Japan, Feb. 18, 1975, 50-21545

Int. Cl.² H04R 1/16

U.S. Cl. 179-100.41 K

7 Claims



1. A piezoelectric type pick-up cartridge comprising a cantilever having one end mounting a stylus and the other end connected to a base member by a wire, an intermediate member deformable in two orthogonal directions mounted on said base member adjacent the point of connection of said base member and said wire, a press plate means secured to the other end of said cantilever and in contact with said intermediate member for transmitting the movement of said cantilever to said intermediate member, a piezoelectric transducing means for generating electric signals in response to the deformations thereof mounted on said base member and positioned to abut the intermediate member on a side thereof opposite to the side of said intermediate member which contacts said press plate means, a damper means mounted on said base member and on said piezoelectric transducing element, said piezoelectric transducing element being tightly positioned between said damper means and said intermediate member, whereby vibration of said stylus is transferred to said piezoelectric element via said cantilever, said press member and said intermediate member.

4,053,722

SOLID STATE TWO-WIRE/FOUR-WIRE CONVERTER WITH COMMON BATTERY

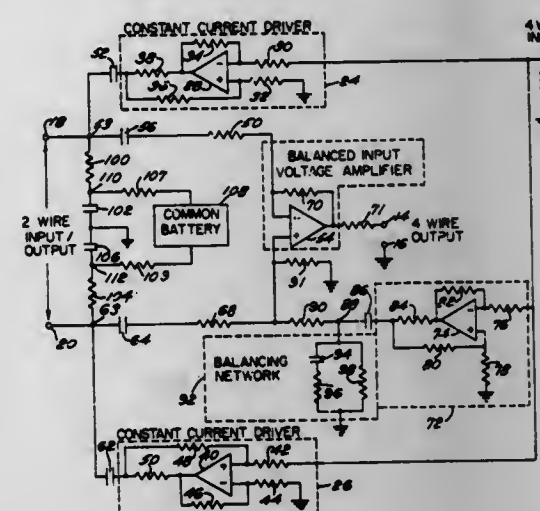
Lawrence P. Nahay, Cinnaminson, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 4, 1976, Ser. No. 729,541

Int. Cl.² H04B 1/58

U.S. Cl. 179-170 NC

2 Claims



1. A two-wire/four-wire converter system comprising:
four-wire input terminals, four-wire output terminals and a pair of two-wire input/output terminals;
an inverting solid state constant current driver and a non-inverting solid state constant current driver, said drivers in combination connected to transmit and balance a signal from said four-wire input terminals to said two-wire input/output terminals;
balancing means for use in inhibiting signals from said four-wire input terminals from appearing at said four-wire output terminals, said balancing means comprising a constant current amplifier having an input connected to said four-wire input terminals and a balancing network connected to the output of said constant current amplifier;
amplifier means connected at its output to said four-wire output terminals, and connected at its input to said inverting constant current driver, said non-inverting constant current driver, said balancing means and said pair of two-wire input/output terminals for transmitting signals originating in the converter system at said two-wire input/output terminals and inhibiting signals originating in the converter system at said four-wire input terminals; and
a battery connected to said two-wire input/output terminals.

4,053,723

METHOD AND APPARATUS FOR MEASURING THE BIT ERROR FREQUENCY IN A CABLE CAUSED BY CROSSTALK BETWEEN LINE PAIRS DURING TRANSMISSION OF A 3-LEVEL CODED PCM SIGNAL

Juho Arras, Stockholm; Mats Orjan Mattsson, Farsta, and Walter Herbert Erwin Widl, Bandhagen, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 14, 1976, Ser. No. 686,561

Claims priority, application Sweden, May 28, 1975, 7506114

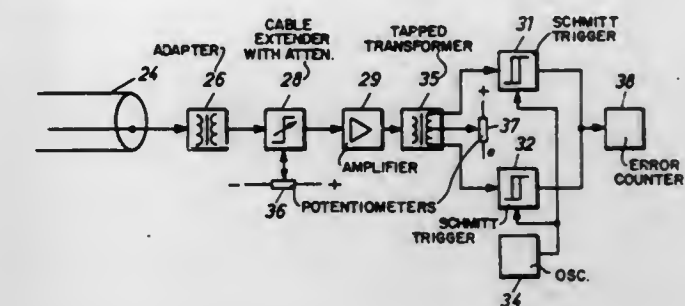
Int. Cl.² H04B 3/46

U.S. Cl. 179-175.3 R

9 Claims

1. A method for measuring in a cable especially a telephone cable the bit error frequency caused by crosstalk from at least one disturbing pair on which is transmitted for example a PCM signal to a given length of a disturbed pair intended for transmission of a 3-level coded PCM signal, characterized in that
a. the disturbances transferred to the disturbed pair by crosstalk are equalized in correspondence to the given cable length,
b. at times determined by the bit time frequency of the in-

tended PCM signal are determined whether the magnitude of the equalized disturbances exceed a critical disturbing level which negligibly deviates from half the vertical eye opening in the eye pattern of the PCM signal intended for transmission being equalized to the same degree, and



c. during a given time positive outcome of the determination whether the magnitude of the equalized disturbances exceed said critical level are added, the corresponding error frequency which the intended PCM signal would have shown when transmitted via the cable length corresponding to the equalization being proportional to the obtained sum and inversely proportional to said given time.

4,053,724

PANEL AND PLURAL MODULE ASSEMBLY HAVING MECHANICAL KEYING AND MODULAR PLUG STRUCTURE TO ACTIVATE/DEACTIVATE AUTOMATICALLY BRIDGED LOAD CARRYING CIRCUITS

Jesús Gomez Llona, Munguia (Vizcaya), Spain

Filed June 19, 1975, Ser. No. 588,618

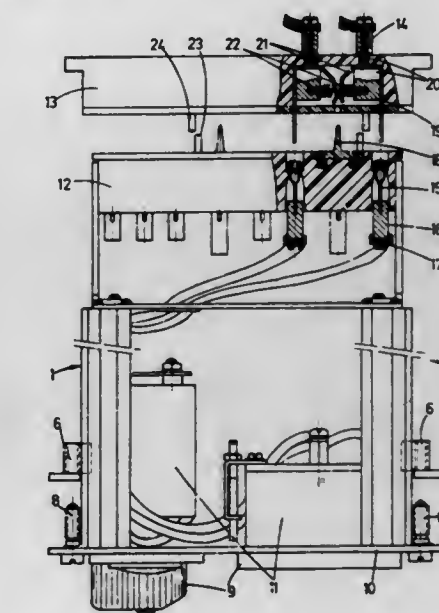
Claims priority, application Spain, June 21, 1974, 427518;

Feb. 12, 1975, 434666; Feb. 12, 1975, 434667

Int. Cl.² H01R 13/70, 33/54

U.S. Cl. 200-51 R

6 Claims



1. A modular switching and control system comprising;
a. a master structure;
b. a plurality of independent switching and control units;
c. said independent switching and control units being of at least first and second different types;
d. said master structure containing mechanical means cooperative with means on said switching and control units for mounting said switching and control units in and removing them from said master structure;
e. said mechanical means being of at least first and second types and having means for preventing mounting of at least said second type of switching and control unit in said first type of mechanical means;

- f. a plurality of first electrical connector plates in said master structure;
- g. a second electrical connector plate on the rear of each switching and control unit, said second electrical connector plate being adapted to electrical and mechanical mating with at least one of said first electrical connector plates in said master structure;
- h. means in each said first electrical connectors which is associated with an external load carrying circuit for maintaining power to the external load carrying circuit when its associated second electrical connector is withdrawn;
- i. means in each said second electrical connector which is associated with an external load carrying circuit for interrupting said means for maintaining when said second first connectors are mated;
- j. a test connector on at least one switching and control unit said test connector being accessible from external to said unit;
- k. a test plug having terminals adapted to mating with said test connector; and
- l. means on said test connector and test plug for making electrical connections with circuits within said switching and control unit.

4,053,725

PRESSURE SWITCH FOR OUTDOOR REFRIGERATION SYSTEMS

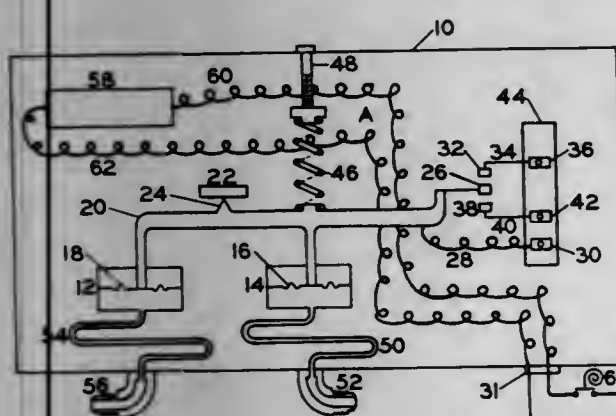
Daniel E. Kramer, 2009 Woodland Drive, Yardley, Pa. 19067

Filed Apr. 7, 1976, Ser. No. 674,572

Int. Cl.² H01H 35/34

U.S. Cl. 200—81 R

6 Claims



1. Improved pressure control means comprising a casing, a switch within the casing, pressure responsive means within the casing for actuating the switch during summer and winter conditions; a connection; restricted conduit means joining the pressure responsive means to the connection for communicating pressure from the connection to the pressure responsive means wherein the improvement comprises; heating means for warming said restricted means.

4,053,726

PUSH-BUTTON ELECTRICAL SWITCH

William J. Schaad, Winnetka, Ill., assignor to Indak Manufacturing Corporation, Northbrook, Ill.

Filed Feb. 24, 1976, Ser. No. 660,920

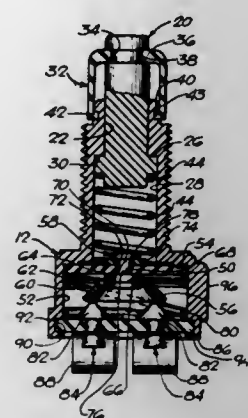
Int. Cl.² H01H 9/04

U.S. Cl. 200—159 R

3 Claims

1. A push-button electrical switch, comprising a casing having an axial generally cylindrical opening therein, a push button movable in said cylindrical opening in an axial direction, said push button having a front portion extending through said opening and out of said casing, said opening having an enlarged axial generally cylindrical rear portion,

an insulating carriage disc movable in said enlarged portion in a generally axial direction, said casing having an insulating rear wall disposed to the rear of said carriage disc and closing the rear end of said enlarged portion, said casing having a rearwardly facing annular shoulder at the front end of said enlarged portion, fixed contact means disposed in said enlarged portion and on said insulating rear wall opposite said carriage disc, movable contact means mounted on the rear side of said carriage disc and movable therewith into and out of engagement with said fixed contact means for establishing and breaking an electrical circuit, a first compression coil spring disposed in said enlarged



portion and compressed between said insulating rear wall and said insulating carriage disc for biasing said disc and said movable contact means away from said fixed contact means, said spring initially biasing said carriage disc against said shoulder, and a second compression coil spring disposed in said opening and compressed between said push button and said insulating carriage disc for initially biasing said push button in a forward direction and for overcoming the strength of said first compression spring and thereby moving said carriage disc rearwardly to bring said movable contact means into engagement with said fixed contact means when said push button is moved rearwardly in said opening toward said carriage disc.

4,053,727

ARC BLOW-OUT SWITCH

Karl Kriechbaum, Kassel, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

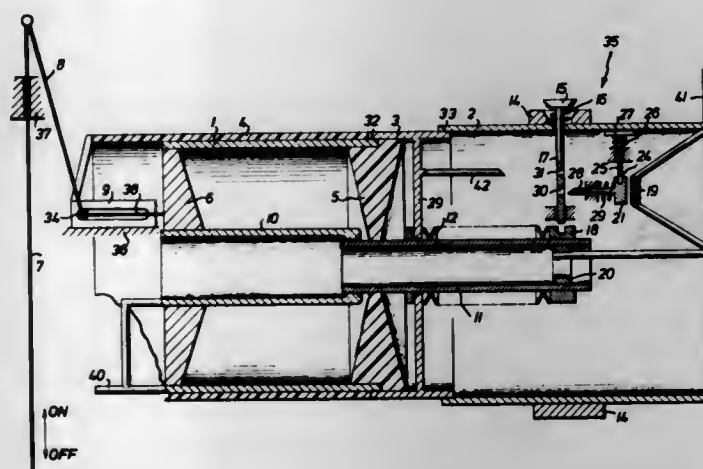
Filed Jan. 28, 1976, Ser. No. 652,973

Claims priority, application Germany, Jan. 31, 1975, 2503910

Int. Cl.² H01H 33/70

U.S. Cl. 200—148 A

14 Claims



1. In a gas current blow-out switch including a stationary compression cylinder; a stationary hollow power contact pin supported in and coaxially with the compression cylinder; an

annular piston surrounding the stationary power contact pin and slidably received at one end of the cylinder for compressing an arc-extinguishing gas in the cylinder; a nozzle stationarily affixed to the cylinder for bounding the cylinder at the other end thereof; and a movable hollow power contact pin supported coaxially with the stationary contact pin and passing through the nozzle; the movable contact pin having a closed position in which it engages the stationary contact pin and an open position in which it is separated from the stationary contact pin and in which compressed gas from the cylinder flows between the separated contacts; the improvement comprising:

- an electrically conducting stationary tube arranged in axial alignment with and spaced from said compression cylinder; said compression cylinder being electrically conducting;
- a contact bridge slidably supported by and being in continuous electric contact with said stationary tube; said contact bridge being in continuous electric contact with said movable contact pin; said contact bridge having a closed position in which it electrically contacts said compression cylinder and an open position in which it is separated from said compression cylinder; said tube and said contact bridge constituting a movable rated current contact and said compression cylinder constituting a stationary rated current contact;
- an insulator cylinder surrounding said compression cylinder and being slidable thereon; said insulator cylinder being coupled to said contact bridge for shifting said contact bridge upon motion of said insulator cylinder;
- a spring connected to said contact bridge and said movable contact pin to urge said movable contact pin towards its said open position upon displacement of said contact bridge towards its said open position;
- a carriage shiftably arranged on a support;
- a drive member secured to said carriage and being displaceable between two limits with respect to said carriage; said drive member being arranged for displacing said carriage after said drive member reached either one of said limits;
- means connecting said drive member to said piston for effecting displacement of said piston by said drive member;
- means connecting said carriage to said insulator tube for effecting displacement of said insulator tube by said carriage; and
- means for moving said drive member.

4,053,728

BRAZED JOINT BETWEEN A BERYLLIUM-BASE PART AND A PART PRIMARILY OF A METAL THAT IS RETRACTABLE WITH BERYLLIUM TO FORM A BRITTLE INTERMETALLIC COMPOUND

Joseph L. Talento, Media, and Carl C. Popadick, West Chester, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Oct. 24, 1975, Ser. No. 625,630

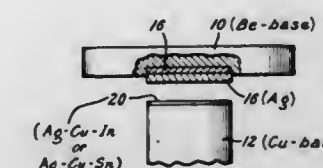
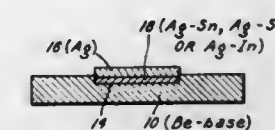
Int. Cl.² H01H 1/02; C22C 5/06

U.S. Cl. 200—267

27 Claims

1. In combination, a first part that is primarily of beryllium, a second part that is primarily of a metal that forms brittle intermediate compounds with beryllium at temperatures above a predetermined level, and a brazed joint between said first part and said second part that is made using temperatures above said predetermined level, said brazed joint comprising:
- a first layer of brazing alloy in contact with said first part and brazed thereto, said brazing alloy just prior to being brazed to said first part consisting essentially of silver and a minor constituent selected from the group consisting of tin, silicon, indium and combinations of two or more of said element minor constituents; the tin being present in a range of 4 to 15% by weight of the alloy in the case of a silver-tin alloy; the silicon being present in a range of 1 to 5% by weight of the alloy in the case of a silver-silicon

alloy; the indium being present in a range of 6 to 25% by weight of the alloy in the case of a silver-indium alloy; and the combination being present in such a weight percentage that the alloy has a solidus temperature of between 675° C and 900° C in the case of an alloy of silver and said combination of elemental minor constituents;



- a second layer contacting said first layer and brazed thereto; said second layer being of a material that just prior to being brazed to said first layer consists essentially of silver;
- and means forming a brazed connection between said second layer and said second part.

4,053,729

METHOD AND ARRANGEMENT OF MASSES AVOIDING CHATTERING

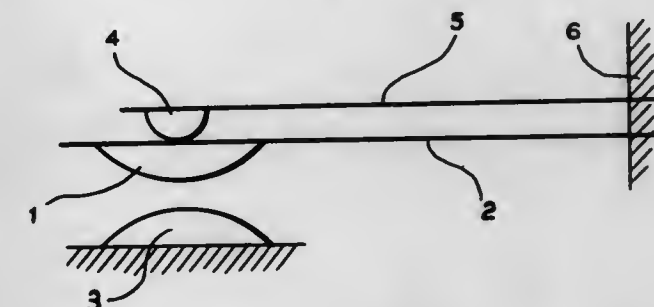
Lothar Reiter, Johann Straussgasse 27, A-1040, Vienna, Austria

Filed Mar. 19, 1976, Ser. No. 668,768

Int. Cl.² H01H 3/60

U.S. Cl. 200—288

5 Claims



1. An electrical contact device having two contact members each of which has a specific elasticity and weight, at least one of said contact members being movable, additional members having different weights and elasticities arranged in relation to one of said contact members in the direction of the push from the rear side of said at least one contact member comprising means for taking over the kinetic energy from said contact members in said pushing direction starting with said at least one movable contact member, said additional members weights decreasing and said elasticities increasing in the direction of said push providing an energy loss factor which increases in the direction of said push whereby the product of said weight times said elasticity of said at least one contact member and of each of said additional members is approximately equal to avoid rebound of said movable contact member and effectively transferring the kinetic energy upon impact caused by said contact members.

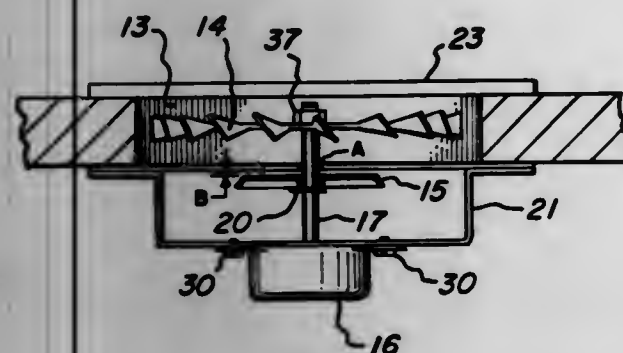
4,053,730

MICROWAVE OVEN SHAFT SEAL

David Alan Baron, Edina; Donald Carl Naab, Plymouth, and James Ronald Hampton, Brooklyn Center, all of Minn., assignors to Litton Systems Inc., Beverly Hills, Calif.
Filed May 17, 1976, Ser. No. 686,709
Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 F

12 Claims



1. In a microwave oven having a plurality of metal walls and a door joined to form an oven cavity, a source of microwave energy adapted to provide a microwave energy field; energy deflecting means adapted for rotational movement in said energy field; driving means located outside of said cavity and having a shaft extending through one of said walls, said deflecting means being operably connected to said shaft, the improvement comprising energy seal means positioned on said shaft between said wall and said motor.

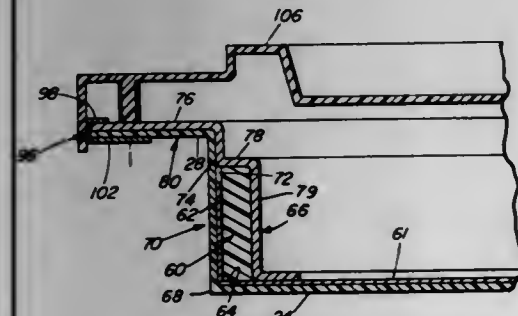
4,053,731

MICROWAVE ENERGY OVEN SEAL

Richard A. Foerstner, Iowa City, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa
Continuation of Ser. No. 479,379, June 14, 1974, abandoned.
This application Jan. 8, 1976, Ser. No. 647,685
Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 D

15 Claims



1. Heating apparatus comprising:
an enclosure;
means for energizing said enclosure with electromagnetic wave energy predominantly adjacent a predetermined operating frequency;
said enclosure comprising a wall member having an access opening communicating with said enclosure;
a door for closing said opening;
an energy escape seal comprising at least portions of said door and access opening peripheral walls and forming a propagation path for said energy extending from a first region adjacent to the interior of said enclosure and to the peripheral edges of said opening to a second region outside said seal;
said seal having a first dielectric loaded frequency responsive structure coupled to said path comprising first substantially low impedance means electrically spaced a distance substantially equal to an integral number of one-half wavelengths at said operating frequency from said first region and a second portion of said path communicating with the first path portion and defined at least in part

by opposing adjacent wall surfaces of said door and wall members when said door is closed;
said second path portion terminating at said second region adjacent to the outer peripheral edges of said door;
a second dielectric loaded frequency responsive structure coupled to said second path comprising second substantially low impedance means electrically spaced from said second region by a distance substantially equal to an integral number of half wavelengths of said frequency; and
said first and second frequency responsive structures being substantially resonant at said predetermined operating frequency and coupled electrically to said path at coupling regions in said path which are spaced apart along said path for reflecting low impedances to said first region at the operating frequency of said apparatus.

4,053,732

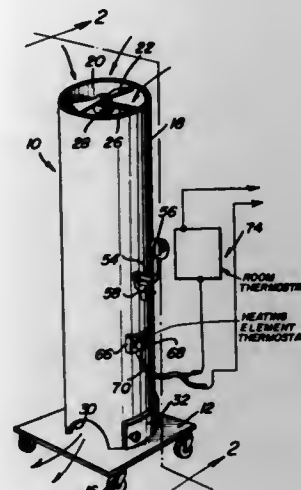
PORTABLE ELECTRIC ROOM AIR HEATER

Frank H. Carter, 428 North St., Taft, Calif. 93268

Filed Nov. 5, 1975, Ser. No. 629,616

Int. Cl.² H05B 1/00; F24H 3/08; F28D 15/00; F24D 13/04
U.S. Cl. 219—365

2 Claims



1. A room air heater comprising a vertically disposed, elongated tubular housing having air inlet means adjacent the upper end thereof and air outlet means adjacent the lower end thereof, fan means in said housing for circulating room air downwardly from the air inlet means adjacent the ceiling to the air outlet means, a heat exchange coil disposed within said housing, a heat exchange air containing tank disposed within said housing and having its upper and lower ends communicated respectively with the remote ends of the heat exchange coil for circulation of heat exchange air from the tank, through the coil and back to the tank, said coil and tank being filled with compressed air serving as the heat exchange air with the compressed air being at approximately 15 psi, a heater element disposed in the tank for heating the heat exchange air therein for causing circulation of such air through the coil and tank whereby room air passing over the coil and tank will be heated, said fan means being located adjacent the upper end of the housing, said tank being vertically elongated and disposed in the lower portion of the housing in peripherally spaced relation thereto and above the air outlet means, said heat exchange coil being disposed below the room air inlet means and above the tank with the heat exchange coil being in the form of a helically coiled tube peripherally spaced from the interior of the housing so that air passing downwardly between the heat exchange coil and housing and between the tank and housing will maintain the housing in a substantially cool condition thereby enabling hand contact with the housing without injury due to burning, said heating element being an elongated electric resistance-type heating rod disposed longitudinally in the tank for heating the compressed air during vertical movement thereof in the tank, thermostatic control means for controlling operation of the heating element and fan means, and a supporting base for the housing with the housing being rigidly secured

thereto, said supporting base extending peripherally of the housing and being provided with supporting wheel means thereon to enable the heater to be easily moved from one location to another thereby eliminating installation cost, said air outlet means including circumferentially spaced notched openings formed in the lower end of the housing at its juncture with the base, said housing including a lateral opening provided with a closure door adjacent the lower end thereof, a pan of less height than the air outlet means, said pan having a quantity of water and antiseptic therein and disposed interiorly of the housing and resting on the supporting base in the flow path of air exiting from the air outlet openings for impinging the air onto the surface of the water for vaporizing and entraining some of the water and antiseptic therein.

4,053,733

TEMPERATURE CONTROL DEVICE

Tomoji Murata, and Masayuki Maese, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

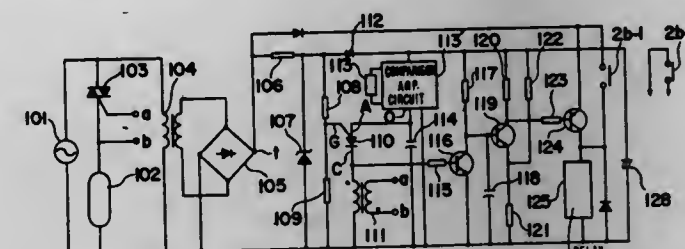
Filed July 16, 1975, Ser. No. 596,243

Claims priority, application Japan, Aug. 6, 1974, 49-90438; Apr. 30, 1975, 50-52697

Int. Cl.² G05D 23/24

U.S. Cl. 219—494

14 Claims



1. A temperature control device for controlling the temperature of a portion to be heated by a heating element to which electric power is supplied, the device comprising:
a pulse generating means for generating pulses with the intervals between the pulses varying in accordance with the temperature of the portion to be heated by the heating element,
a switching means coupled to said pulse generating means for being supplied with the pulses from said pulse generating means and for controlling the electric power supplied to the heating element in accordance with the pulse intervals, and
a sensing means coupled to said pulse generating means for sensing a specific pulse interval at which the temperature of the portion to be heated has reached a predetermined level and upon sensing said specific interval, said sensing means generating a signal indicative of completion of warming-up of the portion to be heated as its temperature reaches the predetermined level.

4,053,734

CURVE READING METHOD AND APPARATUS

Solchiro Yasunaga, 2-28, Denenchofu, Ohta, Tokyo, Japan

Filed June 22, 1976, Ser. No. 698,760

Claims priority, application Japan, June 23, 1975, 50-75686; Oct. 3, 1975, 50-118798

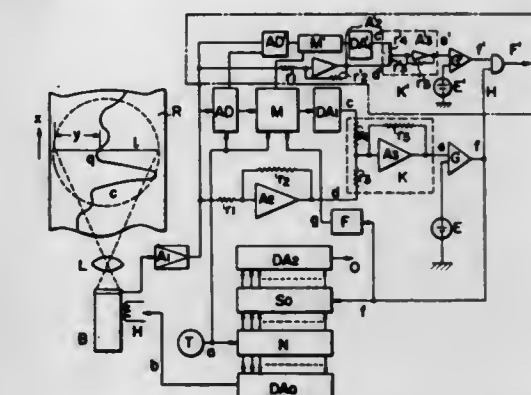
Int. Cl.² G06K 11/02; B22D 7/10; G11B 5/09

U.S. Cl. 235—61.6 A

8 Claims

1. A method of reading an optically visible curve line carried on a recording medium and providing an indication of the meandering of the curve line which method comprises the steps of scanning at a fixed cyclical rate transverse segments of said recording medium with a photoelectronic scanning beam while moving the recording medium relative to said beam, to generate a video output signal containing for each scanning period a voltage train varying in accordance with changes in the optical density of the corresponding scanned segment across the medium and which contains at least one pulse pro-

duced when the scanning beam *c* crosses the curve line, additively combining each such voltage train after inversion of its polarity with the voltage train generated during a preceding scanning period to produce an output signal detecting when variations in the two voltage trains being compared deviate out of synchronism or in magnitude, comparing this output signal with a fixed reference signal of a magnitude higher than noise components to produce an output pulse whenever such output



signal exceeds the reference signal, driving a binary counter having a digital output in synchronism with the rate of scanning of the record medium and initiating a readout of the instantaneous value carried by such counter upon the occurrence of said output pulse, said value corresponding to the time lapse between the start of a scanning period and the occurrence of said output pulse which corresponds to the location of the curve line segment above a base time.

4,053,735

ASSURED-CHECK COMPUTER-BASED BANK CREDIT DISBURSING SYSTEM

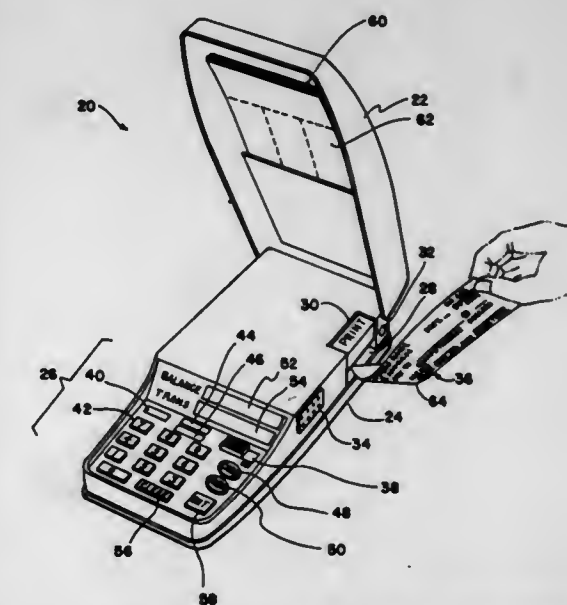
James N. Fondos, 2 Helm Court, Towson, Md. 21204

Filed Aug. 7, 1975, Ser. No. 602,769

Int. Cl.² G06K 1/20; G06F 7/38; B44B 5/00

U.S. Cl. 235—61.9 R

1 Claim

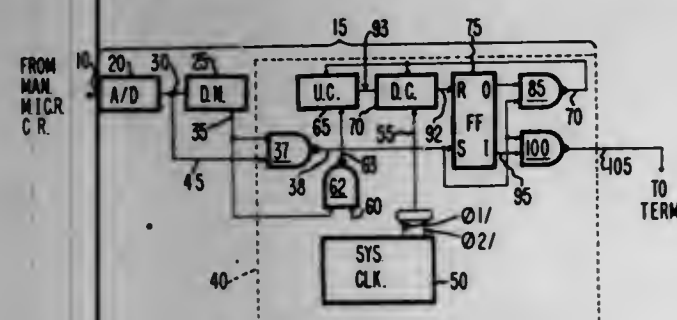


1. A banking system for controlling the dispensing of data, representing amounts of guaranteed credits, usable in purchasing transactions and the like, comprising: a fixed unit for retention under bank control in a bank, a portable unit for carriage by a user of banking services of said bank for use in making purchases; connective means for transferring data, representing banking credit amounts, from the fixed unit to the portable unit to prepare the portable unit for use in making purchases, including means on the respective fixed unit and portable unit for uniquely associating the fixed unit with the portable unit as a prerequisite to said transfer of data, representing banking credit amounts, means in the portable unit for selectively limiting operation of the portable unit to a particular user, including: means in the portable unit for demanding entry of a user-

identifying disbursement code into the portable unit, means associated with said means for demanding for affording a predetermined number of opportunities at spaced times for correct entry of a said disbursement code, means having association with said means for affording for disabling the portable unit upon failure of a correct entry of a said disbursement code following said predetermined number of opportunities; means in the portable unit for dispensing said data, representing banking credit amounts, from the portable unit upon correct entry of a said disbursement code, including means for imprinting amounts on check forms; means having association with the dispensing means for preselecting data, representing banking credit amounts, to be dispensed in respective transactions; means having association with the preselecting means for selectively designating data, representing banking credit amounts, dispensed as cash transactions or charge transactions; including means for signalling requirement for predesignation of data, representing banking credit amounts, to be dispensed as cash transactions or charge transactions and means for preventing dispensing in excess of the banking credit amount balance represented by data in the portable unit, means for indicating data, representing banking credit amounts, involved in each transaction, and means for indicating data, representing banking credit balance, in the portable unit prior and subsequent to each said transaction.

4,053,736
DIGITAL RATE COMPENSATOR FOR A CARD READER

Filed Apr. 2, 1976, Ser. No. 672,999
Int. Cl.: G06K 7/08, 7/10; G11B 25/04, 5/09
U.S. Cl. 235-61.11 D 21 Claims



1. An apparatus enabled to receive clock and data components from a card reader having variable output data rates for determining a data passage window that will adjust in or out to compensate for a relatively uneven data rate, comprising:
clock means for generating a first and a second digital pulse at a relatively low frequency and high frequency response level respectively;
first counter means operative to be reset by a clock component from the card reader for incrementing upon receipt of the first digital pulse from said clock means for measurement of the current temporal interval between clock signals from the card reader;
second counter means for receiving the transferred contents of said first counter means upon receipt of a clock component from the card reader, and for being decremented by each received second digital pulse from said clock means for measuring the current data passage window that is a predetermined proportional subset of the temporal interval as calculated between the preceding set of clock signals from the card reader; and
flip-flop means operative to be enabled to its set state by a clock component from the card reader after said second counter means has zero decremented for indicating the allowable beginning of the data passage window, and further being operative for enabling to its reset state upon receipt of a zero decrementation signal from the second counter means for indicating the predetermined end of the data passage window, wherein said flip-flop means further includes gating means operative upon concurrent receipt

of inputs of signals from the card reader and the reset state of said flip-flop means for outputting to said first and second counter means, a signal indicative that the received signal from the card reader was a clock component.

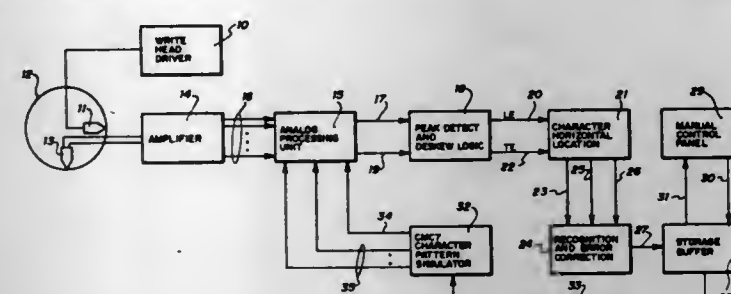
4,053,737
MAGNETIC READER FOR BAR ENCODED
CHARACTERS

James O. Lafavers, and Charles T. Kao, both of Richardson, Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

Filed June 25, 1976, Ser. No. 700,027
Int. Cl.² G06K 7/08, 7/14, 9/18

U.S. Cl. 235—61.11 D

15 Claims



1. A character recognition system for reading bar-space encoded characters printed in magnetic ink on a document surface as it passes a reading station, which comprises:
 - a. magnetic sensing means for scanning a character and forming bipolar sensor responses indicative of the passage of leading and trailing edges of magnetic material on said surface;
 - b. analog processor means in electrical communication with said magnetic sensing means for forming normalized leading edge and trailing edge waveforms from said bipolar sensor responses;
 - c. edge detecting and digitizing means for detecting a character stroke from said leading edge and said trailing edge waveforms and for producing leading edge and trailing edge digital signals;
 - d. deskew logic means receiving said leading edge and trailing edge digital signals from said edge detecting means for merging duplicate edge signals caused by any oblique scanning of said character;
 - e. means in electrical communication with said deskew logic means for detecting and repairing missing character stroke edges and missing character strokes from said leading edge and said trailing edge digital signals; and
 - f. character recognition means receiving corrected leading and trailing edge digital signals from said error correction means for identifying said character.

4,053,738
PROGRAMMABLE DATA ENVELOPE DETECTOR

Edward Roald Besenfelder, Phoenix, and Steve Garner Cantrell, Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Sept. 27, 1976, Ser. No. 727,309
Int. Cl.² G06M 3/02

U.S. CL. 235-92 PB

2 Claims

1. Apparatus for detecting the presence of a data envelope containing a plurality of preamble pulses, a plurality of data pulses, and a plurality of postamble pulses, for use with a source of pulses and a source of timing signals, said pulses and said timing signals being in substantial synchronization with one another, said apparatus including means responsive to said pulses and to said timing signals for counting said pulses and said timing signals, said counting means generating a first signal indicative of the number of preamble pulses which have been counted and generating a second signal after a predetermined number of timing

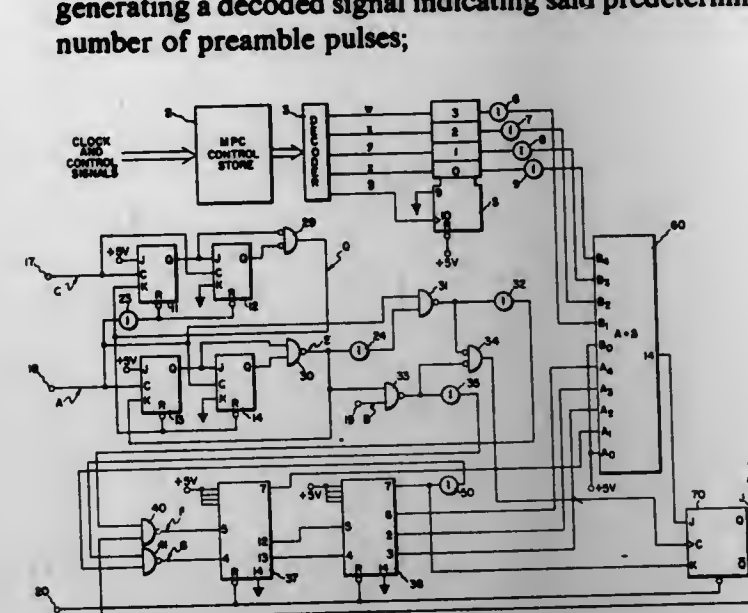
4,053,740
VIDEO GAME SYSTEM

VIDEO GAME SYSTEM
Lawrence David Rosenthal, 7146 Saroni Drive, Oakland, Calif.
94611

Filed Dec. 22, 1975, Ser. No. 643,154
Int. Cl.² A63F 9/00; G06F 3/14, 15/4

U.S. Cl. 364-705

14 Claims



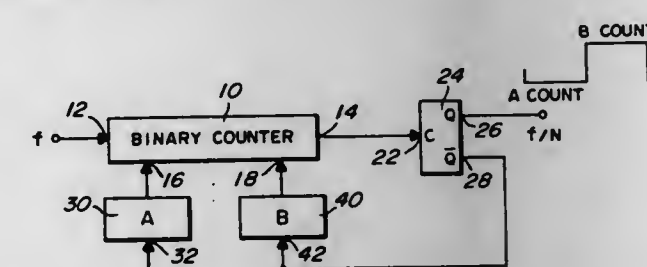
- means for comparing said first signal and said decoded signal and generating a compare signal when said first signal and said decoded signal are equal;
- latching means responsive to said compare signal from said comparing means to said second signal from said counting means, said latching means generating a first output signal upon receipt of said compare signal and generating a second output signal upon receipt of said second signal.

4,053,739
DUAL MODULUS PROGRAMMABLE COUNTER
Robert Lynn Miller, Streamwood, and Robert Neal Weisschap-
pel, Sleepy Hollow, both of Ill., assignors to Motorola, Inc.,
Schaumburg, Ill.

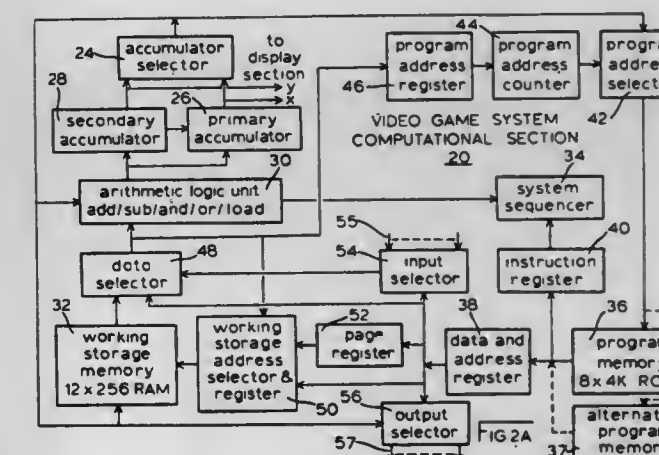
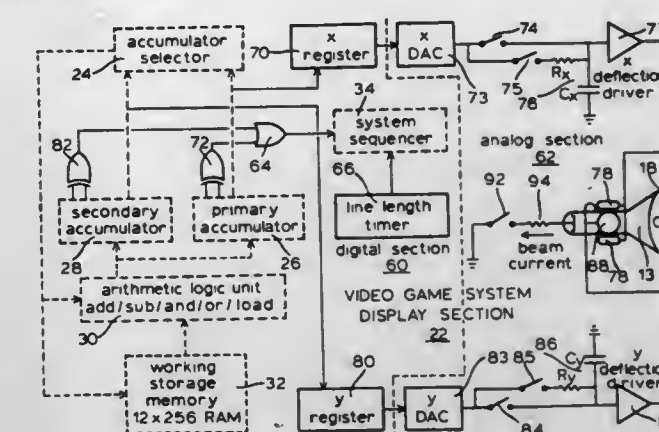
Filed Aug. 11, 1976, Ser. No. 713,470
Int. Cl.² G06F 15/20; H03B 3/04

U.S. Cl. 364-703

5 Claims



1. A multiple modulus counter for dividing a signal having a frequency f by a divisor $N = M_1 + M_2 + \dots + M_m$, where N , M_1 , M_2 , \dots , M_m are selected numbers, comprising:
 counter means including an input for receiving the signal to be divided, an output for producing a signal representative of the count of signals received at the input, and means to input a preset count state;
 a plurality of M_i preset means, each actuatable to preset one of the numbers $M_1 \dots M_m$ into the counter means;
 control means responsive to the count state at the counter output to sequentially actuate a successive one of the preset means in response to the counter counting to the count preset into the counter by the preceding preset means, the control means producing an output waveform having transitions corresponding to the actuation of predetermined preset means,
 whereby the control means output waveform is of a frequency f/N .



1. A method of implementing a computational system and a display system with a shared single digital processor to provide a visual simulation system calling for active participation by operators wherein realistic visual simulations of objects are drawn from a series of line segments on the display screen of a cathode ray tube in accordance with simulation rules and operator commands, said method comprising the steps of
- repeatedly calculating within said system display parameters needed to specify said series of line segments, and
 - repeatedly displaying said series of line segments on said display screen in accordance with said display parameters to provide said visual simulations of objects which may move and change size, shape and orientation as said simulation progresses;
- for each line segment;
- calculating Cartesian coordinates of a starting point of said line segment and calculating component values defining said line segment relative to its said starting point from said data and said operator commands in accordance with said simulation rules;
 - displaying said line segment on said screen by:
 - converting said Cartesian coordinates into deflection voltages directly related to the magnitudes of said Cartesian coordinates;
 - charging networks having the same time constant to the respective levels of said deflection voltages;
 - positioning a drawing beam in said cathode ray tube at a starting point of said line segment on said display screen with said deflection voltages to which said networks have charged;
 - converting said line component value into drawing voltages directly related to the magnitudes of said values;
 - turning on said beam to start drawing said line segment on said display screen and applying said drawing voltages to said charged networks to deflect said beam along the display locus of said line segment being drawn; and

turning off said drawing beam in accordance with said drawing duration gating signal when a terminal end of said line segment has been reached by said drawing beam.

4,053,741

SYSTEM FOR CYCLIC OPERATION OF SELF-RUNNING OBJECTS

Koh Aisoya, and Nobuyuki Koyama, both of Tokyo, Japan, assignors to The Japan Tobacco and Salt Public Corporation, Tokyo, Japan

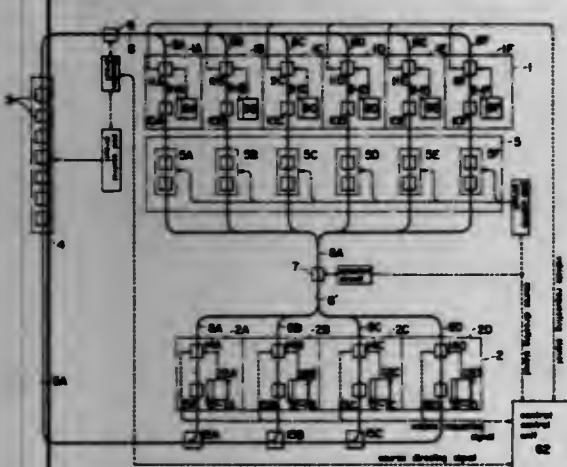
Filed Aug. 29, 1975, Ser. No. 609,169

Claims priority, application Japan, Aug. 30, 1974, 49-98907

Int. Cl.² A24C 5/35; G06F 15/46; B65G 47/00

U.S. Cl. 364-478

10 Claims



1. A method for the cyclic operation of self-running objects in a circular network of guide means including at least two working stages, each working stage having a plurality of working zones, the individual working zones of one stage differing in working capacities from the respective working zones of the succeeding stage, said method comprising the steps of feeding the self-running objects one after another along the guide means to the working zones of the first stage upon requests for the objects from the first stage working zones; effecting first working operations in association with the objects fed to the respective first working zones; pooling the objects after completion of the first working operations at the first stage working zones; feeding the objects pooled, one after another, along the guide means to the working zones of the second stage in response to requests for the objects from the second stage working zones; effecting second working operations in association with the objects fed to the second stage working zones; and pooling the objects after completion of the second working operation at the second stage working zones for further feeding of the objects to the working zones of the first stage.

4,053,742

ENERGY MEASURING SYSTEMS ADAPTED FOR USE IN CONJUNCTION WITH LOAD MOVING AND WEIGHT INDICATING DEVICES

John F. Halsey, III, Boardman Township; Homer P. Halsey, Poland Township, both of Mahoning County, Ohio, and Robert L. Troup, Highland, Ind., assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Dec. 20, 1976, Ser. No. 752,564

Int. Cl.² B66B 19/00; G01R 21/00; G06G 7/48

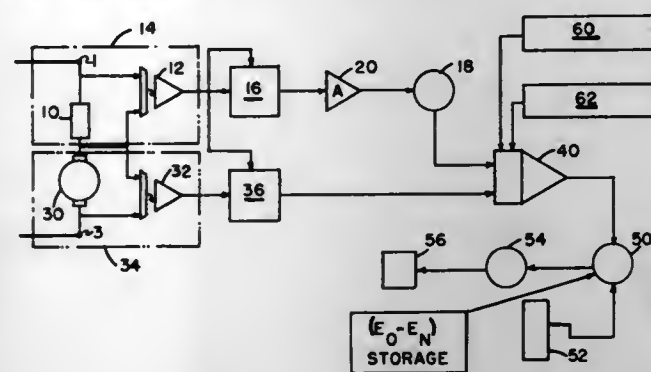
U.S. Cl. 364-506

8 Claims

1. A system comprising movable load-supporting means, motor driving means, and connecting means connecting said motor means to said load-supporting means, which further comprises apparatus for measuring the energy expended to move said load-supporting means and any load thereon from a first position to a second position, said apparatus comprising:

- a. means for measuring the motor armature current;
- b. means for measuring the voltage across the motor armature;

- c. first multiplier means for generating an electrical signal corresponding to the square of the motor current;
- d. inverter means for converting the polarity of the electrical signal from said multiplier means (c);
- e. second multiplier means for multiplying the signal from said inverter means (d) by the electrical resistance of the motor armature and generating a signal corresponding to the product thereof;



- f. third multiplier means for multiplying the motor armature current by the motor armature voltage and generating a signal corresponding to the product thereof; and
- g. integrating device means for integrating the signals from said second (e) and said third (f) multiplier means and producing a voltage corresponding to the energy required to move said load-supporting means and any load thereon.

4,053,743

METHOD FOR CONTROLLING THE PH AND OTHER CONCENTRATION VARIABLES

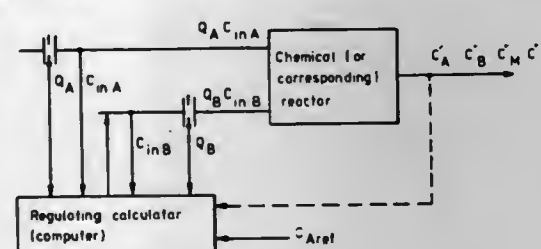
Antti Johannes Niemi, Yrjö Liipolantie 5, Kaunainen, Finland

Filed Feb. 18, 1976, Ser. No. 658,897

Int. Cl.² G06F 15/46; G05D 11/08

U.S. Cl. 364-500

12 Claims



1. A method for controlling concentration variables of process material in a chemical reactor containing reactants which reach thermodynamic equilibrium substantially simultaneously, the reactor having at least one process inlet flow through the inlet, one process outlet flow through an outlet, and one control inlet flow, further at least one desired outlet concentration being provided, the method comprising the steps of:

- a. measuring the concentration of at least one reactant of the process material in the process inlet flow, and the concentration of a reactant of a control material in the control inlet flow;
- b. providing a residence-time distribution function for the process material flow from said inlet to said outlet, and a residence-time distribution function for the control material flow from said control inlet to said outlet;
- c. calculating an apparent outlet concentration of said at least one reactant of the process material and an apparent outlet concentration of said reactant of the control material with the aid of the respective measured inlet concentration and the respective residence-time distribution function in accordance with the following relationship:

$$C_i(t) = \int_{-\infty}^t g(t-\theta) C_{in,i}(\theta) d\theta;$$

g = residence-time distribution (weighting function)

C_i = concentration of component i in the outlet channel

C_{in} = inlet concentration

t, θ = time variables

- d. assuming thermodynamic equilibrium and utilizing said provided desired outlet concentration of the preamble as well as said apparent outlet concentration of said at least one reactant of the process material in step (c), calculating a desired apparent concentration of said reactant of the controlled inlet flow at said outlet; and
- e. controlling the control inlet flow by means of a feedback control, like a proportional, integral and derivative PID control, on the basis of the difference between said apparent outlet concentration of the control reactant in step (c) and said desired apparent outlet concentration of said control reactant in step (d).

4,053,744

MEANS FOR CONTROLLING A SOLVENT REFINING UNIT

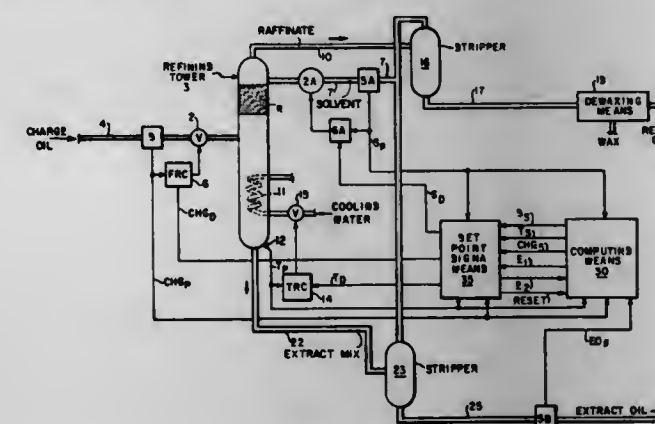
Robert A. Woodle, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,487

Int. Cl.² G06G 7/58; C10G 43/08, 21/00

U.S. Cl. 364-501

7 Claims



1. A control system for a solvent refining unit which treats charge oil with a solvent in a refining tower to yield raffinate and extract-mix, strippers separate the solvent from the raffinate and extract-mix to provide refined waxy oil and extract oil, respectively, the solvent is returned to the tower and the refined waxy oil is subsequently dewaxed to provide refined oil, comprising temperature sensing means for sensing the temperature of the extract-mix in the refining tower and providing a signal T_p corresponding thereto; charge oil sensing means for sensing the flow rate of the charge oil and providing a corresponding signal CHG_p ; extract oil sensing means for sensing the flow rate of the extract oil and providing a signal EO_p representative thereof; solvent sensing means for sensing the flow rate of the solvent and providing a signal S_p corresponding thereto; signal means connected to all the sensing means for providing signals T_p , CHG_p and S_p corresponding to a desired temperature for the extract mix in the refining tower, to a desired flow rate for the charge oil and to a desired flow rate for the solvent in accordance with signals CHG_p and T_p and EO_p so as to operate the refining unit to achieve either a maximum allowable flow rate for the solvent, or a maximum allowable flow rate for the extract oil or a maximum allowable refined oil flow rate or a reduced charge oil flow rate for fixed refined oil flow rate; and control means connected to the signal means for controlling the charge oil flow rate, the refining tower extract mix temperature and the solvent flow rate in accordance with signals CHG_p , S_p and T_p .

4,053,745

VALVE CONTINGENCY DETECTION SYSTEM FOR A TURBINE POWER PLANT

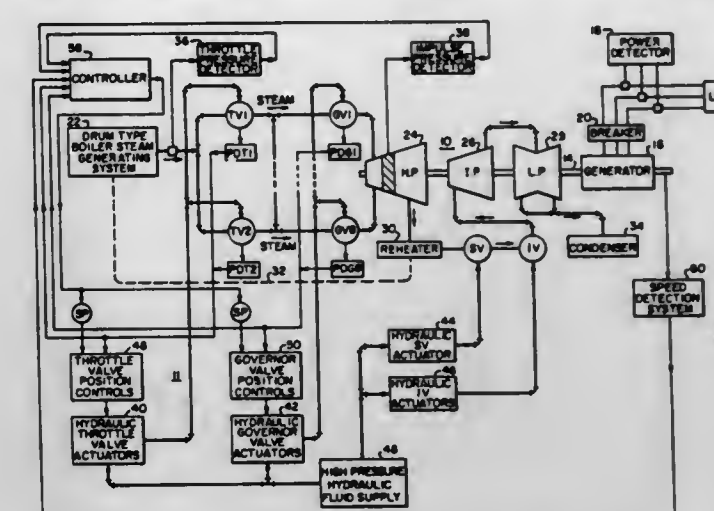
Leaman B. Podolsky, Wilmington, Del., and Charles L. Groves, Jr., Wexford, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 12, 1975, Ser. No. 631,299

Int. Cl.² F01B 25/00

U.S. Cl. 364-494

11 Claims



1. A steam turbine system, comprising a plurality of steam inlet valves for governing the admission of steam to the turbine, means to generate an electrical representation of a desired valve position for each of the steam inlet valves, means to control each of the steam inlet valves in accordance with the desired valve position representation, means to generate an electrical representation of actual valve position for each of the steam inlet valves, means when activated to generate a contingency output representation for each of the steam inlet valves, means to compare the representations of actual and desired position for each of the steam inlet valves, means governed by the compared representation to initiate a predetermined time duration for each valve at times when the actual and desired representations of a respective valve differ by a predetermined value, means governed by the comparison means to activate the contingency output generating means in response to a compared difference of said predetermined value at the termination of the initiated time duration period for each valve, and means governed by the activated contingency generating output means for each valve to indicate a contingency for such associated valve.

4,053,746

SYSTEM AND METHOD FOR OPERATING A STEAM TURBINE WITH DIGITAL COMPUTER CONTROL HAVING INTEGRATOR LIMIT

Andrew Braytenbah, Pennsauken, N.J., and Leaman Podolsky, Wilmington, Del., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 247,851, April 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 247,440, April 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 246,900, April 24, 1972, abandoned. This application Oct. 17, 1973, Ser. No. 407,361

Int. Cl.² H02P 9/04; G05B 15/00; F01D 17/02

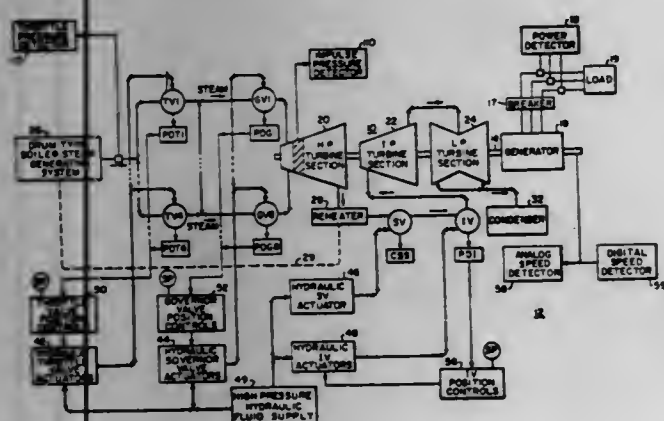
U.S. Cl. 364-494

26 Claims

1. An electric power generating system comprising:

- a. a steam turbine system;
- b. a steam generator for providing steam to said steam turbine system;
- c. an electric generator rotated by said turbine system and adapted to be connected to an electric load;

- d. means for digitally computing and processing, having a central processor unit and a memory interconnected with said central processor unit;
- e. means for converting input signals to digital data, said input converting means being connected to said digital computing means;
- f. means for converting digital data to output signals, said digital to output converting means being connected to said digital computing means;
- g. means for sensing the value of at least one predetermined generating system operating parameter, and for generating input signals representative of said parameter, said sensing means being connected to said input converting means;
- h. means for developing a signal representative of the desired condition of said generating system operating parameter, said means for developing being connected to said input converting means;
- i. means for controlling the steam flow to said turbine;
- j. means for connecting said output signal converting means to said steam flow control means;



- k. said digital computer means being characterized in that it is programmed to perform a plurality of respective functions in accordance with a predetermined priority, said functions including
 - i. developing a difference signal representative of the differential between the desired and the present conditions of said generating system operating parameter, and
 - ii. translating said difference into control signals for said output converting means, said translating function including integrating the difference signals and limiting the integrated difference signals to a specified range corresponding to extreme conditions of said steam control means, and
- l. said control signals being converted to output signals by said output converting means for controlling said steam flow control means as a function of said sensed parameters so as to control steam flow as an intermediate variable, and to control turbine and generator speed and load as end operating variables.

4,053,747

SYSTEM FOR INITIALIZING A BACKUP COMPUTER IN A MULTIPLE COMPUTER ELECTRIC POWER PLANT AND TURBINE CONTROL SYSTEM TO PROVIDE TURBINE AND PLANT OPERATION WITH REDUCED TIME FOR BACKUP COMPUTER AVAILABILITY
 Guy E. Davis, Martinez, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1973, Ser. No. 413,274

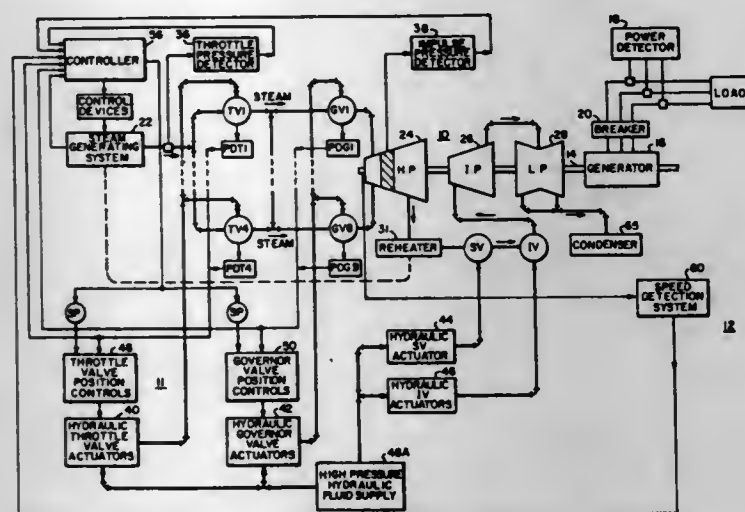
Int. Cl.² F01D 17/02; G05B 15/00; G06F 15/06

U.S. Cl. 364-494

50 Claims

1. A control system for an electric power plant having at least one steam turbine and a steam generator, said control system comprising at least a first digital computer and a second digital computer, means for generating input signals representing predetermined process variables associated with said steam generator, means for generating input signals representing

predetermined process variables associated with said steam turbine, means for coupling the input signals to both of said computers, each of said computers having means for controlling its sequential programmed operation and including substantially identical means for generating control outputs for operating controllable elements of said steam generator and throttle and governor valves of said steam turbine as a function of the input signals, means for sensing predetermined control system malfunctions, means for coupling the outputs of one of said computers to operate the steam generator controllable elements and the turbine valves, means for substantially conforming the structure of the other computer to the structure of



said one computer in real time including means for generating predetermined control outputs in the other computer substantially equal to corresponding ones from said one computer, means for data linking said computers, each of said computers including means for initializing itself after a stoppage including means for transferring the status of predetermined initialization variables over said data link means from one of said computers in control to the other computer being initialized, and means for executing a transfer in the control of the steam generator and the turbine from said one computer to said other computer substantially without disturbing the power generation when said sensing means detects a control system malfunction and after said other computer is initialized.

4,053,748

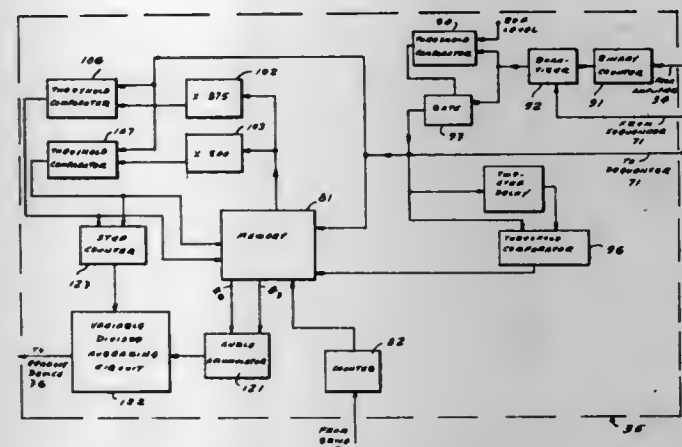
TECHNIQUES FOR DETERMINING THE PEAK ANGLE OF RESPONSE OF PIEZOELECTRIC CRYSTALS AND OTHER RADIATION-SENSITIVE RESONANT DEVICES
 Horst William Kueppers, 126 Brewster Ave., Placataway, N.J. 08854

Filed Dec. 1, 1975, Ser. No. 636,435

Int. Cl.² G01N 23/20

U.S. Cl. 364-525

14 Claims



1. In a machine-instrumented method of determining the angle of peak amplitude response of a radiation-sensitive resonant device to a beam of radiation incident on a first surface of the device as the relative angle between the incident beam and

the first surface is swept in a first direction, the improvement which comprises the steps of:

- scanning the first surface stepwise with the beam of radiation in the first direction;
- sampling the amplitude response of the device at the angle attained at the end of each step;
- storing successive ones of the measured amplitude samples;
- determining the attained angle of scan corresponding to each stored amplitude sample;
- determining the value of a first one of the attained angles occurring when the amplitude of the samples has decreased monotonically over a prescribed number of successive steps;
- retrieving a first one of the stored samples corresponding to a second one of the attained angles occurring the predetermined number of steps before the first attained angle;
- calculating a predetermined amplitude value equal to a prescribed percentage of the retrieved first amplitude sample;
- determining the value of a third one of the attained angles occurring when the samples have decreased in amplitude to the predetermined value following the first attained angle;
- determining the value of a fourth one of the attained angles corresponding to the predetermined value and occurring before the second attained angle; and
- averaging the third and fourth attained angles to approximate the angle of peak response of the device.

4,053,749

DISTANCE METER FOR VEHICLE CAPABLE OF DISPLAYING TRAVELLING DISTANCE TO DESTINATION

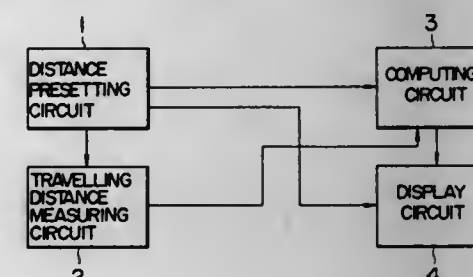
Yoshio Shinoda, Okazaki, and Akira Kuno, Nagoya, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
 Filed Mar. 31, 1976, Ser. No. 672,630

Claims priority, application Japan, May 15, 1975, 50-58235

Int. Cl.² G01C 22/02

U.S. Cl. 364-424

5 Claims



1. A distance meter for a vehicle for displaying the remaining distance to a destination, said meter comprising: distance presetting means for presetting the distance of travel of a vehicle from a starting point to a destination at said starting point and for generating a preset distance signal representative of said preset distance, said distance presetting means including switch means disposed to be opened and closed, the presetting of said preset distance being accomplished in accordance with the number of on-off operations of said switch means; travelling distance measuring means connected to said distance presetting means for generating a travelling distance signal for every predetermined distance travelled by said vehicle, said travelling distance measuring means including a vehicle speed sensor for detecting the rotational speed of the wheel of said vehicle to generate a vehicle speed pulse signal, and a frequency dividing circuit for frequency dividing said vehicle speed pulse signal to generate said travelling distance signal, said frequency dividing circuit being disposed to be reset in response to the first closing of said switch means during a distance presetting operation; computing means connected to said distance presetting

means and said travelling distance measuring means for repeatedly subtracting said predetermined distance travelled by said vehicle from said preset distance represented by said preset distance signal in response to the generation of said travelling distance signals to compute the remaining distance to said destination; and display means connected to said computing means for displaying the result of said computation by said computing means.

4,053,750

FEEDFORWARD FILTER

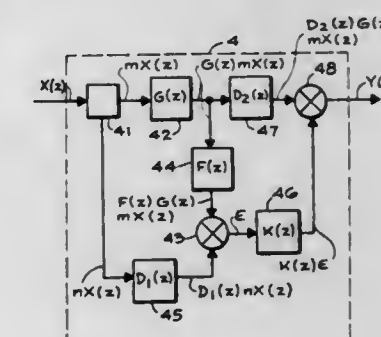
James N. Constant, 1603 Danbury Drive, Claremont, Calif. 91711

Filed May 10, 1976, Ser. No. 684,861

Int. Cl.² G06F 7/38

U.S. Cl. 364-724

15 Claims



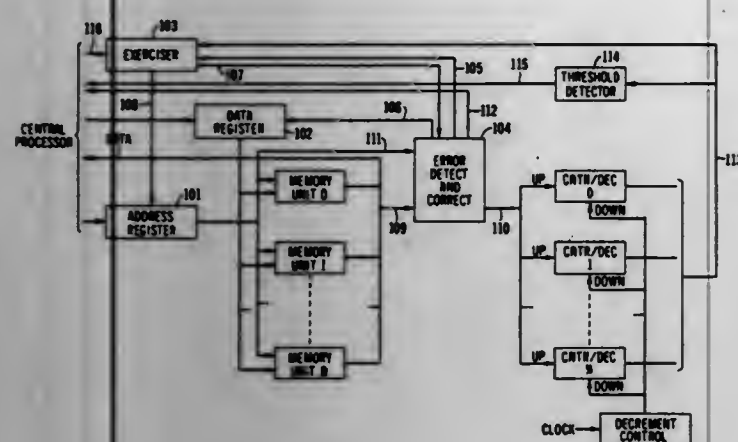
1. A feedforward filter having a transfer function $H(z)$ comprising: a signal divider having input signal $X(z)$ and providing at its output signals $MX(z)$ and $NX(z)$, where $m + n = 1$; a first filter having an arbitrary transfer function $G(z)$, said output $MX(z)$ from said signal divider being input to said first filter, said first filter providing at its output the signal $G(z)MX(z)$; first delay means having transfer function $D_1(z)$, said output $NX(z)$ from said signal divider being input to said first delay means, said first delay means providing at its output the signal $D_1(z)NX(z)$; a second filter having transfer function $F(z)$, said output $G(z)MX(z)$ from said first filter being input to said second filter, said second filter providing at its output the signal $F(z)G(z)MX(z)$; a first mixer having input the signals $F(z)G(z)MX(z)$ from said second filter and $D_1(z)NX(z)$ from said first delay means and providing at its output one of the error signal $\epsilon = F(z)G(z)MX(z) \pm D_1(z)NX(z)$; a third filter having transfer function $K(z)$, said output ϵ from said first mixer being input to said third filter, said third filter providing at its output the signal $K(z)\epsilon$; second delay means having transfer function $D_2(z)$, said output $G(z)MX(z)$ from said first filter being input to said second delay means, said second delay means providing at its output the signal $D_2(z)G(z)MX(z)$; and a second mixer having input the signals $D_2(z)G(z)MX(z)$ from said second delay means and $K(z)\epsilon$ from said third filter and providing at its output the signal $Y(z) = H(z)X(z)$, said output signal $Y(z)$ representing the convolution of said input signal $X(z)$ and said transfer function $H(z)$.

4,053,751

ADAPTABLE EXERCISER FOR A MEMORY SYSTEMCyrus Frank Ault, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 28, 1976, Ser. No. 680,988
Int. Cl.² G11C 29/00; G06F 11/10

U.S. Cl. 235—302.3

7 Claims



1. A memory system comprising: a plurality of independent memory units; means for exercising said memory units comprising means for reading data from said memory units and means for placing correct data in said memory units; error detecting and correcting means connected to said exercising means and to said memory units for receiving data read from said memory units and for detecting and correcting errors in said data, said detecting and correcting means including means for generating error signals; a plurality of counter means corresponding in number to said plurality of memory units, and individually associated therewith, each of said counter means being incremented by said error signals generated during the exercise of the associated memory unit, and decremented at a predetermined rate with time; and means connected to said exercising means and to said plurality of counter means and responsive to the contents of said plurality of counter means for controlling said exercising means such that each of said memory units is exercised at an individually selectable rate dependent upon the contents of its associated counter means.

4,053,752

ERROR RECOVERY AND CONTROL IN A MASS STORAGE SYSTEM

Patrick Fred DeJohn, Dallas, Tex.; Charles Edwin Hoff, Longmont, Colo.; Robert Douglas Tennison, Boulder, Colo., and James Clair Young, Jr., Broomfield, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

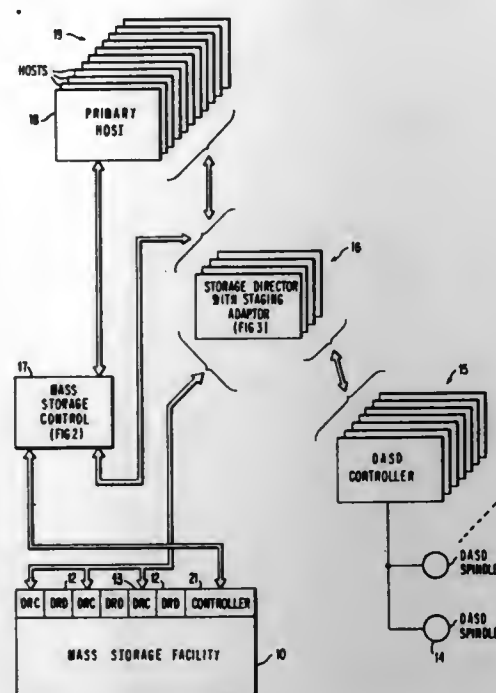
Filed Sept. 15, 1975, Ser. No. 613,592
Int. Cl.² G11C 29/00; G06F 11/04

U.S. Cl. 235—302.1

11 Claims

1. The method of error control for a storage apparatus having a plurality of storage levels, including the steps of: detecting a predetermined number of errors in a given portion of an upper one of said storage levels during a data movement to a lower storage level; indicating data signals stored in said lower storage level associatable with said given portion as signals having data error; moving said data signals in error irrespective of said errors

from said upper storage level to said lower storage level associatable with said upper storage level; and



maintaining said data signals in said upper storage level and inhibiting data access to said given portion of said upper storage level for preserving same for diagnostic analysis.

4,053,753

ELECTRONIC CALCULATOR WITH FUNCTION KEYS
Ichiro Sado; Juji Kishimoto, both of Tokyo; Seiji Saito, Yokohama, and Atsushi Sakurai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

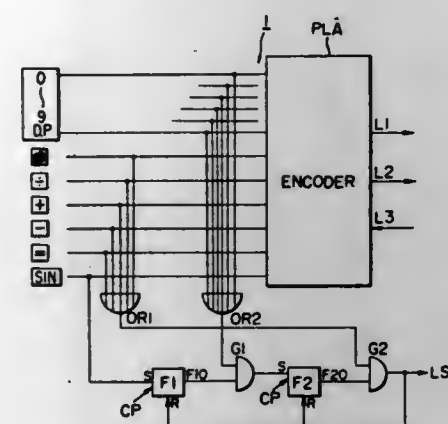
Filed Mar. 19, 1976, Ser. No. 668,803

Claims priority, application Japan, Mar. 28, 1975, 50-37498; Feb. 24, 1976, 51-19133

Int. Cl.² G06F 7/38

U.S. Cl. 364—709

4 Claims



1. An electronic calculator comprising: a plurality of numeric keys operative to enter signals corresponding to selected numerical data; a plurality of operation keys operative to enter signals corresponding to selected arithmetic operations; at least one function key operative to select a predetermined computation to be performed on data entered by said numeric keys; a result key operative to instruct computation of expressions entered by selective actuation of said numeric, said operation and said function keys; input control means coupled to each of said numeric keys, said operation keys, said at least one function key and said result key, for producing control signals in response to actuation of corresponding ones of said keys, said control means comprising a first memory means operative to store a first control signal produced in response to actuation of said at least one function key, a second memory means

coupled to the first memory means and operative to store a second control signal produced in response to actuation of a selected one of said numeric keys only when said first control signal is stored in said first memory means, and signal generating means coupled to said second memory means for producing a command signal operative to enable said predetermined computation in response to actuation of either one of said operation keys and said result key only when said second control signal is stored in said second memory element wherein said command signal is generated only if said numeric keys are actuated next following an actuation of said at least one function key; and arithmetic operation means coupled to said input control means for performing said predetermined computation and for producing a corresponding display output signal in response to the command signal from said input control means.

4,053,754

RECURSIVE PROCESSING OF MULTIPLE INTENSITY-MODULATED SCANS

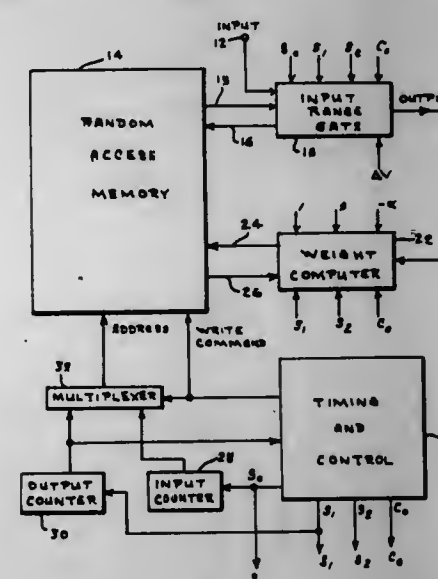
Robert D. Berlin, Syracuse, and Jack B. Williams, Liverpool, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 23, 1976, Ser. No. 698,988

Int. Cl.² G06F 7/38

U.S. Cl. 364—723

5 Claims



light to a light incident surface of a light guide, said light source comprising,

A first lamp for producing conventional viewing illumination, said lamp having a sealed tip portion pointing in the light path direction towards the said light incident surface, a curved mirror positioned in back of said first lamp for condensing the light from said first lamp onto said light incident surface, a flash discharge tube having a pair of electrodes and a housing, a reflective coating on a semicircular portion of said housing to condense the light from said flash discharge tube, said flash discharge tube being positioned to place the outer surface of said reflective coating just in front of said tip to provide minimum interference with said condensed light from said curved mirror and to direct said condensed flash light from the internal surface of said coated reflector onto said light incident surface.

4,053,757

PHOTOFLASH LAMP ARRAY HAVING RADIATION SWITCHES AND FLASH INDICATORS

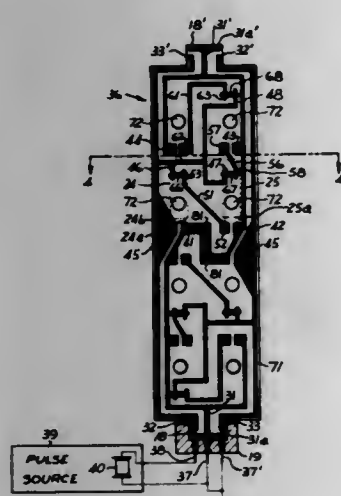
Richard Blount, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 510,323, Sept. 30, 1974, abandoned. This application Dec. 11, 1975, Ser. No. 639,794

Int. Cl.² G03B 15/02

U.S. Cl. 362—4

8 Claims



1. A flash lamp array comprising a plurality of flash lamps and sequencing circuitry for sequentially flashing said lamps, said array being provided with connector means for receiving lamp-firing electrical signals, each of said flash lamps comprising a tubular-like envelope having an end thereof generally facing toward said connector means, said sequencing circuitry comprising a radiation-actuated switch, said array being provided with a flash indicator comprising a radiation-sensitive material, said switch and said flash indicator being located adjacent to the side of said flash lamp with said switch relatively farther than said flash indicator from said connector means, said array further including a circuit board carrying said sequencing circuitry on a side thereof, said lamps being positioned over said side of the board and having lead-in wires connected to said circuitry, said radiation-actuated switch being carried on said side of the circuit board and being connected in said sequencing circuitry, said flash indicator being positioned behind the other side of said circuit board, and window means through said circuit board for permitting radiant energy from said lamp when flashed to impinge upon said flash indicator.

4,053,758 UNDERWATER SWIMMING POOL ILLUMINATION SYSTEMS

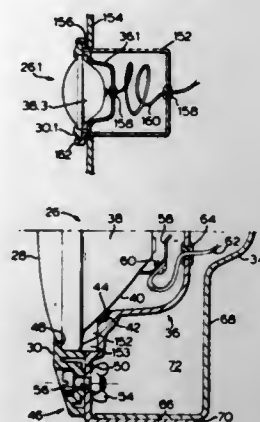
Frank D. Shaw, Etobicoke, Canada, assignor to Swan Recreational Products Limited, Toronto, Canada

Continuation of Ser. No. 477,003, June 6, 1974, Pat. No. 3,955,076. This application Mar. 29, 1976, Ser. No. 671,353

Int. Cl.² F21V 31/00

U.S. Cl. 362—158

3 Claims



1. For use in underwater swimming pool illumination, an underwater lighting assembly comprising:

a waterproof lamp enclosure having a generally bowl-shaped body portion adapted to receive the rear portion of a conically-shaped lamp unit, an O-ring seat formed around the outer part of said body portion and a compressible O-ring fitted in said O-ring seat, retainer means to fit over the outer part of said lamp unit, a flange formed around the outer part of said bowl-shaped body portion, and fastener means associated with said flange and said retainer means to cause the rear portion of said lamp unit to be forced against said compressible O-ring when said fastener means are tightened; electrical wires attached to said lamp unit and passing rearwardly from said body portion, and means for exteriorly waterproofing the rear of said body portion; and a low-voltage battery connected so as to provide low voltage, ripple-free direct current power to said lamp unit; said low-voltage battery and a battery charging circuit being each remotely situated from said waterproof lamp enclosure, said battery being connected to the first and second switch elements of a double-pole, double-throw switch; said electrical wires from said lamp being connected to first contact elements of the first and second poles of said double-pole, double-throw switch; and the output of said battery charging circuit being connected to second contact elements of the first and second poles of said double-pole, double-throw switch; so that when said switch is in its first pole position, said battery is electrically connected to said lamp and not to said battery charging circuit; and when said switch is in its second pole position, said battery is electrically connected to said battery charging circuit and not to said lamp.

4,053,759

LAMPHOUSE AND MODULE FOR PHOTOGRAPHIC SLIDE PROJECTORS

John Nicholas Wilkinson, Duarte, Calif., assignor to Optical Radiation Corporation, Azusa, Calif.

Continuation of Ser. No. 335,018, April 27, 1973, abandoned. This application Nov. 4, 1975, Ser. No. 628,482

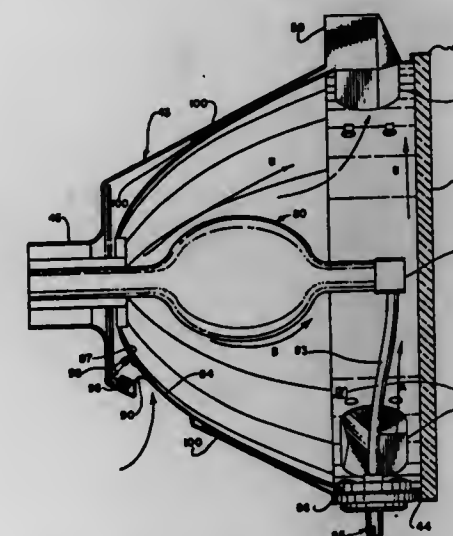
Int. Cl.² F21V 29/00

U.S. Cl. 362—218

5 Claims

1. A high-intensity lamp module, comprising: an elongated high-intensity lamp having a central illumination portion and a pair of oppositely-disposed terminal portions thereon; a housing surrounding said lamp, said housing having two

opposed ends, one of which includes means for mounting said elongated lamp by one of said terminal portions and the other of which includes means for mounting a light-transmitting window; a light-transmitting window mounted in said other end of said housing; a reflector mounted within said housing for reflecting light from said high-intensity lamp out of said housing through said light-transmitting window, said reflector surrounding said lamp but being spaced therefrom to permit cooling fluid within said housing to pass between said lamp and said reflector; a first opening in said housing adjacent the inner face of said light-transmitting window and serving as a port of egress for cooling fluid introduced into said housing;



a second opening in said housing adjacent the inner face of said light-transmitting window at a position substantially opposite to that of said first opening and serving as a port of ingress for cooling fluid introduced into said housing, the flow of cooling fluid from said second opening to said first opening being substantially adjacent such inner face of said window and including the adjacent one of said lamp terminal portions; and a third opening in said housing substantially adjacent the end of said housing serving as a mounting means for said lamp, the flow of cooling fluid from said third opening to said first opening passing between said reflector and said lamp in direct contact with the latter; whereby two separate and distinct paths of flow are provided for cooling fluid introduced into said housing, the two paths becoming one at the point of egress at said first opening in said housing.

4,053,760

WARNING LIGHT GUARD

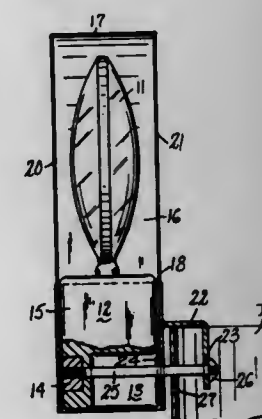
Charles A. Glazier, 445 Orange Ave., West Haven, Conn. 06516

Filed May 10, 1976, Ser. No. 684,549

Int. Cl.² F21V 15/00

U.S. Cl. 362—186

5 Claims



1. A warning light guard comprising, a rectangular base

portion adapted to enclose laterally the battery housing portion of a warning light, an upper portion fixed on the base and including a solid metal band fitting freely around the lamp portion of the light and a strong substantially flat metal grid covering the space between the upper edges of the base portion and the edges of said band, and a mounting bracket fixed on the base portion, for attachment of the guard to a support.

4,053,761

DECORATIVE ITEM

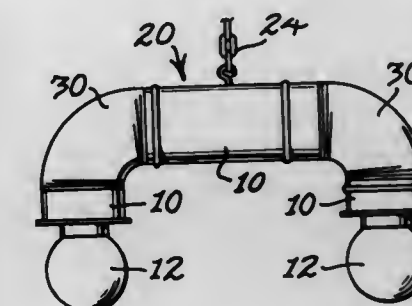
Jerry A. Brinkley, 1416 First Ave., NE., Winchester, Tenn. 37398

Filed Mar. 18, 1976, Ser. No. 668,201

Int. Cl.² F21S 13/10, 1/02

U.S. Cl. 362—413

2 Claims



2. A decorative electric lamp comprising a plurality of sections of stovepipe joined together in an ornamental configuration such as a C-shape, T-shape, V-shape, fire hydrant shape or the like with electric light bulbs on the ends thereof adapted to light up when electricity is turned on, said stovepipe sections being snugly joined together in such a manner so as to allow the sections to be twisted relative to each other when joined to form the desired configuration and to normally retain said configuration until it is desired to change said configuration.

4,053,762

TWIN-BEAM LUMINAIRE LENS

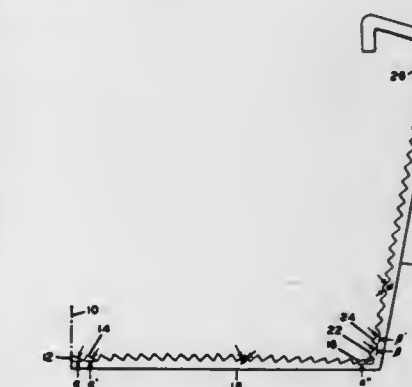
Grafton K. Barboon, Quarryville, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 29, 1975, Ser. No. 644,753

Int. Cl.² F21V 5/00

U.S. Cl. 362—223

4 Claims

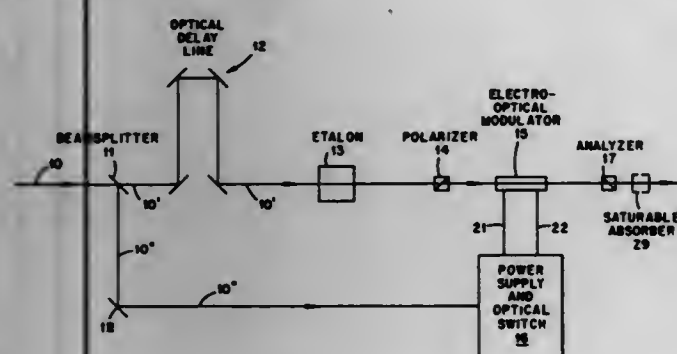


1. An elongated luminaire for illuminating an area therebelow comprising a linear light source of two tubes and an elongated lens having a bottom section and two side sections on either side of the bottom section, said side sections being inclined at an angle from a line perpendicular to the plane of the bottom section of the luminaire, said sections having prisms formed on the side thereof facing the light source, said prisms constituting light incident and light emergent surfaces for redirecting and emitting light rays from the light source generally away from the vertical plane through and parallel to the axis of said linear light source and into annular ranges on either side thereof with substantially half of the light distributed in an

area from 0° to 30° on each side of the vertical plane, and substantially the other half of the light distributed in an area from 30° to 60° on each side of the vertical plane.

4,053,763

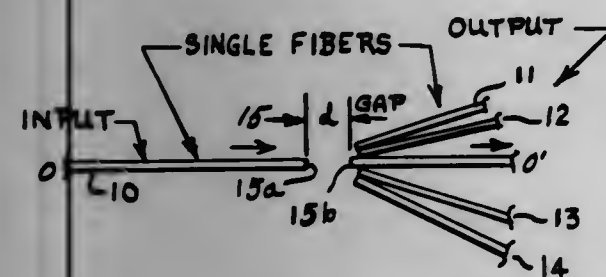
METHOD AND APPARATUS FOR PULSE STACKING
Robert C. Harney, Livermore, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed May 25, 1976, Ser. No. 689,751
Int. Cl.² H01J 39/12; G02B 27/10; G02F 1/01, 1/03
U.S. Cl. 250-206 28 Claims



1. A pulse stacking system in a pulse-forming network capable of forming and summing a sequence of time-delayed waveforms arising from a single light pulse comprising: an etalon, an electro-optical modulator positioned in aligned spaced relationship with said etalon, power supply and optical switch means operably connected to said modulator, means for polarizing a light pulse being directed into said modulator, analyzer means aligned to receive an output pulse from said modulator, said analyzer means being of a differing polarization direction with respect to said polarizing means, and pulse directing means for directing portions of an incoming pulse into said etalon and into said power supply and optical switch means.

4,053,764

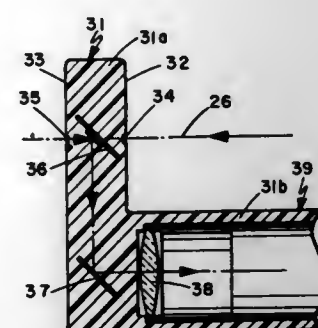
HIGHER-ORDER MODE FIBER OPTICS T-COUPLER
Paul F. Shrank, Utica, and Allen E. Clough, Rome, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Oct. 2, 1975, Ser. No. 619,111
Int. Cl.² G02B 5/14; H01J 5/16, 39/12
U.S. Cl. 250-227 2 Claims



1. A higher order mode fiber optic T-coupler being comprised of a single main optical fiber having first and second ends and a predetermined axis, said first end receiving a first input optical light signal for transmission toward said second end, said single main optical fiber having exclusively an air gap therein, said gap being defined by a first and second separated endfaces in said single main optical fiber, and a first multiplicity of exclusively single fiber optical channels positioned at said second endface of said gap, each of said single optical channels being at a different angle to said single main optical fiber, each of said angular optical channels consisting of a single optical fiber, the variation of distance of said gap and the adjustment of said angle determining the degree of coupling of said higher modes into said optical channels.

4,053,765

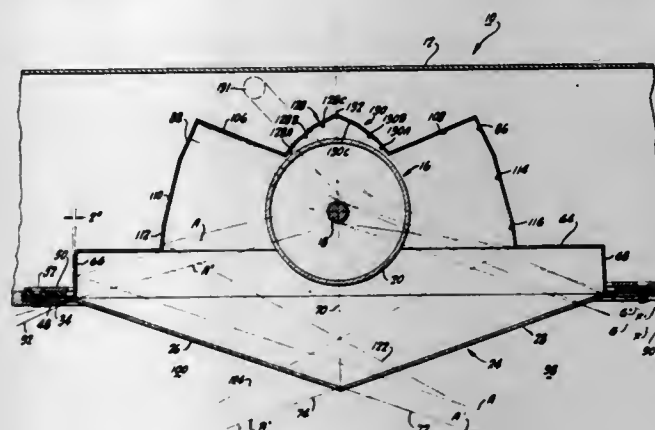
PARALLAX FREE LIGHT PEN
Fernand Bannie Kuffer, Brea, Calif., assignor to General Dynamics Corporation, Pomona, Calif.
Filed Sept. 27, 1976, Ser. No. 727,312
Int. Cl.² G02B 5/14 18 Claims



1. A light pen sighting device for aligning the receptor of a light pen with a source of light for eliminating parallax between said source and the receptor, and comprising: support means for supporting sighting means on the barrel of a light pen adjacent to the receptor thereof, light receiving and transmitting means mounted by said support means and positioned for receiving and directing rays of light from a predetermined direction to the receptor of a light pen on which said support means is mounted, means defining first and second spaced apart reticle means disposed on opposite side of said light receiving and transmitting means and aligned therewith along an axis corresponding to said predetermined direction for directing light from said predetermined direction without parallax to the receptor to which said support means is mounted.

4,053,766

LAMP LENS STRUCTURE
John R. Brass, San Rafael, Calif., assignor to U.S. Industries, Inc., New York, N.Y.
Filed Dec. 23, 1975, Ser. No. 643,930
Int. Cl.² F21V 13/04 23 Claims

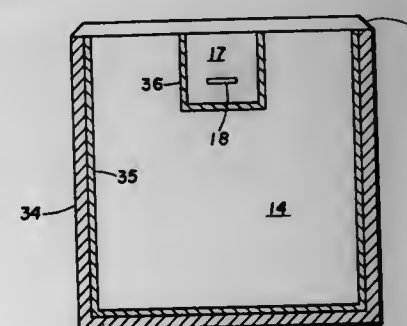


1. A device for projecting light to illuminate an area comprising:
a. light source;
b. lens having at least a first planar element, a second planar element, a third planar element, and a fourth planar element and said first planar element angularly oriented with respect to said second planar element and said third and fourth planar elements angularly oriented with respect to each other and to said first and second planar elements forming a pyramidal shaped lens;
c. first reflector oriented to reflect light from said source substantially parallel to said first planar element, a definable portion of the reflected light passing below said source and through said second planar element in a first

maximum candle power plane from said device to the area to be illuminated;
d. second reflector oriented to reflect light from said source substantially parallel to said second planar element, a definable portion of the reflected light passing below said source and through said first planar lens element in a second maximum candle power plane from said device to the area to be illuminated.

4,053,767

METHOD AND APPARATUS FOR STABILIZING SIGNALS IN RADIOACTIVE WELL LOGGING TOOLS
John G. Kampf, and Lucian A. Ingram, both of Houston, Tex., assignors to Halliburton Company, Duncan, Okla.
Filed Aug. 23, 1976, Ser. No. 716,905
Int. Cl.² G01D 18/00; G01V 5/00
U.S. Cl. 250-252 20 Claims



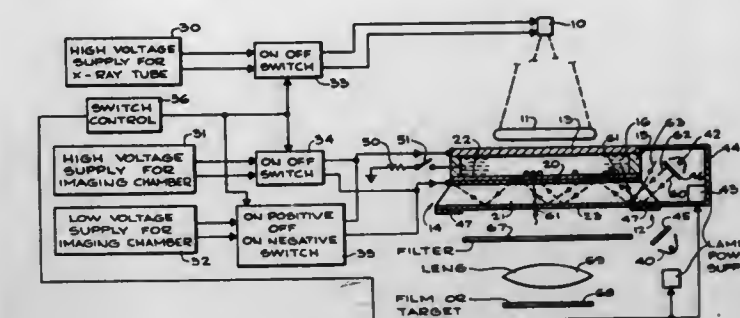
1. An apparatus for measuring radiation in a borehole comprising:
a main scintillation crystal capable of scintillating responsive to the radiation to be measured for giving off a first set of light flashes whose intensity is proportional to the intensity of said radiation;
a reference scintillation crystal embedded in one end of said main crystal, said reference scintillation crystal having a source of mono-energetic radiation embedded therein for inducing in said reference scintillation crystal a second set of light flashes of a predetermined intensity;
light transmitting means adjacent said one end of said main scintillation crystal arranged for transmitting said first set of light flashes directly from said main scintillation crystal and for transmitting said second set of light flashes directly from said reference scintillation crystal;
light sensing means optically coupled to said light transmitting means for generating electrical pulses responsive to the light flashes of said first and second set of light flashes, wherein the height of each of said generated electrical pulses is proportional to the intensity of a respective light flash of said first and second set of light flashes; and
electrical data transmitting means electrically connected to said light sensing means for transmitting said electrical pulses to a point removed from said borehole.

4,053,768

METHOD AND APPARATUS FOR IMPROVING CONTRAST IN ELECTROPHORETIC DISPLAY
John H. Lewis, Los Angeles, and Michael D. McDiarmid, Van Nuys, both of Calif., assignors to Xonics, Inc., Van Nuys, Calif.
Filed Sept. 10, 1976, Ser. No. 722,276
Int. Cl.² G03B 41/16 15 Claims

1. In an electronradiography imaging chamber for providing a visual image, the combination of:
first and second electrodes;
means for supporting said electrodes in spaced relation with a gap therebetween;
an X-ray absorber and electron and positive ion emitter in said gap, with X-ray radiation entering said gap being

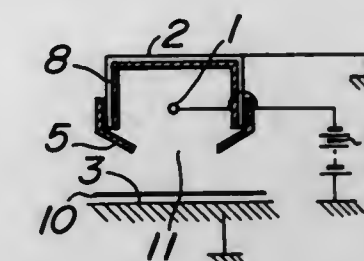
absorbed and providing electrons and positive ions in said gap;
a plurality of electrophoretic particles dispersed in a liquid in said gap;
a dye dispersed in said liquid, said dispersed dye having a color absorption spectrum;
means for connecting an electrical potential across said electrodes for attracting electrons toward one electrode and positive ions toward the other depending upon the



polarity of the power source and forming an electrostatic charge image, with said particles being selectively deposited as a function of said electrostatic charge image forming a visual image viewable through one of said electrodes; and
means for directing illumination onto deposited particles, with said illumination having a color emission spectrum substantially corresponding to said dye absorption spectrum.

4,053,769

CORONA CHARGE DEVICE
Masaji Nishikawa, and Muneco Kasuga, both of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan
Filed Mar. 9, 1976, Ser. No. 665,315
Claims priority, application Japan, Mar. 15, 1975, 50-31578
Int. Cl.² G03G 15/00 2 Claims



1. A corona charge device comprising a corona discharge wire connected to a high voltage source and a grounded conductive shield electrode including an elongate rectangular closed vessel including side walls and end walls, said vessel being open at its bottom between opposed side walls to define an opening, the corona discharge wire being surrounded by said vessel and being resiliently supported by said end walls of said vessel such that a flow of ions is directed downwardly from said corona discharge wire through said opening toward a field electrode, said device further comprising means for controlling the flow of ions toward said field electrode including elongate insulating plates each having upper and lower half portions, said upper half portions being respectively secured to and extending along each side wall of said conductive shield electrode and said lower half portion being inclined at an angle with respect to said upper half portion to reduce the transverse width of said opening, means for maintaining said insulating plates at an electric potential which is higher than the electric potential of said grounded conductive shield electrode and means for setting an electrical potential of at least the inner surface of said shield electrode to an electrical potential between the electrical potential applied from said high voltage

source to said corona discharge wire and ground electrical potential.

4,053,770

A.C. CORONA DISCHARGING DEVICE

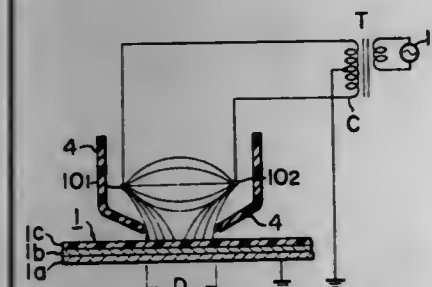
Hiroshi Tanaka, Tokyo; Shinkichi Takahashi, Kinata; Tsuru Takahashi; Shusei Tsukada, both of Tokyo, and Gichi Marushima, Kumae, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 8,270, Feb. 3, 1970, abandoned. This application Mar. 21, 1977, Ser. No. 779,581

Int. Cl.² G03G 15/00

U.S. Cl. 250-324

8 Claims



1. An A.C. corona discharging system for applying a corona discharge to a photoconductive member having a conductive backing, and for contemporaneously projecting an optical image upon the member, comprising in combination: means for connecting the conductive backing of the member to a point of reference potential; an electrode, and means for supporting said electrode at a position spaced from said photoconductive member on the side remote from said backing, wherein said electrode and said photoconductive member are relatively movable for scanning the surface of the latter; means for connecting a source of alternating current voltage between said point of reference potential and said electrode for establishing a corona discharge between said electrode and said photoconductive member; and insulating material supported at a position spaced from said photoconductive member and surrounding said electrode to define an optical path for the projection of said image therethrough upon said photoconductive member, wherein said material is disposed to become oppositely charged during alternate half cycles of said source voltage for enhancing the corona discharge.

4,053,771

METHOD AND DEVICE FOR ACTIVATION ANALYSIS

Georges Ande, Meylan, and Jean Laverlochère, La Tronche, both of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Filed Dec. 1, 1975, Ser. No. 636,631

Claims priority, application France, Dec. 6, 1974, 74.40122

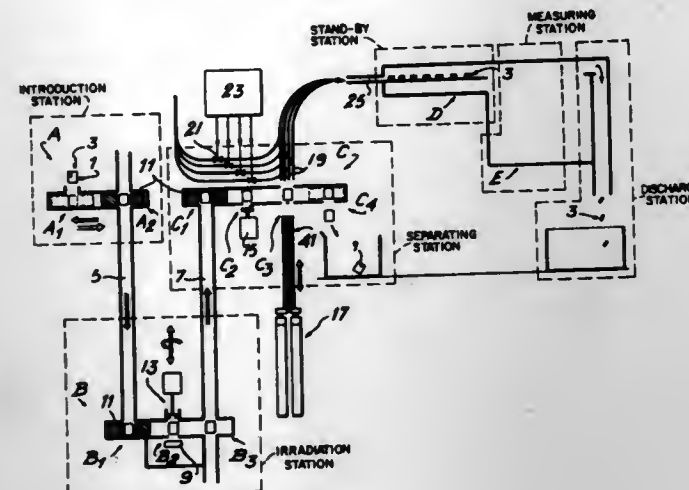
Int. Cl.² G01T 1/00

U.S. Cl. 250-328

10 Claims

1. A method of activation analysis of N samples, wherein the

N samples are irradiated simultaneously and wherein said N samples are each measured in turn after having been separated



from each other, the irradiation time being N times longer than the time of measurement of one sample.

4,053,772

LOCATING UNDERGROUND URANIUM DEPOSITS

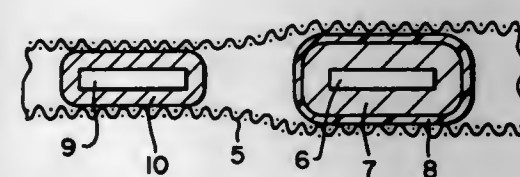
Patrick E. Felice, Jeannette, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1976, Ser. No. 701,432

Int. Cl.² G01T 1/11

U.S. Cl. 250-337

31 Claims



1. A method of locating underground deposits of uranium comprising
A. placing underground a dosimeter in the form of a thin layer about 5 to about 18 mg/cm² thick which is capable of storing energy from alpha particles;
B. activating said dosimeter to cause it to release said stored energy from alpha particles; and
C. measuring the amount of energy released.

4,053,773

MOSAIC INFRARED SENSOR

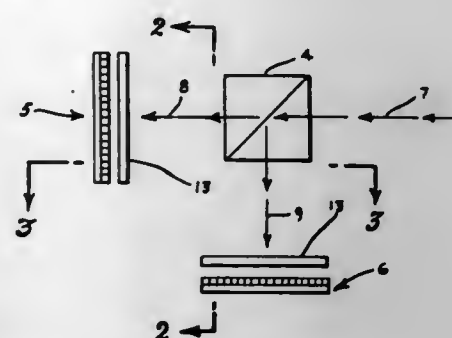
Bruce A. Deresh, Dewitt, and Robert J. Chevalko, Fabius, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 23, 1976, Ser. No. 669,542

Int. Cl.² H01J 39/12; H01L 27/14

U.S. Cl. 250-349

1 Claim



1. A mosaic infrared sensor comprising:
a. first and second arrays of m spaced, juxtaposed columns of n discrete, contiguous infrared detector elements, the infrared detector columns of said first array having widths substantially equal to the spacings between the infrared

detector columns of said second array and the infrared detector columns of said second array having widths substantially equal to the spacings between the infrared detector columns of said first array, the infrared detector columns of each array being aligned with the intercolumn spacings of the other array;

b. beam splitting means adapted to divide received infrared energy into first and second substantially equal sources of infrared energy, said first array being in intercepting relationship with said first source of infrared energy and said second array being in intercepting relationship with said second source of infrared energy, and
c. an optical concentrator means disposed between said beam splitting means and each array of infrared detector element columns, each said optical concentrator means being adapted to focus infrared energy from said beam splitting means onto the infrared detector element columns.

4,053,775

CONSTANT FLOW RADON GAS MONITOR

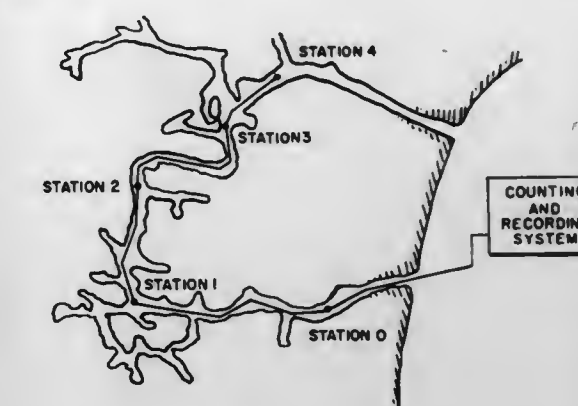
John C. Franklin, and Thomas O. Meyer, both of Spokane, Wash., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 29, 1976, Ser. No. 653,314

Int. Cl.² G01T 1/20; G01N 21/24

U.S. Cl. 250-364

8 Claims



1. A system for continuously monitoring the concentration of radon gas in air comprising:
detector means for continuously detecting the concentration of radon gas through alpha particle monitoring and outputting electric pulses representative thereof;
pump means to continuously force ambient gas through said detector means at a predetermined flow rate;
filter means for filtering out moisture, particulate matter and radon daughters from the ambient gas before it passes to said detector means; and
counting and recording means operatively connected to said detector for continuous electronically counting the number of representative alpha particles pulses detected and recording the number counted.

4,053,776

SUB-MICRON PARTICLE DETECTOR

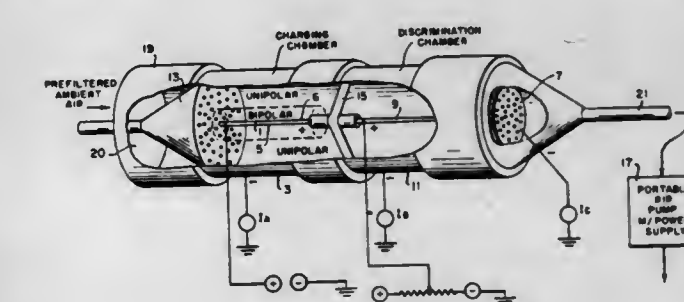
Martin Hertzberg; Charles D. Litton, both of Pittsburgh, and Randall Garloff, Monroeville, all of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,757

Int. Cl.² G01T 1/185

U.S. Cl. 250-382

10 Claims



1. In a system wherein an x-ray tube directs x-rays at one side of an object and a photographic film is positioned at the other side of said object, and means are provided for sensing the x-rays passing through said object and film for controlling the dose of x-ray exposure, the improvement in said means comprising

scintillation means for generating photons in response to received x-rays which have passed through said film, and for enabling received x-rays to pass therethrough, said scintillation means being positioned to cover an area of said film where optimal exposure is desired,
voltage generating means positioned adjacent to said scintillation means for generating a voltage responsive to the photons generated and x-rays passing therethrough,
means for integrating the voltage generated by said voltage generating means to produce an integrated voltage, and
means responsive to said integrated voltage reaching a predetermined value for inactivating said x-ray tube.

mary ionization with a high intensity electric field thereat and also a larger unipolar charging region of lower electrical intensity between said primary ionization region and the outer electrode of the chamber;
the collection electrode being near said charging chamber and in gaseous communication to receive charged submicron particles after they pass through the chamber;
pump means for moving the gas containing the submicron particles from the housing inlet to the charging chamber and then to the collection electrode; and
electronic circuitry connected to both the charging chamber and collection electrode to individually measure the change in radial current flow in the charging chamber and the change in charged particle flow at the collection electrode.

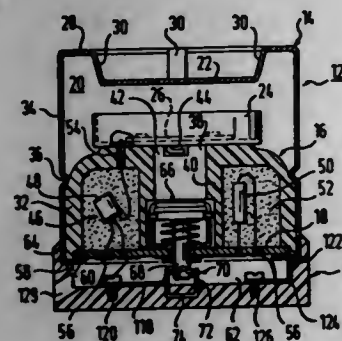
4,053,777

ACCIDENT- AND TAMPERING-PROOF ATTACHMENT MEANS OF AN OBJECT TO A STATIONARY SUPPORT
Heinz Otto Berger, Neuss, and Wolfgang Munstedt, Cologne, both of Germany, assignors to GEBA, Gesellschaft fuer elektronische Bauelemente mbH & Co., Neuss, Germany
Filed Sept. 15, 1976, Ser. No. 723,337

Claims priority, application Germany, July 7, 1976, 2630572; July 7, 1976, 1621503

Int. Cl.² G01T 1/18

U.S. Cl. 250-380



1. A shock, vibrations, and tampering-proof attachment means of an object, such as a signal producing insert of an ionization alarm system coaxially along a common central axis to a fixed support face of a support, such as of land-, marine- and air-vehicles.

A. said object comprising:

A. 1. an elongated protrusion mounted nonrotatably and coaxially in the bottom of said object and protruding through its bottom downwardly facing said support face;

A. 2. a spring assembly mounted coaxially within the bottom of said object;

A. 3. a helical crescent shaped channel with openings within the protruding bottom of said protrusion said channel continuing with a vertex directed upwardly and from there to its end;

B. said support provided with a connector means for a rod, said connector means fixed nonrotatably coaxially with said protrusion; said connector means protruding upwardly from said support;

C. a rod mounted between the said connector means and reaching into said protrusion to engage said channel in a direction substantially radial to the common axis to permit assembly of said object with said support by rotation of the former relative to the latter, to prevent their separation by accident or design.

said spring assembly comprising an axial helical spring and an upper stop, the protrusion being provided with a head, being mounted within said spring and pushed by it upwardly with the head against the stop away from the connecting element;

the axial distance of the path between the openings within the protruding bottom of said protrusion from the vertex

being greater than that from the vertex to the end of said channel;
the axial distance between the point of engagement of said rod with said channel or point of catch of the connecting element held in the support, and the stop being smaller than the distance between the free end of the protrusion and the stop in the protrusion of abutment of the protrusion against the stop;
the spring assembly being provided on its inner side with at least one indentation extending inwardly in deviation from a circular cross-section, and extending along at least part of the axial height of the spring assembly, and that the head being provided with milled grooves, corresponding to said at least one indentation.

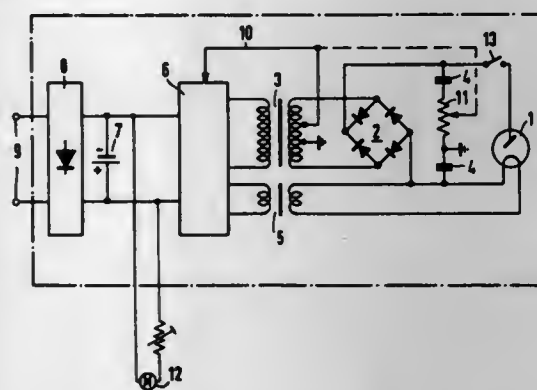
4,053,778

TRANSPORTABLE X-RAY DIAGNOSTIC APPARATUS
Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Oct. 20, 1975, Ser. No. 624,167

Claims priority, application Germany, Oct. 23, 1974, 2450388
Int. Cl.² H05G 1/00

U.S. Cl. 250-402

1 Claim



1. In a transportable X-ray diagnostic generator including an X-ray tube; a high-voltage rectifier; a high-voltage condenser connected in parallel with said X-ray tube and high-voltage rectifier; a high-voltage transformer; and a filament transformer; an inverted converter being connected to the primary windings of said high-voltage transformer and filament transformer for charging said high-voltage condenser and supplying said filament transformer; and storage cell means being connected to the input of said inverted converter; the energy for an X-ray exposure being stored partially in said storage cell means and partially in said high-voltage condenser; said generator further including charging apparatus connected to said storage cell means and having inputs connected to a terminal plug arrangement; said converter having an output voltage of a frequency higher than the frequency of the power supply, the output frequency of said converter being between 1,000 and 2,000 Hz; means for adjusting the output voltage of said converter and comprising a variable resistor, said high voltage condenser comprising two condenser elements, said variable resistor being connected between said two condenser elements; a mobile carriage mounting the generator components; and a motor connected to said storage cell means for driving said mobile carriage, said storage cell means storing partially the energy for an X-ray exposure and providing energy for driving said carriage by said motor.

4,053,779 **METHOD AND APPARATUS FOR CONSTRUCTING MODELS OF BODY SECTIONS**

Marcello Barbieri, Fulbourn, England, assignor to Robert Mac-Millan, Manomet, Mass.; Nicholas Della Grotta, Johnston and Guerino D. Della Grotta, Warwick, both of, R.I., part interest to each

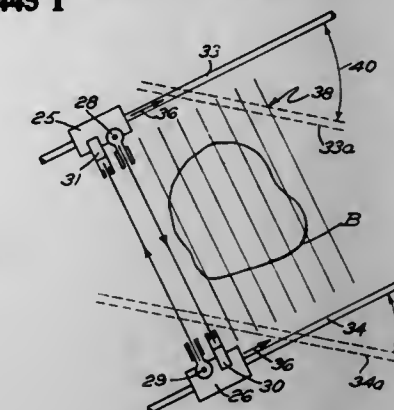
Filed May 9, 1975, Ser. No. 576,109

Claims priority, application United Kingdom, May 10, 1974, 20723/74; Nov. 8, 1974, 48378/74

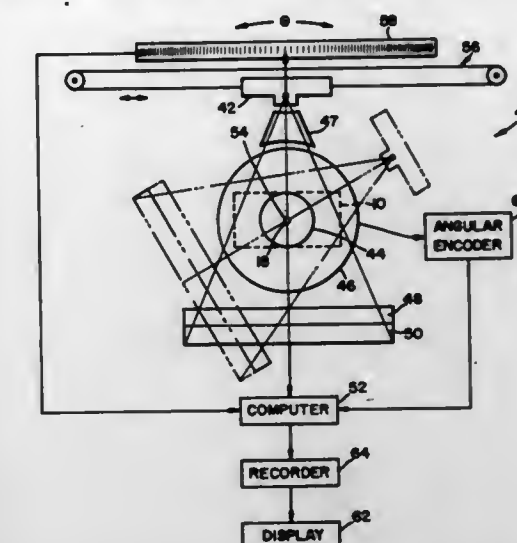
Int. Cl.² G03B 41/16

U.S. Cl. 250-445 T

1 Claim



ing the source and detector means laterally across the opening; and determining for each of a plurality of different angular



orientations of frame means the central position of each translational scan relative to centered member.

4,053,781

PACKING MEMBER FOR RADIOGRAPHIC POSITIONING MEANS

Godfrey Newbold Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

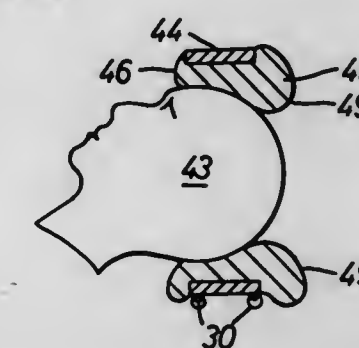
Filed Dec. 24, 1975, Ser. No. 644,160

Claims priority, application United Kingdom, Jan. 16, 1975, 1880/75

Int. Cl.² A61B 6/02, 6/04

U.S. Cl. 250-456

10 Claims



1. Apparatus for examining a body using radiation having a wavelength between 0.1A and 159A, comprising:

A. a first source of radiation disposed to transmit radiation through a body and a first detecting means for detecting radiation from said first source transmitted through said body,

B. a second radiation source adjacent said first detector for transmitting radiation through a body to be examined and second detecting means adjacent said first radiation source for detecting radiation from said second source transmitted through said body,

C. means for translating said sources and detectors simultaneously across a section of the body,

D. means for controlling the sources to generate a plurality of successive rays,

E. each detecting means generating an output corresponding to the image of the body between the radiation source and the detecting means,

F. circuit means for summing the outputs of said detectors,

G. circuit means for processing the resultant signal to obtain an output, and

G. means responsive to said output for producing a visual representation.

4,053,780

METHOD FOR CALIBRATION OF AN AXIAL TOMOGRAPHIC SCANNER

Robert A. Sparks, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 20, 1975, Ser. No. 623,861

Int. Cl.² G01N 23/00

U.S. Cl. 250-445 T

15 Claims

1. A method of calibrating an axial tomographic scanner including frame means having an opening therein for receiving an object to be examined, a source of penetrating radiation and detector means mounted on the frame means for directing one or more beams of penetrating radiation from the source to the detector means, means to rotate the frame means including the source and the detector means mounted thereon about the opening and means to translate the source and the detector means laterally across the opening between successive rotations of the frame means by the rotation means; said method comprising positioning a centering member coincident with the center of rotation of the frame means for a first angular orientation thereof; rotating the frame means about the opening and the positioned centering member therein and translat-

1. Radiographic apparatus for examining part of the interior of body by means of penetrating radiation including a packing member comprising a bag containing a mixture of emulsifying ointment with a cellulosic filler, said mixture having an absorption to the radiation similar to that of human tissue, the member as a whole being flexible and being adapted to be placed in contact with said body in the vicinity of the part to be examined, locating means, arranged to maintain said member in place, and means for disposing said locating means in a predetermined position with respect to the source of said radiation.

4,053,782

DEVICE FOR ALIGNING AN X-RAY SOURCE WITH AN IMAGE RECEPTOR

Joseph J. Grass, Brookfield, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 8, 1976, Ser. No. 721,555

Int. Cl.² G03B 41/16

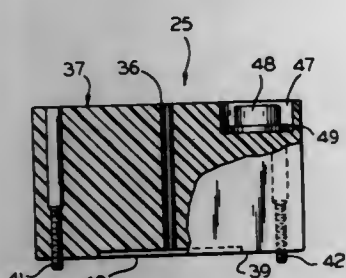
U.S. Cl. 250-491

8 Claims

1. A device for determining when a selected ray in an x-ray beam which diverges from a focal spot is perpendicular to a predetermined plane, comprising:

a straight x-ray impermeable tube comprised of a wall having a concentric bore and having a length which is substantially greater than its inside and outside diameters,

support means for said tube constructed and arranged to permit radiation from said focal spot to be projected generally axially of said tube along the inside and outside



thereof and to permit said tube to be moved in the path of said beam, whereby perpendicularity of said selected ray will be indicated when the image of the inside and outside of said tube are concentric.

4,053,783

X-RAY LASER UTILIZING GAS JET

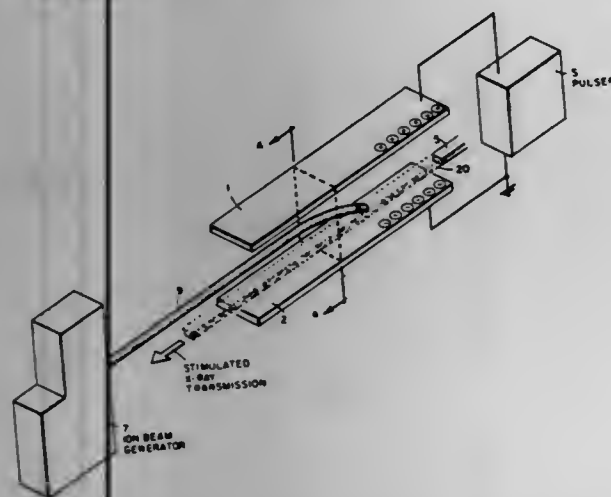
Marian O. Sealy, Tucson, Ariz., assignor to University Patents, Inc., Stamford, Conn.

Filed Oct. 29, 1974, Ser. No. 518,270

Int. Cl.² H01J 35/00

U.S. Cl. 250-493

5 Claims



1. Apparatus for generating emission, comprising: means for producing a gas jet target capable of population inversion; means for generating an ion beam; and means for scanning the ion beam along said gas jet so as to impinge thereon and cause emission therefrom, the scanning speed being substantially equal to the wavefront velocity of said emission.

4,053,784

PHOTO SEQUENCE PROGRAMMER

Yoshikazu Kura, 31-3, Higashi Magome 1-chome, Ota, Tokyo, Japan

Filed Dec. 5, 1975, Ser. No. 638,148

Claims priority, application Japan, Dec. 7, 1974, 49-140116

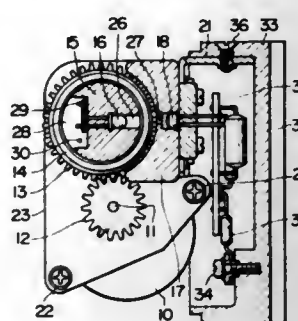
Int. Cl.² G06K 7/10

U.S. Cl. 250-570

15 Claims

1. A photo sequence programmer comprising: a rotary transparent cylinder; a plurality of light-emitting elements disposed inside said cylinder; a plurality of light-receiving elements disposed outside said cylinder, each light-emitting element facing a light-receiving element through said transparent cylinder between them; opaque tapes attached on the surface of said cylinder in accordance with a predetermined arrangement to effect interruption of light being transmitted from said light-

emitting elements to said light-receiving elements in a predetermined sequence as said cylinder rotates;



and a plurality of switching circuits including said plurality of light-emitting elements and said plurality of light-receiving elements, said switching circuits being actuable in response to said interruption of light.

4,053,785

OPTICAL SMOKE DETECTOR WITH SMOKE EFFECT SIMULATING MEANS

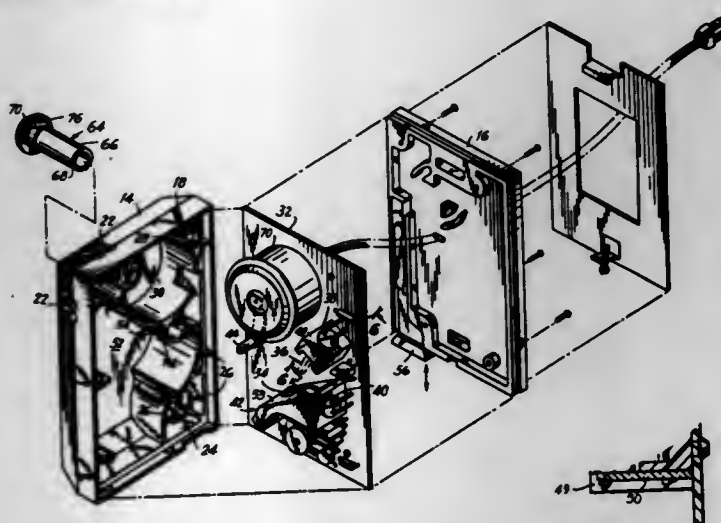
Sung Chul Lee, Bridgeport; Vaclav Oldrich Podany, Norwalk, both of Conn., and Hilario Simoes Costa, New Rochelle, N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,018

Int. Cl.² G01N 21/26

U.S. Cl. 250-574

5 Claims



1. In a smoke detection apparatus in which there is included a housing enclosing a smoke detector chamber, a main light source mounted within the housing and a photocell device arranged within the housing for receiving substantial light from said main light source only when such light is scattered by smoke entering such chamber, the improvement which comprises a smoke effect simulating means, said means including an auxiliary or secondary light source, and means for selectively directing light from said auxiliary source onto said photocell so as to substitute for said light scattered by smoke, thereby to simulate the effect of the presence of smoke in said chamber.

4,053,786

TRANSDUCER OUT OF RANGE PROTECTION FOR A STEAM TURBINE GENERATOR SYSTEM

Donald J. Jones, and Gary W. Berkebile, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 21, 1973, Ser. No. 427,429

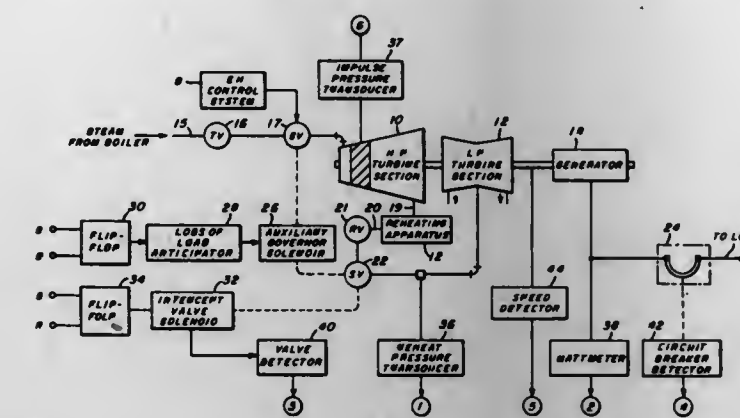
Int. Cl.² F01K 13/02

U.S. Cl. 290-52

16 Claims

1. A turbine system comprising: a turbine having at least one high-pressure stage and at least one low-pressure stage, an electrical generator driven by said turbine for supplying electrical power to a load, means responsive to a predetermined mismatch between the

steam pressure sensed at the inlet to the low-pressure turbine stage and a representation of the electrical output of the generator for interrupting the flow of steam to at least part of the turbine for a predetermined interval of sufficient duration to permit correction of a partial load loss represented by said predetermined mismatch, and



means responsive to a continued mismatch between the steam pressure sensed at the inlet of the low-pressure turbine and the representation of the electrical output of the generator after steam flow to the turbine has been reestablished for preventing continued interrupting of said steam flow.

4,053,787

MODULAR HYDROELECTRIC POWER PLANT

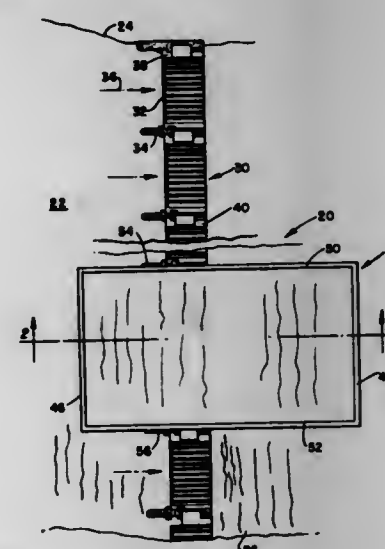
Richard E. Diggs, S. 12A Road, P.O. Box 776, Carthage, Mo. 64836

Filed Oct. 23, 1975, Ser. No. 625,177

Int. Cl.² F03B 13/00

U.S. Cl. 290-54

15 Claims



13. Apparatus for converting water movement in a stream into usable power comprising:

a plurality of supporting members spaced apart transversely of the stream and being substantially flush with the stream bed and having supporting structure guide means; a plurality of separate, independent modules, each having a frame member located in the water and each having module guide means which are complementary to said supporting structure guide means for cooperation therewith to removably support said modules in said supporting structure in a manner such that said modules can be removed therefrom, said modules each being self-contained and separated from adjacent modules by said supporting member, each module further including an articulated turbine wheel rotatably attached to said frame member, each of said turbine wheels including a plurality of sections and partitions connecting adjacent sections together at the ends thereof, each section having a plurality of turbine blades with blades in one section being staggered with respect to blades in adjacent sections to be in spaced

parallelism therewith for producing uniform rotation of said turbine wheel, a power generating means mounted on said frame member and connected to said turbine wheel for rotation therewith, and means mounted on said frame of each module for withdrawing power from said power generating means, said frame member of each module being mounted on said supporting structure to be beneath the surface of the water so that water flows over said frame member and cascades downwardly onto said turbine wheels to rotate same.

4,053,788

ELECTRICAL ENERGIZABLE APPARATUS AND ADAPTER CONNECTOR FOR USE THEREWITH

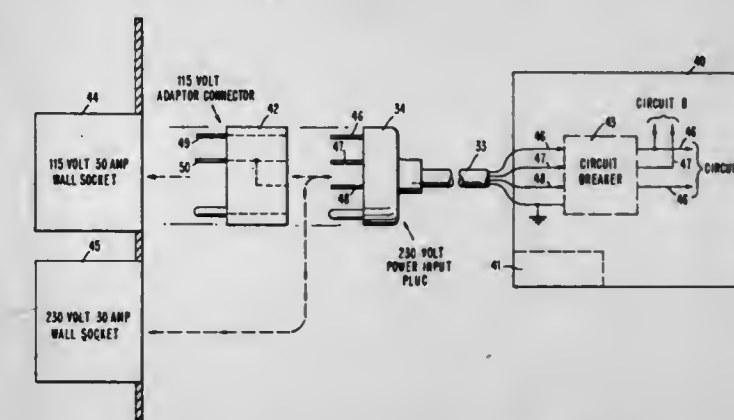
Edward Thomas Roble, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 11, 1976, Ser. No. 713,742

Int. Cl.² H02J 3/00

U.S. Cl. 307-11

8 Claims



1. Electrical energizable apparatus, comprising: a plurality of electrically energizable devices, each of a low voltage rating, which are operatively associated to perform a function, at least two circuit means whose totality includes said devices, each circuit means being substantially current-load-balanced, a high voltage input plug having at least two low voltage circuits individually connected to a separate one of said circuit means, such that upon insertion of said input plug into a high voltage electrical input socket, each of said devices receives its rated low voltage, and a passive adapter connector associated with said apparatus, having a high voltage socket portion cooperable with said input plug, and having a low voltage plug portion cooperable with a low voltage electrical input socket, said connector containing a branching electrical conductor circuit which connects each of said devices to its rated low voltage.

4,053,789

TOUCH ACTUATED SYSTEM RESPONSIVE TO A COMBINATION OF RESISTANCE AND CAPACITANCE

Sheldon L. Schultz, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 27, 1976, Ser. No. 718,230

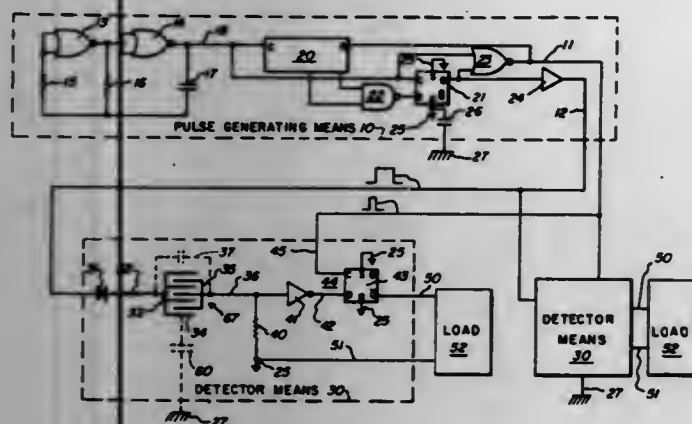
Int. Cl.² H01H 35/00

U.S. Cl. 307-116

10 Claims

1. A touch actuated system that responds to the touch of an animal, including: continuous pulse generating means for generating a pair of pulse outputs; at least one touch actuated detector means connected to receive said pair of pulse outputs; said detector means including a touch responsive area having two spaced conductor means which are adapted to be connected together resistively by an animal that has an inherent capacitance to ground; said touch responsive area having a first of said spaced conductor means connected to a first of said

pulse outputs through an asymmetrically conducting impedance means; said touch responsive area having a second of said spaced conductor means connected to pulse processing means; and said pulse processing means connected to a second of said



pulse outputs with said pulse processing means changing state to operate a load when an animal contacts said touch responsive area to alter the resistance between said spaced conductor means concurrently with said inherent capacitance being charged.

4,053,790

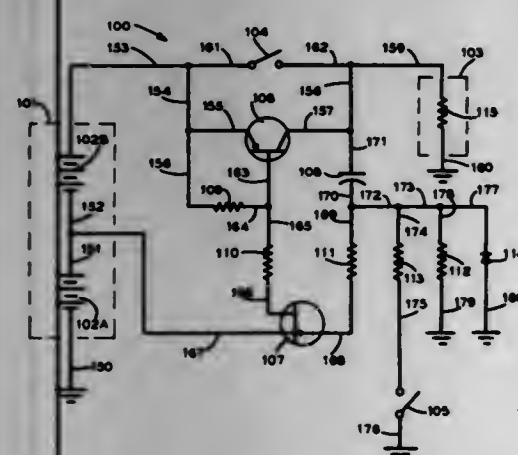
POWER LINE SWITCH WITH TIME DELAY TURN OFF
Harold Edward Myers, St. Joseph, Mich., assignor to Heath Company, Benton Harbor, Mich.

Filed Aug. 31, 1976, Ser. No. 719,302

Int. Cl.² H03K 17/26

U.S. Cl. 307-141.4

7 Claims



1. A power conservative time delay cut-off switch having a power on and power cut-off state for permitting a load to receive power from a power source for a predetermined event actuated period of time corresponding to the time that the switch is in the power on state and which draws no power in the power off state, comprising:

- a first switching device which has a conductive and a non-conductive state and includes input, output and control terminals, said input terminal being coupled to said power source and said output terminal being coupled to said load, for permitting power to reach said load while said device is in its conductive state;
- bias means;
- a second switching device which has a conductive and a non-conductive state and includes input, output and control terminals, said input terminal of said second device being coupled to said bias means and said output terminal of said second device being resistively coupled to the control terminal of said first device, for placing and maintaining said first device in the same conductivity state as said second device;
- means for providing a pulse of short duration to said second device to initially place said second device in its conductive state;
- means for storing an electric charge over said predeter-

mined period which includes a first and second terminal, said first terminal being coupled to the output terminal of said first device and said second terminal being coupled, through a resistance of high impedance, to ground, for developing an electric charge for storage while said first device is in its conductive state; and
f. means for varying the potential on the control terminal of said second device, coupled between said second device and said means for storing, directly as a function of the electric charge stored by said means for storing.

4,053,791

LOGIC CIRCUIT OF RATIOLESS STRUCTURE
Kenzo Masuda, Tokorozawa, Japan, assignor to Hitachi, Ltd., Japan

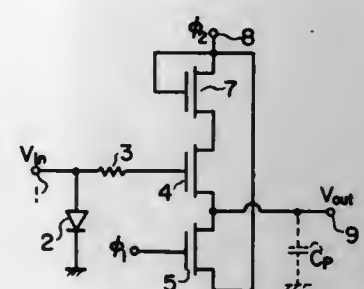
Filed June 22, 1976, Ser. No. 698,520

Claims priority, application Japan, June 23, 1975, 50-75599

Int. Cl.² H03K 19/08

U.S. Cl. 307-205

3 Claims



1. A logic circuit of a ratioless structure comprising:
an input terminal;
a drive MOS FET having its gate connected to said input terminal;
a pre-discharge MOS FET having its drain connected to the source of said drive MOS FET and its gate arranged for reception of a first clock pulse signal which causes a pre-discharge of charges accumulated at the drain of said pre-discharge MOS FET;
a load MOS FET having its source connected to the drain of said drive MOS FET and its gate arranged for reception of a second clock pulse signal; and
an output terminal connected to the junction between the source of said drive MOS FET and the drain of said pre-discharge MOS FET.

4,053,792

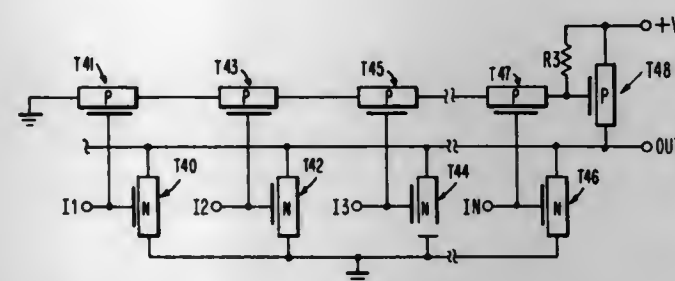
LOW POWER COMPLEMENTARY FIELD EFFECT TRANSISTOR (CFET) LOGIC CIRCUIT
Anthony T. Cannistra, and Joseph A. Petrofsky, Jr., both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1974, Ser. No. 483,507

Int. Cl.² H03K 19/08, 19/34

U.S. Cl. 307-205

4 Claims



1. A complementary field effect transistor logic circuit comprising:
an output node;

4,053,794

SEMICONDUCTOR LOGIC GATES

Colin Raymond Edwards, Frome, Somerset, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

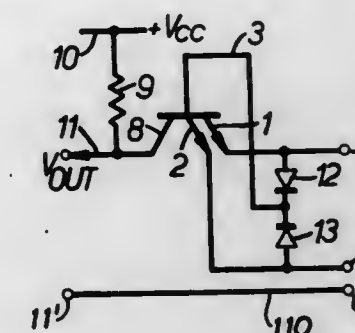
Filed Nov. 19, 1975, Ser. No. 633,182

Claims priority, application United Kingdom, Nov. 21, 1974, 50528/74

Int. Cl.² H03K 19/08, 19/12, 19/32, 19/20

U.S. Cl. 307-216

19 Claims



a first plurality of transistors of a first channel type connected in parallel between a first potential level and said output node, each said transistor receiving an input signal at a control electrode;
a pull-up transistor of a second channel type connected between said output node and a second potential level; impedance means connected between said second potential level and a control electrode of said pull-up transistor; and
a second plurality of transistors of said second channel type connected in electrical series between said first potential level and the control electrode of said pull-up transistor, each said second plurality of transistors having a control electrode receiving an input corresponding to each of the inputs received by said first plurality of transistors.

4,053,793

MODULAR LOGIC CIRCUIT FOR PERFORMING DIFFERENT LOGIC FUNCTIONS

Wolfram Ernst, Munich; Josef Rohrig, Oberhaching, and Gerhard Renz, Neuried, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

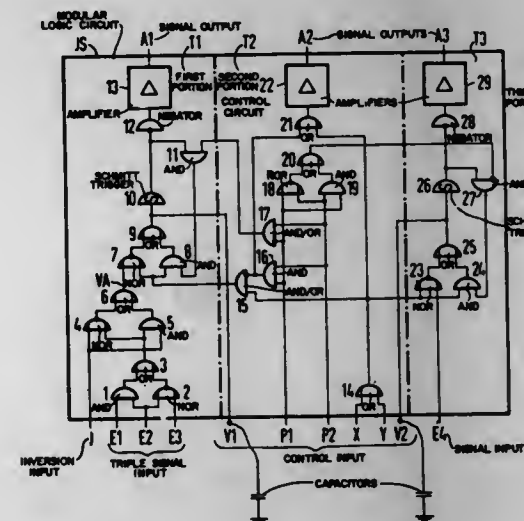
Filed Mar. 25, 1976, Ser. No. 670,160

Claims priority, application Germany, Mar. 25, 1975, 2513153

Int. Cl.² H03K 19/08

U.S. Cl. 307-207

4 Claims



1. A modular logic circuit for performing a plurality of differing logic functions comprising:
first, second and third portions,
said first portion comprising first logic circuit means for receiving first input pulse signals and for producing a first output pulse signal having a predetermined length and time position relationship to said first input pulse signals,
said third portion comprising third logic circuit means for receiving a third input pulse signal which is independent of said first input pulse signals and for producing a third output pulse signal having a predetermined length and time position relationship with said third input pulse signal,
said second portion comprising second logic circuit means including means for receiving control input signals and for producing therefrom control output signals, said control output signals having levels which cause said first and third logic circuit means to selectively produce said predetermined length and time position relationships.

4,053,795

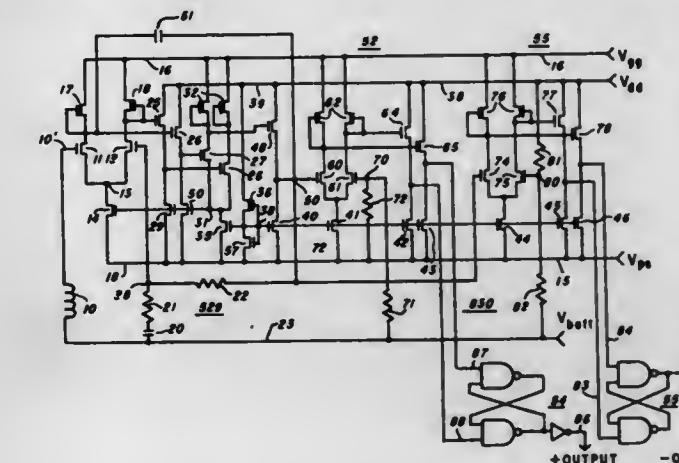
LOW LEVEL FIELD EFFECT TRANSISTOR AMPLIFIER
Michael J. Cochran, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 6, 1976, Ser. No. 702,824

Int. Cl.² H03K 5/20

U.S. Cl. 307-350

16 Claims



1. A low-level field effect transistor amplifier comprising:
a. A pair of input field effect transistors arranged as a differential pair, each input field effect transistor having first and second electrodes and a gate;
b. field effect transistor means for connecting the first electrodes of said input field effect transistors to a circuit common, said field effect transistor means having at least one gate;
c. a pair of output field effect transistors, each output field effect transistor having first and second electrodes and a gate;
d. a first field effect transistor having first and second electrodes and a gate, the gate of which is connected to the second electrode of one of said input field effect transistors and the first electrode of which is coupled to the gate of one of said output field effect transistors;

being fastened to the shaft for rotation about said central axis in a plane substantially perpendicular to said axis, and said armature plates being spaced apart along said shaft to substantially fill the circular cylindrical cavity defined by said pole faces; and in which the spacing between armature plates is substantially equal to the length of the air gap formed between the pole faces and the circular outer perimeter of each armature plate.

4,053,802 HIGH-VOLTAGE VACUUM TUBE, PARTICULARLY AN X-RAY TUBE

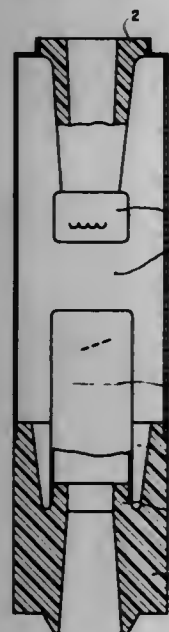
Walter Hartl, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 9, 1975, Ser. No. 656,618

Claims priority, application Germany, Feb. 18, 1975, 2506841 Int. Cl.² H01J 35/00

U.S. Cl. 313—55

4 Claims



1. A high-voltage vacuum tube comprising an envelope having a metal portion and within the envelope a cathode, an anode, and an insulator member, said metal portion in the operation of said tube being at a high negative voltage relative to said anode, said insulator being provided with a recess open to the interior of the tube and spacedly surrounding the anode, said anode being mounted within said recess and being connected to the insulator member at the bottom portion of the recess.

4,053,803

GAS DIELECTRIC OVERCOAT FOR PANEL

Roger E. Ernsthausen, Lackey, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 406,022, Oct. 12, 1973, Pat. No. 3,943,394, which is a continuation-in-part of Ser. No. 204,700, Dec. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 70,745, Sept. 8, 1970, Pat. No. 3,634,719. This application Dec. 9, 1975, Ser. No. 639,147

The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.

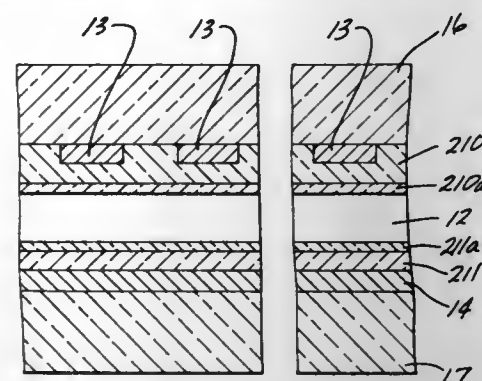
Int. Cl.² H01J 65/00, 61/02, 61/15

U.S. Cl. 313—201

6 Claims

1. In a gas discharge display/memory device characterized by an ionizable gas medium in a gas chamber formed by a pair of opposed dielectric material charge storage members having surfaces in contact with the gas medium and at least one electrode insulated from the gas medium by a dielectric member, the improvement wherein each dielectric gas contacting surface is at least partially coated with a layer of at least

one inorganic lead compound selected from the group consisting of lead chloride, lead iodide, lead bromide, and



lead fluoride, said lead compound layer having a thickness of at least about 100 angstrom units.

4,053,804

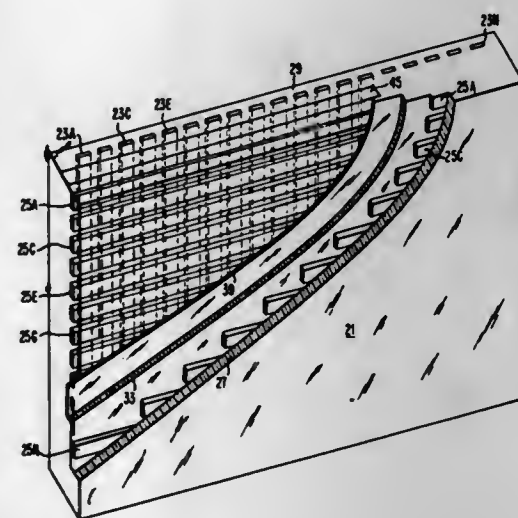
DIELECTRIC FOR GAS DISCHARGE PANEL
M. Osama Aboelfotoh, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,180

Int. Cl.² H01J 17/04

U.S. Cl. 313—218

13 Claims



1. In a gaseous discharge display device, the combination comprising an ionizable gaseous medium, a pair of nonconductive support members, conductor arrays formed on each of said support members, and a dielectric medium insulating at least one of said conductor arrays from contact with said gaseous medium, said ionizable gaseous medium contacting surface of said dielectric medium comprising a gold doped oxide in an amount sufficient to increase the memory margin of the panel while affording relatively stable operating voltages.

4,053,805

ARC DISCHARGE LAMP COMPRISING MERCURY, SCANDIUM AND LITHIUM IODIDE, SCANDIUM EMISSION BEING SUPPRESSED

John A. Scholz; Phillip J. Gardner, both of Danvers, Mass., and H. Graham Silver, Kings Point, N.Y., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Dec. 9, 1974, Ser. No. 530,786

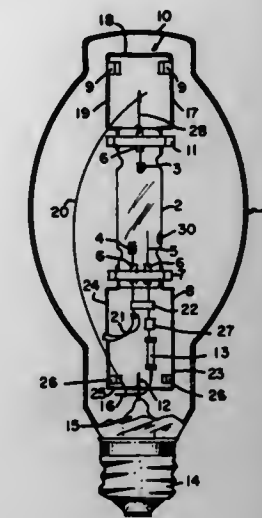
Int. Cl.² H01J 17/20, 61/18

U.S. Cl. 313—229

1 Claim

1. A red emitting metal halide arc discharge lamp comprising an arc tube having sealed ends and electrodes disposed in said ends and a fill within said arc tube comprising mercury,

scandium and lithium iodide, the relationship between the scandium and the lithium iodide being such that lithium is the



primary light emitting metal and scandium emission is suppressed.

4,053,806

PYROELECTRIC DETECTOR COMPRISING NUCLEATING MATERIAL WETTABLE BY AQUEOUS SOLUTION OF PYROELECTRIC MATERIAL

Andrew Alfred Turnbull, Reigate, and Harry Sewell, Horsham, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,449

Claims priority, application United Kingdom, Sept. 2, 1974, 38214/74

Int. Cl.² H01J 29/45, 31/49, 39/00

U.S. Cl. 313—388

12 Claims



1. A pyroelectric detector comprising a substrate, supporting a thin, solid layer of pyroelectric material selected from the group comprising TGS and triglycine fluoroberyllate which are partly or wholly deuterated and a layer of nucleating material selected from the group consisting of aluminum, titanium, matt carbon, magnesium fluoride aluminum oxide, and silica and wettable by an aqueous solution of the pyroelectric material and to which the pyroelectric material adheres intermediate the pyroelectric layer and the substrate.

4,053,807

THERMIONIC CATHODE AND HEATER STRUCTURE ON CERAMIC BASE PLATE

Torao Aozuka, Chofu; Akio Ohkoshi; Sholchi Muramoto, both of Tokyo; Akira Nakayama, Fuchu, and Koichiro Sumi, Inagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

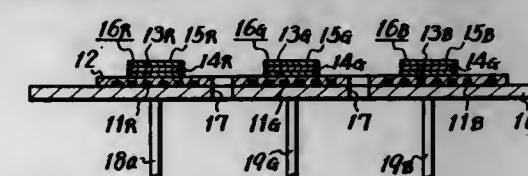
Filed Mar. 31, 1976, Ser. No. 672,501

Claims priority, application Japan, Apr. 3, 1975, 50-40590

Int. Cl.² H01J 29/50, 29/46, 19/18

U.S. Cl. 313—409

10 Claims



1. A thermionic cathode structure, comprising:

- a ceramic base plate;
- a heater layer of tungsten coated on a predetermined area of said ceramic base plate;
- a ceramic insulating layer coated on said ceramic base plate and covering said heater layer;
- a cathode lead layer of tungsten coated on a portion of said ceramic insulating layer superposed over said area of the ceramic base plate;
- a base metal layer coated on said cathode lead layer; and
- a cathode material coated on said base metal layer, said heater layer, ceramic insulating layer, cathode lead layer, base metal layer and cathode material forming a cathode member.

4,053,808

ELECTRON BEAM COLLIMATOR

Jack Peacock, Haywards Heath, England, assignor to U.S. Philips Corporation, New York, N.Y.

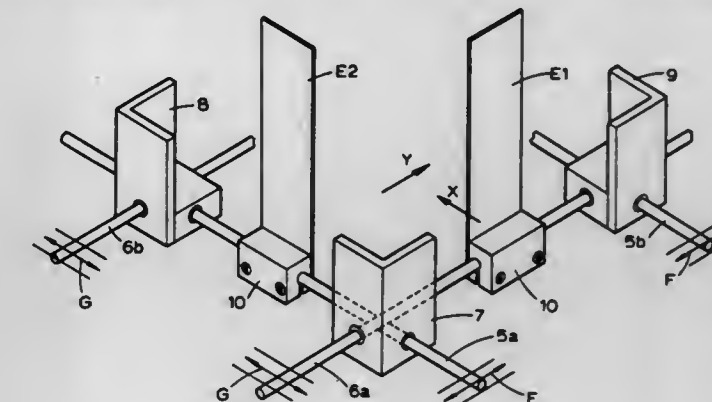
Filed Nov. 12, 1976, Ser. No. 741,376

Claims priority, application United Kingdom, Nov. 13, 1975, 46891/75

Int. Cl.² H01J 29/02; G21K 1/04

U.S. Cl. 313—458

2 Claims



1. An electron beam collimator comprising a tube structure of rectangular cross-section and which is defined by first substantially rigid wall members each of which comprises two planar wall portions which meet to form a corner of the tube structure and by further intermediate rigid planar wall members, each side of the tube structure comprising one of the wall portions of one of said first wall members and one of the wall portions of another of said first wall members and at least one intermediate planar wall portion formed by one of the intermediate planar wall members, and each wall portion in each side being arranged in overlapping and sliding relationship with an adjacent wall portion in that side so that the cross-section of the tube structure, and hence of the beam emerging therefrom, can be varied, and means for moving the wall portions relative to one another to vary the cross-section of the tube structure, said means comprising first and second elements which are movable towards and away from one another, and third and fourth elements which are movable towards and away from one another in a direction at right angles to the direction of movement of the first and second elements, one of the first wall members connected to the first and third elements for movement with each of these two elements relative to the other, another of the first wall members being connected to the first and fourth elements for movement with each of these two elements relative to the other, another of the first wall members being connected to the second and third elements for movement with each of these two elements relative to the other, the other of the first wall members being connected to the second and fourth elements for movement with each of these two elements relative to the other, and the intermediate wall member or members in each side of the tube structure being connected to a respective one of the first, second, third and fourth elements for movement therewith.

4,053,809

SHORT-ARC DISCHARGE LAMP WITH STARTING DEVICE

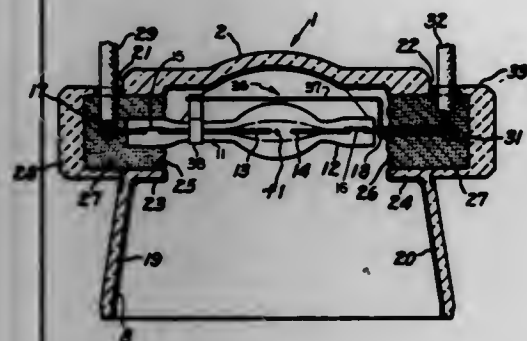
Elmer G. Fridrich, Chardon, and Rolf S. Bergman, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed June 18, 1976, Ser. No. 697,426

Int. Cl.² H01J 61/54

U.S. Cl. 313—198

11 Claims



1. An arc discharge lamp comprising an envelope having a bulb portion and an elongated stem extending from said bulb portion, and first and second electrodes extending into said envelope and spaced apart therein in said bulb portion to define an arc discharge path, said first electrode being part of an elongated electrode structure hermetically sealed in said stem at a region thereof spaced from said bulb portion, said first electrode extending through said stem from said seal region and into said bulb portion, wherein the improvement comprises a starting device of electrically conductive material positioned externally of said envelope and connected electrically to said second electrode and extending from said second electrode to and fitting around and substantially encircling said stem alongside said first electrode between said seal region and said bulb portion.

4,053,810

LOSSLESS TRAVELING WAVE BOOSTER TUBE

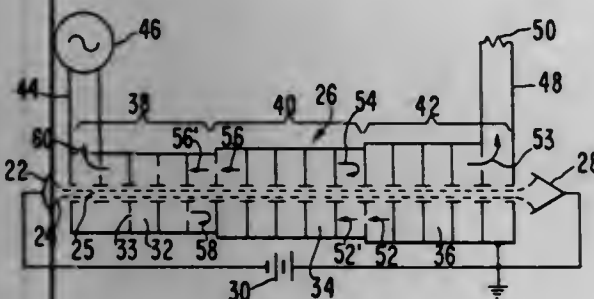
Bertram G. James, Redwood City, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed June 25, 1976, Ser. No. 699,763

Int. Cl.² H01J 25/34

U.S. Cl. 315—3.6

6 Claims



1. In a traveling-wave amplifier tube, a coupled-cavity slow-wave circuit adapted to interact with a stream of electrons over an extended path, output transmission line means coupled to an output end of said circuit at the downstream end of said path, means for coupling electromagnetic energy to an input end of said circuit at the upstream end of said path, the improvement wherein: a plurality of cavities forming a first portion of said circuit nearer said output end have outer walls with larger dimensions transverse to said beam path than those of a plurality of cavities forming a second, adjacent portion nearer said input end, whereby the upper cutoff frequency of said first portion is lower than that of said second portion.

4,053,811

FLUORESCENT LAMP SIMULATOR

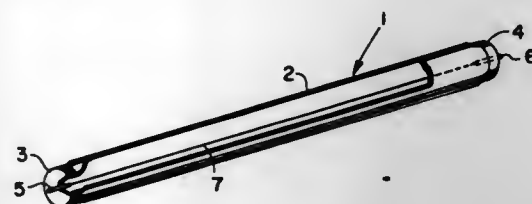
Robert Ray Abernethy, 7295 Walton Road, Walton Hills, Ohio 44146

Filed May 8, 1975, Ser. No. 575,628

Int. Cl.² H05B 41/16, 41/46; H01C 1/02

U.S. Cl. 315—95

13 Claims



1. For use in a lighting apparatus including a ballast circuit normally operable to effect energization of plural electric discharge lamps to produce respective normal lumen outputs and respective pairs of socket-type connectors in which the terminals of respective lamps may be located for electrical connection in said ballast circuit and for mechanical support of said lamps, the improvement comprising means for nonreactively completing at least a portion of said ballast circuit when one of said lamps has been removed therefrom thereby to enable said ballast circuit effectively to energize at least one remaining lamp in circuit connection therewith to produce its normal lumen output, said means for substantially completing said ballast circuit being insertable into a pair of socket-type connectors from which a lamp has been removed for mechanical support by said pair of socket-type connectors and to electrically couple the same.

4,053,812

SYSTEM FOR DRIVING A DISPLAY DEVICE

Tetsunori Kaji, and Masashi Mizushima, both of Hachioji, Japan, assignors to Hitachi, Ltd., Japan

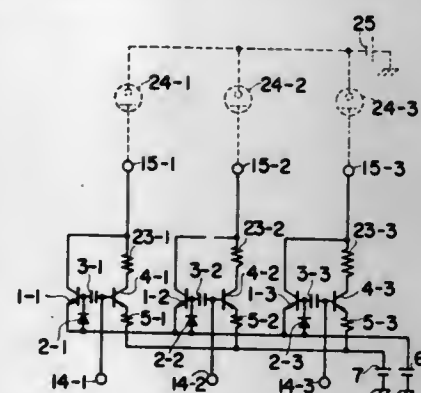
Filed Apr. 4, 1975, Ser. No. 565,267

Claims priority, application Japan, Apr. 5, 1974, 49-37955

Int. Cl.² H05B 37/00

U.S. Cl. 315—169 TV

22 Claims



1. A system for driving a display device comprising: display means including at least one photo element having characteristics such that each of the firing voltage level and the operating voltage level thereof is greater than the extinction voltage level thereof; current source means connected to said display means for generating a pulsed current to drive said display means; and first setting means connected to said display means for setting the voltage applied to said photo element to a value less than the extinction voltage level thereof at the trailing edge of the pulsed current.

4,053,813

DISCHARGE LAMP BALLAST WITH RESONANT STARTING

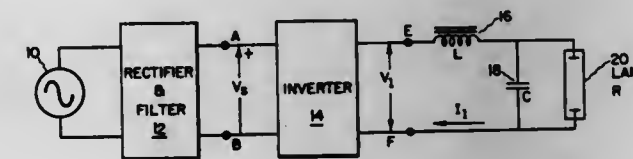
William P. Kornumpf, Schenectady, N.Y., and Thomas M. Jahns, Twin Lakes, Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,529

Int. Cl.² H05B 37/00

U.S. Cl. 315—206

3 Claims



1. A discharge lamp circuit comprising: an output circuit including a discharge lamp, an inductor connected in series with said lamp, and a capacitor connected in parallel with said lamp; and a transistorized inverter circuit source of ac voltage connected in series with said output circuit, said source including means for automatically adjusting the frequency of said ac voltage in response to the impedance of said output circuit and functioning so that said ac voltage is adjusted to the approximate resonant frequency of said output circuit as such times as the Q of said output circuit is high and is adjusted away from said resonant frequency at such times as the Q of said output circuit is not high; wherein said transistorized inverter comprises: a transformer including a primary winding defining a first end, a second end, and a center tap, and further including a secondary winding having a first end and a second end, the polarity of said windings being chosen so that the first end of said primary winding is positive when the first end of said secondary winding is positive, the center tap of said primary winding being connected to a first polarity supply voltage; a first transistor having an emitter connected to a second polarity of said supply voltage, a collector connected to the second end of said primary winding, and a base connected to the first end of said secondary winding; a first resistor and a first bias diode connected in series between the base of said first transistor and the emitter of said first transistor; a second transistor having an emitter connected to said second polarity supply voltage, a collector connected to the first end of said primary winding, and a base; a capacitor connected between the base of said second transistor and the second end of said secondary winding; a second resistor and a second diode connected between the base of said second transistor and the emitter of said second transistor; a third diode connected from the collector of said first transistor to the emitter of said first transistor; a fourth diode connected from the collector of said second transistor to the emitter of said second transistor; and a pair of output terminals connected respectively to the first end of said primary winding and the second end of said primary winding, whereby a square wave voltage is produced between said pair of output terminals.

4,053,814

CONTINUOUS AUTOMATIC STARTING ASSIST UV CIRCUIT FOR MICROWAVE POWERED ELECTRODELESS LAMPS

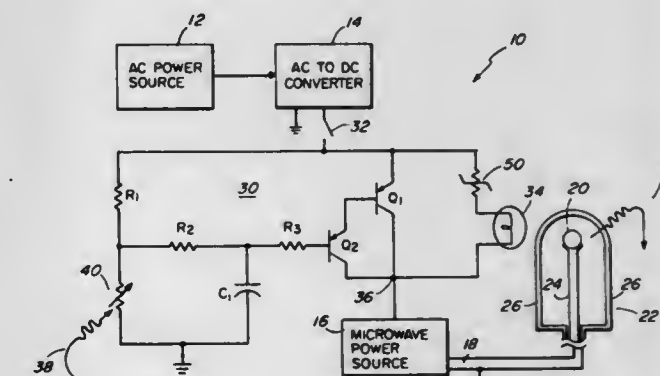
Robert J. Regan, Needham; Paul O. Haugejaa, Acton, and William H. McNeill, Carlisle, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed July 14, 1976, Ser. No. 705,328

Int. Cl.² H05B 41/16, 41/24

U.S. Cl. 315—248

8 Claims



1. In an electrodeless light source having a source of power at a microwave frequency, an electrodeless lamp with an envelope made of a light-transmitting material and a volatile fill material emitting light upon breakdown and excitation and a termination fixture having an inner conductor and an outer conductor disposed around the inner conductor, the lamp being disposed at one end of the conductors to form a termination load for the microwave source coupled to the other end of the conductors, a starting control circuit including: a. the source including a dc power source and a microwave power source receiving the dc power for providing microwave power in an amount related to the amount of dc power, the microwave power output being coupled to the inner and outer conductors, b. switch means for controlling the application of dc power to the microwave power source, c. a UV light source disposed near the lamp and coupled in series between the dc power source and the microwave power source to emit UV light upon activation of the switch means to assist in starting the lamp, the UV source upon emission of light decreasing the amount of dc power coupled to the microwave power source to reduce the output thereof, d. means for continuously decreasing the dc current through the UV source and increasing the dc voltage for the microwave power source in relation to the amount of light generated within the fixture as the lamp is started, e. transistor means coupled between the dc power source and microwave power source and across the UV source to provide a shunt path therearound whose impedance is a function of the state of conduction of the transistor means, and f. light sensitive means responsive to the light from the lamp for controlling the conductive state of the transistor means to regulate the dc power applied to the microwave power source in direct relation to the amount of light from the lamp.

4,053,815

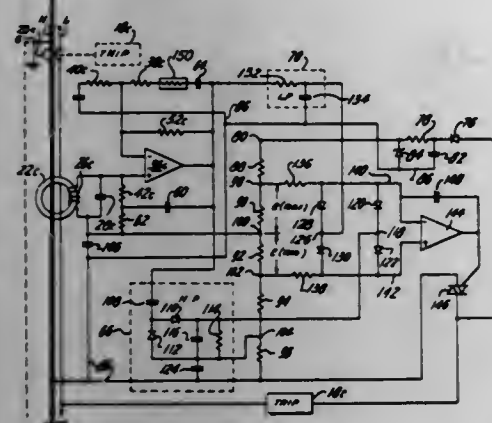
GROUND FAULT INTERRUPTERS

Richard C. Sireom, Scarborough, Canada, assignor to Federal Pacific Electric Company, Newark, N.J.
Continuation of Ser. No. 395,422, Sept. 10, 1973, Pat. No. 3,879,639, which is a continuation of Ser. No. 320,855, Jan. 4, 1973, abandoned. This application Apr. 17, 1975, Ser. No. 569,061

Int. Cl.² H02H 3/28

U.S. Cl. 361-42

5 Claims



1. A neutral-to-ground fault detector for a distribution circuit to supply alternating current at about 60 Hz to a load, where the circuit includes line and neutral conductors extending to load-connection terminals, and where the neutral conductor has a ground connection, said neutral-to-ground fault detector including a differential current transformer having a core, single turn primary windings forming current paths in series with said line and neutral conductors respectively, between said load-connection terminals and said ground connection of said neutral conductor, said primary windings being arranged to produce mutually cancelling magnetic effects in the core due to load current carried thereby, and a multi-turn winding on the core, means including a capacitor connected to said multi-turn winding for producing resonance therein at a frequency substantially higher than 60 Hz, said core and said resonant winding being formed to have a Q greatly in excess of unity at the resonant frequency, means for exciting said resonant winding within its pass band, and means for detecting the reduction of Q of the resonant winding resulting from a neutral-to-ground fault on the portion of said neutral conductor remote from said ground connection, and line-to-ground leakage detecting means having control means selectively responsive to 60 Hz signals exceeding a prescribed level and having input signal means coupled to said core.

4,053,816

PROTECTION MEANS FOR OBJECTS INCLUDED IN ELECTRICAL POWER SUPPLY NETWORKS

Gunnar Nilsson, Västervik, Sweden, assignor to ASEA Aktiebolag, Västervik, Sweden
Filed Nov. 7, 1975, Ser. No. 629,787

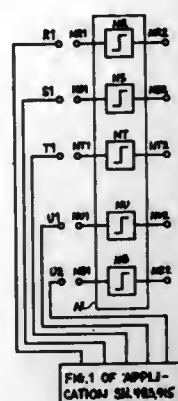
Claims priority, application Sweden, Nov. 21, 1974, 7414614
Int. Cl.² H02H 3/26

U.S. Cl. 361-42

2 Claims

1. Protection means for objects included in electrical power supply networks, comprising a three-phase directional wave detector with two inputs per phase, three single-phase and one three-phase tripping output, one three-phase blocking output, and one level detector with one partial detector for each of the single-phase tripping outputs and the three-phase blocking output, said level detector is provided with a further partial detector connected to the three-phase tripping output of the wave detector, and said two partial detectors are connected to

the three-phase outputs of the wave detector and have a lower reference level than the other partial detectors of the level



detector and are connected to the single-phase tripping outputs of the wave detector.

4,053,817

ELECTROMAGNETIC VIBRATOR

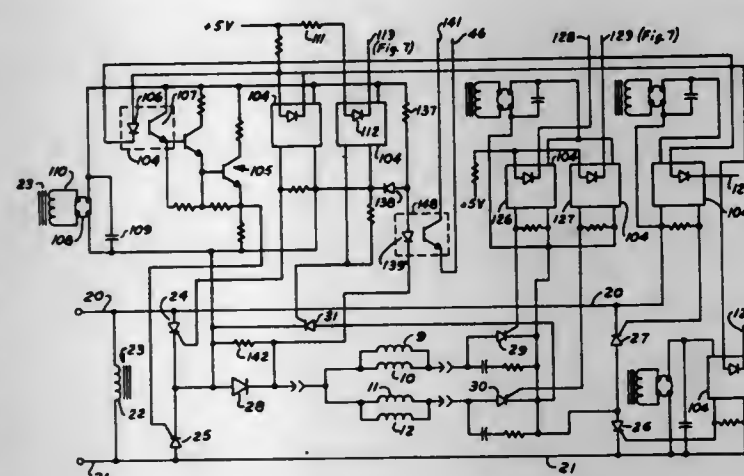
Maynard Charles Yeasting, Elmore, Ohio, assignor to Rexnord Inc., Milwaukee, Wis.

Filed June 17, 1976, Ser. No. 697,030

Int. Cl.² H02K 33/14

U.S. Cl. 318-128

8 Claims



1. In an electromagnetic vibrator comprising a work member to be vibrated, an exciter member, and resilient means connecting the members to form a vibratory system, a drive comprising an electromagnetic motor having a part on each of said members and a control for energizing said motor, said control comprising means for energizing said motor during at least part of a first half cycle of an alternating current power line voltage cycle, means for deenergizing the motor during a subsequent half cycle, and synchronizing means adapted to select as said first half cycle the first half cycle of the power line voltage that starts when said resilient means are near maximum extension in a selected direction.

4,053,818

GYRO SLAVING/BOOT STRAP AMPLIFIER

James R. Younkin, 2900 Sheryl, Fayetteville, Ark. 72701

Filed Apr. 1, 1976, Ser. No. 672,741

Int. Cl.² G05B 11/32; G05F 1/00

U.S. Cl. 318-562

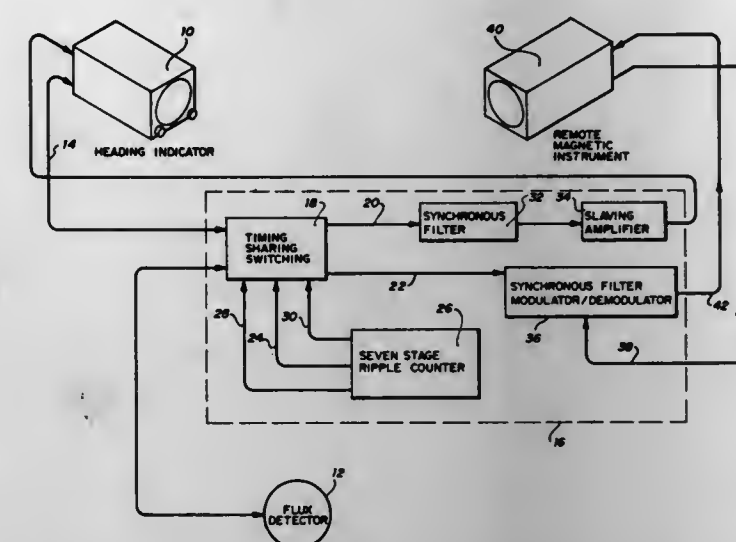
17 Claims

1. A gyro slaving/boot strap amplifier for driving a heading indicator and a remote magnetic instrument, comprising in combination:

switching means receiving input signals from the heading indicator and magnetic position data from a flux detector to provide a heading error signal and an angular position signal,

a timer generating a time sharing signal to said switching means to alternate the operation thereof between provid-

ing the heading error signal and the angular position signal,
a slaving circuit responsive to the heading error signal from said switching means to provide a drive voltage to the heading indicator, and



a boot strap circuit responsive to the angular position signal from said switching means to provide an energizing signal to the remote magnetic instrument.

4,053,819

NUMERICAL CONTROL SYSTEM FOR LATHES

Mitsuo Matsumoto, Kokubunji, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

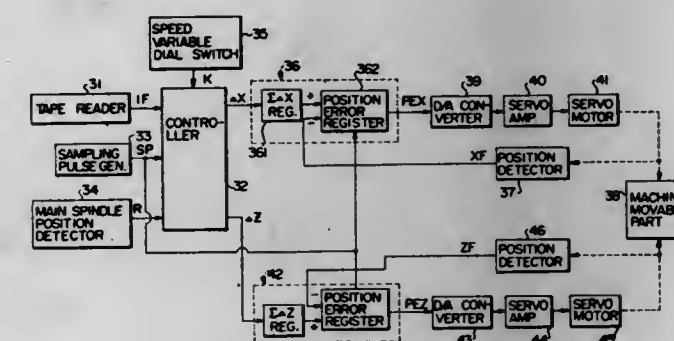
Filed Mar. 31, 1976, Ser. No. 672,440

Claims priority, application Japan, Oct. 15, 1975, 50-123233

Int. Cl.² G05B 19/18

U.S. Cl. 318-636

9 Claims



1. A numerical control system for lathes, comprising a numerical data source for providing numerical instruction data defining a feed per minute instruction mode, feed per spindle revolution instruction mode and a thread cutting instruction mode; a sampling pulse generator for generating a sampling pulse for each predetermined time Δt ; a spindle position detector mechanically mounted on a spindle of the lathe, dividing one rotation of the spindle and delivering an output corresponding to any divided position on the spindle as a cyclic function from a spindle reference position; and a controller adapted to calculate, in said feed per minute instruction mode, instruction position increment values corresponding to a tool moving amount for each said predetermined time on the basis of said numerical data, to calculate, in said feed per revolution instruction mode, instruction position increment values corresponding to a tool moving amount for said predetermined time on the basis of said numerical data and an amount of spindle rotation detected for each said predetermined time at said spindle position detector and to calculate, in said thread cutting instruction mode, instruction position increment values corresponding to a tool moving amount for each predetermined time on the basis of said numerical data and spindle revolution position data from a spindle reference position detected for each said predetermined time at said spindle position detector.

4,053,820

ACTIVE FILTER

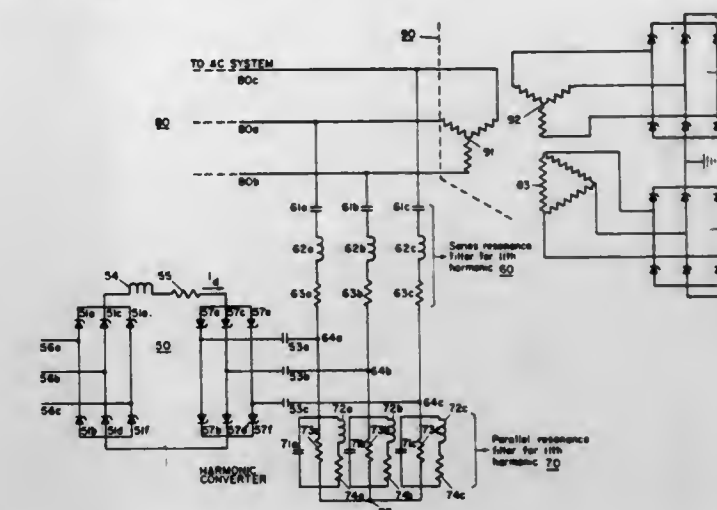
Harold A. Peterson, Madison, Wis., and Narendra Mohan, Minneapolis, Minn., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 29, 1976, Ser. No. 653,307

Int. Cl.² H02M 1/12

U.S. Cl. 363-44

13 Claims



1. A filtering network for suppression of currents having a frequency that is a given harmonic of a base frequency of a multiphase alternating current power source, said filtering network comprising:

- a passive resonance filter network for each phase of said alternating current power source tuned at a fixed frequency value corresponding to said given harmonic frequency of said base frequency; and
- means associated with said passive filter for injection into each phase of said multiphase alternating current power source an injected current of such magnitude, phase and frequency that the sum of the harmonic current in each phase and the injected current are substantially zero, said means including a harmonic converter having a source of variable magnitude unidirectional current and commutated switching elements for producing said injected harmonic currents by converting the unidirectional current from said source into a plurality of alternating currents each being injected into one of said phases and having a frequency determined by the rate of commutation of said switching elements, a phase as determined by the delay or advance of the commutation of said switching elements and a magnitude determined by the value of the magnitude of current produced by said variable magnitude unidirectional current source.

4,053,821

VOLTAGE MULTIPLIER CIRCUIT

R. Kenneth Hose, Jr., Cupertino; Keith Riordan, Sunnyvale, and Stephen M. Martin, Pleasanton, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jan. 26, 1976, Ser. No. 652,442

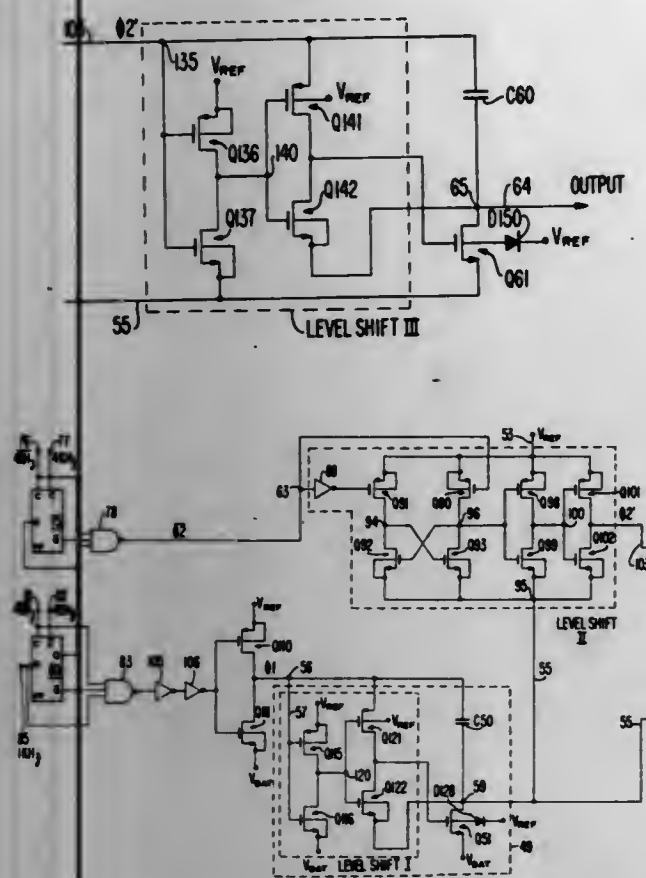
Int. Cl.² H02M 3/155

U.S. Cl. 363-60

18 Claims

1. A voltage multiplier circuit comprising:
 - a source of a reference clock signal;
 - a voltage source;
 - a pair of cascaded inverters forming a first voltage level shift means, a first of said pair of inverters being coupled between said voltage source and ground potential, and having an input thereof coupled to said reference clock signal and an output coupled to an input of the second of said pair of cascaded inverters, said second inverter being coupled between said reference clock signal and an output of the voltage multiplier circuit;

charge storage means coupled in parallel with said second inverter, and,



switching means coupled between said output of the multiplier circuit and said voltage source, and having a switching input coupled to an output of said second inverter.

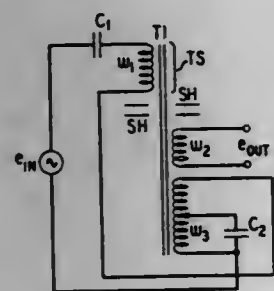
4,053,822

SUBHARMONIC FREQUENCY GENERATOR

Herman Irving Tillinger, Morris Township, and Ralph Walk, Randolph Township, both of Morris County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 23, 1976, Ser. No. 753,713
Int. Cl.² H02M 5/16

U.S. Cl. 363—172

10 Claims



1. A subharmonic frequency generator comprising input means for accepting a signal of a given frequency, a transformer including a primary winding coupled to said input means, a secondary winding, and a magnetic core linking said primary and secondary windings, magnetic path means for diverting a portion of the flux generated in response to current in said primary winding from coupling with said secondary winding to derive a specific transformer inductance, said magnetic core designed to have a portion of the core encompassed by said primary winding saturate in response to said given signal, said magnetic shunts diverting sufficient flux from a portion of the core encompassed by said secondary winding to maintain operation therein within a linear range, a first resonant circuit tuned to a first selected frequency and including said primary winding, a second resonant circuit tuned to a second selected frequency and including said primary winding, the saturable part of said core producing harmonic and beat

frequencies and said transformer inductance forming a linear inductance component common to said first and second resonant circuits.

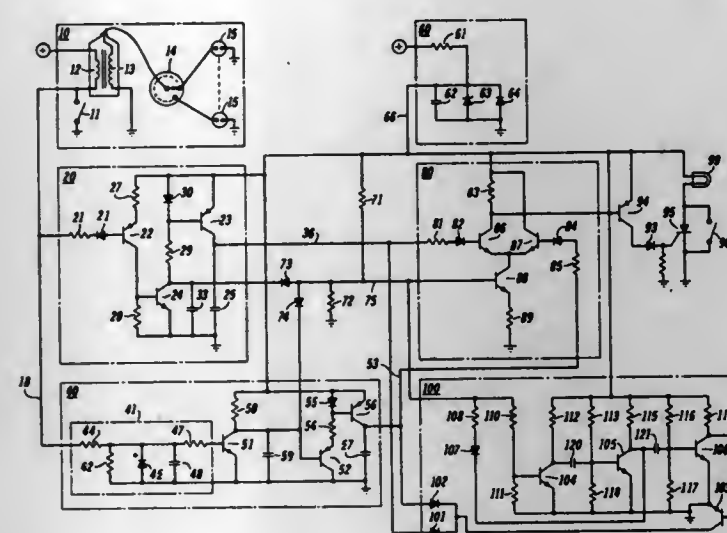
4,053,823

IGNITION ARC MONITOR CIRCUIT

Michael R. Adamian, P.O. Box 223, Naperville, Ill. 60540
Filed Apr. 22, 1976, Ser. No. 679,139
Int. Cl.² G01R 13/42

U.S. Cl. 324—17

10 Claims



1. Ignition arc monitor circuit for use with an internal combustion engine having an ignition system having a defined operating cycle, comprising: a first capacitor; first circuit means for charging said first capacitor during a first portion of said operating cycle; a second capacitor; second circuit means for charging said second capacitor during a second portion of said cycle; and means for comparing the charge on said first and second capacitors and for providing a fault indication if the charge on said second capacitor is less than on said first capacitor.

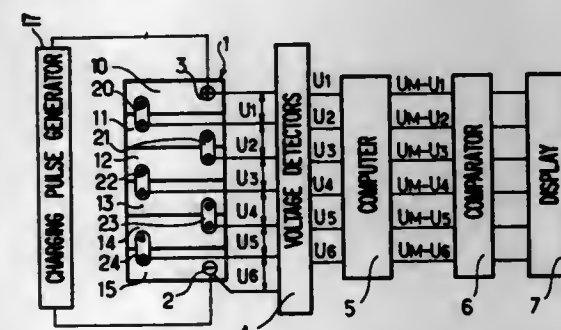
4,053,824

METHOD AND DEVICE FOR CHECKING A STORAGE BATTERY

Jean-Michel Dupuis, Gennevilliers, and Pierre Lasserre, Nanterre, both of France, assignors to Compagnie Europeenne d'Accumulateurs S.A., Paris, France
Filed July 26, 1976, Ser. No. 708,452
Claims priority, application France, July 30, 1975, 75.2382
Int. Cl.² G01N 27/42

U.S. Cl. 324—29.5

4 Claims



1. A method of checking a lead battery of series connected storage cells at the end of the battery production line, comprising the following steps, in order: fully charging said lead battery at the end of battery production; measuring an elementary transient open circuit voltage at the terminals of each storage cell in a time period from the

end of charging which ranges from a few tens of minutes to about ten hours; comparing said elementary voltages with the average transient voltages of said storage cells; and rejecting the battery if the difference between said average transient voltage and one of said elementary transient voltages is greater than a predetermined threshold.

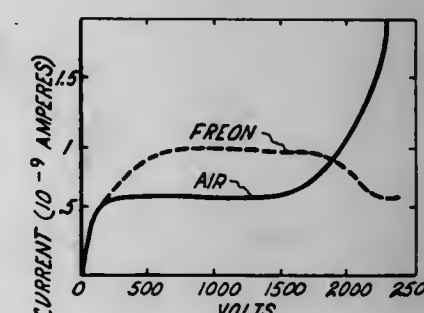
4,053,825

IONIZATION CHAMBER TYPE GAS LEAK DETECTOR OPERATING IN THE HIGH VOLTAGE AVALANCHE REGION

James R. Young, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed July 22, 1974, Ser. No. 490,586
Int. Cl.² G01N 27/66

U.S. Cl. 324—33

4 Claims



1. A gas leak detector device comprising: ionization chamber means open to the ambient for sampling the ambient atmosphere in the region of said ionization chamber means and for producing charged particles means including: a. a chamber having a first end open to the ambient and a second end; b. a first electrode disposed within said chamber and having a first end positioned within said chamber adjacent the first end thereof and having a second end closer to a second end of said chamber and rigidly supported thereat; c. a radioactive source attached to said first electrode near the first end thereof; and d. a second electrode disposed within said chamber, having a pointed first end positioned in close proximity to said radioactive source for increasing the electric field therebetween upon a high voltage being applied across said first and second electrodes, and having a second end closer to the second end of said chamber and rigidly supported thereat; said second electrode being oriented perpendicular to said radioactive source so that the pointed first end or said second electrode is the closest portion thereof to the radioactive source, said second electrode and a portion of said first electrode including the second end thereof being oriented parallel to each other and to the longitudinal axis of said chamber; and means connected to said ionization chamber means for operating said ionization chamber means in the high voltage avalanche region of the current versus applied voltage characteristics of the leak detector device which provides a significantly larger current change for a particular rate of a gas leak being detected than if said ionization chamber means was operated in the saturated current region of the current versus applied voltage characteristics so that the leak detector device is substantially more sensitive to smaller leaks of the gas.

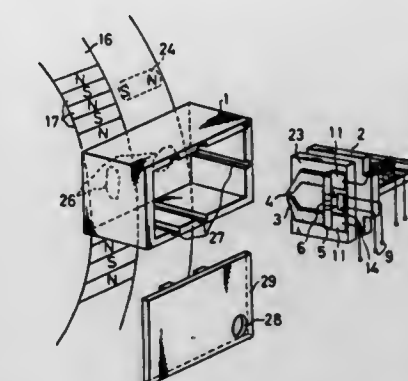
4,053,826

APPARATUS FOR DETECTION OF ROTATIONAL ANGLE AND NUMBER OF ROTATIONS OF A ROTARY BODY

Kiyoshi Wasawa, Fujisawa; Toru Kita, Yokohama; Takao Sugisaki, and Minoru Higurashi, both of Tokyo, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo and Nissan Motor Company, both of Japan
Filed Mar. 30, 1976, Ser. No. 671,983
Claims priority, application Japan, Apr. 4, 1975, 50-40984
Int. Cl.² G01R 33/00

U.S. Cl. 324—34 D

1 Claim



1. Apparatus for detecting the rotational angle and the number of rotations of a rotary body, comprising: a housing of magnetic shield material; a magnetic shield plate dividing said housing into two compartments; a first insulating board disposed in one of said compartments parallel to said shield plate; a second insulating board disposed in the other compartment perpendicular to said shield plate; a pair of input terminals and a pair of output terminals disposed on each of said boards; a magnetic yoke affixed to each of said boards, each yoke comprising a pair of ferrite pole pieces having a relatively narrow air gap therebetween adjacent a given edge of the corresponding board and a relatively wide separation therebetween in a region remote from said air gap, and a wire having a layer of magnetic material exhibiting uniaxial magnetic anisotropic characteristics plated thereon, said layer having a hard magnetization axis in the axial direction of said wire, and an easy magnetization axis in the circumferential direction of said wire, said wire being connected between said pole pieces at said remote region, a coil wound on said wire, the ends of said coil being electrically connected across the corresponding pair of output terminals; a capacitor on said board having its terminals electrically connected across the corresponding pair of output terminals; means electrically connecting the ends of each wire across the corresponding pair of input terminals; means for applying an alternating current signal having a predetermined frequency to each pair of input terminals; said given edges of said boards being disposed adjacent a given surface of said housing, said housing having apertures in said surface, an aperture therein communicating with each compartment, each of said boards being positioned so that the ends of the corresponding pole pieces forming said air gaps extend into said apertures; first and second juxtaposed parallel coaxial rotary disks comprising magnetized magnetic material; means for securing said disks to said rotary body for rotation therewith about the axis of said disks; the periphery of each disk having alternating N and S magnetic poles disposed thereon, the number of magnetic poles on the periphery of one disk being substantially greater than the number of magnetic poles on the periphery of the other disk; said disks being disposed adjacent said given surface of

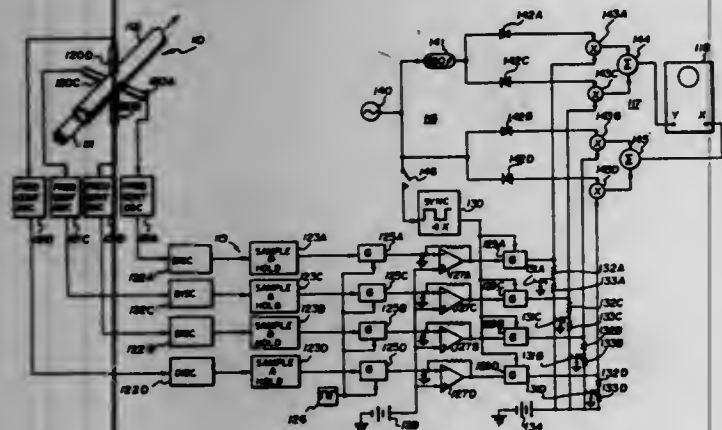
housing so that each of said air gaps is adjacent the periphery of a corresponding disk, whereby one of said pair of output terminals provides a signal of twice said predetermined frequency for predetermined increment of rotation of said body, and the other pair of output terminals provides another signal of twice said predetermined frequency for each substantially greater increment of rotation of said body.

4,053,827
APPARATUS FOR MEASURING, AND INDICATING, THE THICKNESS OF A NON-METALLIC COATING ON AN ARCuate METAL SURFACE

Louis Guy Millette, Pointe Claire; Peter Murphy, Longueuil; Georges Michel Miller, Chateaugay, and Wieslaw Josef Tyaszewski, Dollard des Ormeaux, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed June 21, 1976, Ser. No. 698,008
Claims priority, application Canada, Apr. 30, 1976, 251557
Int. Cl.² G01R 33/12

U.S. Cl. 324—34 TK

6 Claims



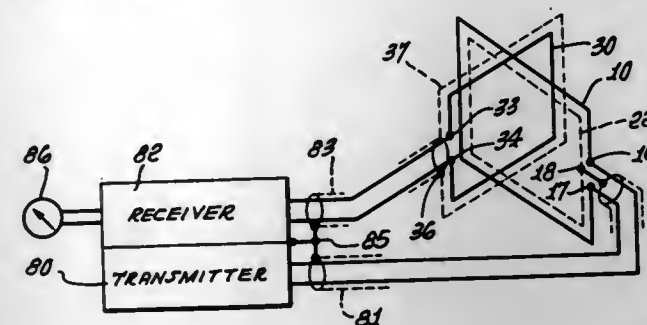
1. Apparatus for measuring, and indicating, the thickness of a non-metallic coating on an arcuate metal surface, comprising: at least one measuring head for positioning relative to said coating; at least one support member on each measuring head for supporting said measuring head relative to said coating; a sensing member on each measuring head and arranged to develop a signal representative of the distance between said sensing member and said arcuate metal surface; a profiled surface on said support member for presentation to said coating, said profiled surface having a Vee shape with convex arcuate sides when viewed in a direction parallel to the axis of the arcuate metal surface, the arcuate sides initially defined by sequentially positioning a series of metal cylindrical mandrels of different diameters relative to the sensing member with the axes of the mandrels lying in a common plane normal to the sensing member, so as to develop a signal of the same magnitude from the sensing member for each mandrel, each arcuate side being a curve which is tangential to the peripheries of the mandrels at these respective positions, the penetration of said arcuate metal surface and coating into said Vee shape varying with the outer diameter of the coating to offset variations in the signals resulting from variations in the outer diameter of the non-metallic coating; signal processing means connected to said sensing member, for processing said signal from said sensing member; means connected to said signal processing means for displaying an output therefrom, said output indicative of the thickness of said non-metallic coating.

4,053,828
METAL DETECTOR WITH FIRST AND SECOND NESTED RECTANGULAR COILS

Frank E. Ambler, Sepulveda; Carl James Duthler, Westhills, and Norton L. Moise, Pacific Palisades, all of Calif., assignors to Xonics, Inc., Van Nuys, Calif.
Filed May 3, 1976, Ser. No. 682,514
Int. Cl.² G01R 33/12

U.S. Cl. 324—41

19 Claims



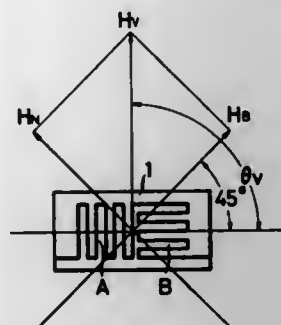
1. In a two coil metal detector, the combination of: a first coil of rectangular configuration and comprising a plurality of turns of wire encapsulated in an insulating material and having a rectangular opening; a second coil of rectangular configuration and comprising a plurality of turns of wire encapsulated in an insulating material, with said second coil positioned in said first coil opening with the axes of said coils disposed substantially at a right angle; a first layer of electrical resistive material on said first coil; a second layer of electrical resistive material on said second coil, each of said layers of electrical resistive material having a resistance in the range of about 1,000 to about 100,000 ohms per square unit of area; means for making electrical connections to said coils and layers; and an encapsulating material in the gap between said coils binding said coils together in a fixed relation, with said coils adjusted relative to each other for substantially minimum coupling between the coils.

4,053,829
APPARATUS FOR DETECTING THE DIRECTION OF A MAGNETIC FIELD TO SENSE THE POSITION OF, FOR EXAMPLE, A ROTARY ELEMENT OR THE LIKE

Tsunehiro Maruo, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed July 21, 1975, Ser. No. 597,818
Claims priority, application Japan, July 31, 1974, 49-87732
Int. Cl.² G01R 33/06

U.S. Cl. 324—46

17 Claims



1. Apparatus for detecting the direction of an external rotary magnetic field comprising in combination: a magnetoresistive element having an insulating substrate, a first set of substantially longitudinal ferromagnetic metal film strips disposed in serpentine configuration on said substrate for providing a first main current conducting path, a second set of substantially longitudinal ferromag-

netic metal film strips disposed in serpentine configuration on said substrate perpendicular to said first set of film strips for providing a second main current conducting path perpendicular to said first main current conducting path, a first end of said first set of strips being electrically connected to a first end of said second set of strips to define a junction, a first current supply terminal connected to the opposite end of said first set of strips and a second current supply terminal connected to the opposite end of said second set of strips, and an output terminal connected to said junction between said strips for supplying an output signal;

a stationary bias magnet located adjacent to said magnetoresistive element for supplying a bias field thereto at a predetermined angle relative to one of said current conducting paths, said bias field being parallel to the plane of said substrate; and

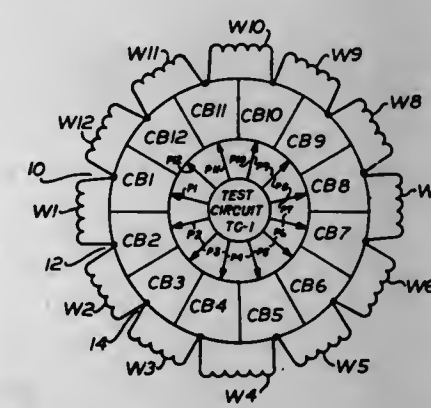
said magnetoresistive element being positionable in said external field so that said external rotary magnetic field is applied to said element parallel to the plane of said substrate at an angle θ relative to one of said current conducting paths, wherein θ varies from 0° to 360° , thereby providing a composite magnetic field at said element with a component due to said bias field and a component due to said external rotary field for causing said output signal to vary as a function of θ .

4,053,830
ARMATURE WINDING TERMINATION CONTINUITY TESTER AND METHOD

James L. Porter, Shaker Heights, Ohio, assignor to Avtron Manufacturing, Inc., Cleveland, Ohio
Filed Nov. 10, 1976, Ser. No. 740,559
Int. Cl.² G01R 31/02, 31/04

U.S. Cl. 324—51

13 Claims



1. Apparatus for testing armature winding termination continuity of an armature having a circular array of commutator bars and a plurality of armature windings each having its opposite ends terminated to a different one of said bars so as to define a plurality of sets of bar-to-bar winding terminations, comprising:

means for simultaneously applying test currents of equal value to flow through each said set of bar-to-bar winding terminations to develop respective bar-to-bar voltages; means for simultaneously measuring voltage differences between the voltages developed across different selected pairs of all of said sets of bar-to-bar winding terminations; means for simultaneously determining whether any of said voltage differences exceeds a reference limit; and, means for providing an output indication dependent upon said determination.

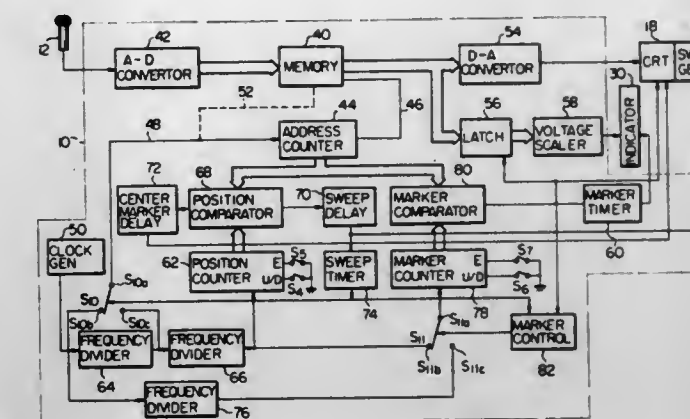
4,053,831
WAVEFORM ANALYSIS SYSTEM
Masamichi Furukawa, and Susumu Iguchi, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan
Filed Mar. 29, 1976, Ser. No. 671,212

Claims priority, application Japan, Mar. 30, 1975, 50-38160; Mar. 31, 1975, 50-38830; Mar. 31, 1975, 50-38831; Mar. 31, 1975, 50-38832

Int. Cl.² G01R 23/16

U.S. Cl. 324—77 A

25 Claims



1. A waveform analysis system, comprising: a digital memory; a display unit to display a waveform stored in the digital memory; an address counter to sequentially address storage locations in the digital memory for display; a marker counter to designate a storage location for display of a marker corresponding to said designated storage location on the display unit; a clock pulse generator to generate clock pulses to drive the address counter and the marker counter; marker counter switch means to selectively enable the marker counter to be driven by the clock pulses; marker comparator means to sense for a same count in the address counter and the marker counter and generate an indicator enable signal in response thereto; indicator means to numerically indicate contents of said designated storage location in response to the indicator enable signal; and magnification means for controlling the display unit to display a selected section of the storage locations in magnified form; the display unit further comprising a sweep generator for generating a sweep signal of predetermined duration, the magnification means comprising a frequency divider and magnification switch means for connecting the frequency divider between the clock pulse generator and the address counter while the sweep signal is being generated by the sweep generator.

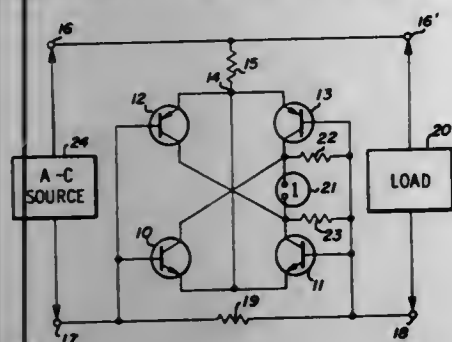
4,053,832
A.C. POWER METER
Carl T. Nelson, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed May 24, 1976, Ser. No. 689,235
Int. Cl.² G01R 21/06

U.S. Cl. 324—142

6 Claims

1. A multiplier circuit comprising: First and second PNP transistors and first and second NPN transistors, each of said transistors having emitter, base, and collector electrodes, means coupling the emitters of all of said transistors to a first terminal, means coupling the collectors of said first NPN and said second PNP transistors together, means coupling said coupled first NPN and second PNP collectors to a second terminal,

means coupling the collectors of said second NPN and said first PNP transistors together,
means coupling said coupled second NPN and first PNP collectors to said second terminal,
means coupling the bases of said second PNP and NPN transistors together and to said second terminal,
means coupling the bases of said first NPN and PNP transistors together and to a third terminal, and



means for sensing the difference in value between the combined currents of said first PNP and said second NPN transistors and the combined currents of said second NPN and said first PNP transistors whereby said means for sensing responds to the product of the current flowing in combined transistor emitters and the voltage difference existing between the coupled bases of said first NPN and PNP transistors and the coupled bases of said second NPN and PNP transistors.

4,053,833

CONTACTLESS TEST METHOD FOR INTEGRATED CIRCUITS

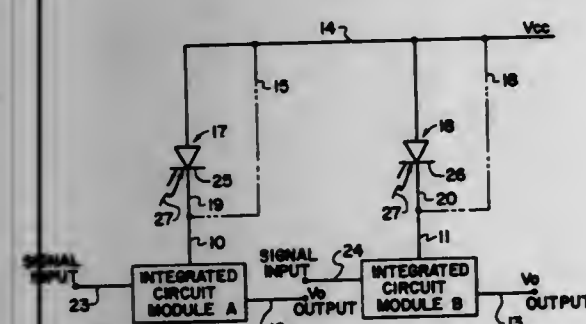
Paul R. Malmberg, Pittsburgh, Pa.; Robert M. Handy, Phoenix, Ariz.; Donald F. Stoneburner, Mooreville, Pa., and David Green, Palisades Post, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 441,924, Feb. 12, 1974, Pat. No. 3,956,698. This application Feb. 27, 1975, Ser. No. 553,780

Int. Cl.² G01R 31/26, 15/12

U.S. Cl. 324-158 R

6 Claims



1. A method of contactless testing an integrated circuit comprising:

- fabricating integrally with an integral circuit to be tested a plurality of conductive semiconductor elements with different resistance values and having outputs electrically connected to at least one input to said integrated circuit, each conductive semiconductor element (i) having an input adapted for electrical connection to an electrical source and an output electrically connected to at least one input of said integrated circuit, and (ii) being adapted to electrically conduct when exposed to a radiation beam and supply at a connected input or inputs to said integrated circuit a desired electrical input;
- connecting inputs of said conductive semiconductor elements to at least one electrical source;
- selectively exposing at least one said conductive semiconductor element with a radiation beam to cause said conductive element to electrically conduct and supplying a plurality electrical inputs of different voltage levels at the connected inputs of said integrated circuit from the electrical source; and

D. measuring electrical responses of at least a segment of the integrated circuit to said electrical input to determine whether said circuit segment possesses specified electrical characteristics.

4,053,834

NARROWBAND PHASE MODULATION COMMUNICATION SYSTEM WHICH ELIMINATES THRESHOLDING

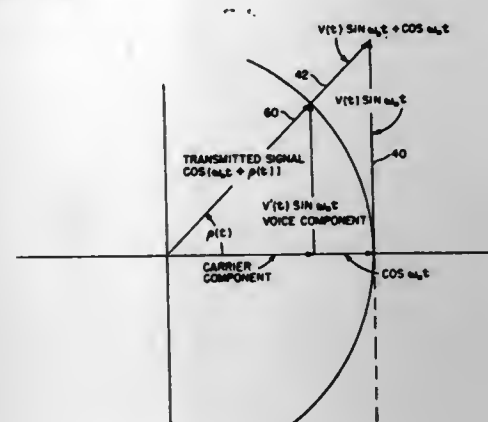
Theodore Lerner, Williamsville, N.Y., assignor to Textron, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 350,353, April 12, 1973, abandoned. This application Sept. 12, 1975, Ser. No. 612,952

Int. Cl.² H04B 1/62; H02B 1/00; H04B 1/10

U.S. Cl. 325-46

5 Claims



1. A narrowband phase modulation voice communication system characterized by the absence of thresholding effects at useful signal-to-noise ratios, comprising in combination:

transmitter means for transmitting a signal having a voice signal component and receiver means for receiving the transmitted signal;

said transmitter means including carrier signal generator means for generating a carrier signal of fixed amplitude, voice signal input means for generating a voice signal, and phase modulator means connected to said carrier signal and to said voice signal for producing a resultant signal in the form of a variable amplitude resultant signal having a voice signal component and a fixed amplitude carrier signal component in phase quadrature, said voice signal component having a maximum amplitude whereby said resultant signal has a maximum phase deviation ϕ which is large with respect to but less than 90° such that $\sin \phi \neq \phi$, and limiter means connected to said phase modulator means for limiting said resultant signal to a constant amplitude signal whereby said carrier signal component is of variable amplitude and said voice signal component is attenuated; and

said receiver means including phase locked loop demodulator means for coherently tracking said variable amplitude carrier component to recover said attenuated voice signal component.

4,053,835

APPARATUS FOR TRANSMITTING HIGH FREQUENCY SIGNALS

Otto Breitenbach, Nuremberg, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Germany

Filed Jan. 30, 1976, Ser. No. 653,645

Claims priority, application Germany, Feb. 20, 1975, 2507191

Int. Cl.² H04B 1/00

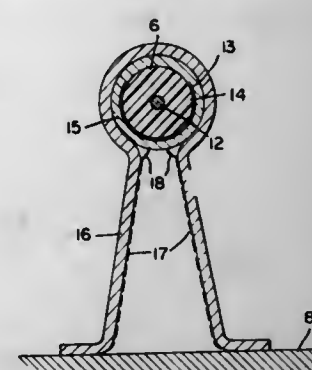
U.S. Cl. 325-51

9 Claims

1. Apparatus for transmitting high frequency signals to a vehicle adapted to travel along a predetermined path comprising:

- a reflecting high frequency cable disposed parallel to said path, said reflecting high frequency cable including a central conductor for radiation high frequency information, coaxial outer conductor means enabling said high frequency information to be conveyed and a coaxially

disposed layer of dielectric material intermediate said central and outer conductors;
support means for mounting said coaxial cable in parallel with said predetermined path, said support means includ-



ing metallic material disposed along the length of said coaxial cable; and
means for electrically connecting said coaxial outer conductor to said metallic material at predetermined intervals along the length of said coaxial cable.

4,053,836

DEVICE FOR TRANSMISSION OF INFORMATION BY PULSE CODE FREQUENCY SHIFT MODULATION

Jean Fellrath, Neuchatel, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchatel, Switzerland

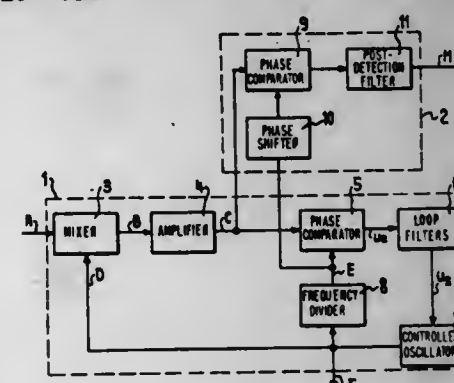
Filed Aug. 13, 1975, Ser. No. 604,196

Claims priority, application Switzerland, Aug. 22, 1974, 11477/74

Int. Cl.² H04B 1/26; H04L 27/14

U.S. Cl. 325-320

8 Claims



1. A device for receiving information by frequency shift keying, the received information being a binary input signal wherein two characteristic frequencies corresponding to the binary digits "0" and "1" are in a predetermined ratio, comprising a phase-locking superheterodyne receiver having only one local oscillator phase controlled by the input signal and a mixer for producing an intermediate signal frequency equivalent to half the shift of the input signal frequency, the said shift being defined by the difference between the two characteristic frequencies of the digits "0" and "1", and a demodulator formed by a phase detector coupled to receive the intermediate frequency signal and a signal of the same frequency obtained from the local oscillator, said phase detector determining whether, in balance, the phase between these signals is in the region of 0° or 180° .

4,053,837

QUADRIPHASE SHIFT KEYED ADAPTIVE EQUALIZER

Carl R. Ryan, Mesa, and James H. Stilwell, Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 586,105, June 11, 1975, abandoned.

This application Nov. 26, 1976, Ser. No. 745,264

Int. Cl.² H03H 7/36

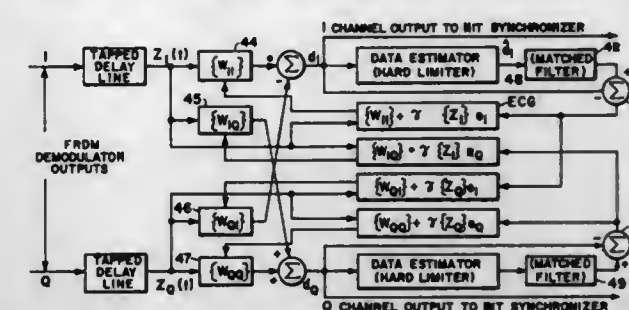
U.S. Cl. 325-323

5 Claims

1. A quadrature shift keyed (QPSK) adaptive equalizer having in-phase and quadrature channels for equalizing incoming demodulated QPSK signals, comprising:

- a first and second tapped delay lines connected to received the demodulated signals and provide in-phase and quadra-

ture output signals in the in-phase and the quadrature channels;
b. means for developing error signals connected to an output of each of the in-phase and quadrature channels; and
c. in-phase and quadrature filter means connected to receive



the in-phase and quadrature output signals, respectively, and the error signals, each filter means including first and second adjustable components and independent equalizer coefficient generator means associated with each of said components for individually adjusting said associated components to minimize the error signals in each channel.

4,053,838

RADIO RECEIVER

Yuji Amaya, Kobe, Japan, assignor to Fujitsu Ten Limited, Kobe, Japan

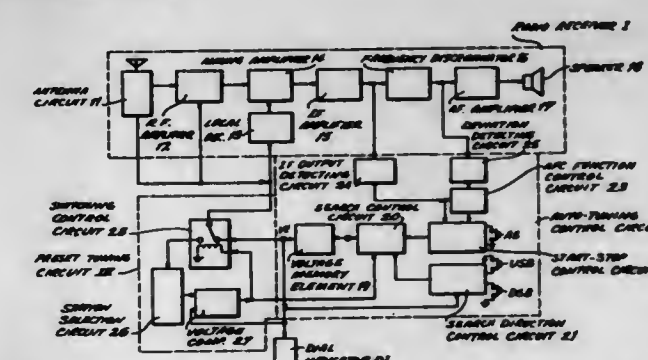
Filed Dec. 23, 1975, Ser. No. 643,640

Claims priority, application Japan, Dec. 24, 1974, 49-472; Dec. 24, 1974, 49-476; Dec. 26, 1974, 50-148392; Dec. 26, 1974, 50-148393; Dec. 25, 1974, 49-871; June 30, 1975, 50-81732

Int. Cl.² H04B 1/34

U.S. Cl. 325-470

15 Claims

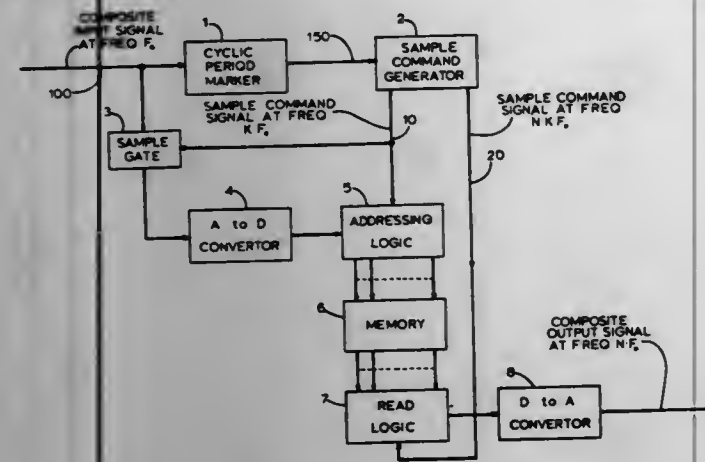


4. A radio receiver having a tuning circuit with a variable reactance element and a tuning frequency controlled by a variable tuning control voltage applied to the variable reactance element and a plurality of tuning control circuit parts having different station selection modes, each of said tuning control circuit parts having output lines and providing an output via its output lines, said radio receiver comprising:

function selection circuit means connecting the tuning control circuit parts to the variable reactance element of the radio receiver, said function selection circuit means comprising variable control voltage generating means, for providing a variable tuning control voltage to the variable reactance element from the outputs of said tuning control circuit parts;

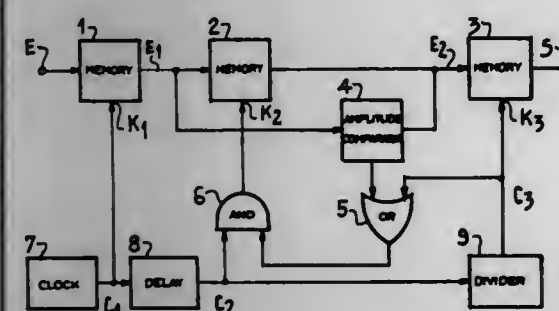
a plurality of clamp diodes;
a plurality of bistable circuits each having a pair of inputs and a pair of outputs, each of said bistable circuits having one of its outputs connected to the output lines of a corresponding one of the tuning control circuit parts via corresponding ones of the clamp diodes;
a plurality of function selection switches each connected to a corresponding one of the inputs of a corresponding one of the bistable circuits; and
circuit means connecting the other input of each of the other bistable circuits to said one input of each of said bistable circuits in a manner whereby when any of the function selection switches is closed, the clamp diodes other than those connected to the output of the corresponding bistable circuit are clamped thereby making the outputs of the tuning control circuit parts connected to the bistable circuits with the open function selection switches ineffective.

4,053,839
METHOD AND APPARATUS FOR THE FREQUENCY
MULTIPLICATION OF COMPOSITE WAVES
 George Kneidl, Jr., 139 Waverly Ave., Patchogue, N.Y. 11772
 Filed May 29, 1973, Ser. No. 364,647
 Int. Cl.² H03B 19/00
 U.S. Cl. 328—38 27 Claims



1. A frequency multiplying system comprising a source of a time varying input signal to be multiplied, memory means, cyclic period marker means responsive to said input signal source for producing pulses at the fundamental frequency of said input signal, means responsive to said cyclic period marker means for producing first and second sampling signals having frequencies which are multiples of the fundamental frequency of said input signal means for continuously sampling said input signal with said first sampling signal and storing signal samples resulting from said sampling in said memory means, and means responsive to said second sampling signal for continuously reading out said stored signal samples from said memory means, whereby the ratio of the frequencies of the output of said memory means and said input signal is equal to the ratio of the frequencies of said second and first sampling signals.

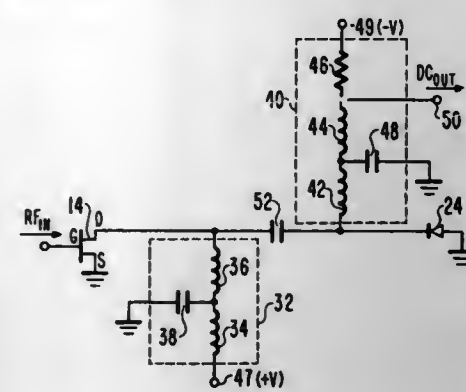
4,053,840
BAND COMPRESSION DEVICE
 Jean-Claude Baron, Paris, France, assignor to Thomson-CSF, Paris, France
 Filed July 27, 1976, Ser. No. 709,109
 Claims priority, application France, Aug. 1, 1975, 75.24148
 Int. Cl.² H03K 5/20; H04B 1/66
 U.S. Cl. 328—151 9 Claims



1. A band compression device for receiving input signals of predetermined frequency bandwidth and for delivering output signals of bandwidth n times narrower comprising: sampling means for sampling said input signals; storing means for storing at least two successive samples in a series of n successive samples; amplitude comparing means for comparing said samples taken in pairs and for providing a logic transfer control signal depending on each of said amplitude comparisons; an output memory for receiving the sample greatest in amplitude in said series and delivering said output signal; and control means connected to said storing means, said output memory and receiving said logic control signal for trans-

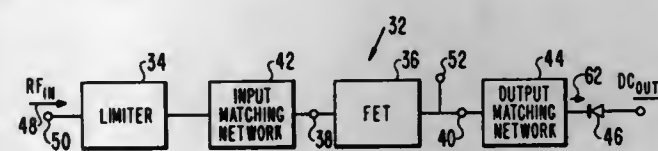
ferring said greatest of the compared samples to said output memory.

4,053,841
MICROWAVE FREQUENCY DISCRIMINATOR
COMPRISING AN FET AMPLIFIER
 Arye Rosen, Cherry Hill, and Louis Sebastian Napoli, Hamilton Square, both of N.J., assignors to RCA Corporation, New York, N.Y.
 Filed Sept. 13, 1976, Ser. No. 722,582
 Int. Cl.² H03D 3/26
 U.S. Cl. 329—103 12 Claims



1. A microwave frequency discriminator comprising: a transistor amplifier including a field effect transistor having first, second and third electrodes, said transistor amplifier having an output port, and an input port for receiving an input RF signal of substantially constant power level, said transistor being biased an amount for generating in response to said input RF signal an output RF signal having a predetermined frequency gain roll-off characteristic within a predetermined frequency bandwidth; input shaping means connected to said input port, said input shaping means being formed to augment said transistor frequency gain roll-off characteristic; detector means responsive to said output RF signal for generating a dc signal; and biasing means responsive to a predetermined bias voltage for matching the output impedance of said transistor with the input impedance of said detector means, whereby at said conditions of matched impedances the voltage of said dc signal varies substantially linearly as a function of the frequency of said input RF signal.

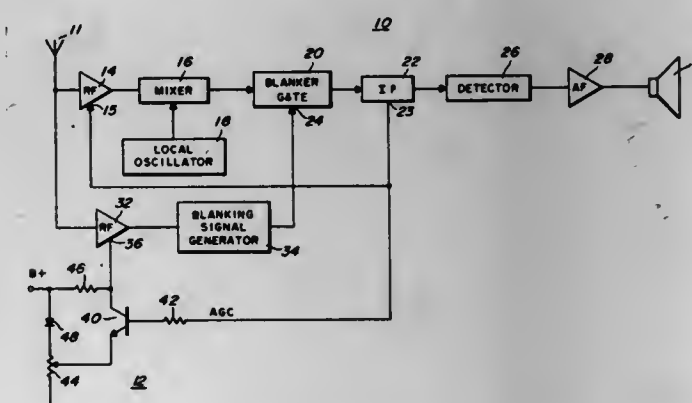
4,053,842
MICROWAVE FREQUENCY DISCRIMINATOR
COMPRISING AN FET AMPLIFIER
 Zygmund Turaki, Selden, N.Y., and Daniel David Mawhinney, Livingston, N.J., assignors to RCA Corporation, New York, N.Y.
 Filed Sept. 13, 1976, Ser. No. 722,585
 Int. Cl.² H03D 3/26
 U.S. Cl. 329—103 8 Claims



1. A microwave frequency discriminator comprising: a transistor amplifier including a field effect transistor having an output port and an input port for receiving an input RF signal of substantially constant power level, said transistor being biased an amount for generating an output RF signal within a predetermined frequency bandwidth in response to said input RF signal;

input and output matching means connected to said input and output ports, respectively, said input and output matching means being formed to provide selected input and output impedance conditions to said amplifier such that the power of said output RF signal varies substantially linearly with the frequency of said input RF signal throughout said frequency bandwidth; and detector means responsive to said output RF signal for generating a D.C. signal varying substantially linearly as a function of the frequency of said input RF signal.

4,053,843
BLANKER INHIBIT CIRCUIT
 Larry Richard Wright, Glenview, and Donald Charles Cohlman, Rolling Meadows, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
 Filed Mar. 25, 1976, Ser. No. 670,217
 Int. Cl.² H04B 1/10
 U.S. Cl. 325—479 5 Claims

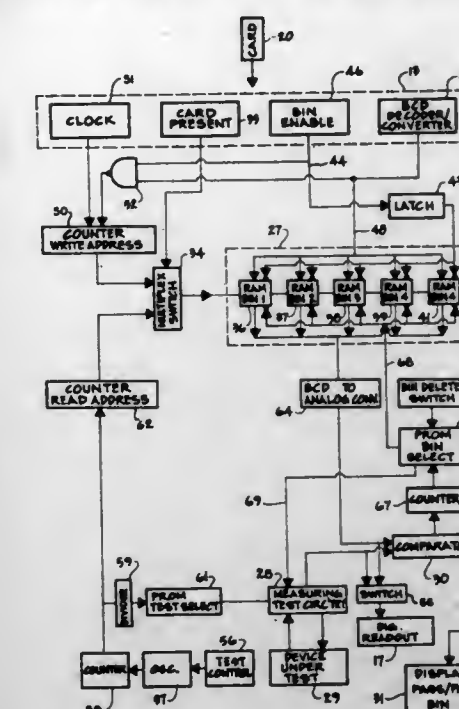


1. An AM radio receiver including: means for receiving radio frequency signals; tuner means for processing the received radio frequency signals and producing audio output signals in response thereto, the tuner means also producing an automatic gain control signal having a level representative of the magnitude of the received radio frequency signals; a blanker circuit for detecting noise pulses in the received radio frequency signals and blanking the tuner means in response thereto; and inhibit means for inactivating the blanker circuit responsive to the automatic gain control signal assuming a predetermined level corresponding to a minimum received radio frequency signal level, whereby when the received radio frequency signals exceed the minimum value the inhibit means inactivates the blanker circuit.

4,053,844
CARD-READER INTEGRATED CIRCUIT TESTER
 Moise N. Hamaoui, Sunnyvale, Calif., assignor to Moise N. Hamaoui; Halfon N. Hamaoui and Robert Hacco, all of Sunnyvale, Calif., part interest to each
 Filed Sept. 26, 1975, Ser. No. 617,242
 Int. Cl.² H03F 21/00; G01R 19/00
 U.S. Cl. 330—2 20 Claims

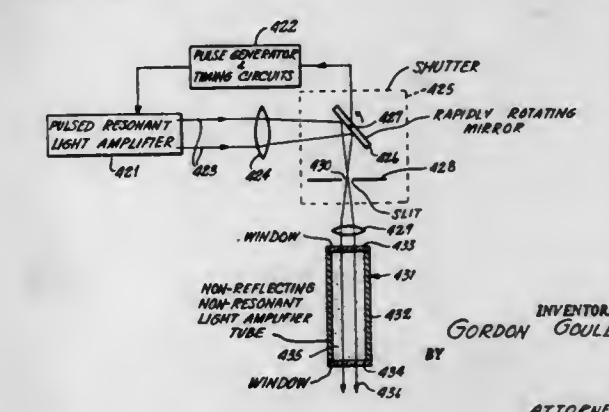
1. Apparatus for checking one or more electrical parameters of a plurality of similar electronic circuit devices to be tested comprising: means for extracting from programming means information providing a plurality of differing tolerance comparison values for a parameter of such devices to be checked, said values represent differing classification groups into which said plurality of similar electronic circuit devices are to be distributed; means for measuring the value of the parameter of one of said electronic circuit devices to be checked; means for

comparing the measured value of the parameter with said plurality of differing tolerance comparison values to identify a



classification group corresponding to said measured value; and means for displaying the results of said comparison.

4,053,845
OPTICALLY PUMPED LASER AMPLIFIERS
 Gordon Gould, 329 E. 82 St., New York, N.Y. 10028
 Continuation of Ser. No. 644,035, March 6, 1967, abandoned, and Ser. No. 804,540, April 6, 1959, abandoned, said Ser. No. 644,035, is a division of said Ser. No. 804,540, and a continuation-in-part of Ser. No. 804,539, April 6, 1959. This application Aug. 16, 1974, Ser. No. 498,065
 Int. Cl.² H01S 3/091, 3/22
 U.S. Cl. 330—4.3 12 Claims



1. Apparatus for light amplification comprising a bounded volume containing an excitable medium, the atoms, ions or molecules of said medium having well defined energy states including a lowest state, a lower state above said lowest state, and a higher state above said lower state, and a bright pumping light source composed of a radiative substance different from said medium which substance emits energy in a spectral range which can be absorbed by said medium, the major portion of the energy absorbed by said medium causing transitions of the atoms, ions, or molecules thereof to populate the higher state, said bright pumping light source being arranged to direct light into said medium to excite said atoms, ions, or molecules to emit light photons in the bounded volume when stimulated to do so by the presence of stimulating light at a frequency substantially corresponding to the emitted light due to transitions from the higher state to the lower state, said emitted light having substantially the same phase, frequency, polarization and wavefront shape as the stimulating light, thus adding coherently to the amplitude of the stimulating light.

4,053,846

AMPLIFIER APPARATUS

William F. Acker, Seminole, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

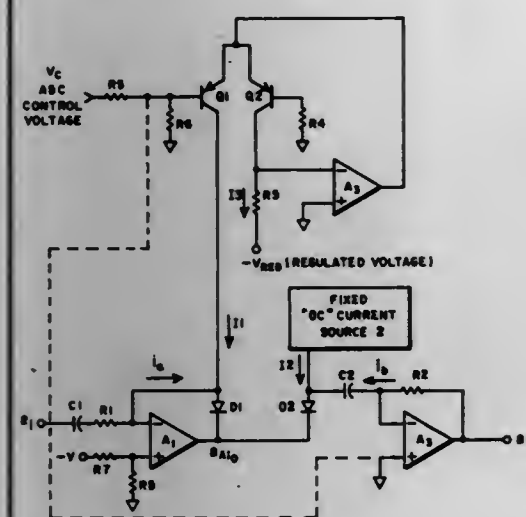
Division of Ser. No. 589,954, June 24, 1975, Pat. No. 3,992,616.

This application July 16, 1976, Ser. No. 705,984

Int. Cl.² H03G 3/30

U.S. Cl. 330—279

17 Claims



1. A variable gain amplifier for amplifying non-zero frequency components of an input signal, said amplifier comprising:

- a first characteristic means, having a nonlinear voltage-current relationship occurring between first and second terminals thereof, capable of carrying a significant current directed from said first terminal to said second terminal;
- a second characteristic means, having a nonlinear voltage-current relationship occurring between third and fourth terminals thereof, capable of carrying a significant current directed from said third terminal to said fourth terminal, said second and fourth terminals being electrically connected together;
- an input means connected to said first terminal to provide input signal current through said first characteristic means, between said first and second terminals, which is related to said input signal;
- a first capacitive means connected in series between said third terminal and an output terminal; and
- maintaining means to maintain selected non-zero frequency voltage components occurring between said first and second terminals substantially equal to corresponding non-zero frequency components occurring between said third and fourth terminals.

4,053,847

SELF FEEDBACK TYPE LOW-NOISE CHARGE SENSITIVE AMPLIFIER

Tadashi Kumahara, and Seturo Kinbara, both of Tokai, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 670,099

Claims priority, application Japan, Mar. 31, 1975, 50-38692

Int. Cl.² H03F 3/16

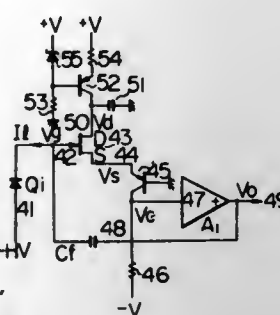
U.S. Cl. 330—277

3 Claims

1. A self-feedback low-noise charge sensitive amplifier comprising

- an input stage including a junction type field-effect transistor (FET) as the active element thereof, said FET having source, drain and gate terminals,
- a transistor having an emitter electrode coupled to the source terminal of said FET, a base electrode connected to ground and a collector electrode,
- an amplifier having an input terminal connected to the collector electrode of said transistor and an output terminal coupled to the gate terminal of said FET, and
- a capacitor having one end grounded and the other end

connected to the drain terminal of said FET, said capacitor stabilizing the gate potential of said FET and changing



the drain terminal voltage of said FET in response to a change in the potential at the gate terminal of said FET.

4,053,848

CIRCUIT ARRANGEMENT FOR COMBINING HIGH FREQUENCY POWER COMPONENTS

Wilhelm Kleische, Berlin, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

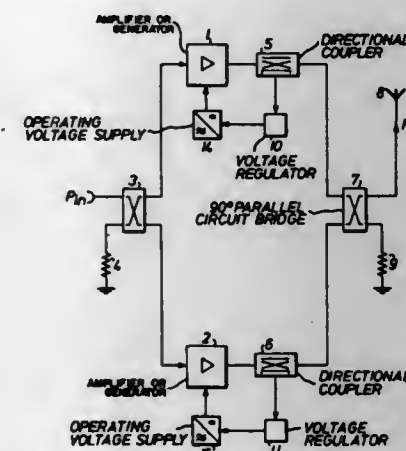
Filed May 3, 1976, Ser. No. 682,502

Claims priority, application Germany, May 3, 1975, 2519845

Int. Cl.² H03F 3/60, 3/30

U.S. Cl. 330—53

8 Claims



1. In a circuit arrangement for combining high frequency power components with the same frequency including a pair of amplifiers or generators for providing high frequency power components with the same frequency at their respective outputs, a 90° parallel circuit bridge having its output connected to a load and two substantially decoupled inputs, each of which is coupled to the output of a respective one of said pair of amplifiers or generators with the input resistance values of said inputs depending on said output load; the improvement comprising: a separately controlled operating voltage supply of each of said amplifiers or generators; and means for controlling said operating voltage supplies so that the output power of each of said amplifiers or generators remain substantially constant even with mismatching.

4,053,849

OSCILLATION MEANS FOR GENERATING A DIFFERENTIAL AC SIGNAL PROPORTIONAL TO MOVEMENT OF A CONDUCTING MEMBER

Gerald S. Bower, Templeton, and Scott F. Voelker, Lafayette, both of Calif., assignors to Systron Donner Corporation, Concord, Calif.

Filed Oct. 1, 1976, Ser. No. 728,854

Int. Cl.² G08C 21/00

U.S. Cl. 331—65

4 Claims

1. An electrical oscillator for use in transducing mechanical motion to an electrical output comprising a resonant circuit having a predetermined resonant frequency, first and second

4,053,851

NEAR 16 MICRON CO₂ LASER SYSTEM

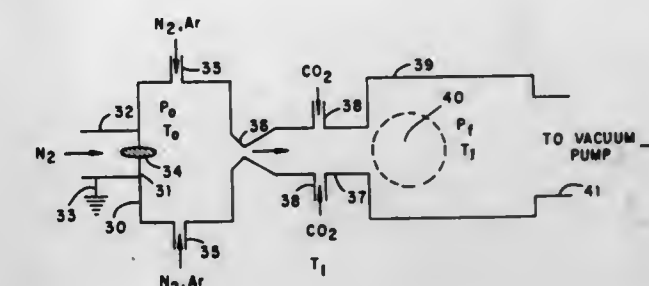
William F. Krupke, Pleasanton, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 10, 1975, Ser. No. 594,821

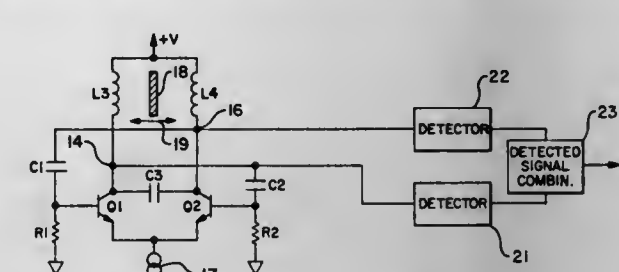
Int. Cl.² H01S 3/22

U.S. Cl. 331—94.5 G

19 Claims



terminals on electrically opposed ends of said resonant circuit, first and second inductors mounted in spaced relation and connected in series within said resonant circuit, a capacitor within said resonant circuit connected in parallel with said first and second inductors, an electrically conductive member mounted between and disposed for differential motion relative to said first and second inductors, whereby motion toward one of said first and second inductors is away from the other of said



first and second inductors, first and second electronic switches operating to couple an electrical energy source alternately to said first and second terminals at a frequency substantially coincident with said predetermined resonant frequency, whereby the amplitude of said predetermined resonant frequency changes differentially at said first and second terminals with differential motion of said electrically conductive member.

4,053,850

MAGNETRON SLOT MODE ABSORBER

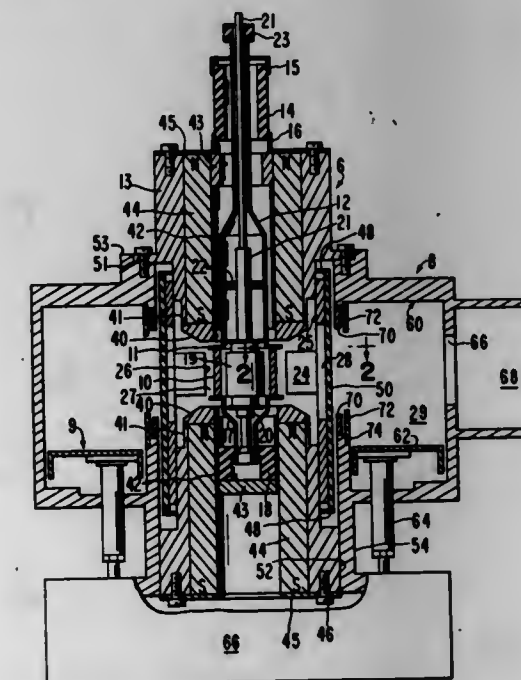
George Kenneth Farney, Boxford, and William Allen Gerard, Andover, both of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Sept. 23, 1976, Ser. No. 726,088

Int. Cl.² H03B 9/10

U.S. Cl. 331—91

14 Claims



1. In an electronic oscillator: circuit means adapted to interact with electrons at a selected frequency to generate electromagnetic energy, cavity means adapted to resonate at said frequency, a conductive wall forming a common part of the electrical boundaries of said circuit means and said cavity means, at least one slot in said wall for coupling electromagnetic fields of said circuit means and said cavity means, lossy material near said slot, a conductive shield between said lossy material and the interior of said cavity means for shielding said lossy material from fields of said cavity means, the portion of said shield near said slot being spaced from said wall by a distance larger than the width of said slot.

4,053,852

METHOD AND APPARATUS FOR GENERATING COHERENT NEAR 14 AND NEAR 16 MICRON RADIATION

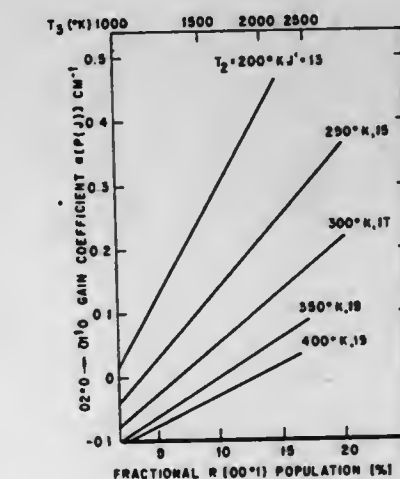
William F. Krupke, Pleasanton, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 10, 1975, Ser. No. 594,822

Int. Cl.² H01S 3/22

U.S. Cl. 331—94.5 G

8 Claims



1. A method for producing coherent radiation in CO₂ vibrational-rotational transitions at wavelengths near 14 and near 16 microns composed of the steps of: passing a gaseous mixture of N₂ and Ar through a glow discharge region producing a high vibrational temperature in the N₂ while maintaining a relatively low gas temperature, passing the mixture through a nozzle bank causing a flow thereof at supersonic speed, injecting precooled CO₂ into the supersonic flow creating an interaction zone wherein the precooled CO₂ mixes with the translationally cooled N₂ — Ar mixture causing pumping of the CO₂, and directing a saturating pulse of radiation selected from the group consisting of near 10.6 microns and near 9.6 microns through the interaction zone creating a population inversion and thereby producing a gain in the near 14 micron wavelength when the saturating pulse of radiation is near 10.6 mi-

crons and in the near 16 micron wavelength when the saturating pulse of radiation is near 96 microns.

4,053,853

REPETITIVELY PULSABLE TRAVELING WAVE LASER

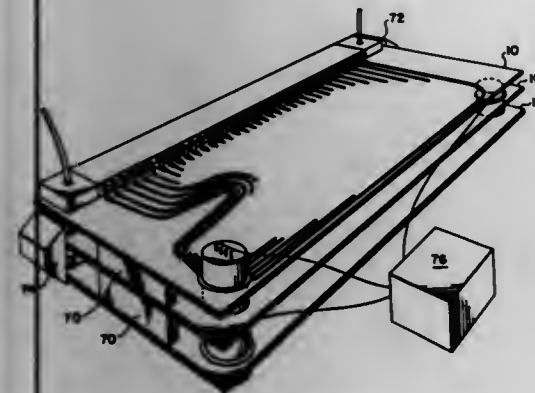
Carl B. Collins, Jr., 1214 Cloverdale, Richardson, Tex. 75080

Filed Aug. 18, 1975, Ser. No. 605,410

Int. Cl.² H01S 3/097

U.S. Cl. 33—94.5 PE

8 Claims



1. A traveling wave laser comprising a discharge channel containing a laser medium having a wave initiating end and an output end; electrical pulse generating means for repetitively producing a localized electrical pulse; a plurality of discrete pulse transmission lines of progressively greater lengths coupling the pulse generating means to the discharge channel at spaced points extending from the initiating end to the output end for sequentially applying each pulse to the points along the discharge channel in advance of a coherent electromagnetic wave propagating through the discharge channel from the initiating end to the output end; and each of the discrete pulse transmission lines including a first conductor, a second conductor, and a third conductor, the first and second conductors being separated by a first layer of a dielectric medium thereby defining a first wave propagation path along the first and second conductors, and the second and third conductors being separated by a second layer of a dielectric medium thereby defining a second wave propagation path along the second and third conductors, the second conductor being electrically coupled to the pulse generating means to receive an electrical charge for the storage of electrical energy in the first and second wave propagating paths, the discharge channel being electrically coupled to the first and third conductors to receive electrical waves propagated through the first and second propagation paths in response to an abrupt discharge of electrical energy stored therein.

4,053,854

Q SWITCHING MICROWAVE OSCILLATOR

Richard Calvin Havens, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed June 7, 1976, Ser. No. 693,824

Int. Cl.² H03B 7/14

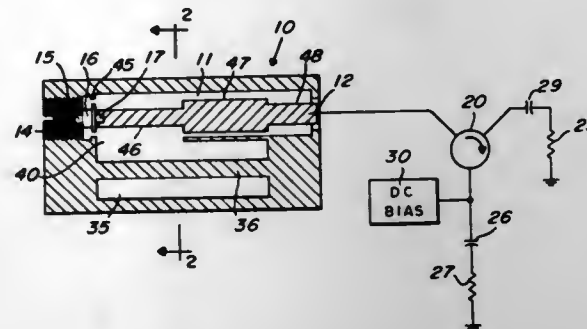
U.S. Cl. 331—101

14 Claims

1. A microwave Q switching oscillator comprising:
 - a transmission line;
 - a negative impedance device connected at one end of said transmission line for terminating said transmission line in a negative impedance and generating RF energy at a desired frequency;
 - the opposite end of said transmission line forming an output for generated pulses of RF energy;
 - a cavity tuned to be resonant at the desired frequency and capable of storing a predetermined amount of RF energy;
 - coupling means for coupling RF energy at the desired frequency between said transmission line and said cavity;
 - means coupled to the negative impedance device for re-

ceiving thereon a bias normally at a first level and periodically changed to a second level.

- g. susceptance means cooperating with said negative impedance device to tune said device to an antiresonant mode of operation when the second level of bias is applied thereto; and



- h. said negative impedance device operating in a resonant mode when the bias is at the first level to cause RF energy to be stored in said resonant cavity and operating in the antiresonant mode when the second level of bias is applied to change the Q of said resonant cavity and allow RF energy to flow from said resonant cavity to the output of said transmission line at a different rate than that at which it was stored.

4,053,855

METHOD AND ARRANGEMENT TO ELIMINATE MULTIPACTING IN RF DEVICES

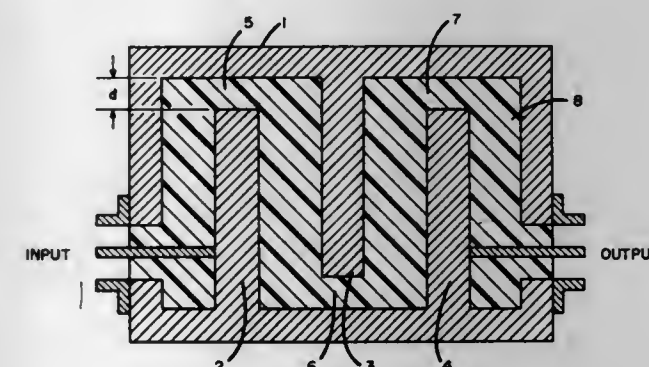
Aare Kivi, Massapequa, N.Y., and Louis Felt, Fairlawn, N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 28, 1975, Ser. No. 626,161

Int. Cl.² H01P 1/20, 7/06, 3/12

U.S. Cl. 333—73 W

4 Claims



1. An arrangement to eliminate multipacting in radio frequency (RF) devices disposed in a vacuum-like environment comprising:
 - a RF device disposed in said environment, said device having two RF electrodes capable of supporting multipacting in a RF high voltage region therebetween; and
 - a dielectric material having a given dielectric constant and a given dielectric strength disposed between said two electrodes in at least said region to eliminate multipacting, said dielectric material completely filling said region;
 said environment is space; and said RF device including
 - a microwave filter having a cavity with a cavity wall providing one of said two electrodes and a plurality of resonators providing the other of said two electrodes; and
 - said dielectric material fills said cavity.

4,053,856

QUASI-TOROIDAL INDUCTOR AND RESONATOR

Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850

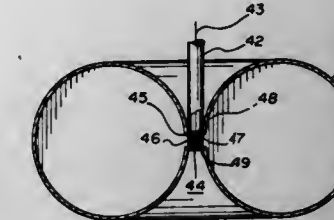
Hill Park Road, both of Montreal, Quebec, Canada

Filed Feb. 3, 1976, Ser. No. 654,801

Int. Cl.² H01P 7/00; H03H 7/04

U.S. Cl. 333—82 R

4 Claims



1. A resonator comprising a quasi-toroidal inductive envelope formed by a continuous conductive shell having a discontinuity in the surface near the axis thereof, the discontinuity being small in comparison with the perimeter of the shell taken along a cross-section through the axis of the quasi-toroidal envelope, a first terminal in the form of a cylinder of small radius compared with the dimensions of the shell concentric with the axis of the shell and extending axially away from and connected to one side of the discontinuity, a second terminal in the form of a conductor lying generally along the axis of the shell electrically connected to and extending axially from the other side of said discontinuity to the interior of said cylinder and insulated therefrom, thereby to form a co-axial cable termination for said resonator, and a capacitor formed between the first and second terminals in the vicinity of the discontinuity of said surface, thereby to form a parallel resonant circuit.

4,053,857

RESETTABLE ELECTRO-MECHANICAL VACUUM FUSE

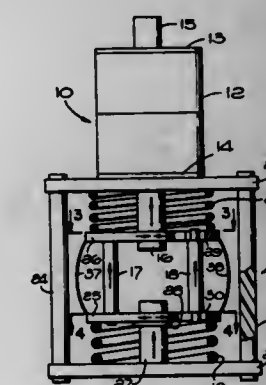
Orhan A. Guraydin, San Jose, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 7, 1976, Ser. No. 693,287

Int. Cl.² H01H 9/30

U.S. Cl. 335—147

10 Claims



1. An electro-mechanical device for interrupting at least one electric circuit whenever the current carried by said circuit substantially exceeds a predetermined value, comprising:
 - a vacuum interrupter having at least one pair of contacts and a control shaft, said contacts providing circuit continuity in response to a first position of said control shaft, and said contacts separating to interrupt said circuit in response to a second position of said control shaft;
 - first means external to said vacuum interrupter and including at least a pair of generally parallel conductive rods ar-

ranged in said circuit to divide most of the current in said circuit between the rods of said pair; second means including resilient mounting means for holding said rods in place by application of longitudinal pressure thereon, said rods being displaceable, at least at one displacement point along the length thereof, by application of a laterally acting force sufficient to overcome the laterally acting static forces extant at said displacement point; and third means associated with said resilient mounting means and connected to said interrupter control shaft to cause said shaft to assume said second position in response to a magnitude of current in said rods sufficient to produce corresponding magnetic forces overcoming said laterally acting static forces and therefore to produce lateral displacement of said rods.

4,053,858

MAGNET SYSTEM FOR AN ELECTROMAGNETIC RELAY

Martin Aldn, Degerndorf, and Eberhard Wanka, Dachau, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

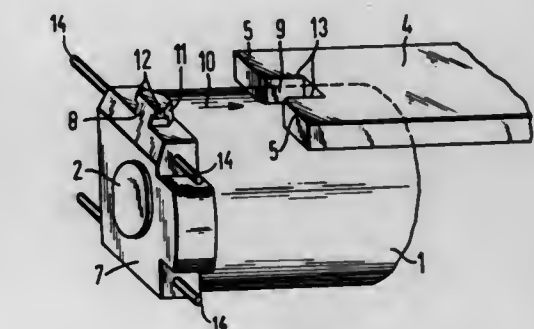
Filed Nov. 12, 1975, Ser. No. 631,081

Claims priority, application Germany, Nov. 20, 1974, 2455018

Int. Cl.² H01F 7/14

U.S. Cl. 335—276

5 Claims



1. An electromagnetic relay having a coil body with an elongated magnetizable core extending axially therethrough from a rear end press-fittingly engaging a first end of an angled, magnetizable yoke to a front end adjacent a pivotable armature, said yoke having a second end extending to a point spaced adjacent said front end of said core and receiving said armature pivotally thereon, and said coil body having a non-magnetizable coil flange affixed about said coil axially adjacent said front end of said core, and wherein:
 - said coil flange has a projection formed thereon extending laterally of said coil body into a position engageable with said second end of said yoke; and
 - said second end of said yoke forms an aperture sized for press-fittingly receiving said projection therein upon assembly of said yoke to said core and coil body.

4,053,859

TEMPERATURE SENSITIVE SWITCH

Walter Hollweck, Nurnberg, Germany, assignor to INTER CONTROL, Herman Kohler Elektrik GmbH & Co KG, Nurnberg, Germany

Filed Sept. 28, 1976, Ser. No. 727,519

Claims priority, application Germany, Oct. 3, 1975, 2544201

Int. Cl.² H01H 61/00

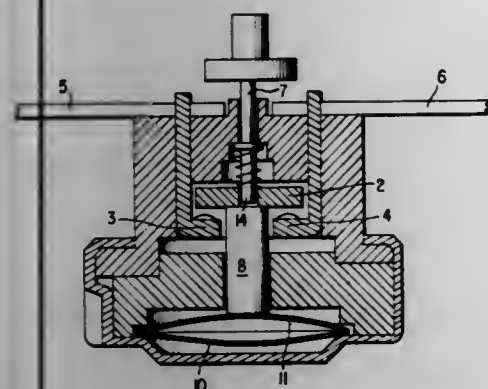
U.S. Cl. 337—91

10 Claims

1. In a temperature sensitive switch including a movably supported electric contact having a closed and an open position, a temperature sensitive element coupled to the movable contact and being arranged for displacement from a first position to a second position at a predetermined maximum temperature; the temperature sensitive element being further arranged to move the movable contact from the closed position into the

open position upon motion of the temperature sensitive element from the first position into the second position; the improvement comprising

- a. a bistable element having first and second positions and being coupled to said temperature sensitive element and said movable contact; said bistable element being arranged for movement from its first position into its second position by said temperature sensitive element when said temperature sensitive element moves from its first position into its



second position; said bistable element being arranged for maintaining, in its second position, said movable contact in said open position independently from the position of said temperature sensitive element; and

- b. resetting means for simultaneously moving said bistable element from its second position into its first position and said movable contact from said open position to said closed position independently from the position of said temperature sensitive element.

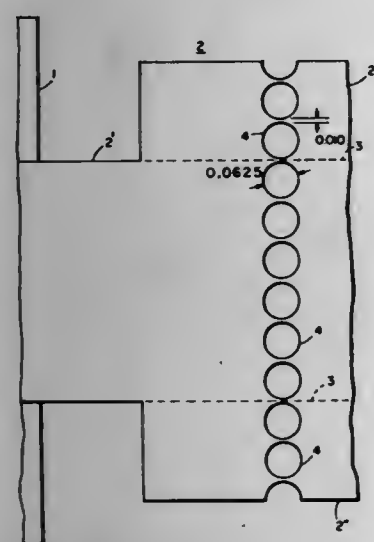
4,053,860 ELECTRIC FUSE

Frederick J. Kozacka, South Hampton, and Richard A. Belcher, Hampton Falls, both of N.H., assignors to Gould, Inc., Newburyport, Mass.

Filed July 14, 1976, Ser. No. 705,038
Int. Cl.² H01H 85/04

U.S. Cl. 337-164

7 Claims



1. An electric fuse including
 - a. a pair of parallel connected fusible elements each having a pair of parallel center portions and lateral portions enclosing acute angles with said center portions;
 - b. said center portions having sides affixed to a pair of blade contacts while said lateral portions are non-connected to said pair of blade contacts;
 - c. a casing housing said pair of fusible elements and a granular arc-quenching filler inside said casing embedding said pair of fusible elements;
 - d. overlays of a metal having a lower fusing point than the metal of which said pair of elements are made arranged on said pair of fusible elements to cause interruption of said pair of fusible elements at temperatures below the fusing

point of the metal of which said pair of fusible elements are made; and

- e. a plurality of transverse lines of circular perforations in each of said pair of fusible elements, said lines of perforations from edge to edge of each of said pair of fusible elements and the ratio of the diameter of said perforations to the solid metal current paths therebetween being in the order of 6:1, and the cross-sectional area of each said solid metal current paths being in the order of 0.00005 to 0.000075 inch.

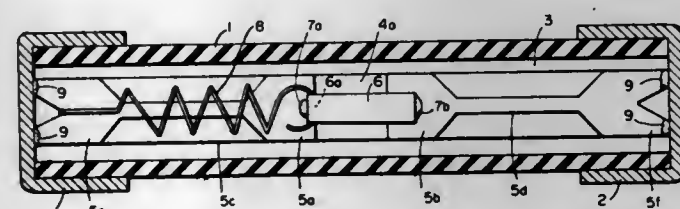
4,053,861 ELECTRIC TIME-LAG FUSE HAVING A SMALL CURRENT RATING

Edward J. Knapp, Jr., Merrimac, Mass., assignor to Gould, Inc., Newburyport, Mass.

Filed Nov. 8, 1976, Ser. No. 739,955
Int. Cl.² H01H 71/20

U.S. Cl. 337-165

4 Claims



1. An electric time lag fuse including
 - a. an elongated metal clad strip of electric insulating material wherein the metal layer is removed from the center region of the strip to define an insulating gap, wherein the axially outer regions of said metal layer immediately adjacent said gap are of relatively large width and the axially outer regions of said metal layer more remote from said gap are relatively narrow width;
 - b. a shorting strip of sheet metal conductively interconnecting said axially outer regions of said metal layer immediately adjacent said gap;
 - c. a pair of soft solder joints effecting said conductive connection; and
 - d. a helical spring having one end attached to said shorting strip to bias said shorting strip to a circuit-open position thereof involving a pair of series breaks, said helical spring being normally shunted by one of said axially outer regions of said metal layer.

4,053,862 FUSE-ELEMENT FOR FUSES USED IN ELECTRIC NETWORKS

Tibor Csizy, Arpad Karpat, and Janos Melis, all of Budapest, Hungary, assignors to Villamos Berendezes es Keszulek Muvek, Budapest, Hungary

Filed Feb. 5, 1976, Ser. No. 655,492
Claims priority, application Hungary, Feb. 10, 1975, VI 1027
Int. Cl.² H01H 85/02, 85/46

U.S. Cl. 337-221

6 Claims



1. A fuse-element for use in an electric network, comprising, in combination:

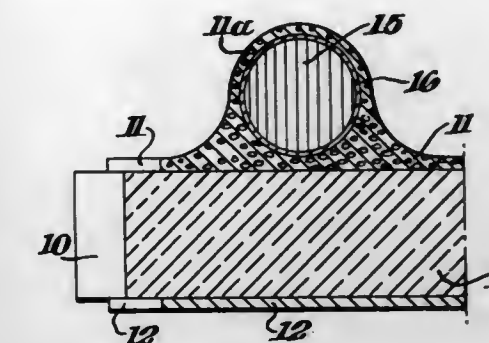
a metal strip including at least one portion having a reduced cross-section;

a shunt element of conductive material shunting said portion bonding means conductively bonding said shunt element to said metal strip and being capable of being released at a temperature higher than a predetermined temperature;

said shunt element defining a chamber facing towards said metal strip and being sealed by said bonding means between said metal strip and said shunt element; and

a material disposed in said chamber having a boiling temperature below said predetermined temperature and capable of producing an internal gas pressure within said chamber sufficient to break said bond when said material is heated to a temperature higher than said boiling temperature.

surface region of said body, said one electrode being comprised of aluminum particles that are bound by a matrix of a



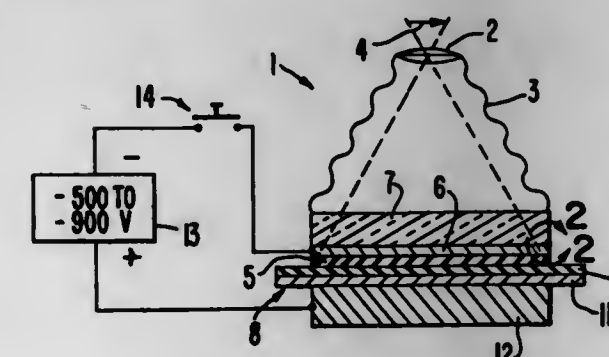
4,053,863 ELECTROPHOTOGRAPHIC PHOTOCONDUCTIVE PLATE AND THE METHOD OF MAKING SAME

Guy A. Marlor, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 149,821, June 3, 1971, abandoned, which is a continuation of Ser. No. 721,331, April 15, 1968, abandoned. This application July 17, 1972, Ser. No. 272,241
Int. Cl.² H01L 31/08

U.S. Cl. 338-15

29 Claims



1. An electrophotographic plate which is capable of forming a charge image pattern in response to and in correspondence with a photon image comprising:

a photoconductive layer comprising electrically connected photoconductive particles of crystalline material bound together by glass disposed in interstices between the particles;

the glass comprising less than 40% by weight of the total material of the layer;

the photoconductive particles being selected from the group consisting of sulphides, tellurides, selenides and sulphoselenides of a material selected from the group consisting of zinc and cadmium, and containing activator proportions of a halide and activator proportions of a metal selected from the group consisting of copper and silver.

4,053,864 THERMISTOR WITH LEADS AND METHOD OF MAKING

George H. Rodriguez, Williamstown, and John P. Maher, Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Dec. 20, 1976, Ser. No. 752,584
Int. Cl.² H01C 7/02

U.S. Cl. 338-22 SD

14 Claims

1. A thermistor having a fatigue resistant lead joint comprising a PTCR titanate ceramic body; at least one electrode being bonded to and making ohmic contact with one surface region of said body; a base-metal lead having a portion thereof being bonded by and completely embedded within said one electrode; and another electrode being in contact with another

lead-aluminoborate glass, said glass amounting to from 20 to 60% by weight of the sum of said glass and said aluminum.

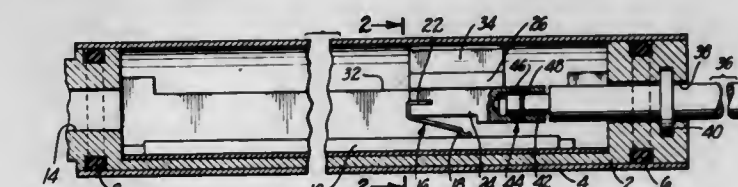
4,053,865 LINEAR MOTION COUPLING

Milton Reese Brown, Jr., Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Apr. 22, 1976, Ser. No. 679,114
Int. Cl.² H01C 10/40

U.S. Cl. 338-180

7 Claims



1. In a linear motion potentiometer which includes a housing, resistance and collector tracks extending along the inside of said housing, a contact spring electrically and mechanically bridging said resistance and collector tracks, and a drive shaft extending inwardly into said housing for moving said contact spring in longitudinal, reciprocable wiping contact along said resistance and collector tracks, wherein the improvement comprises low backlash means for coupling said drive shaft to said contact spring, said means comprising:

a mounting means for said contact spring, said mounting means including a bore for receiving said drive shaft and a slot transversely intersecting said bore for receiving an O-ring, said O-ring being positioned in said slot encircling said drive shaft and said O-ring being formed from a stiffly deformable, springy material and coupling said drive shaft to said mounting means so as to absorb transverse and angular movements of said drive shaft and transmit to said mounting means longitudinal drive shaft movement.

4,053,866 ELECTRICAL RESISTOR WITH NOVEL TERMINATION AND METHOD OF MAKING SAME

Kenneth M. Merz, Gladwyne, and Howard E. Shapiro, Philadelphia, both of Pa., assignors to TRW Inc., Cleveland, Ohio

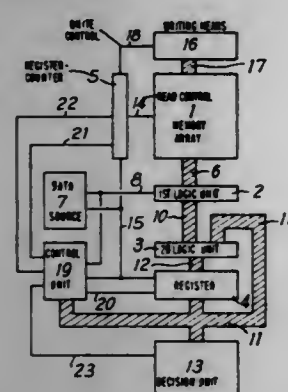
Filed Nov. 24, 1975, Ser. No. 634,481
Int. Cl.² H01C 1/012

U.S. Cl. 338-309

24 Claims

1. An electrical resistor comprising a substrate of an electrical insulating material, a termination on and directly adhering to said substrate, said termination being a conductive material selected from the

storing said plurality of reference logical entities in a two dimensional array with one logical entity in each column, each row containing data elements of the same sequential rank of the respective reference logical entities; electrically receiving sequentially said data elements constituting said flow of data transmitted as aforesaid by a data source from said collection of data to be searched; detecting the first data element of the first received logical entity; immediately comparing said first data element simultaneously and independently with the contents of the first row of said array according to a first set of logic functions selected in accordance with search objectives; immediately combining in parallel the results of that first comparison step with a predetermined set of initial states of a result register according to a second set of logic functions selected in accordance with search objectives and temporarily storing the results of this combination step in said result register; immediately comparing the next received data element simultaneously and independently with the content of the second row of said array according to said first set of selected logic functions;



immediately combining in parallel the results of that second comparison step with said temporarily stored results of the first combination step according to said second set of selected logic functions and temporarily storing the results of this second combination step in place of said first stored results in said result register; proceeding with this alternation of comparison and combination steps up to and including either the comparison and combination steps following detection of the last data element of said first received logical element or the comparison step utilizing the last row of said table and the following combination step, whichever occurs first; providing the results of the last combination step as the result of the foregoing iterative and simultaneous basic search processing of said first received logical entity with reference to said plurality of reference logical entities, and then proceeding according to the same basic search process above set forth following the first-mentioned storage step for processing the further received logical entities beginning in each case with detection of the first data element thereof.

4,053,872

THERMOPLASTIC OPTICAL RECORDING MEDIUM USING IR WAVE LENGTH

Roger Wayne Honebrink; Leslie Harold Johnson, and David Shih-Fang Lo, all of St. Paul, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

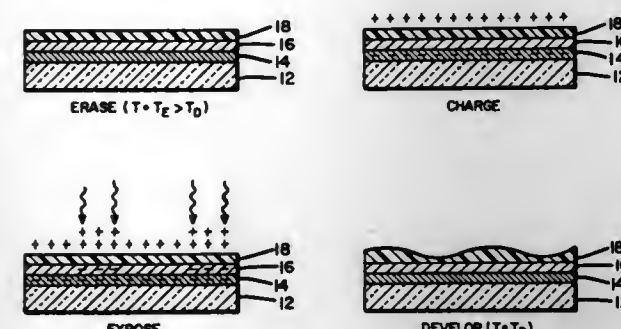
Filed Dec. 8, 1975, Ser. No. 638,241
Int. Cl.² G11C 11/46; G01D 15/02

U.S. Cl. 340-173 TP

4 Claims

1. An integral, laminated medium for the optical recording of data in a thermoplastic film, comprising:
a planar, dimensionally stable substrate;
a layer of conductive material affixed to and continuous over the top surface of said layer of conductive material and

which is only optically responsive to light that is of a wavelength that is below the IR range; and,



a layer of thermoplastic material affixed to and continuous over the top surface of said layer of photoconductive material and which is only thermally responsive to light that is of a wavelength that is in the IR range.

4,053,873

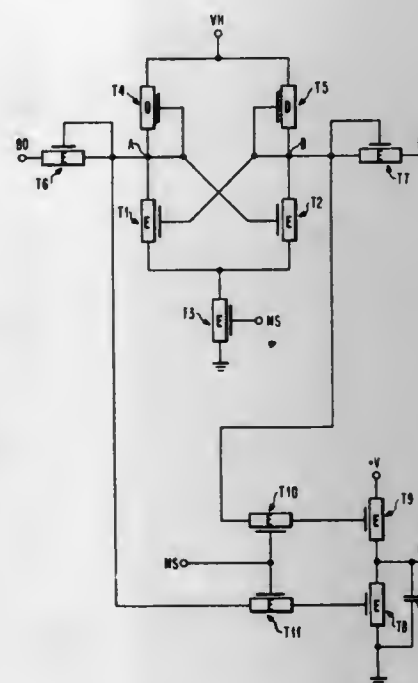
SELF-ISOLATING CROSS-COUPLED SENSE AMPLIFIER LATCH CIRCUIT

Leo Boyes Freeman; Robert James Incerto, both of Poughkeepsie, and Joseph Anthony Petrosky, Jr., Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,067
Int. Cl.² G11C 11/40

U.S. Cl. 340-173 R

48 Claims



1. In an electronic memory system, a sense amplifier latching circuit comprising:
first and second sources of potential;
first and second input nodes;
first and second output nodes;
first and second transistors, each having first and second controlled electrodes and a control electrode, said first controlled electrodes being electrically connected, said second controlled electrode of said first transistor being electrically connected to the control electrode of said second transistor, said second controlled electrode of said second transistor being electrically connected to the control electrode of said first transistor;
said first output node being in electrical contact with said electrical connection between the second controlled electrode of said first transistor and the control electrode of said second transistor;
said second output node being in electrical contact with said electrical connection between said second controlled

electrode of said second transistor and the control electrode of said first transistor;
a first unidirectionally conducting means electrically connected between said first source of potential and said first output node;
a second unidirectionally conducting means electrically connected between said first source of potential and said second output node;
a third unidirectionally conducting means electrically connected between said first input node and said first output node;
a fourth unidirectionally conducting means electrically connected between said second input node and said second output node; and
a third transistor having first and second controlled electrodes and a control electrode, the first controlled electrode of said third transistor being electrically connected to said second source of potential, the second controlled electrode of said third transistor being in electrical contact with said electrical connection between the first controlled electrodes of said first and second transistors, the control electrodes of said third transistor being electrically connected to a third source of potential.

4,053,874

APPARATUS FOR MONITORING THE LIQUID LEVEL IN A TANK

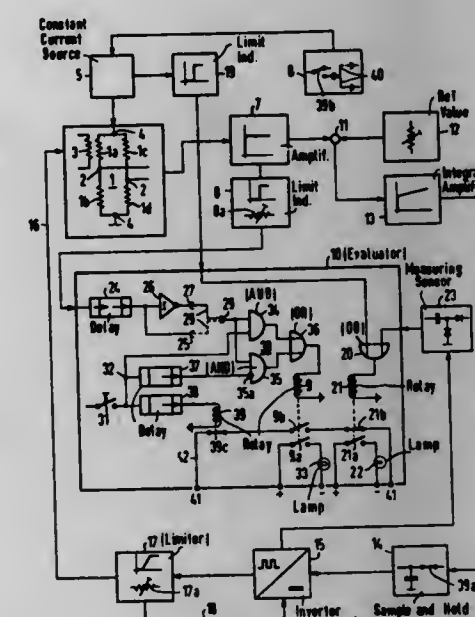
Helmut Glaser, Forchheim, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 26, 1976, Ser. No. 661,428

Claims priority, application Germany, Mar. 10, 1975, 2510356
Int. Cl.² G08B 21/00

U.S. Cl. 340-244 R

9 Claims



1. In apparatus for monitoring the liquid level in a tank, which includes a resistance bridge supplied with DC current having two bridge arms arranged inside the tank with one of these bridge arms electrically heated, an output signal stage with an output indication in the form of a binary level, and a current regulator for the heating current of the heated bridge arm having the output of the resistance bridge as a control input, said apparatus including means for testing the operation of the monitoring device by simulating a given filling level, an improved means for testing comprising:
a. a constant current source for supplying at least two DC currents of different magnitude;
b. means for initiating testing;
c. a switching device, having its control input coupled to said means for initiating testing, for selectively coupling one of the two currents of different magnitude to the resistance bridge;
d. an analog value storage device interposed between the current regulator and the bridge; and
e. means responsive to said means for initiating testing for

interrupting the connection between the output of the resistance bridge and the current regulator when the testing device is operated.

4,053,875

STATIC CHARGE DETECTOR HAVING FAIL-SAFE VOLTAGE SURGE PROTECTION MEANS

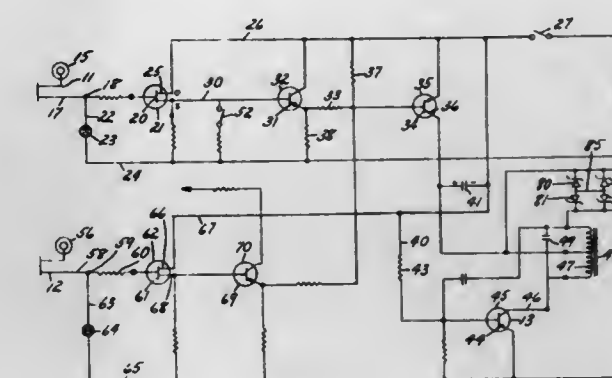
Julius B. Kupersmit, 145-80 228th St., Springfield Gardens, N.Y. 11413

Filed Dec. 27, 1976, Ser. No. 754,548

Int. Cl.² H02H 1/04; G08B 21/00

U.S. Cl. 340-248 P

1 Claim



1. In a static charge detector including receptor means for detecting a signal, neon tube means for grounding a signal in excess of a predetermined voltage, a gating field effect transistor receiving a signal of voltage between predetermined limits below said predetermined voltage, an emitter follower connected to the emitter of said field effect transistor, a switching transistor controlled by said emitter follower, an oscillating transistor controlled by said switching transistor, a transformer receiving the output of said oscillating transistor, and an audible transducer receiving the output of said transformer, the improvement comprising: improved means for preventing excessive voltage surges as a result of failure of said transformer during use, said means comprising first and second pairs of Zener diodes, each connected in parallel with the output of said transformer, said pairs of transistors being mutually interconnected to provide multiple paths, to enable the same to function upon the simultaneous failure of not more than two of said Zener diodes.

4,053,876

ALARM SYSTEM FOR WARNING OF UNBALANCE OR FAILURE OF ONE OR MORE PHASES OF A MULTI-PHASE HIGH-CURRENT LOAD

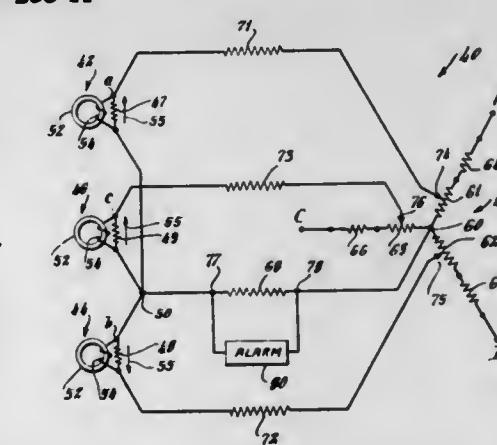
Douglas E. Taylor, Bridgeport, Conn., assignor to Sidney Hoffman, Bridgeport, Conn.

Filed Apr. 8, 1976, Ser. No. 675,187

Int. Cl.² G08B 21/00

U.S. Cl. 340-253 H

8 Claims



1. An alarm system for warning of unbalance or failure of one phase of a three-phase load circuit having three power

leads running thereto and capable of being used with a high current flow in the load circuit comprising:

three similar magnetically permeable transformer cores each having an opening therein through which the perspective power lead is passed for defining a magnetically permeable path encircling each power lead,

three similar secondary transformer windings, one of said windings being positioned on each of said cores and passing through the opening thereof,

said secondary windings each having the same winding sense with respect to the power lead passing through the core on which the respective secondary winding is located,

three similar resistors, one of said resistors being shunted across the terminals of each of said secondary windings,

said three transformer shunt resistors being connected together at a common junction forming a first Y resistance pattern defining a phantom neutral point at their common junction,

a second Y resistance pattern having three similar resistance legs joined at a common junction defining a second neutral point, each of said resistance legs including a potentiometer having an adjustable tap thereon,

means connecting the outer terminal of each of said resistance legs to a respective one of the phases of the load circuit,

three similar resistance elements each connected in circuit between one of the outer terminals of said transformer shunt resistors and one of said adjustable taps,

said resistance elements each being connected in circuit between the outer terminal of the secondary winding of the transformer which is associated with a particular phase of the load circuit and the tap of the potentiometer which is in the resistance leg that is connected to the same phase of the load circuit,

an unbalance sensing resistance element connected in circuit between said phantom neutral point and said second neutral point,

said potentiometers being adjustable for producing a null in voltage across said unbalance sensing resistance element when balanced three-phase current is flowing through the load circuit, and

alarm circuit means including alarm means for producing a warning signal when a voltage appears across said unbalance sensing resistance element.

4,053,877

METHOD OF AND APPARATUS FOR SURVEYING AN AREA

Arthur Timothy Torlesse, Chichester; Anthony Wulston Bovill, and Robert Charles West, both of Fareham, all of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

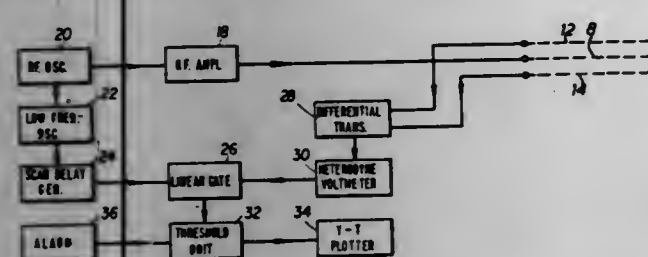
Filed Dec. 16, 1975, Ser. No. 641,358

Claims priority, application United Kingdom, Dec. 31, 1974, 56093/74

Int. Cl.² G08B 13/24

U.S. Cl. 340-258 R

1 Claim



1. A security system for surveying an area for the movement of unauthorized personnel in the area, which security system comprises in combination:

- A. alarm means;
- B. an extended length of a coaxial transmitter cable positioned beneath the surface of the area, the transmitter cable comprising means for emitting radio frequency signals with a low transmission loss along its length so that the transmitted radio frequency signals are substantially constant along the length of the cable, said means for emitting comprising means for emitting an amplitude modulated continuous signal;

C. a pair of coaxial receiver cables, each of extended length, positioned beneath the surface of the area and spaced apart equally on either side of the transmitter cable, each receiver cable comprising means for receiving the radio frequency signals from the transmitter cable by the radio frequency signals leaking into the receiver cables with substantially uniform strength along the length of the cable; and

D. receiver means for receiving signals received by the receiver cable when the radio frequency signals vary due to unauthorized personnel movement in the area, said receiver means including a differential transformer and means for connecting said receiver means to said alarm means.

4,053,878

METHOD AND APPARATUS FOR IMPROVING THE CLARITY AND CHARACTER DENSITY ON A DOT MATRIX VIDEO DISPLAY

Jack W. Cannon, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,889

Int. Cl.² G06F 3/14

U.S. Cl. 340-324 AD

10 Claims

1. A method for improving the clarity and density of displayed characters in a cathode ray tube character display system in which the character format is formed by an M-wide row and N-high column coordinate matrix and characters to be displayed are built up row by row from discrete character elements which are identified within the matrix by character generating data bits applied to an unblanking circuit in the system, said method comprising the steps of

providing a memory means having character generating data bits arranged only in groups of two or more consecutive unblanking bits, and

applying said character generating data bits from the memory means to the unblanking circuit at a frequency rate between two and four times the maximum Z-modulation frequency of the cathode ray tube character display system to produce a continuous character element for each unblanking bit group, thereby producing a four wide by seven high character element matrix.

4,053,879

FAIL SAFE DIGITAL CODE RATE GENERATOR

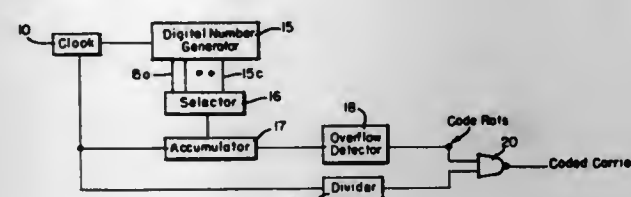
Robert Anderson, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed June 20, 1975, Ser. No. 588,567

Int. Cl.² G08C 19/28

U.S. Cl. 340-351

6 Claims



1. A digital code rate generator with fail-safe attributes for generating a code rate, said digital code rate generator comprising:

- clock means generating a continuous pulse train at a determined repetition rate,
- first means, driven by said clock means pulse train for generating a digital representation of a multi-digit decimal

number, said digital representation comprising a single serial pulse stream of determined duration, said first means repetitively generating said representation, a representation generated in response to each clock pulse train segment

an accumulator having a numerical capacity and means connecting said accumulator to said first means, for summing, in said accumulator, the representations of said digital number passed by said connecting means,

an overflow detector operated by said accumulator when the sum of digital representations passed to said accumulator exceeds said accumulator numerical capacity, to produce a signal, continued operation of said clock means, first means, accumulator and overflow detector producing additional signals,

dividing means driven by said clock means, a multi-input gate, one of said gate inputs connected to said overflow detector and another said input connected to said divider, whereby said overflow detector produces a timed series of signals corresponding to a code rate, and said gate produces an output comprising a modulated carrier, modulated at said code rate.

4,053,880

KEYING APPARATUS

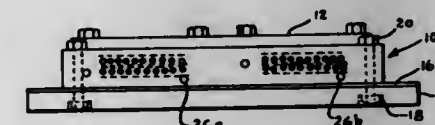
John P. Harmon, PSC Box 1019, APO New York, N.Y. 09611

Filed Dec. 5, 1975, Ser. No. 638,212

Int. Cl.² G08C 9/08

U.S. Cl. 340-365 R

2 Claims



1. A code keying apparatus comprising in combination: means for holding a plurality of key pins, said holding means maintaining said plurality of key pins in substantially parallel configuration to each said holding means allowing said plurality of key pins a degree of movement, said holding means comprising in combination,

a plurality of pin guide units having a plurality of pin guide holes drilled therein, said plurality of pin guide holes being aligned throughout said plurality of pin guide units, said plurality of pin guide units being arranged in parallel with respect to each other,

means for locking said plurality of key pins in a plurality of pin positions, said plurality of variable pin positions representing a predetermined code, said predetermined code being locked in place by said locking means, said locking means comprising in combination:

a plurality of pin locking bars having friction pads mounted thereto, said friction pads being utilized to contact and hold in place said plurality of key pins, said plurality of pin locking bars being fastened together and to said support base by a plurality of bolts and nuts, said plurality of pin locking bars being operatively fastened together so as to allow an increase or decrease of pressure upon said key pins, and

a support base having said holding means and said locking means mounted thereto.

4,053,881

MOBILE RADAR APPARATUS

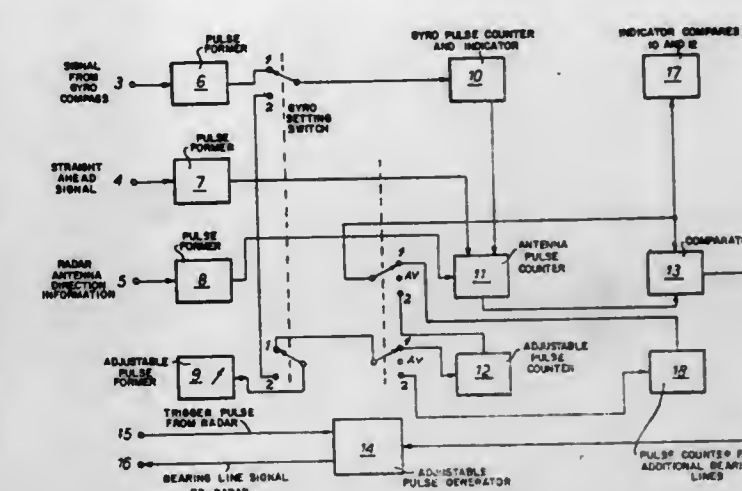
David Dahl, Ski, Norway, assignor to Lehmkühl A/S, Oslo, Norway

Filed Nov. 17, 1975, Ser. No. 632,716

Int. Cl.² G01S 7/22

U.S. Cl. 343-5 EM

4 Claims



1. Improvement in a mobile radar apparatus having a gyro compass for indicating the true course on a radar screen, characterized in that information direction signals from a radar antenna (5) and a gyro compass (3) are converted in pulse formers (8 and 6 respectively) to pulses which are supplied to pulse counters (11 and 10 respectively) and that a third pulse counter (12) is adjustable to the desired counting value by means of pulses from an adjustable pulse generator (9), and that a pulse signal which represents the radar antenna straight-ahead-position causes the reading in of the counting value in the pulse counter (10) for the gyro compass in the pulse counter (11) for direction information signals and which continues counting until it reaches the counting value set in the third pulse counter (12), whereupon a pulse train is released which causes indication of a desired set bearing line on the radar screen.

4,053,882

POLARIZATION RADAR METHOD AND SYSTEM

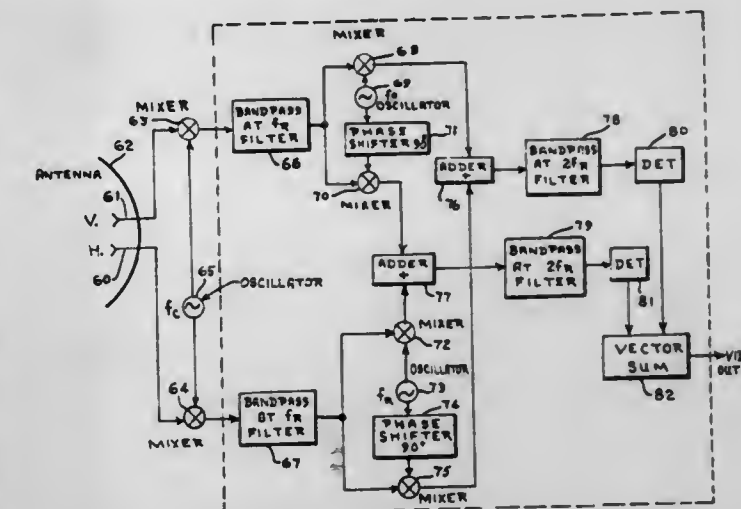
Paul Van Etten, Clinton, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,201

Int. Cl.² G01S 9/02

U.S. Cl. 343-5 SA

8 Claims



1. A polarization radar modulation system being comprised of means to generate a pulse waveform, means to rotate the polarization of said pulse waveform at a very fast and constant angular rate, said polarization rotation rate being at least 360° during one pulse, first antenna means to direct the rotated pulse waveform toward a target of interest for reflection therefrom,

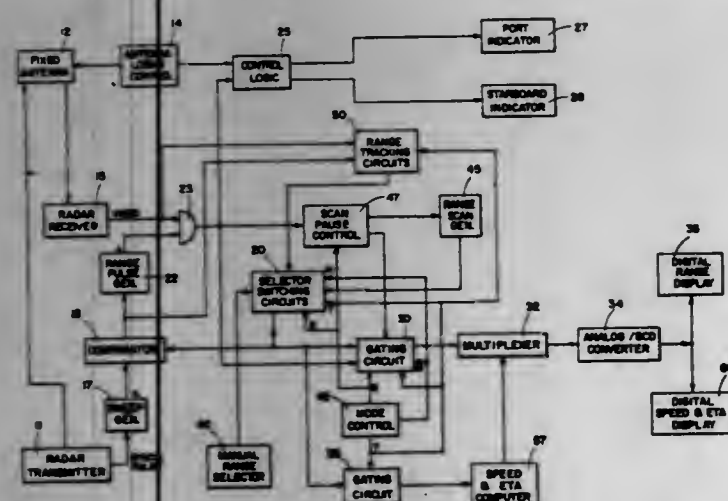
second antenna means to receive the energy of the reflected signal, said received energy having the same polarization as the transmitted polarization and both rotating at a constant linear rate, a receiver connected to said second antenna means, said received signals containing frequency components other than transmitted and said receiver being tuned thereto to obtain target discrimination.

4,053,883

FIXED DUAL BEAM RANGE SCANNING AND TRACKING RADAR WITH DIGITAL DISPLAY
Leonard M. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.
Filed Apr. 14, 1976, Ser. No. 676,982
Int. Cl.² G01S 9/02

U.S. Cl. 343-7.3

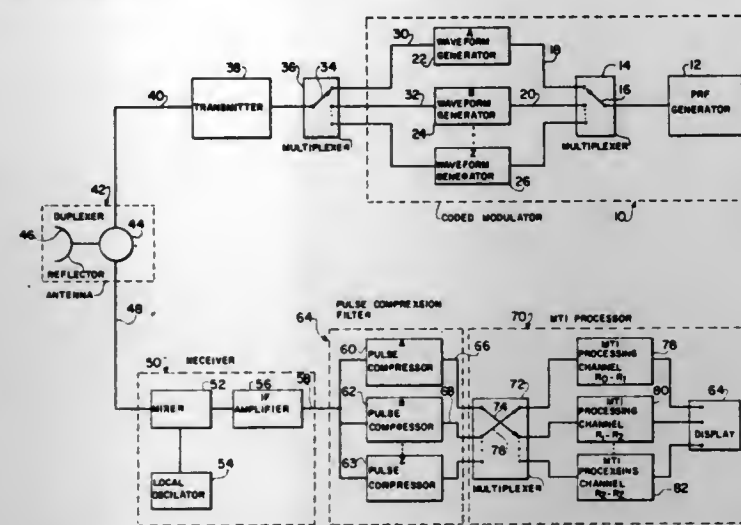
15 Claims



1. In a radar system having a transmitter for transmitting pulsed signals in a fixed beam and a receiver for receiving echoes from targets in the path of said signals and converting said echoes to video signals,

means responsive to said transmitter for generating a repetitive linear sawtooth sweep signal synchronized with said pulsed signals, the magnitude of said sweep signal representing instantaneous radar range, means for generating an analog range signal having a magnitude representing range including a range scan generator, means for comparing said sweep signal and said range signal and generating a range pulse signal when said sweep signal reaches the magnitude of said range signal, gating means responsive to said last mentioned pulse signal and receiving the video signals from said receiver for providing an output whenever said video signals are in time coincidence with said pulse signal, means responsive to the output of said gating means for providing an indication of the presence and relative azimuth of said target echoes, means for converting the range signal to digital form, scan pause control means for interrupting the scanning operation of said range scan generator for a predetermined period of time, said scan pause control means being responsive to the output of said gating means whereby the scanning operation is interrupted whenever the video and range pulse signals are in time coincidence, gating means responsive to said scan pause control means interpolated between the range scan generator and said means for converting the range signal to digital form for passing the range signal to said digital converting means only during the times the scanning operation is being interrupted, and digital display means for displaying said digital range signal.

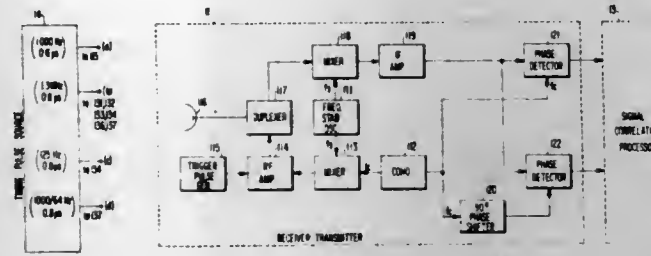
HIGH PRF UNAMBIGUOUS RANGE RADAR
Ben H. Cantrell, Springfield, Va., and Bernard L. Lewis, Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 26, 1976, Ser. No. 670,816
Int. Cl.² G01S 7/28, 9/42
U.S. Cl. 343-7.7 3 Claims



1. In a pulse-compression MTI doppler radar system including an antenna, a coded modulator having at least two waveform generators for generating coded pulses having low cross-correlation, a transmitter, a receiver, and a display, the improvements comprising:

a pulse-compression filter, connected to receive the output of said receiver, having at least two pulse compressors for providing pulse-compressed signals, each pulse compressor matched autocorrelatively to a different one of said waveform generators; at least two MTI processing channels for providing unambiguous range and speed indications to said display; and a multiplexer connected to receive the outputs of said pulse compressors for directing said pulse-compressed outputs to said MTI processing channels.

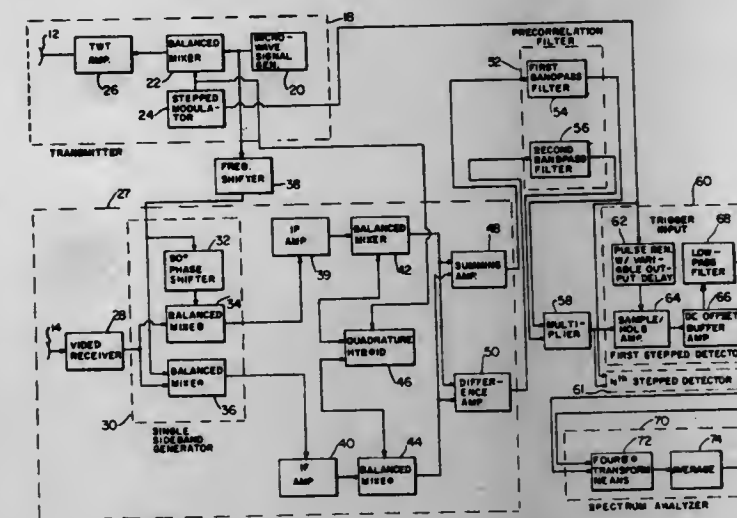
MOVING TARGET INDICATION RADAR
Yuichi Tomita; Takeru Irtabu, and Eiichi Kiuchi, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan
Filed Apr. 5, 1976, Ser. No. 673,323
Claims priority, application Japan, Apr. 3, 1976, 51-40628; Mar. 29, 1976, 51-34959
Int. Cl.² G01S 9/42
U.S. Cl. 343-7.7 7 Claims



1. A moving target indication radar comprising:
a. a radar signal analog processing portion including:
i. a constant-rate rotating antenna,
ii. means for transmitting at intervals through said antenna a microwave pulse of a predetermined frequency and width,
iii. means for receiving pulse returns from stationary and moving objects lying in the space scanned by said antenna, said pulse returns being received for every unit azimuthal region corresponding to one microwave

pulse in the form of a chain of unit data respectively for unit range region defined by the width of said microwave pulse, and
iv. means for processing the received pulse returns to produce Doppler frequency data, wherein said means for processing comprises phase detecting means for providing in phase and quadrature phase analog data signals representing real and imaginary parts of the Doppler frequency data, and
b. a radar signal digital processing portion including:
i. means for converting said Doppler frequency data to a digital signal, wherein said means for converting Doppler frequency data to a digital signal receives said in phase and quadrature phase analog signals and generates first and second digital words representing real and imaginary parts of the Doppler frequency data, and said means for dividing the converted digital signal into a plurality of digital Doppler frequency components is a discrete Fourier transform circuit,
ii. means for dividing the converted digital signal into a plurality of digital Doppler frequency components,
iii. a buffer memory connected to store the outputs of said dividing means at an interval equal to an integral multiple of the transmitting interval, and
iv. means for averaging the outputs of the buffer memory which represent the data of a plurality of every n -th (n is an integer) one of said unit azimuthal regions and for subtracting the average output from the data for the substantial center unit of said plurality of unit azimuthal regions, whereby the returns from said stationary and moving objects having a considerable azimuthal spread are substantially eliminated to bring out those returns from moving targets of limited azimuthal spreads.

STEPPED DUAL-FREQUENCY, OCEAN-WAVE SPECTROMETER
John W. Wright, Accokeek, Md.; William J. Plant, Annandale, and Dale L. Schuler, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Nov. 19, 1976, Ser. No. 743,374
Int. Cl.² G01S 9/60
U.S. Cl. 343-5 SA 13 Claims

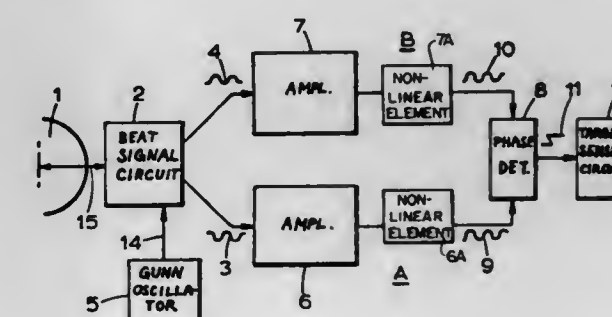


1. An ocean-wave, spectrometer radar system comprising: transmitter means for generating a first local oscillator frequency and a sync signal, and for transmitting, in successive steps, coherently related pairs of frequencies having different, small, and known frequency separations; coherent receiver means for receiving and separating the radar returns of said stepped pairs of frequencies; frequency-shifter means connected between said transmitter means and said receiver means for shifting the frequency of said first local-oscillator frequency; multiplier means receiving said separated radar returns for

said stepped pairs of frequencies from said receiver and multiplying said separated radar returns to obtain a Bragg resonance condition for each step;
a plurality of stepped detector means, each receiving a sync signal from said transmitter and the output of said multiplier, each for detecting a different step of said multiplier output.
utilization means receiving the outputs of said stepped detector means, for processing and utilizing the outputs of said stepped detector means.

DOPPLER RADAR SYSTEM
Kenneth Holford, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 12, 1975, Ser. No. 631,382
Claims priority, application United Kingdom, Nov. 29, 1974, 51762/74
Int. Cl.² G01S 9/44 9 Claims

U.S. Cl. 343-9



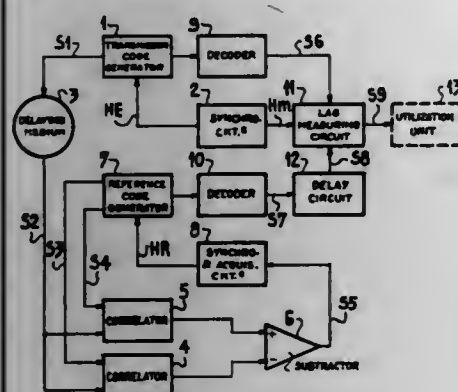
1. A Doppler radar system comprising a phase detector responsive during each beat signal cycle to produce an output signal having a first level when the two beat signals have a relative phasing within specified limits and a second level when their relative phasing has shifted outside these limits, respective amplifying means to which said beat signals are applied before application to said phase detector, said amplifying means having a gain sufficient to produce, in the absence of said beat signals, output noise signals which are due to noise in the system and which render the phase detector responsive in accordance with the relative positions of their rising and falling edges to produce its output signal with either said first or second level, storage means responsive to the phase detector output signal for storing a representative level thereof, and threshold means responsive to provide an indication of a moving target when said representative level of output signal changes from a quiescent value to a threshold value.

ARRANGEMENT FOR MEASURING THE LAG BETWEEN TWO TIMED SIGNALS BY ELECTRONIC CORRELATION
Léon Robin, and Thaddeus Hawkes, both of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Oct. 5, 1976, Ser. No. 729,799
Claims priority, application France, Oct. 10, 1975, 75.31123
Int. Cl.² G01S 9/08 8 Claims

U.S. Cl. 343-13 R

1. An arrangement for measuring the lag between two timed signals by electronic correlation, comprising: a first circuit for generating a numerical coded signal, means for transmitting the said coded signal through a transmission medium, means for receiving the coded signal after said transmission, a discriminator circuit of the type comprising two correlation circuits for correlating the coded signal received with respective ones of two reference coded signals reproducing said numerical code and relatively displaced in time in such a way that their respective auto-correlation functions partially overlap to form a common range of lag measurement, and a differential circuit for providing a signal representing the difference be-

tween the correlation outputs, a first synchronising circuit for synchronising with a first clock signal the said first generator circuit, a second generator circuit for producing the said two reference signals, a second synchronising circuit for synchronising the said second generator circuit using a synchronising signal whose frequency is locked to the amplitude of the said difference signal, and lag measuring means comprising two state-decoding circuits having inputs connected to the said



generator circuits respectively and outputs connected to a measuring circuit, said state decoding circuits providing each a pulse signal, the time interval separating said pulse signals corresponding to the lag to be measured, the said first synchronising circuit providing a second clock signal for measurement purposes whose period is a sub-multiple of the period of said first clock signal to enable the said measuring circuit to count pulses.

4,053,889

NON-LINEAR SPREAD SPECTRUM TRANSMITTER/RECEIVER FOR A HOMING SYSTEM

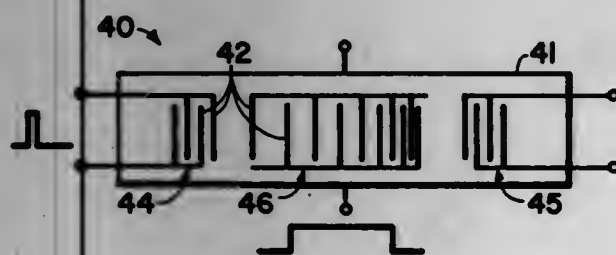
Robert H. Johnson, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed July 27, 1976, Ser. No. 709,052

Int. Cl.² G01S 9/233

U.S. Cl. 343—17.2 PC

2 Claims



1. In a detection, track and homing system including a spread spectrum transmitter adapted to transmit signals to a remotely located target and a spread spectrum receiver adapted to receive signals reflected from the target in response to the transmitted signals impinging thereon where the velocities between the transmitter/receiver and the target are relatively high, surface acoustic wave apparatus providing doppler invariant pulse compression/expansion comprising:

- a piezoelectric base;
- a plurality of spaced apart interdigitated fingers formed on a surface of said base and interconnected to provide an input transducer and an acoustically coupled output transducer; and
- the fingers forming the output transducer having spacings therebetween which vary nonlinearly in a generally hyperbolic function for reducing frequency shift errors due to doppler effects.

4,053,890

INTERNAL CALIBRATION SYSTEM

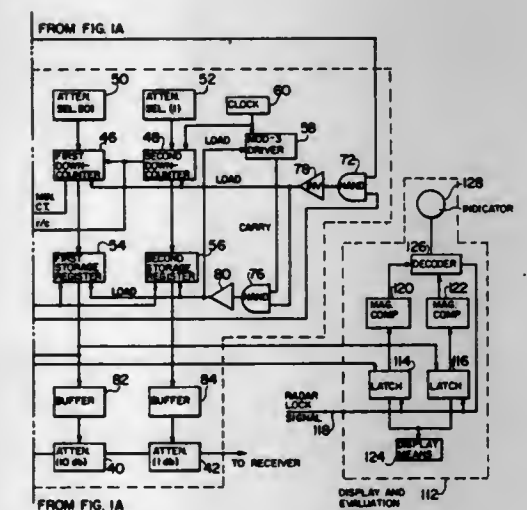
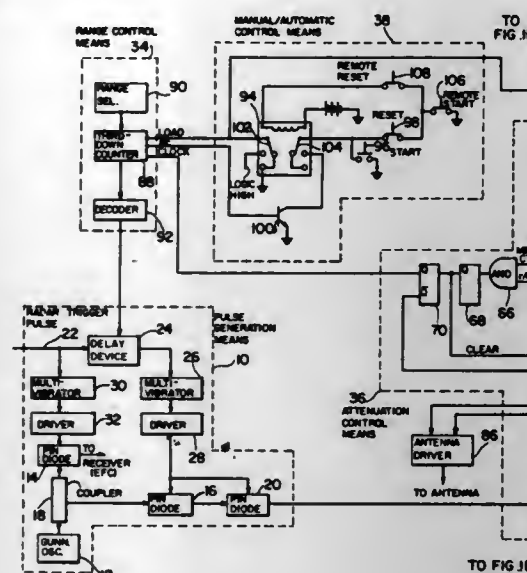
David S. Woodson, III, Clinton, Md., and Louis R. Rudolph, Annandale, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,895

Int. Cl.² G01S 7/40

U.S. Cl. 343—17.7

4 Claims



1. Apparatus for automatically calibrating a pulse-type radar receiver, which comprises:

pulse-generation means coupled to a radar trigger for producing pulses of RF radiation at a selectable time delay after receiving said radar trigger for injection into the radar receiver to simulate signals reflected from a target; attenuation control means coupled to said pulse-generation means for selectively varying the attenuation of said time-delay RF pulses, said attenuation control means comprising a first down-counter, a second down-counter, a tens attenuation selector for setting the initial count in said first down-counter, a ones attenuation selector for setting the initial count in said second down-counter, means coupled to said first and said second down-counters for attenuating said RF pulses corresponding to the counts in said first and said second down-counters, and means for resetting said first and said second down-counters with the initial counts when the counts in said first and said second down-counters are zero;

range control means coupled to said pulse-generation means for selecting the time delay of said RF pulses, said range control means comprising a third down-counter coupled to said pulse-generation means to select to time delay of said RF pulses, said third down-counter being further coupled to said attenuation control means so that the third down-counter is clocked when the counts in said first and said second down-counters are zero, and a range selector coupled to said third down-counter;

manual/automatic control means coupled to said range control means to control the counting of said third down-counter and to reset said third down-counter to the initial count when the count is zero, said manual/automatic control means further coupled to said attenuation control means to control the counting of said first and said second down-counters; and display and evaluation means coupled to said attenuation control means and to a radar lock signal for determining the amplitude of said RF pulses which produces a radar tracking lock, said display and evaluation means further comparing the amplitude of said RF pulses which produces a radar lock with a predetermined standard to provide an indication of the radar receiver's operational status.

4,053,891

RADAR OBJECT DETECTOR USING NON-LINEARITIES

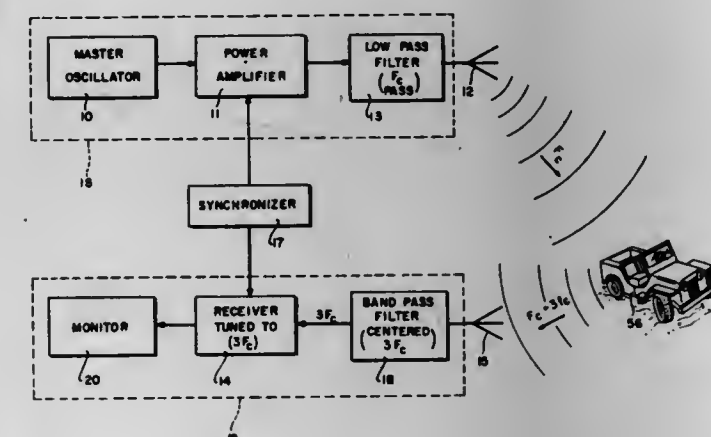
Charles L. Opitz, Westfield, NJ, assignor to Lockheed Electronics Company, Plainfield, N.J.

Filed May 24, 1967, Ser. No. 642,657

Int. Cl.² G01S 9/02

U.S. Cl. 343—5 SA

5 Claims



1. A radar device for remotely detecting compound metal objects comprising, oscillator means for generating electromagnetic energy in at least one band of frequencies, antenna means for transmitting said energy in a beam toward said compound metal object, and receiver means tuned to a predetermined functionally related frequency band different from the first mentioned band of frequencies for detecting only that which is produced by the electrical non-linearity characteristics of the object.

4,053,892

SYSTEM FOR ENABLING COHERENT SIGNAL PROCESSING AT A REMOTE RECEIVING STATION

Charles W. Earp, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,342

Claims priority, application U.S. Pat. No. 3,755,755

Int. Cl.² G01S 1/44

U.S. Cl. 343—106 R

8 Claims

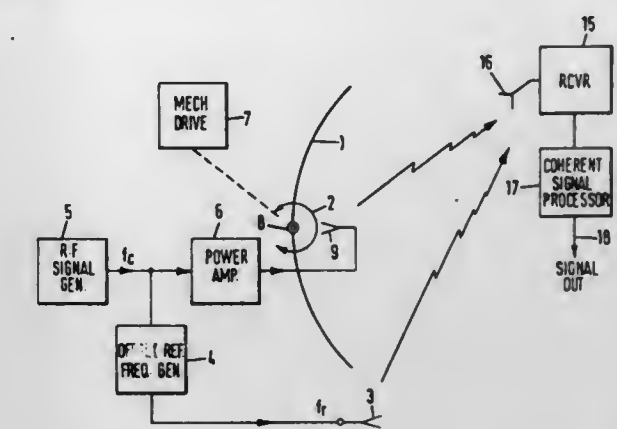
1. In a microwave landing system of the scanning beam type in which a remote receiving station derives angular navigational information from the transmissions of a ground beacon by processing signals received from said beacon, the combination of comprising:

a scanning antenna within said ground beacon, all the radiating elements of which are contemporaneously excited for sweeping a collimated beam through a predetermined angular sector of space;

first means for generating a first radio frequency signal to energize said scanning antenna;

second means responsive to said first radio frequency signal for generating a second ratio frequency signal therefrom, said second means being responsive to said first ratio frequency signal for generating said second ratio frequency signal for generating said second ratio frequency signal

frequency with a predetermined phase relationship with said first radio frequency signal but offset therefrom in frequency, said second ratio frequency signal being substantially continuous during transmission of said first radio frequency signal, and substantially independent of the transmissions and angular position of said scanning antenna;



and a nonscanning second antenna arranged to provide radiation coverage at least over said sector swept by said scanning antenna, said second antenna being energized by said second radio frequency signal, said second radio frequency signal thereby providing a reference signal at said remote receiving station for coherent processing of said first radio frequency signal received at said remote station.

4,053,893

METHOD OF AND APPARATUS FOR INDICATING THE GEOGRAPHICAL POSITION OF A PILOT VEHICLE

Francis Boyer, Elancourt, France, assignor to Societe Francaise d'Equipements pour la Navigation Aeronautique S.F.E.N.A., Velizy-Villacoublay, France

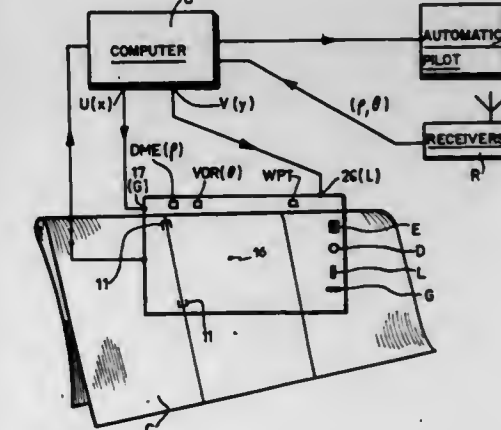
Filed Nov. 18, 1975, Ser. No. 632,971

Claims priority, application France, Nov. 18, 1974, 74.37993

Int. Cl.² G01S 3/02

U.S. Cl. 343—112 PT

4 Claims



1. An apparatus for use in indicating the geographic position of a craft in accordance bearing and distance information from beacon transmitters, said indicating apparatus comprising a casing;

a figurative point movable according to two orthogonal displacements;

an access slot gaping on three sides of said casing so as to receive a geographical map or portion of a map even when approximately oriented and folded for reception in said gap;

a window placed above said map receiving slot, said figurative point being displaceable in the area of said window in order to occupy any position in the window;

means for alignment with the meridian of said map, consti-

tuted by pointers which are brought into coincidence with said meridian;
two associated transducers for supplying signals representing angular position information of said map with respect to said indicating apparatus, this information being a function of the respective positions of said pointers;
means for setting values for basic reference information signals including information on magnetic declination, and scale of said map;
a device for locking said map in position at the back of said window holding it firmly and accepting the folding of said map in several thicknesses, the operation of indicating apparatus being subordinated to the locking of said maps through said locking device.

4,053,894

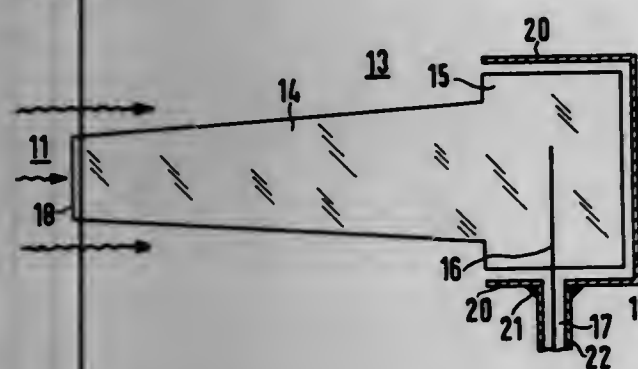
RADIO SIGNAL SWITCHING SYSTEM EMPLOYING DIELECTRIC ROD ANTENNAS

Oskar Beckmann, St. Polten, Austria, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Mar. 20, 1975, Ser. No. 560,404

Claims priority, application Germany, Mar. 21, 1974, 2413744
Int. Cl.² H01Q 13/20

U.S. Cl. 343—225

8 Claims



1. A transmission arrangement for the transmission of a control signal to each control path of a number of controllable semiconductor valves in a static high-voltage converter and for firing said valves, comprising:

- a high-frequency transmitter for emitting high-frequency electromagnetic radiation which is modulated in dependence upon said control signal;
- a plurality of high-frequency receivers located at some distance from said transmitter, each of said receivers being associated with one of said valves and each including a demodulator whose output is fed as a firing signal to the control path of the associated valve; and
- a number of receiving antennas for receiving said high-frequency electromagnetic radiation, each receiving antenna being associated with one of said plurality of high-frequency receivers, each receiving antenna having a front part in the form of a cylindrical rod tapered along its longitudinal axis, said cylindrical rod having its smaller end pointed in the direction of the transmitted high-frequency electromagnetic radiation which it is to receive and said cylindrical rod consisting of material which is electrically non-conductive, and each receiving antenna having a rear part including coupling means for coupling the high-frequency electromagnetic radiation traveling along said cylindrical rod to the associated high-frequency receiver, a metal plate being disposed at the larger end of said rod, such that the normal to said plate is aligned with the radiation direction of said transmitter, said plate having a slot whose height is equal to half a wavelength of said radiation when said radiation is in said rod and whose width is substantially smaller than said half a wavelength, whereby the receiving antenna will not promote electrical discharges which would otherwise result because of the large potential difference between individual semiconductor valves and between a semiconductor valve and ground.

4,053,895 ELECTRONICALLY SCANNED MICROSTRIP ANTENNA ARRAY

Carmen S. Malagisi, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 24, 1976, Ser. No. 744,498

Int. Cl.² H01Q 3/26

U.S. Cl. 343—700 MS

10 Claims



1. An antenna element comprising:
a metallic disc in juxtaposition with a metallic ground plane member and separated therefrom by a dielectric medium,
an electrical short circuit connecting the center of said metallic disc and said ground plane member,
at least two pairs of diametrically opposed short circuiting switches connected between the edge of said disc and said ground plane member, and
a phase control circuit for actuating said short circuiting switches.

4,053,896

SELF-ERECTING, HEMISPHERICALLY DIRECTIONAL BUOY ANTENNA

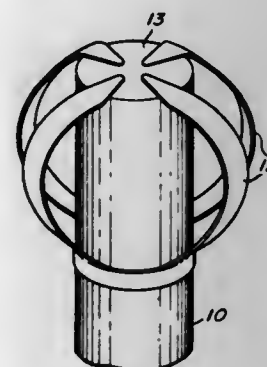
Charles Raymond Bitter, Jr., and Robert Bruce Malcolm, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 15, 1976, Ser. No. 666,853

Int. Cl.² H01Q 1/34

U.S. Cl. 343—709

7 Claims



1. A self-erecting, hemispherically directional antenna comprising:

- a body;
- movable means affixed to said body and movable with relation thereto from a first to a second position;
- a plurality of elongated, electrically conductive spring members each connected at one end to said body and at the other end to said movable means, said spring members being generally equally spaced about a central axis;
- said spring members assuming a stored position with said movable means in the first position and defining spaced apart arcuate portions of a sphere with said movable means in the second position;
- connecting means electrically coupled to said spring members for coupling radio signals between said spring members and a radio;
- said movable means being biased toward the second position; and
- releasable means normally positioned to hold said movable means in the first position and releasable to allow said movable means to move to the second position.

4,053,897

MICROWAVE ELEMENT INCLUDING SOURCE ANTENNA AND CAVITY PORTIONS

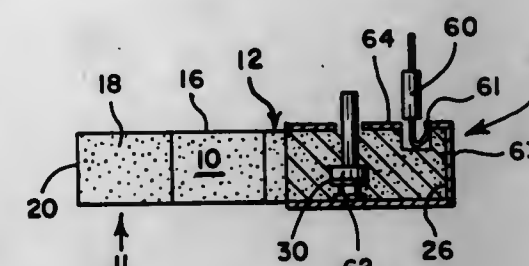
Eldon Nerheim, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 14, 1976, Ser. No. 732,263

Int. Cl.² H01Q 13/00; H03F 1/36

U.S. Cl. 343—785

15 Claims



1. A microwave element, including: dielectric means including an antenna portion, an iris formed as a reduced cross section in said dielectric means, and a microwave cavity portion; said antenna portion of said dielectric means having a reduced cross section opposite said iris with said reduced cross section terminating in a continuously diminishing configuration; said microwave cavity portion being covered with a conductive material to create microwave resonant cavity means; said microwave cavity means further including an opening midway between an effective first wall portion adjacent said iris and a cavity wall portion opposite said first portion; and surface means defining said opening with said surface means adapted to receive microwave energy generator means in said opening for the generation of microwave energy in said cavity means that is propagated through said iris and radiated from said antenna portion of said microwave element.

4,053,898

LASER RECORDING PROCESS

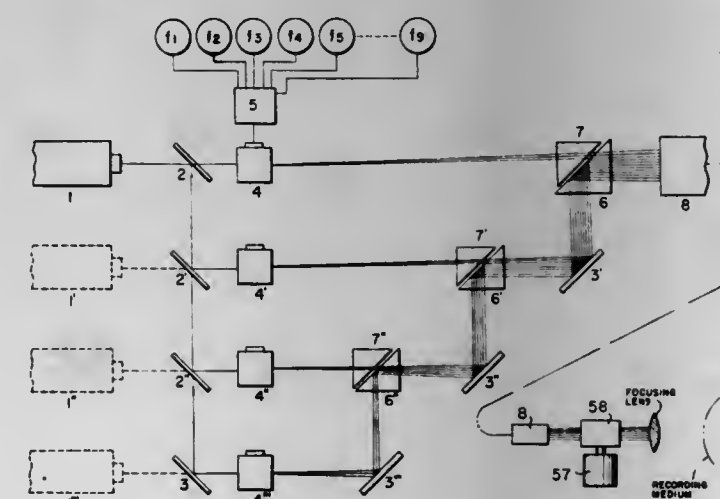
Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki; Takesuke Tokiwa, Yokohama; Kazuo Kawakubo, Hino; Fujio Iwatate, Tokyo, and Hisashi Nakatsui, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 607,503, Aug. 25, 1975, Ser. No. 607,504, Aug. 25, 1975, and Ser. No. 594,126, July 8, 1975. This application Sept. 3, 1975, Ser. No. 610,082

Claims priority, application Japan, Sept. 13, 1974, 49-105632

Int. Cl.² G06K 15/12

U.S. Cl. 346—1

17 Claims



1. An optical recording method for recording image information upon a recording medium, comprising the steps of:
forming at least two light beams;
projecting said light beams along first and second paths, respectively;
dividing and simultaneously modulating each of said light beams to form respective first and second groups of modulated beams, wherein the beams of each said group are

spaced along respective first and second imaginary straight lines, each of which projects through the beams of its associated group and is disposed substantially perpendicular to the directions of travel of the beams;
directing each said group of beams through optical means for disposing such groups in a common array wherein the linearly spaced beams of each group are linearly spaced from the beams of the other group along a third substantially straight line projecting through each of said modulated beams and substantially perpendicular to their directions of travel; and
scanning said recording medium with said array of modulated beams to form straight lines of image information on said recording medium in a direction substantially perpendicular to the scanning direction.

4,053,899

ELECTROGRAPHIC RECORDER COVER ASSEMBLY WITH RETRACTABLE ELECTRODES

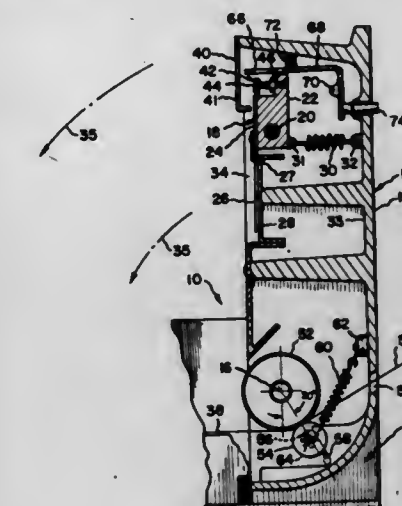
Robert F. Strange, Round Rock, Tex., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,034

Int. Cl.² G01D 9/00, 15/00

U.S. Cl. 346—68

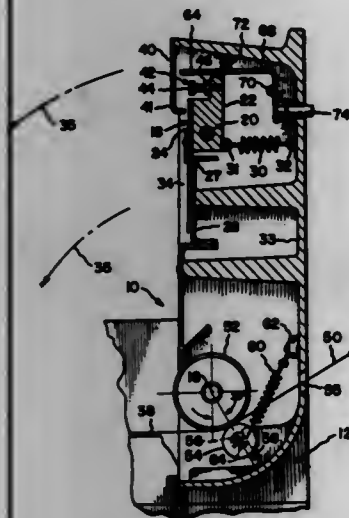
12 Claims



1. An electrographic segment electrode mounting assembly supportable in a cover for a base of an electrographic printer to dispose electrographic electrodes in a first protected and inoperative position when the printer cover is open and in a second operative position when the printer cover is closed with respect to the base of the printer, comprising:

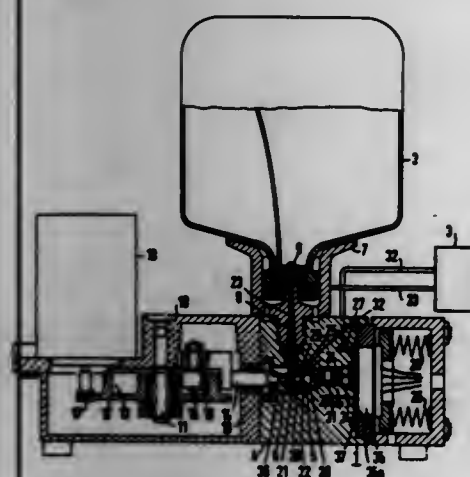
- a segment electrode assembly;
- support means pivotable about a fixed axis for mounting the segment electrode assembly to an electrographic printer cover movable between an open position and a closed position;
- frame means for encompassing the segment electrode assembly in a first protected and inoperative position when the cover is open;
- biasing means cooperatively mounted between the segment electrode assembly and the electrographic printer cover to maintain the segment electrode assembly in the first protected and inoperative position when the cover is open; and
- actuating means for moving the segment electrode assembly from the first protected and inoperative position to the second operative position when the cover is closed.

4,053,900
ELECTROGRAPHIC PRINTER RECORDING MEDIUM LOADING ASSEMBLY
 Robert F. Strange, Round Rock, Tex., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
 Filed Apr. 2, 1976, Ser. No. 673,033
 Int. Cl.² G01D 15/34
 U.S. Cl. 346—136 10 Claims



1. An electrographic printer recording medium loading assembly, comprising:
 an electrographic printer cover structurally defining a ramp member;
 a drive roller mounted to the printer cover;
 a length of recording medium disposable to tangentially approach and engage the drive roller and be driven thereby;
 a wrap roller bearing against and movable along the ramp member having first and second roller positions for cooperatively engaging the recording medium with the drive roller, the first and second roller positions being disposed in an arcuate path about the periphery of the drive roller; and
 at least one extension spring extending between the printer cover and the wrap roller to bias the wrap roller against the ramp member and against the recording medium engaging the drive roller.

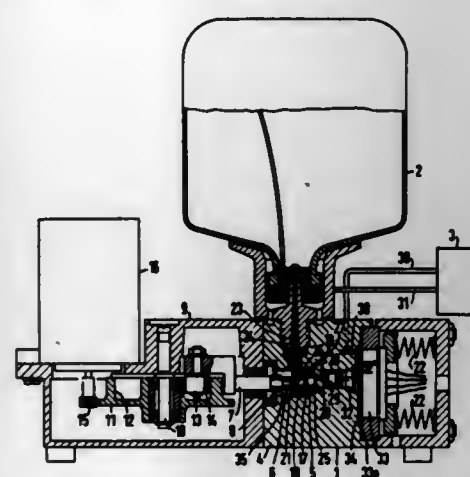
4,053,901
FLUID PUMP FOR A WRITING DEVICE HAVING AN AIR EJECTOR FEATURE
 Bengt Skafvenstedt, Stockholm; Sture Ahlgren, Vaellingby, and Eberhard Tschuertz, Jaerfaella, all of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
 Filed Nov. 29, 1976, Ser. No. 745,573
 Claims priority, application Germany, Dec. 22, 1975, 2557961
 Int. Cl.² G01D 15/16; B43K 5/04, 5/18; F04B 21/00
 U.S. Cl. 346—140 R 3 Claims



1. A pump mechanism for delivering ink or the like writing

fluid from a fluid reservoir to a writing device comprising pump housing means, means forming a cylinder in said housing comprising a suction chamber and a pumping chamber, a piston carried within said cylinder and movable in a forward direction to block communication between said suction and pumping chambers, and in a backward direction to open communication between said suction and pumping chambers, means including a capillary tube for communicating said suction chamber and the reservoir, and flexible membrane means in said cylinder having a portion connected to said pump housing means and another portion connected to said piston for joint movement therewith, whereby said flexible membrane means forces air bubbles from said capillary tube to the reservoir as the piston moves in said forward direction.

4,053,902
FLUID PUMP FOR A WRITING DEVICE
 Bengt Skafvenstedt, Stockholm; Sture Ahlgren, Vaellingby, and Eberhard Tschuertz, Jaerfaella, all of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
 Filed Nov. 29, 1976, Ser. No. 745,574
 Claims priority, application Germany, Dec. 22, 1975, 2558063
 Int. Cl.² G01D 15/16; B43K 5/04, 5/18; F04B 7/04
 U.S. Cl. 346—140 R 7 Claims

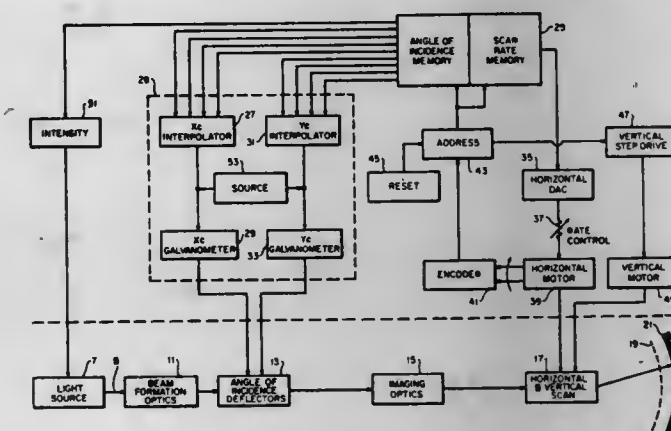


1. A pump mechanism for delivering ink or the like writing fluid from a reservoir to a writing device comprising a pump housing having an internal cylinder wall forming a cylinder, a piston disposed within said cylinder and slidable forward in a pumping stroke and backward in a suction stroke, and drive means for moving said piston through said pumping and suction strokes, said cylinder wall comprising a frusto-conical portion tapered inwardly in a direction away from said piston, and said piston comprising a plastic member having a forward end portion which cooperates with said tapered portion of said cylinder wall and which has an outside diameter which is greater than the smallest diameter of said tapered cylinder wall portion to slidably engage the same in sealing relation as said piston moves forward during a pumping stroke, and to move out of engagement with the same as the piston moves backward in a suction stroke, said forward end portion of said piston having a forward facing recess formed therein permitting radially inward deformation of said forward end portion of said piston upon engagement thereof with said tapered cylinder wall portion.

4,053,903
SCANNING RATE AND INTENSITY CONTROL FOR OPTICAL SCANNING APPARATUS
 Thomas W. Schultz, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.
 Filed June 23, 1976, Ser. No. 699,047
 Int. Cl.² G03B 41/00 6 Claims

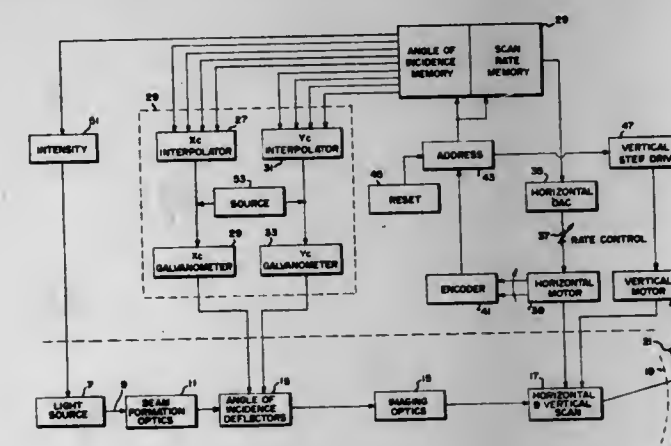
1. In a control system for use with an optical scanning expo-

sure system in manufacturing cathode ray tubes having a faceplate with a layer of photosensitive material thereon, said optical scanning exposure system including a light source with a wavelength spectrum for exposing the photosensitive material, means for scanning the faceplate with a light beam, and means for deflecting the light beam at an angle related to the angle of incidence of an electron beam in a cathode ray tube, and said electrical control system including an angle of inci-



dence and scan rate memory means, a scan rate means for controlling scanning of the light beam, and an angle of incidence deflection control means for controlling the angle of incidence of the light beam, the improvement comprising means for controlling the integral with respect to time of the light beam intensity at each exposed region of photosensitive material on the faceplate of the cathode ray tube to provide a predetermined amount of exposure at predetermined positional locations across the surface of the faceplate.

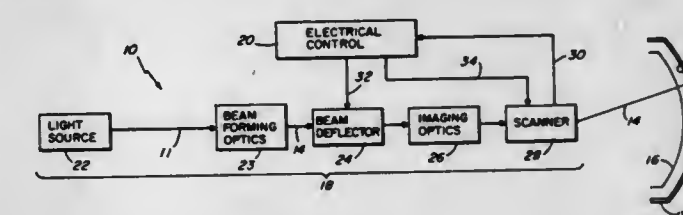
4,053,904
OVERLAP AND OVERSCAN EXPOSURE CONTROL SYSTEM
 G. Norman Williams, Seneca Falls, and Mahlon B. Fisher, Skaneateles, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.
 Filed June 23, 1976, Ser. No. 699,054
 Int. Cl.² G03B 41/00 6 Claims



1. In a method for controlling an optical scanning exposure system for exposing a photosensitive layer on a faceplate of a cathode ray tube wherein the electrical control system includes an angle of incidence and scan rate memory storage means, scanning means, and an angle of incidence control means and the method for controlling the optical scanning exposure system includes the steps of activating the scan rate means to cause light beam scanning of the faceplate of the cathode ray tube, applying signals representative of the positional location of a light beam to the angle of incidence and scan rate memory means to derive signals representative of the angle of incidence of an electron beam, coupling the signals representative of the angle of incidence of an electron beam to said angle of incidence control means, and coupling signals representative of said desired rate of scan to said means for

effecting horizontal and vertical scanning, the improvement comprising the added step of:
 retrieving from said angle of incidence and scan rate memory means signals for altering the operation of said scan rate means to cause said horizontal and vertical light beam scanning means to provide overlapping adjacent horizontal scan lines and more uniform illumination of the photosensitive layer on the faceplate of the cathode ray tube.

4,053,905
OPTICAL SCANNING APPARATUS FOR PHOTOLITHOGRAPHY OF A COLOR CATHODE RAY TUBE HAVING AN APERTURE MASK
 John Schlafer, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.
 Filed June 23, 1976, Ser. No. 699,109
 Int. Cl.² G03B 41/00 41 Claims

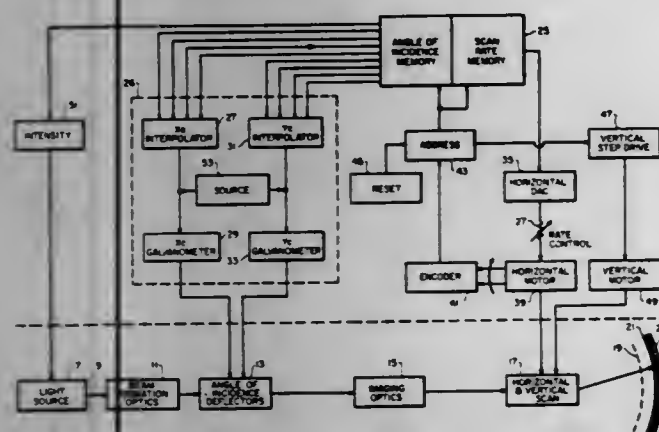


1. An optical scanning apparatus for use in manufacturing cathode ray tubes wherein a layer of a photosensitive material on the inner surface of a tube faceplate is exposed by scanning a light beam over an array of light-transmitting apertures in a mask disposed adjacent to the layer of material on the faceplate, the apparatus including:
 a. a light source for creating a light beam having a wavelength spectrum which exposes the photosensitive material;
 b. means disposed in the path of the light beam for deflecting the light beam through an angle which is related to a predetermined angle of incidence that an electron beam has at each point on the aperture mask as it passes through the transparent regions of the mask in an operating tube;
 c. optical means, operating on the deflected light beam, for imaging the point of deflection of the light beam substantially at the faceplate so that the light beam may be made to impinge on the mask with an angle of incidence related to that of an electron beam in an operating tube, the angle of incidence being obtained substantially without translation of the light beam at the faceplate; and
 d. means for scanning the deflected light beam over the aperture mask in a predetermined fashion to expose the photosensitive material adjacent to all light-transmitting regions on the mask, the deflecting means being operative in synchronism with the scanning means to provide the light beam with the proper angle of incidence for each light-transmitting region on the mask.

4,053,906
CONTROL SYSTEM FOR AN OPTICAL SCANNING EXPOSURE SYSTEM FOR MANUFACTURING CATHODE RAY TUBES
 Thomas W. Schultz, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.
 Filed June 23, 1976, Ser. No. 699,045
 Int. Cl.² G03B 41/00 16 Claims

1. In an optical scanning exposure system for use in manufacturing cathode ray tubes having a faceplate with a layer of photosensitive material thereon and the scanning exposure system including a light source providing a light beam having a wavelength spectrum for exposing photosensitive material, means for deflecting the light beam at an angle related to an angle of incidence of an electron beam at a plurality of points on the faceplate of an operating cathode ray tube, and means

for effecting horizontal and vertical light beam scanning of the faceplate of the cathode ray tube, a control system comprising: storage means for storing information representative of the proper angle of incidence of a light beam at a matrix of positional locations on the faceplate of said cathode ray tube and of the rate of scan of the light beam from one positional location to the next; encoder means coupling said means for effecting horizontal and vertical light beam scanning to said storage means and providing horizontal and vertical light beam scan position information to said storage means;



scan rate means coupling said storage means to said horizontal and vertical light beam scanning means and providing electrical signals for controlling the rate of light beam scanning intermediate to said positional locations of said matrix; and angle of incidence control means coupling said storage means to said angle of incidence deflection means and providing electrical signals related to the angle of incidence of an electron beam to control the angle of incidence of said light beam.

4,053,907

PROGRAM-CONTROLLED SHUTTER

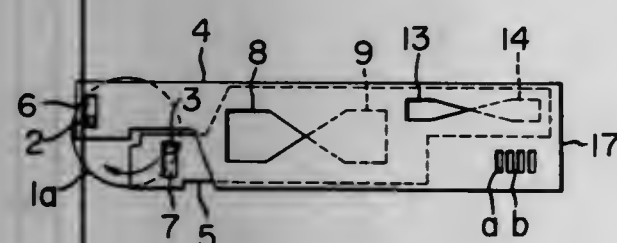
Hiroshi Iwata, Osaka, and Katsuji Ishikawa, Higashi, both of Japan, assignors to West Electric Co., Ltd., Japan
Filed Oct. 14, 1975, Ser. No. 621,819

Claims priority, application Japan, Oct. 18, 1974, 49-120903; Oct. 18, 1974, 49-120904

Int. Cl.² G03B 7/14

U.S. Cl. 354—29

9 Claims



1. A program-controlled shutter comprising
 - a. aperture setting means including a plurality of shutter blades adapted to be used as the aperture setting blades, a step-motor drivingly coupled to said plurality of shutter blades for displacing them stepwise, and a driving circuit adapted to control the rotation of said step-motor in response to the input driving pulse or pulses;
 - b. shutter-blade-displacement detecting means for providing a series of output pulses each corresponding to an incremental motion of said shutter blades during the displacement of said shutter blades;
 - c. driving pulse generating means adapted to generate said driving pulse or pulses to be applied to said step-motor in response to the output pulses from said shutter-blade-displacement detecting means; and
 - d. photometric means for detecting the brightness of a sub-

ject and for generating a brightness detection signal corresponding to the amount of said brightness from said subject that passes through said shutter blades during the time when said shutter blades are so displaced to define an aperture and to generate a shutter closing signal to be applied to said driving circuit and said driving pulse generating means when the integrated value of the brightness detection signal reaches a predetermined level, whereby said shutter blades are displaced to define the optimum aperture depending upon the brightness of the subject and to close said aperture after a predetermined time depending upon the brightness of the subject, thereby attaining the optimum exposure.

4,053,908

EXPOSURE MULTIPLE SETTING DEVICE FOR PROGRAMMING ELECTRIC SHUTTER

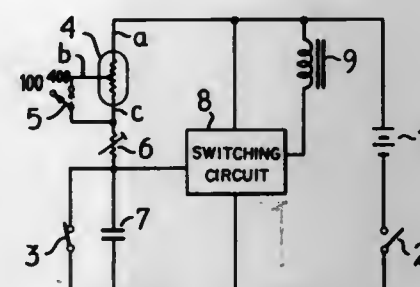
Takeo Saito, Yotsukaido; Yuzuru Takazawa, Togane; Shinji Nagaoka, Yotsukaido, and Yoichi Seki, Shisui, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan
Filed Sept. 3, 1976, Ser. No. 720,368

Claims priority, application Japan, Sept. 4, 1975, 50-122021[U]

Int. Cl.² G03B 7/08

U.S. Cl. 354—31

5 Claims



1. A control circuit for a programming electric shutter of a camera comprising: a d.c. power supply, photoconductive means for sensing the brightness of a subject to be photographed, a timing capacitor connected in series with said photoconductive means between positive and negative terminals of said power supply, trigger switch means normally short-circuiting said capacitor and operable simultaneously with the opening of the shutter to permit charging of said capacitor by current flowing through said photoconductive means, a switching circuit connected with said capacitor and responsive to the voltage level to which said capacitor is charged, shutter closing means controlled by said switching means to close the shutter when the capacitor voltage reaches a predetermined level, said photoconductive means comprises a plurality of discrete photoconductive bodies in a single unit, and switch means for selectively connecting said discrete photoconductive bodies in circuit with said capacitor to control the rate of charging of said capacitor as a function of the brightness of the subject to be photographed, thereby permitting the characteristics of said photoconductive means to be matched to the speed of the film used in the camera.

4,053,909

DATA REGISTERING EQUIPMENT FOR A CAMERA

Nobuhiko Shinoda, Tokyo; Tadashi Ito, Fumio Ito, both of Yokohama, and Soichi Nakamoto, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 6, 1975, Ser. No. 547,462

Claims priority, application Japan, Feb. 12, 1974, 49-16985

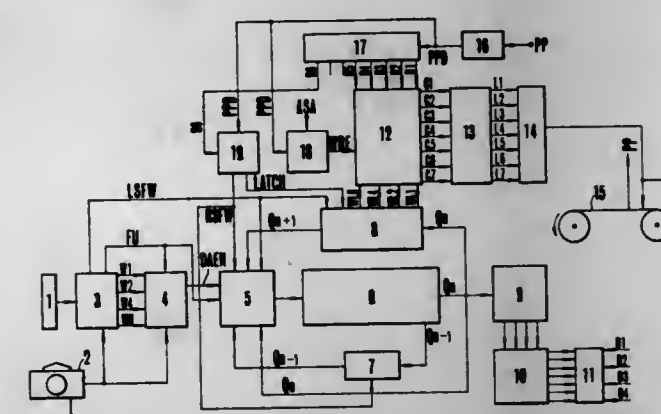
Int. Cl.² G03B 17/24

U.S. Cl. 354—105

5 Claims

1. For a camera defining a film position and forming exposure information signals, a data recording apparatus comprising:

data setting means for having data set therein and generating pulses corresponding to a set value, receiving means for receiving exposure information signals in the form of pulses, a first gate coupled to said data setting means and receiving means for passing one of the output signals of said data setting means and exposure information signal of the receiving means, a counter coupled to the first gate for memorizing the outputs of the first gate, a decoder coupled to the counter for decoding the content memorized by the counter, recording means coupled to the decoder for applying the



memorized content decoded by the decoder to the film position as visible indications, first pulse generating means to generate pulse signals in response to shifting of the position of the film, second pulse generating means coupled to said first pulse generating means for generating timing pulses based on the pulse signals from said first pulse generating means and for setting the timing of the application by the recording means on the basis of the timing pulses thereof, and a second gate connected between said decoder and recording means and coupled to said second pulse generator means for applying the output of said decoder on the recording means in synchronism with the timing pulses of said second pulse generating means.

4,053,910

MULTIPLE EXPOSURE OPTICAL RECORDING APPARATUS

Jurij Bodnar, 41 E. 3rd Ave., San Mateo, Calif. 94401
Division of Ser. No. 458,725, April 8, 1974, Pat. No. 3,940,775, which is a continuation-in-part of Ser. No. 344,107, March 23, 1973, abandoned. This application Feb. 23, 1976, Ser. No. 660,612

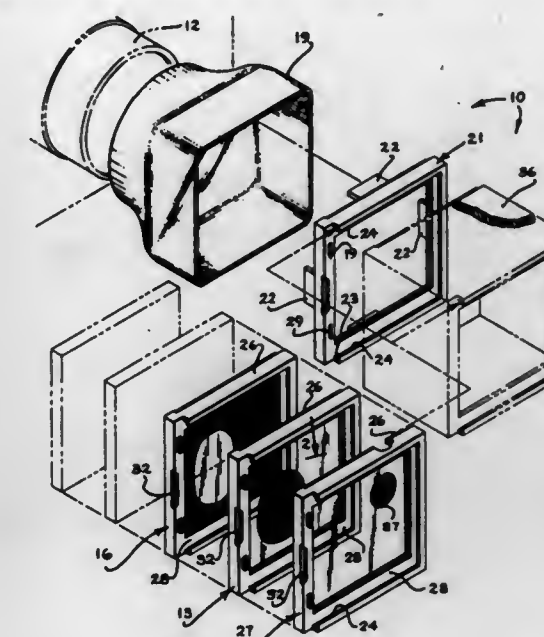
Int. Cl.² G03B 15/00

U.S. Cl. 354—120

7 Claims

1. Apparatus for composing pictures of objects comprising a camera having means for transporting film with frames each of given size therethrough, a lens serving to direct light onto said film, first and second mask assemblies serving to block light to complementary portions of a frame of said film, said first and second mask assemblies each having a size corresponding to said given size of said frames of said film, and means serving to dispose each of said first and second mask assemblies for use in succession in front of said lens comprising a tubular sun shade mounted on said camera with one end surrounding said lens and having an axial length substantially equal to that distance serving to maintain substantially a one-to-one ratio between said size of said mask assemblies and said given size of said frames of said film to inhibit exposure of complementary por-

tions of a frame to said film and to facilitate the provision of substantially indistinguishable demarcation between the areas



of the recorded images of said objects recorded at different positions on said film.

4,053,911

LIGHT-RECEIVING DEVICE FOR USE WITH THE EXPOSURE METER IN SINGLE LENS REFLEX CAMERA

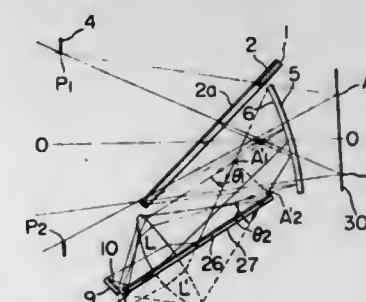
Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Dec. 19, 1975, Ser. No. 642,335

Claims priority, application Japan, Dec. 27, 1974, 49-148855

Int. Cl.² G03B 19/12

U.S. Cl. 354—152

7 Claims



1. In a single lens reflex camera having a finder optical system, an objective lens, and a meter device including a light receiving portion:

- a. a principal mirror for reflecting part of the light passing through said objective lens toward said finder optical system and for transmitting therethrough the remainder of said light;
- b. first optical means including a reflector member and disposed between said principal mirror and the focal plane of the objective lens and in inclined relationship with respect to the optical axis of said objective lens;
- c. a condensing mirror extending between the image of an object formed by and between said objective lens and said first optical means and the light-receiving portion of said metering device; and
- d. an image-forming half-lens provided on said condensing mirror to condense said image of the object toward said light-receiving portion of said metering device by cooperating with said condensing mirror, the optical axis of said half-lens being substantially coincident with the reflecting surface of said condensing mirror.

4,053,912

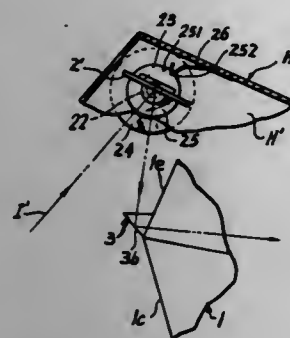
VIEW FINDER SYSTEM FOR A SINGLE LENS REFLEX CAMERA

Yoshiaki Okuma, Yokohama, and Hideo Yokota, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan. Continuation-in-part of Ser. No. 460,075, April 11, 1974, abandoned. This application Oct. 2, 1975, Ser. No. 618,920. Claims priority, application Japan, Apr. 17, 1973, 48-45279; Apr. 17, 1973, 48-45280.

Int. Cl.² G03B 13/06, 19/12

U.S. Cl. 354-225

10 Claims



1. A view finder system for a single lens reflex camera associated with a lens barrel having an objective lens and photographic information indicating means mounted thereon, comprising:

- a focusing screen on which an image of an object to be photographed is formed by said objective lens;
- an eye-piece
- a pentagonal roof prism having a bottom face optically facing said focusing screen, two roof faces, a front reflecting face, an exit face optically facing said eye-piece and a front non-reflecting face, and directing light from said focusing screen to said eye-piece to provide the image of the object in a field of the finder;
- a sub-prism having a single entrance face, a single reflecting face and a single exit face cemented to a lower portion of the front non-reflecting face of said pentagonal roof prism, wherein said entrance face faces upward; and
- a mirror optically facing both the indicating means and the entrance face of the sub-prism, said mirror being located above said indicating means and said sub-prism and arranged so that a light beam from said indicating means incident upon the mirror is thereby directed through the entrance face to the reflecting face of said sub-prism and also thereby directed through the exit face of said sub-prism cemented to the front non-reflecting face of said pentagonal roof prism directly in a direction of an upper portion of said eye-piece to provide an image of said indicating means in the field of the finder.

4,053,913

ELECTRIC SHUTTER DEVICE FOR A FOCAL PLANE SHUTTER

Akihiko Sato, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan.

Filed Apr. 6, 1976, Ser. No. 674,280

Claims priority, application Japan, Apr. 19, 1975, 50-52661[U]

Int. Cl.² G03B 9/34

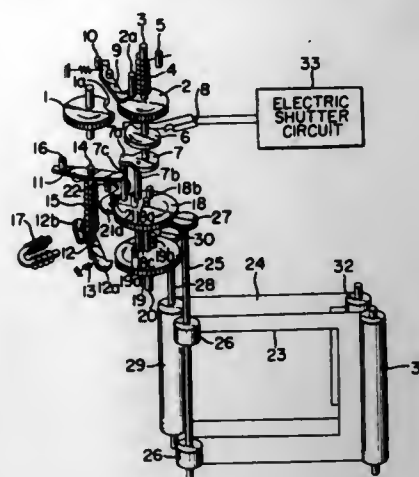
U.S. Cl. 354-244

12 Claims

1. In a focal plane shutter device having: film winding means; shutter moving means including a front curtain interlocking part interlocked with a shutter front curtain energized for movement in the operational direction for shutter release and a rear curtain interlocking part interlocked with a shutter rear curtain energized for movement in the same direction as that of said front curtain; a front curtain member being disposed in a displaceable manner at a first position engageably to stop said front curtain interlocking part and at a second position to enable the shutter front curtain to travel by release of said front curtain interlocking part; a rear curtain member displaceably provided at a first position engageably to stop said

rear curtain interlocking part, and at a second position to enable the shutter rear curtain to travel by releasing said rear curtain interlocking part; and rear curtain control means engageably to stop said rear curtain member at said first position until lapse of a predetermined exposure time commencing at shutter release operation, the improvement which comprises:

- a. control means interlocked with the film winding operation to charge the shutter at the time of film winding by actuat-



ing said shutter moving means, and to displace each of said front and rear curtain members to said respective first positions, and including means for accumulating positional energy, said control means being operable to displace said front curtain member to the second position at the time of shutter release by discharging the positional energy accumulated during film winding; and

- b. shutter release means disposed engageably to retain said control means in a shutter charging condition.

4,053,914

LIGHT EMISSIVE DIODE

Anthony Richard Goodwin, Great Dunmow, England, assignor to IIT Industries, Inc., New York, N.Y.

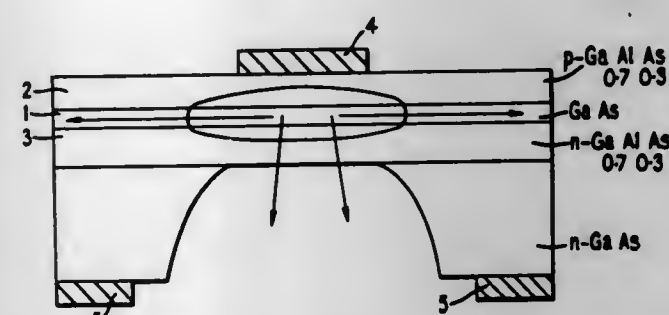
Filed Sept. 9, 1975, Ser. No. 611,727

Claims priority, application United Kingdom, Oct. 3, 1974, 42947/74

Int. Cl.² H01L 33/00

U.S. Cl. 357-17

6 Claims



1. A uni-directional light emissive diode having improved linear response characteristics comprising:
- an active junction region for propagating light in a plane substantially parallel to said junction and in a plane substantially perpendicular to said junction;
 - a mesa for containing said active region having a pair of top and bottom opposing surfaces and tapered sides connecting between said surfaces said tapered sides inclining toward said top surface for reflecting said parallel light in a direction perpendicular to said bottom surface and mixing said parallel light with said perpendicular light and causing said light to become uni-directional; and
 - a cavity approximate said second surface for receiving one end of an optical fiber therein, whereby said uni-directional light is transmitted into said optical fiber.

4,053,915

TEMPERATURE COMPENSATED CONSTANT CURRENT SOURCE DEVICE

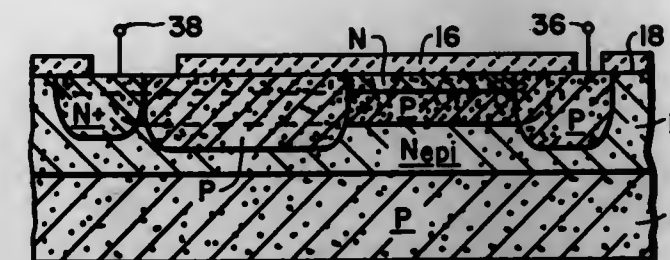
David L. Cave, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 22, 1976, Ser. No. 669,065

Int. Cl.² H01L 29/80, 29/78, 27/02

U.S. Cl. 357-22

2 Claims



1. A temperature compensated semiconductor current source device having a first terminal which is adapted to be connected to an operating bias potential for producing a current at an output terminal thereof of which the magnitude is substantially independent to variations of in combination:
- a junction field effect transistor having a predetermined, controlled pinch-off voltage characteristic and having:
 - a. an epitaxial layer of semiconductor material of a first conductivity type;
 - b. a drain electrode comprising a semiconductor material of a second conductivity type, said drain electrode being diffused into said epitaxial layer;
 - c. a source electrode comprising said semiconductor material of said second conductivity type having a predetermined value of resistivity being diffused into said epitaxial layer;
 - d. a source to drain channel region of said second conductivity type being formed into said epitaxial layer between said source and drain electrodes, said channel region being ion-implanted;
 - e. a first region of a semiconductor material having a higher concentration of said first type, said first region being diffused into said epitaxial layer adjacent to said source electrode; and
 - f. a second region of said first conductivity type formed into said epitaxial layer which extends into said first region and having a bottom surface contiguous along the upper surface of said source to drain ion-implanted channel;
 - g. first metal conductor means for connecting said first region to the first terminal of the device;
 - h. second metal conductor means for connecting said drain electrode to the output terminal;
 - said source electrode being extended in its physical area such that a linear diffused resistor is formed integrally therewith having a predetermined temperature coefficient that is a function of the resistivity of said semiconductor material comprising said source electrode; and
 - said diffused resistor and said field effect transistor having respective temperature coefficients which compensate each other so that the magnitude of the current produced at the output terminal of the current source device is substantially independent to temperature variations.

4,053,916

SILICON ON SAPPHIRE MOS TRANSISTOR

James R. Cricchi, Catonsville, and Michael D. Fitzpatrick, Glen Burnie, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 4, 1975, Ser. No. 610,493

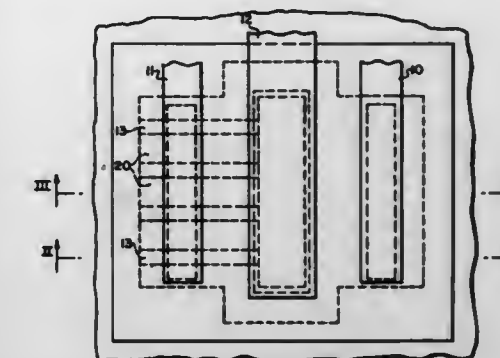
Int. Cl.² H01L 27/12, 29/78, 29/34

U.S. Cl. 357-23

10 Claims

1. A planar transistor comprising
- a. a semiconductor structure including:
 - 1. a channel region of a first conductivity type interposed

- between drain and source regions of a second conductivity type,
- 2. at least one high conductivity region of said first conductivity type contiguous to said source and channel regions;
- b. an insulating layer overlying said channel region;
- c. an electrically conductive layer overlying said insulating layer to form the gate of said transistor;



- d. electrically conductive means electrically coupled to said drain region to form the drain terminal of said transistor; and
- e. electrically conductive means coupled to said source region and to said high conductivity region to form the source terminal of said transistor

4,053,917

DRAIN SOURCE PROTECTED MNOS TRANSISTOR AND METHOD OF MANUFACTURE

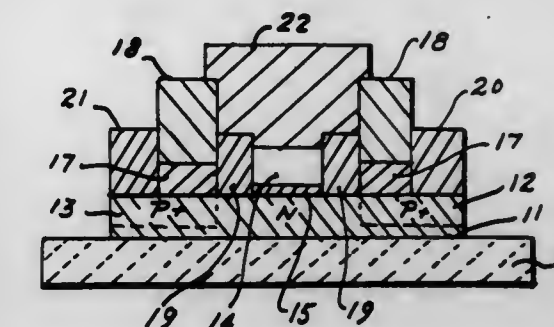
Franklyn C. Blaha, Glen Burnie; James R. Cricchi, Catonsville, and Marvin H. White, Laurel, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 16, 1976, Ser. No. 714,412

Int. Cl.² H01L 29/78, 29/34, 49/02

U.S. Cl. 357-23

1 Claim



1. A drain source protected MNOS transistor comprising
- a substrate of electrically insulating material,
 - a mesa of N type semiconductor material deposited on the surface thereof,
 - a source region formed by P+ diffusions into a portion of said mesa adjacent one edge thereof,
 - a drain region formed by P+ diffusions into a portion of said mesa adjacent the edge thereof opposite said source region,
 - a first region of gate silicon dioxide growth on said mesa surface covering a strip of the channel portion thereof opposite said source region,
 - a second region of gate silicon dioxide growth on said mesa surface covering a strip of the channel portion thereof adjacent said drain region,
 - a substrate gate window on said mesa surface in part defined by said first and second gate silicon dioxide growth regions,
 - a tunneling silicon dioxide growth layer on and coextensive with said substrate gate window,

a layer of memory silicon nitride on and coextensive with said tunneling silicon dioxide growth layer,
a third region of gate silicon dioxide growth on said source region adjacent said first region of gate silicon dioxide,
a fourth region of gate silicon dioxide on said drain region adjacent said second region of gate silicon dioxide,
a first layer of silox on said third region of gate silicon dioxide,
a second layer of silox on said fourth region of gate silicon dioxide,
a drain electrode,
a source electrode, and
a gate electrode, said first and second regions of gate silicon dioxide growth being approximately 1000 Å thick, said tunneling silicon dioxide growth layer being approximately 25 Å thick, said third and fourth regions of gate silicon dioxide growth being approximately 300 Å thick, said first and second layers of silox being approximately 10,000 Å thick, and said memory silicon nitride layer being approximately 300 Å thick.

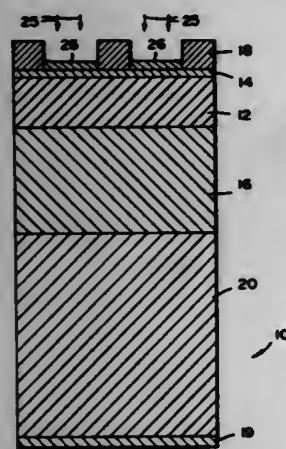
4,053,918 HIGH VOLTAGE, HIGH CURRENT SCHOTTKY BARRIER SOLAR CELL

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Richard J. Stirn, La Canada, Calif.

Filed Aug. 5, 1974, Ser. No. 495,021
Int. Cl.² H01L 27/14, 31/00, 29/48, 29/205

U.S. Cl. 357—30

8 Claims

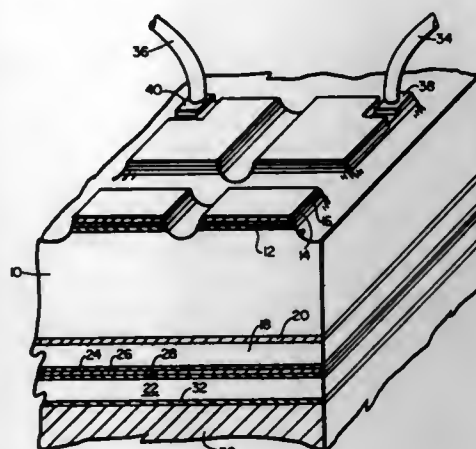


1. A Schottky barrier solar cell comprising:
a first layer of semiconductor material characterized by a first band gap width on the order of 1.4 eV;
a second layer of semiconductor material on top of said first layer and characterized by a second band gap width which is wider than the band gap of said first layer and is on the order of 2 eV, the thickness of said second layer being on the order of not more than one micron;
a third layer of semitransparent metal on top of said second layer and forming therewith a Schottky barrier, the thickness of said third layer being on the order of tens of angstroms, said third layer having a top surface remote from said second layer;
a first electrical contact in electrical contact with said third layer at the top surface thereof, the top surface of said first layer, other than the surface portion covered by said first electrical contact, being exposable to solar radiation whereby at least some photons of energies greater than said second band gap are absorbed in said second layer, and photons of energies greater than said first band gap and less than said second band gap pass through said second layer and are absorbed in said first layer, with photons absorbed in both layers generating carriers which move to said barrier; and
means including a second electrical contact, in contact with said first layer of semiconductor material.

4,053,919
HIGH SPEED INFRARED DETECTOR
Austin M. Andrews, II; John E. Clarke; Joseph T. Longo, and Edward R. Gertner, all of Thousand Oaks, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Aug. 18, 1976, Ser. No. 715,760
Int. Cl.² H01L 27/14

U.S. Cl. 357—30

1 Claim

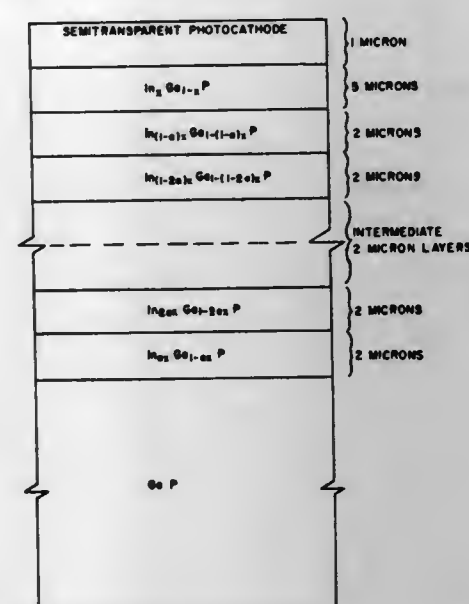


1. A high speed photodiode device particularly adapted to operate as a detector in the 10.6 μ portion of the infrared spectrum comprising (A) a substrate composed of a vapor transport grown $\text{Pb}_{0.8}\text{Sn}_{0.2}\text{Te}$ p-type material; (B) a first layer epitaxially grown on said substrate for absorbing 10.6 μm radiation and being composed of a $\text{Pb}_{0.8}\text{Sn}_{0.2}\text{Te}$ p-type material; and (C) a second layer epitaxially grown on said first layer to provide a region transparent to 10.6 μm radiation and being composed of a $\text{Pb}_{0.9}\text{Sn}_{0.1}\text{Te}$ n-type material.

4,053,920
STEP GRADED PHOTOCATHODE
Ronald E. Enstrom, Skillman, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation of Ser. No. 630,234, Nov. 10, 1975, abandoned.
This application Dec. 21, 1976, Ser. No. 753,158
Int. Cl.² H01L 27/14

U.S. Cl. 357—30

2 Claims



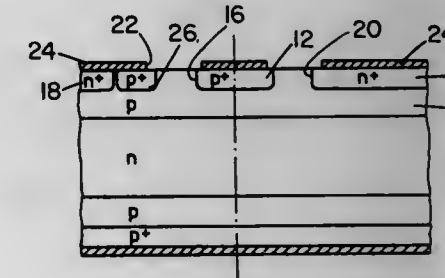
1. A III-V photocathode comprising host crystal of substantially pure III-V material; a series of graded layers of transition material approximately 2 microns thick and having a stoichiometric formula $\text{III}_x\text{V}_{1-x}$, $\text{III}_{1-x}\text{V}_x$ deposited on said host crystals, where the value of x is varied in steps to provide an abrupt increase of 8-10 mole percent of III-V in each successive graded layer as compared with the underlying material, the last of

said graded layers containing between 30 - 58 mole percent of III-V;
final layer of said transition material containing 40 - 65 percent of III-V approximately 5 microns thick deposited over the last of said graded layers; and
a photocathode layer composed of III-V compounds at least one of which is different from those in said transition material deposited on said final layer and activated with cesium vapor and oxygen.

4,053,921
SEMICONDUCTOR COMPONENT HAVING EMITTER
SHORT CIRCUITS
André Jaecklin, Ennetbaden, and Thomas Vlasak, Birr, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed Oct. 15, 1975, Ser. No. 622,496
Claims priority, application Switzerland, Dec. 3, 1974, 16055/74

Int. Cl.² H01L 29/74, 29/747
U.S. Cl. 357—38

7 Claims



1. A shorted emitter structure for a semiconductor device, said semiconductor device comprising:
a wafer of semiconductor material having first and second parallel surfaces and a layer of one semiconductor material of a first conductivity type extending from said first surface;
a center gate region of said first conductivity type generally located at the center of said first surface;
an annular cathode region of semiconductor material of a second conductivity type extending from said first surface and surrounding and spaced from said center gate region;
a plurality of short circuit elements comprising angular segments of said first conductivity type disposed within interior radial regions of said annular cathode region but spaced from said annular cathode region, said short circuit elements having inner diameter regions which are substantially continuous with the inner diameter of said annular cathode region; and
an annular cathode metallizing ring which extends from about the inner diameter of said cathode region and said annular segments to about the outer diameter of said cathode region and extending across and electrically connecting said annular segments of said first conductivity type to said cathode region of said second conductivity type.

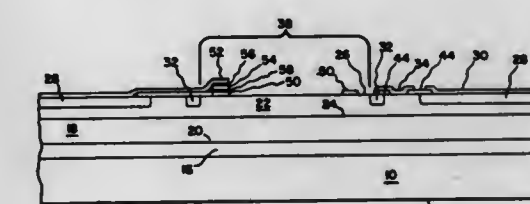
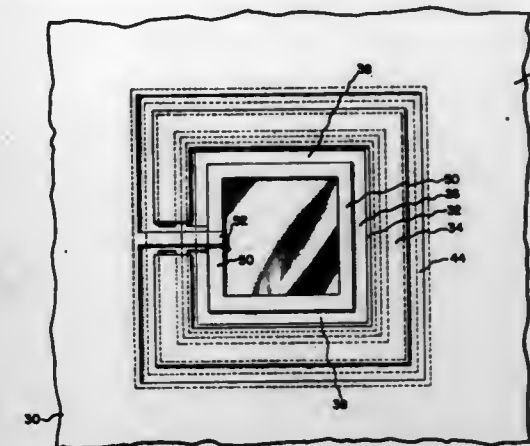
4,053,922
LIGHT TRIGGERED THYRISTOR HAVING
CONTROLLED TURN ON DELAY
Armand P. Ferro, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed May 19, 1976, Ser. No. 687,986
Int. Cl.² H01L 29/74

U.S. Cl. 357—38

11 Claims

1. In a radiation triggered thyristor having an anode, a cathode and a radiation sensitive gate region, the improvement for providing adjustable turn-on time comprising:
electrode means in said gate region surrounding at least a portion of said gate region and essentially isolated from said cathode region, said electrode means adapted to

collect at least a portion of the current generated in said gate region by the incidence of radiation thereon; and



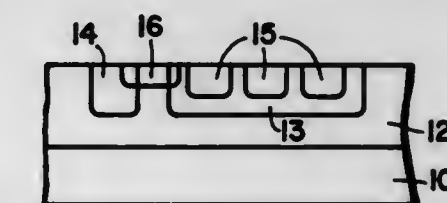
adjustable resistor means connected between said electrode means and said cathode.

4,053,923
INTEGRATED LOGIC ELEMENTS WITH IMPROVED
SPEED-POWER CHARACTERISTICS
S. Daniel Kang, Houston, Tex., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 23, 1976, Ser. No. 726,083
Int. Cl.² H01L 27/04

U.S. Cl. 357—51

2 Claims



1. In a monolithic semiconductor circuit comprising a semiconductor body of a first conductivity type, a pair of mutually spaced regions in said body and each of a second conductivity type, said regions constituting respectively the emitter and collector regions of a lateral transistor, said collector region having therewithin a region of said first conductivity type constituting the collector of an inversely operated vertical transistor, said collector region of said lateral transistor constituting the base region of said vertical transistor, said semiconductor body constituting the base region of said lateral transistor and the emitter region of said vertical transistor, said collector and base regions of said vertical transistor having therebetween a collector base P-N junction, said base and emitter regions of said vertical transistor having therebetween a base-emitter P-N junction, conductive means for reverse biasing said collectorbase junction and forward biasing said base-emitter junction, conductive means for receiving a control signal at the base of said vertical transistor, wherein the improvement comprises a shunt resistive means connected between said collector and said emitter of said lateral transistor for increasing the switching speed of said circuit.

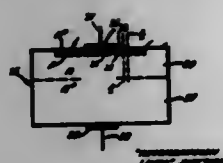
4,053,924

ION-IMPLANTED SEMICONDUCTOR ABRUPT JUNCTION

Leonard F. Roman, North Hollywood, and George H. Elliott, Granada Hills, both of Calif., assignors to California Linear Circuits, Inc., La Mirada, Calif.
Continuation of Ser. No. 548,067, Feb. 7, 1975, abandoned, which is a continuation of Ser. No. 391,779, Aug. 27, 1973, abandoned, which is a continuation of Ser. No. 196,281, Nov. 8, 1971, abandoned. This application Aug. 2, 1976, Ser. No. 710,749
Int. Cl.² H01L 29/167

U.S. Cl. 357-63

12 Claims



1. An ion implanted PN junction, having a forward biased depletion region when forward bias is applied across the junction, a reverse biased depletion region when reverse bias is applied across the junction, and a steady state reverse current characteristic, said junction comprising:

a first region and a second region, said first region being relatively highly doped when compared to said second region and being adjacent to said second region, said second region being relatively lightly doped when compared to said first region and being of opposite conductivity type, and a thin intermediately doped recombination layer immediately adjacent said junction and of the same conductivity type as the relatively highly doped one of said regions, said thin intermediately doped recombination layer constituting recombination means overlapping the forward biased depletion region of the junction with a thickness much less than that of the reverse biased junction depletion region under reverse bias, for providing dopant ion-recombination-generation centers so located that the forward and reverse recovery times of the junction are improved without degrading the steady state reverse current characteristics of the junction.

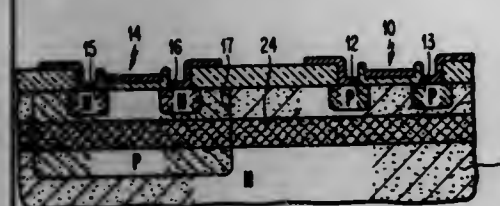
4,053,925

METHOD AND STRUCTURE FOR CONTROLLING CARRIER LIFETIME IN SEMICONDUCTOR DEVICES

Peter Burr, Winchester, England; Richard C. Joy, Hopewell Junction, and James F. Ziegler, Putnam Valley, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.
Filed Aug. 7, 1975, Ser. No. 602,710
Int. Cl.² H01L 21/76, 21/265, 29/167, 29/32

U.S. Cl. 357-44

14 Claims



1. An integrated semiconductor device in a semiconductor substrate of monocrystalline semiconductor material of a first type conductivity, regions of a second opposite type conductivity, complementary field effect transistors in the substrate and in the regions, the improvement comprising at least one region of implanted inert atoms within the de-

vice, said inert atoms selected from the group consisting of argon, krypton and xenon that reduce the gain of parasitic transistor action by reducing the minority carrier lifetime, said implanted inert atoms in said region forming substantially immobile recombination centers, said region subjected to a high temperature anneal that substantially recrystallizes any lattice damage resulting from the implantation step, the concentration of said implanted inert atoms being substantially greater than the density of any remaining lattice damage sites.

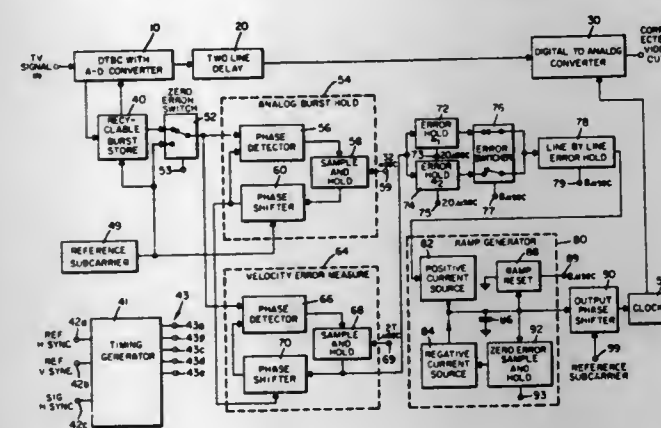
4,053,926

TIMING ERROR COMPENSATOR

Maurice G. Lemoine, and Leonard A. Pradera, both of Redwood City, Calif., assignors to Ampex Corporation, Redwood City, Calif.
Filed Mar. 3, 1975, Ser. No. 554,886
Int. Cl.² H04N 5/785; H03K 13/02

U.S. Cl. 358-8

31 Claims



25. Apparatus for time displacing a signal while it is being converted from a digital form to an analog form comprising a digital to analog converter responsive to clock signals to receive and convert a series of digital signals to an analog representation, an adjustable time base clock signal generator for generating a clock signal having a time base dependent on the time base of a time base control signal, said clock signal coupled to said digital to analog converter to command it to convert said series of digital signals to an analog representation, and means for generating said time base control signal.

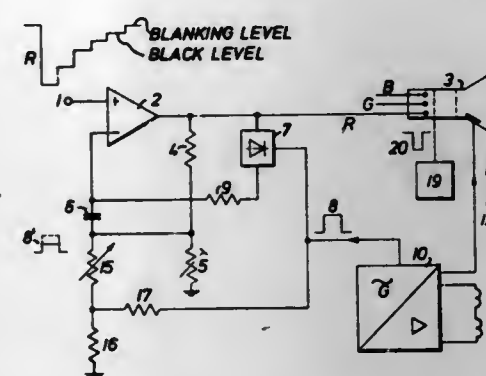
4,053,927

CHROMINANCE AMPLIFIER CONTROL CIRCUIT PROVIDING SIMULTANEOUS ADJUSTMENT OF GAIN AND DC LEVEL

Burchard Schmidtman, Barsinghausen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Filed Mar. 9, 1976, Ser. No. 665,164
Claims priority, application Germany, Mar. 18, 1975, 2511707
Int. Cl.² H04N 9/535, 9/20

U.S. Cl. 358-29

6 Claims



1. In a circuit for use in a color television receiver, equipped

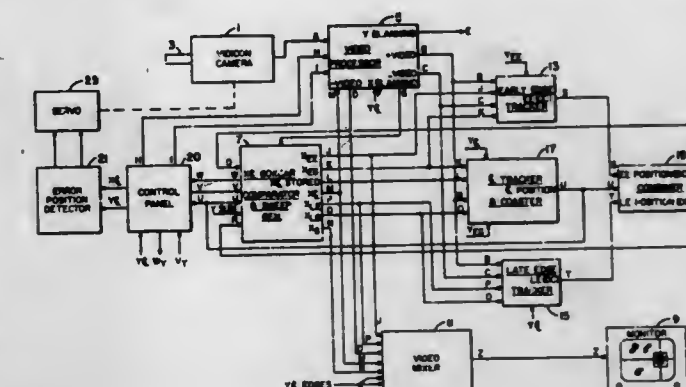
4,053,929

CONTOUR FITTING PICTORIAL TRACKING GATE

Robert H. Collins, III; William J. Steele, and Albert L. Thomas, Jr., all of Birmingham, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Apr. 7, 1969, Ser. No. 815,517
Int. Cl.² H04N 7/18

U.S. Cl. 358-126

10 Claims



1. A system for tracking a target comprising: a directional sensing means for sensing an image of at least a portion of the target, said sensing means having outputs which are video signals in accordance to the image sensed, a video processor having inputs connected to outputs of said sensing means, said processor including means for clamping to ground the video signal at a predetermined position of a contrast area on the image, circuit means connected to outputs of said processor so as to generate at its outputs, tracking gates about said contrast area, tracking means connected to the outputs of said circuit means and said processor so as to track a center position of said contrast area and provide orthogonal error signals of the position of said contrast area, and servoing means connected to said orthogonal error signals and to said directional sensing means for positioning the sensing means so that the image sensed will include said contrast area.

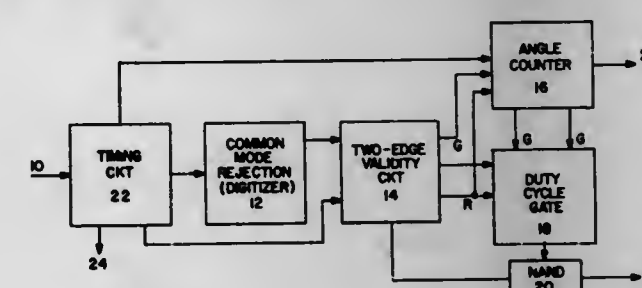
4,053,928

EDGE DETECTION ANALYZER

Criley Orton, Ridgecrest, Calif., and Richard G. Bahler, Holyoke, Colo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed July 23, 1976, Ser. No. 708,253
Int. Cl.² H04N 7/00

U.S. Cl. 358-96

5 Claims



1. Apparatus to be coupled to a source of video signals that are responsive to a field-of-interest, which will detect video contrast levels in the signals that correspond to contrast edges in the field-of-interest even though the contrast level may be less than full scale, and, further, which will measure the angle of the contrast edge, comprising:

circuit means for processing said signals to obtain said levels, and comparing the average of said levels with said signals to identify the existence of at least one said contrast edge; circuit means for rejecting said output when more than one side edge is identified during a preselected period; electronic counting means for measuring the angle of said edge identified by an output that is not rejected by said rejecting means; timing means coupled to said processing and comparing means, said rejecting means, and said measuring means for controlling the function of each in accordance with a timing sequence.

4,053,930

METHOD AND DEVICE FOR CODING COMPRESSING VIDEO INFORMATION

Mutsuo Ogawa, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan
Filed Dec. 28, 1973, Ser. No. 429,147
Claims priority, application Japan, Dec. 31, 1972, 47-313
Int. Cl.² H04N 7/12

U.S. Cl. 358-133

8 Claims

RUN-LENGTH	CODE COMPRESSION MODE (1)	CODE COMPRESSION MODE (2)
1	0 0 0 0	0 0 0 0
2	0 1 0 0	0 1 0 0
3	0 1 1 0	0 1 1 0
4	0 1 1 1	0 1 1 1
5	0 1 1 1 0 0	0 1 1 1 0 0
6	0 1 1 1 1 0	0 1 1 1 1 0
7	0 1 1 1 1 1	0 1 1 1 1 1
8	0 1 1 1 1 1 0 0	0 1 1 1 1 1 0 0
9	0 1 1 1 1 1 1 0	0 1 1 1 1 1 1 0
10	0 1 1 1 1 1 1 1	0 1 1 1 1 1 1 1
11	0 1 1 1 1 1 1 1 0 0	0 1 1 1 1 1 1 1 0 0
12	0 1 1 1 1 1 1 1 1 0	0 1 1 1 1 1 1 1 1 0
13	0 1 1 1 1 1 1 1 1 1	0 1 1 1 1 1 1 1 1 1
14	0 1 1 1 1 1 1 1 1 1 0 0	0 1 1 1 1 1 1 1 1 1 0 0
15	0 1 1 1 1 1 1 1 1 1 1 0	0 1 1 1 1 1 1 1 1 1 1 0
16	0 1 1 1 1 1 1 1 1 1 1 1	0 1 1 1 1 1 1 1 1 1 1 1
17	0 1 1 1 1 1 1 1 1 1 1 1 0 0	0 1 1 1 1 1 1 1 1 1 1 1 0 0
18	0 1 1 1 1 1 1 1 1 1 1 1 1 0	0 1 1 1 1 1 1 1 1 1 1 1 1 0
19	0 1 1 1 1 1 1 1 1 1 1 1 1 1	0 1 1 1 1 1 1 1 1 1 1 1 1 1
20	0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0	0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0
21	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0
22	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
23	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0
24	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0
25	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
26	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0
27	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0
28	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
29	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 0 0
30	0 1 0	0 1 0

1. A method for coding and compressing video information comprising the steps of
a. representing by a coded signal each run-length of white or black elementary areas which appear in succession in video information,

- b. replacing a bit in at least one bit place in said coded signal with a discrimination signal which discriminates said coded signal as a signal representing white or black elementary areas, and
- c. weighting said discrimination bits by the same weights used for weighting the bits of the coded signals representing run-lengths.

4,053,931

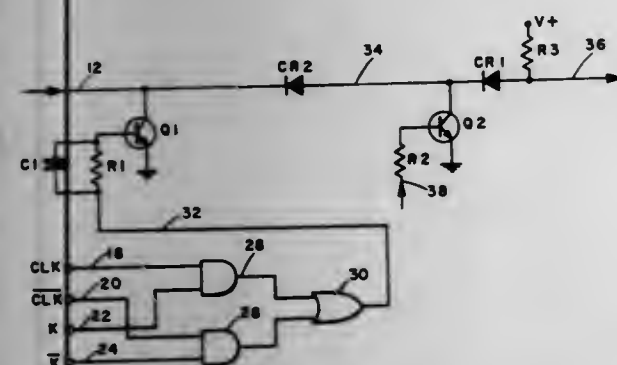
ENHANCEMENT OF A VIDEO SIGNAL PRODUCED FROM INFORMATION STORED IN A DIGITAL MEMORY

Joseph Key Hawkins, and Leo Francis Cavanaugh, both of San Diego, Calif., assignors to Robot Research, Inc., San Diego, Calif.

Filed Sept. 2, 1976, Ser. No. 719,907
Int. Cl.² H04N 7/12

U.S. Cl. 358-134

2 Claims



1. Apparatus for producing a video signal from information stored in a digital memory, said stored information representing the video signal intensity in each of a plurality of picture element locations within a plurality of scan lines, comprising, means for producing an analog video signal for display from said stored information, wherein the improvement comprises: means for blanking said analog video signal during the first half of each picture element location during alternately displayed lines and for blanking said analog video signal during the last half of each picture element location during the remaining displayed lines.

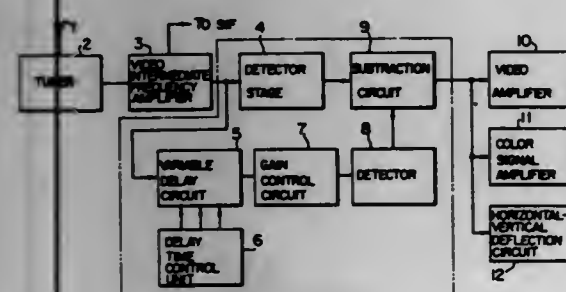
4,053,932

GHOSH SIGNAL ELIMINATING SYSTEM
Nasao Yamaguchi, Minoru Miyata, and Keisuke Yamamoto, all of Ibaragi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 1, 1975, Ser. No. 636,720
Claims priority, application Japan, June 10, 1974, 49-65738; June 10, 1974, 49-65739; June 10, 1974, 49-65740
Int. Cl.² H04N 5/21; H04B 1/12

U.S. Cl. 358-167

6 Claims



1. A ghost signal eliminating system comprising: a surface wave delay circuit for delaying a video signal by a

- delay time of a ghost signal with respect to a true image, said surface wave delay circuit having a plurality of coarse adjustment terminals for coarsely adjusting the delay time and a plurality of fine adjustment terminals for finely adjusting the delay time;
- a subtraction circuit for subtracting the video signal delayed by said surface wave delay circuit from the original video signal;
- a fine adjustment switching circuit for switching said plurality of fine adjustment terminals of said surface wave delay circuit;
- a coarse adjustment switching circuit for switching said plurality of coarse adjustment terminals of said surface wave delay circuit;
- a first level detection means for producing a fixed voltage at a corresponding one of a plurality of output terminals thereof depending on the level of a varying control voltage applied thereto;
- a voltage comparator means for subtracting said fixed voltage developed at the corresponding one of the output terminals of said first level detection means from said varying control voltage;
- a second level detection means for producing a fixed voltage at a corresponding one of a plurality of output terminals thereof depending on the level of the output voltage from said voltage comparator means;
- a means for applying the fixed voltage developed at the output terminals of said first level detection means to a plurality of control terminals of said coarse adjustment switching circuit; and
- a further means for applying the fixed voltage developed at the output terminals of said second level detection means to a plurality of control terminals of said fine adjustment switching circuit.

4,053,933

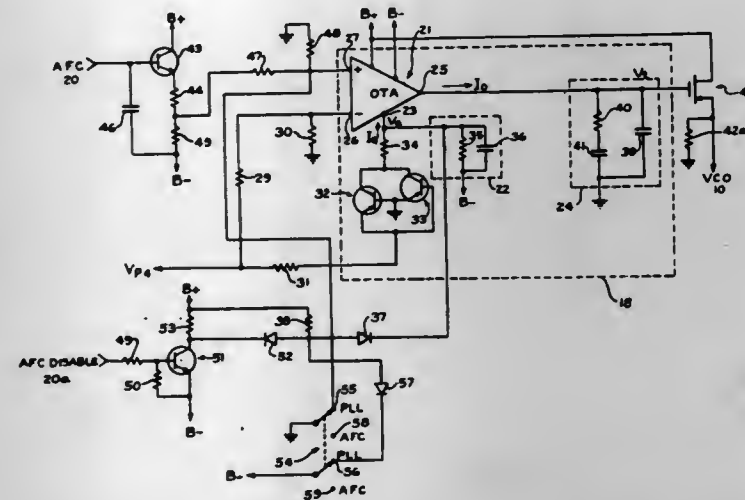
ADAPTIVE PHASE LOCKED LOOP FILTER FOR TELEVISION TUNING

Johanny Collins, Oak Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 2, 1976, Ser. No. 737,945
Int. Cl.² H03B 3/04; H04N 5/44

U.S. Cl. 358-191

11 Claims



1. In a phase locked loop of the type having a phase comparator developing an error signal for controlling the output of a voltage controlled oscillator through a low-pass filter, the improved low-pass filter comprising: amplifying means having a directional control input and a gain control input both connected for receiving said error signal, said amplifying means being operable for developing an output current having a direction and duty cycle determined by, respectively, the polarity of said error signal applied to said directional control input and the pulse width of said error signal applied to said gain control input; and

- a capacitive network connected for charging and discharging in response to said output current for controlling the output of said voltage controlled oscillator.

4,053,934

MEASURING THE QUALITY OF IMAGES

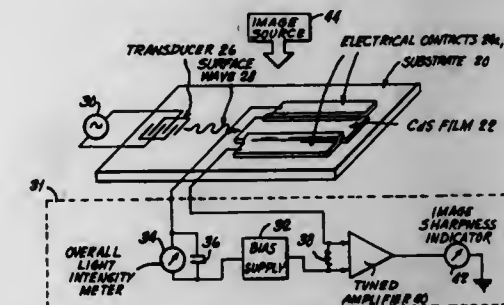
Philipp G. Kornreich, North Syracuse, and Stephen T. Kowel, Liverpool, both of N.Y.

Continuation-in-part of Ser. No. 434,102, Jan. 17, 1974, abandoned, Ser. No. 493,990, Aug. 1, 1974, and Ser. No. 499,606, Aug. 22, 1974, said Ser. No. 434,102, is a continuation-in-part of Ser. No. 319,680, Dec. 29, 1972, abandoned, said Ser. No. 493,990, is a continuation of said Ser. No. 319,680, said Ser. No. 499,606, is a continuation-in-part of said Ser. No. 434,102, said Ser. No. 319,680, and Ser. No. 365,054, May 30, 1973, Pat. No. 3,836,712, which is a division of Ser. No. 319,680. This application May 12, 1975, Ser. No. 576,433

Int. Cl.² H04N 3/14; G02F 1/11

U.S. Cl. 358-213

60 Claims



1. Apparatus for detecting the sharpness of an image comprising:

- a medium having a measurable property which varies as a function of the intensity pattern of an image formed thereon and as a function of strain disturbances in the medium;
- means for forming a selected image on the medium;
- means for causing a selected strain disturbance in the medium which propagates along the image formed on the medium; and
- means for measuring said property while the image is formed on the medium and while the selected strain disturbance is present therein and for deriving thereby a signal which is a Fourier transform representation of an aspect of the entire image and which represents the sharpness of the image formed on the medium but is substantially independent of the average intensity of the image formed on the medium and means for utilizing said signal for control purposes.

4,053,935

TAPE CASSETTE WITH FLEXIBLE APERTURE CLOSURE

Haruo Shiba, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1976, Ser. No. 679,341
Claims priority, application Japan, Apr. 22, 1975, 50-54882[U]

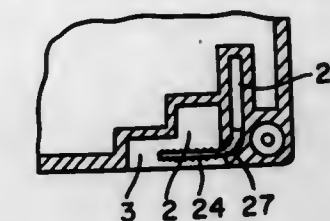
Int. Cl.² G11B 15/04

U.S. Cl. 360-60

2 Claims

1. A tape cassette comprising: a cassette body, a bias changeover slot disposed in the cassette body, an accidental erasure preventive slot disposed in the cassette body adjacent to the bias changeover slot, a storage slot disposed adjacent to the accidental erasure preventive slot, the storage slot having a curved portion,

- an elongated cover element disposed at least partially in the storage slot, the elongated cover element having a first position blocking the accidental erasure preventive slot and a second position opening the accidental erasure preventive slot,



- the elongated cover element being bendable so as to be able to travel in the curved portion of the storage slot as the elongated cover element is moved from its first position to its second position.

4,053,936

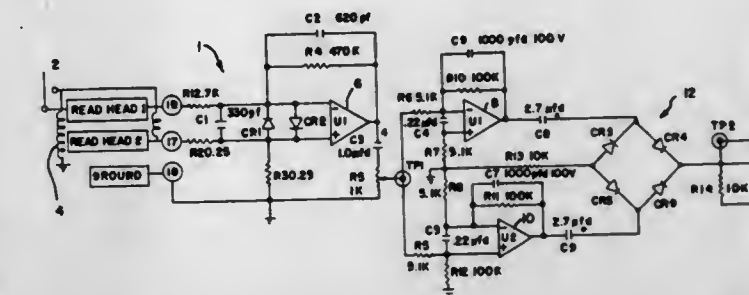
READ AND WRITE CIRCUITRY

Tilman H. Foust, Jr., Gaithersburg, Md., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 3, 1976, Ser. No. 692,411
Int. Cl.² G11B 15/12, 5/02

U.S. Cl. 360-62

4 Claims



1. A read circuit and a write circuit for a magnetic head wherein the circuits are isolated one from the other during operation of either one of said circuits, the combination comprising:

- a read circuit provided with an input data line receiving read input signals, the output of said data line being supplied to an operational amplifier, a rectifier bridge and a peak detector in series producing an analog signal having peaks occurring at flux reversals of said read input signals, converter means for converting said analog signal to serial binary signals suitable for data reading, a timer input to said converter means for determining the bit cell time of said binary signals, the output of said converter means being suitable for data reading,
- a write circuit provided with a pair of positive NOR gates, the output of a first of said NOR gates connected to an input of a second of said NOR gates,
- a clock input line enabling one input of each of said NOR gates,
- a data input line enabling a second input of said first NOR gate,
- a first switch referenced to minus potential connected to said read head and causing current flow from ground to minus potential through the read head upon said first switch being enabled by the output of said first NOR gate,
- a second switch referenced at positive potential and connected to said read head and causing current flow from positive potential through said read head to ground upon enabling of said second switch by the output of said second NOR gate, and
- means electrically isolating said first and second switches from said read circuit and means electrically isolating said read circuit from current flow to said read head during operation of said write circuit.

4,053,937

CALIBRATION TIMING BANDS

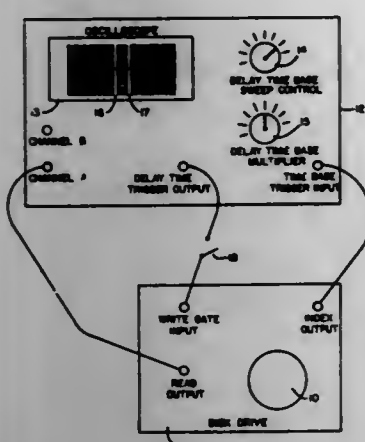
William Hugh Hersey, Jr., Cypress, Calif., assignor to Mohawk Data Sciences Corporation, Herkimer, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,505

Int. Cl.² G11B 21/10; G04F 8/00

U.S. Cl. 360-77

2 Claims



1. A method of preparing an alignment disc pak in which first and second signals of different frequencies (f_1 and f_2) are recorded in eccentric bands at a selected track on the disc such that when the recorded signals are played back, the playback signal consists of three components having frequencies f_1 , f_2 and (f_1-f_2) ; said method comprising the steps of:

displaying a frame of the playback signal with one beam of a multibeam oscilloscope on the display surface thereof, where a frame is equal in time to the time of a single revolution of the disc, so that the (f_1-f_2) signal component appears as a "cat's eye" pattern having two outer crossovers and an intermediate crossover; producing on the display surface with another of the oscilloscope beams a time marker; measuring the distance S_p between the intermediate crossover and one of the outer crossovers; positioning said time marker to first one and then the other of two positions on either side of the intermediate crossover, the two positions being defined by the formula $(G_c - S_p \pm 0.2/2)$ where G_c is the geometric center of the displayed frame of the playback signal; producing first and second narrow timing bands on either side of the intermediate crossover by erasing the recorded signals only in radial sectors of the disc corresponding in position to the two positions of the time marker and to the width of such marker.

4,053,938

TEMPERATURE SENSING TRANSFORMER PRIMARY SWITCH

Michael J. Ester, Waukegan, Wis., assignor to RTE Corporation, Waukegan, Wis.

Filed Apr. 16, 1975, Ser. No. 568,655

Int. Cl.² H02H 7/04

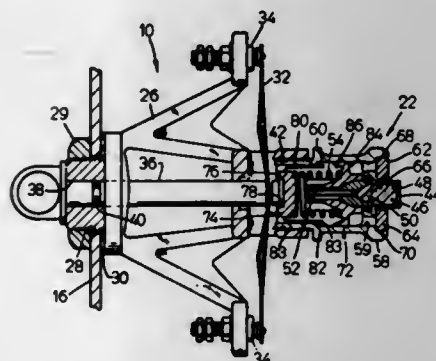
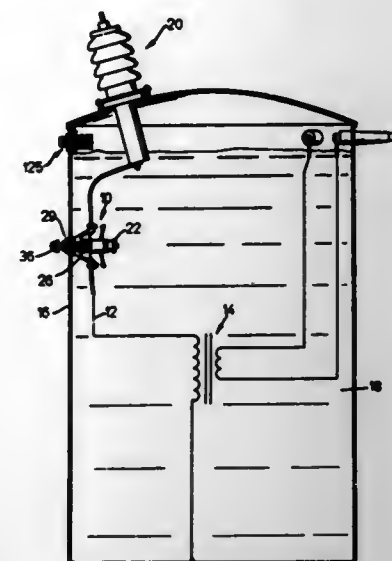
U.S. Cl. 361-37

23 Claims

1. A temperature sensing assembly for opening a distribution transformer snap action type primary switch when the temperature of the fluid in the transformer exceeds the maximum safe operating temperature of the transformer, said assembly comprising:

a housing mounted on the primary switch below the level of the dielectric fluid in the transformer, a temperature responsive actuator positioned in said housing, said actuator being responsive to the maximum safe operating temperature of the transformer, and bias means positioned between said actuator and switch

whereby the motion of said actuator will compress the bias means and open the primary switch when the com-



pressive force in the bias means is sufficient to actuate the primary switch.

4,053,939

ELECTRIC LOCK SYSTEM

Shunsaku Nakauchi, Mitaka, and Akifusa Takahashi, Tokyo, both of Japan, assignors to Kokusai Gijutsu Kaisha Kabushiki Kaisha, Tokyo, Japan

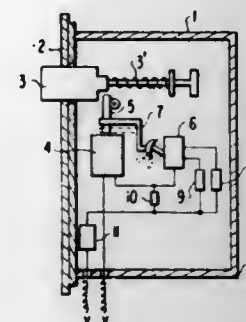
Filed Nov. 24, 1975, Ser. No. 634,388

Claims priority, application Japan, Nov. 25, 1974, 49-134375; Nov. 25, 1974, 49-134376

Int. Cl.² H01H 47/00

U.S. Cl. 361-171

6 Claims



1. An electro-mechanical lock system comprising, a latch, a pair of supply terminals adapted to be connected to a source of remote power, a self-sustaining solenoid having a coil and a core, said core having two self-sustaining positions locking and unlocking said latch respectively, and said coil being connected to receive power supplied to said pair of supply terminals, impedance changing means connected in circuit with said pair of terminals and said coil for altering the impedance between said pair of terminals when said core moves from one self-sustaining position to another self-sustaining position, a remote control circuit including at least one power source and one measuring device, said remote control circuit being connected to said pair of terminals by a pair of wires.

4,053,940

MODIFIED OFFSET KEYING APPARATUS FOR PHASE COMPARISON RELAYING

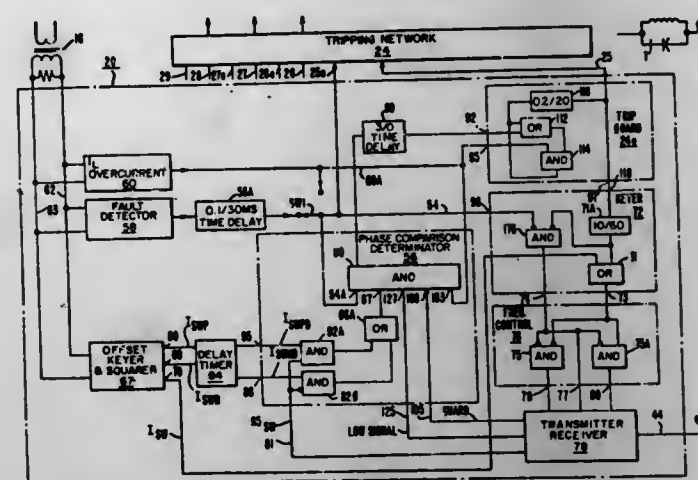
Walter L. Hiaman, Jr., New Providence, and Russell W. Gonnem, Morris Plains, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1976, Ser. No. 716,045

Int. Cl.² H02H 7/26, 3/28

U.S. Cl. 361-68

8 Claims



1. Phase comparison relaying apparatus for protecting an alternating current power transmission line including at least one conductor interconnecting first and second busses, said apparatus comprising:

- a first circuit means, cooperatively associated with said first bus, adapted to receive a signal representative of the instantaneous magnitude of current flowing in the conductor, for establishing a first set of constant upper and lower limits of a current security margin, both of said first set limits being established to one side of the effective zero axis of the waveform of the signal to be received and for generating
 - a first output signal when the instantaneous magnitude of the received signal is between said upper and lower limits of said security margin,
 - a second output signal when the instantaneous magnitude of the received signal is above said limits of said security margin, and
 - a third output signal when the instantaneous magnitude of the received signal is below said limits of said security margin;
- a second circuit means, cooperatively associated with said first bus, adapted to receive the signal representative of the instantaneous magnitude of current flowing in the conductor, for establishing a first constant keying threshold limit to the other side of the effective zero axis of the waveform of the received signal and for generating
 - a first output keying signal when the instantaneous magnitude of the received signal is above said first keying threshold limit, and
 - a second output keying signal when the instantaneous magnitude of the received signal is below said first keying threshold limit;
- a third circuit means, cooperatively associated with said second bus, adapted to receive a signal representative of the instantaneous magnitude of current flowing in the conductor, for establishing a second set of constant upper and lower limits of a current security margin, both of said limits being established to one side of the effective zero axis of the waveform of the received signal and for generating
 - a first output signal when the instantaneous magnitude of the received signal is between said upper and lower limits of said security margin,
 - a second output signal when the instantaneous magnitude of the received signal is above said limits of said security margin, and
 - a third output signal at the other of its said outputs

when the instantaneous magnitude of the received signal is below said limits of said security margin; and
d. fourth circuit means, adapted to receive the signal representative of the instantaneous magnitude of current flowing in the conductor, for establishing a second constant keying threshold limit to the other side of the effective zero axis of the waveform of the received signal and for generating
i. a first output keying signal when the instantaneous magnitude of the received signal is above said second keying threshold limit, and
ii. a second output keying signal when the instantaneous magnitude of the received signal is below said second keying threshold limit; and
wherein said first and second keying threshold limits are established to be of different magnitudes.

4,053,941

OIL IMPREGNATED ELECTRIC DEVICE

Tokihiko Shimizu, Takatsuki; Yasuo Iijima, Kobe, and Makoto Kusano, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

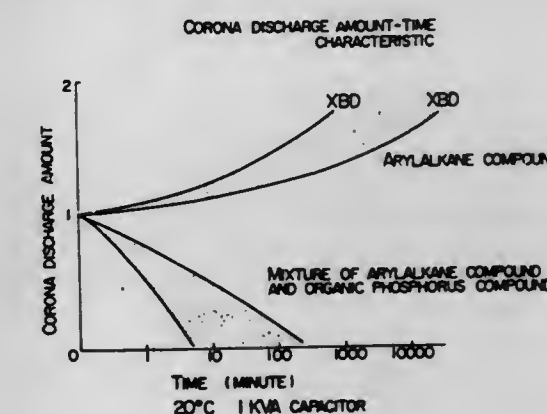
Filed June 6, 1975, Ser. No. 584,356

Claims priority, application Japan, June 20, 1974, 49-70459; June 20, 1974, 49-70460

Int. Cl.² H01G 4/22

U.S. Cl. 361-319

6 Claims



1. An oil impregnated electric device containing an element comprising at least one pair of electrodes and at least one sheet of polyolefin film, wherein said element is impregnated with a mixture comprising 1,1-phenylxylyl ethane and from 10 - 80 volume % of an organic phosphorus.

4,053,942

DEVICE FOR REMOVING LOW LEVEL CONTAMINANTS FROM A LIQUID

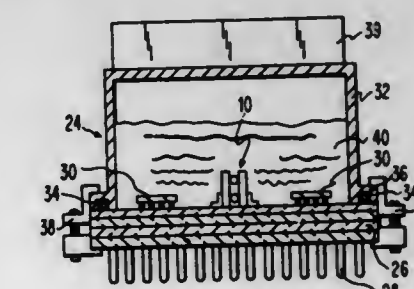
William E. Dougherty, Jr., Wappingers Falls; Lawrence V. Gregor, Hopewell Junction; Donald L. Klein; Thomas F. Redmond, both of Poughkeepsie, and Morton D. Reeber, Shrub Oak, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed June 28, 1976, Ser. No. 700,653

Int. Cl.² H05K 7/20

U.S. Cl. 361-385

8 Claims



1. In a liquid cooled semiconductor package assembly hav-

ing at least one semiconductor device carrier substrate, at least one semiconductor device mounted on the substrate, a cover for forming an enclosure about said semiconductor device, and a cooling liquid in the enclosure adapted for cooling the device, the improvement comprising

a means to trap and hold contaminants from said cooling liquid, said means including an electrical heating element immersed in the cooling liquid, and a confining means immersed in the cooling liquid and adapted to enclose and maintain a pulsating vapor bubble generated by said heating element, said heating element disposed within said confining means and at least partially immersed in said cooling liquid, means to permit controlled partial escape of a portion of the vapor bubble and ingress of cooling fluid to said confining means.

4,053,943

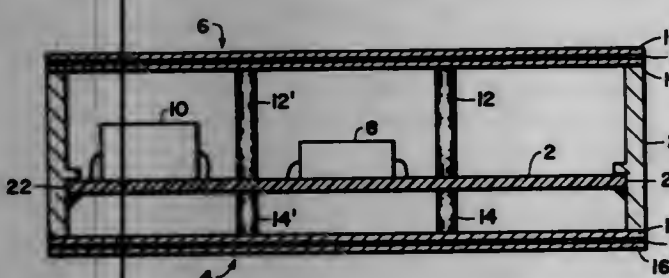
TECHNIQUE FOR DAMPING ELECTRONIC MODULE PRINTED WIRING BOARD

Lee Robert Galvin, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jan. 22, 1976, Ser. No. 651,654
Int. Cl.² H02B 1/62

U.S. Cl. 361-399

1 Claim



1. In an apparatus for damping printed circuit board vibration energy, the improvement comprising:

at least one damping means for absorbing a portion of the vibration energy, said at least one damping means being positioned remote from and parallel to the printed circuit board and comprising a lamination including a layer of high hysteresis elastomer;

at least one post means for connecting said at least one damping means to the printed circuit board, each of said at least one post means having two extremities, one of said extremities being fastened to the printed circuit board and the other of said extremities being fastened to said at least one damping means for providing mechanical energy transfer from the printed circuit board to said at least one damping means; and

frame means for structurally integrating the printed circuit board and said at least one damping means, said frame means being fastened to the perimeter of the printed circuit board and to the perimeter of each of said at least one damping means.

4,053,944

MICROPROCESSOR CONTROLLED SIGNAL PATTERN DETECTOR

Jerry Duane Dixon, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

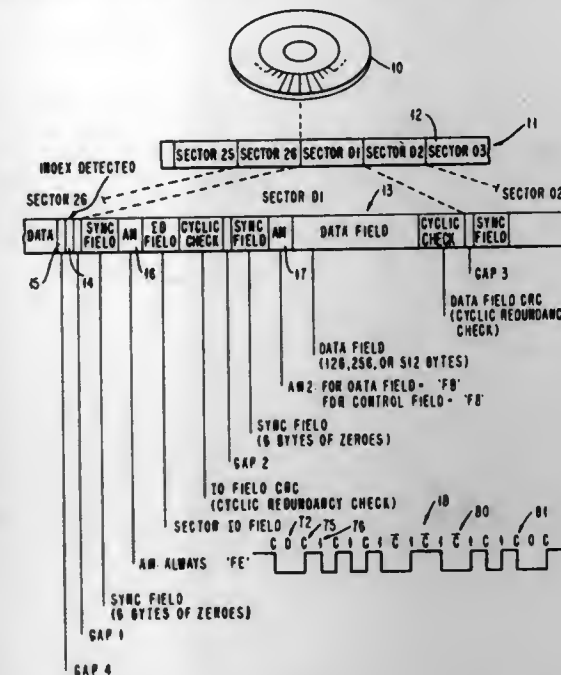
Filed Apr. 30, 1976, Ser. No. 682,225
Int. Cl.² G06F 1/04, 13/04

U.S. Cl. 364-200

7 Claims

1. A signal pattern detector including:
a source of information comprised of a sequence of signals having first or second binary states;
timing means associated with said source of information for generating a control clock signal having a predetermined frequency;
a stored program processor, including a processor clock, having a frequency different from said predetermined

frequency, and defining a processor cycle, cycle control means connected to said processor clock for inhibiting or initiating a processor cycle, addressable storage for program instructions, instruction access means normally accessing instructions from said addressable storage in sequence, and instruction decode means for storing instructions accessed from said storage means and providing a function signal identifying an instruction to be executed during said processor cycle, wherein each processor cycle commences with transfer of an instruction to said instruction decode means, and which further includes means,



responsive to a first function signal from said instruction decode means, for accessing a second instruction from said addressable storage, and connected to said cycle control means to inhibit commencement of the next processor cycle,

means connected to said cycle control means and connected and responsive to said control clock signal, for initiating the next processor cycle; and
signal storage means connected and responsive to said instruction decode means, providing a function signal for said second instruction, for storing and indicating the state of each signal from said source of information.

4,053,945

MASTER-SLAVE CONTROL METHOD AND DEVICE FOR A MULTIPHASE CIRCUIT

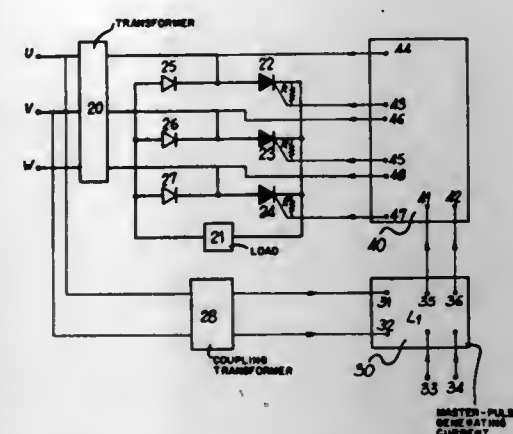
Guy H. Dumas, 42 rue du Pere Corentin, 75014 Paris, France

Filed Jan. 5, 1976, Ser. No. 646,835

Claims priority, application France, Feb. 18, 1975, 75.05054
Int. Cl.² H02M 7/155

U.S. Cl. 363-129

1 Claim



1. A master-slave device for controlling the power of a multiphase thyristor bridge comprising:
a slave means for forming a master-pulse having a deter-

mined and adjustable phase relationship with one phase of the multiphase feed voltage;
delay means in parallel or serial-parallel in order to provide a number of slave-pulses equal to the number of phases of the multiphase feed voltage;
coupling means comprising photocouplers for applying said slave-pulses to the respective gates of the thyristors of the bridge whereby the control circuit is insulated from the charge circuit.

4,053,946

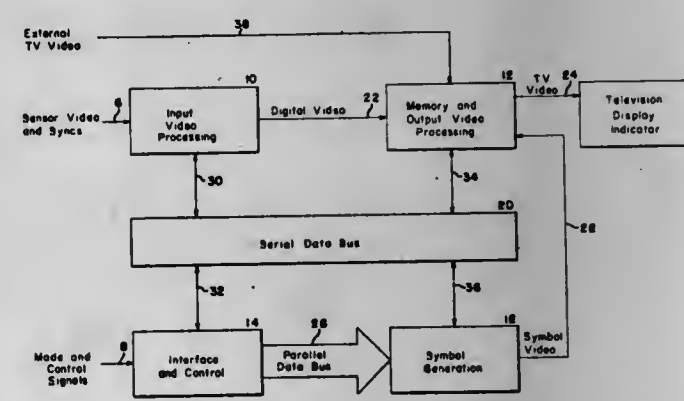
MODULAR PROGRAMMABLE DIGITAL SCAN CONVERTER

Eugene W. Opittek, Santa Ana; James L. Heard, Torrance, both of Calif.; Bruce W. Keller, Scotland, Ark.; Michael D. Pruznick, Huntington Beach, and Thomas A. Bosseler, Westminster, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 24, 1975, Ser. No. 634,711
Int. Cl.² G06F 3/05

U.S. Cl. 364-200

10 Claims



1. A modular programmable digital scan converter adapted for responding to applied control signals and to sensor data of various formats so as to provide display data, said scan converter comprising:

input video processing means for converting the sensor data into digital signals and for integrating and detecting said digital signals to produce processed output digital signals, said input video processing means comprising a plurality of modules which have means for responding to applied digital set-up and address words so as to implement processing parameters for the converting, integrating and detecting operations;

memory and output processing means for storing said output digital signals and for reading out and processing said stored data so as to provide display data, said memory and output processing means comprising a plurality of modules which contain means for responding to applied digital set-up and address words such that the format and data rates for storing and reading out said output digital signals are selected in response to the set-up and address words; and

interface and control means, responsive to the control signals, for applying the digital set-up and address words to the modules of said input video processing means and to the modules of said memory and output processing means, said interface and control means including a programmable controller which is programmed to provide a selected relationship between the control signals and the digital set-up and address words; whereby

the specific processing parameters implemented by the input video processing means, and the storage and read out rates and formats of said memory and output processing means are determined by said programmed controller.

4,053,947 METHOD AND APPARATUS FOR EXECUTING SEQUENTIAL DATA PROCESSING INSTRUCTIONS IN FUNCTION UNITS OF A COMPUTER

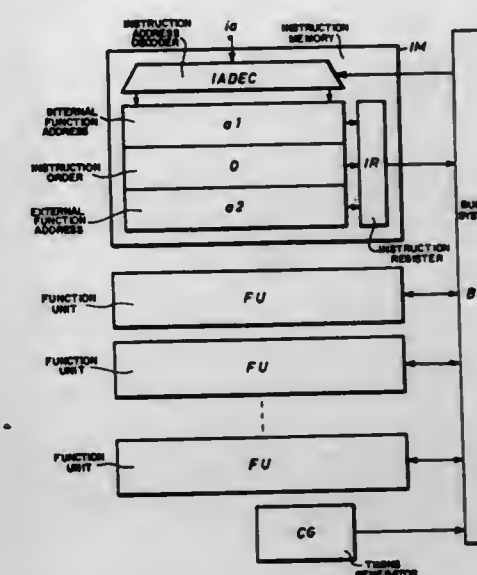
Karl-Johan Werner Carlsson, Solna, and Erik Ivar Sjöqvist, Farsta, both of Sweden, assignors to Telefonaktiebolaget L.M. Ericsson, Stockholm, Sweden

Filed Apr. 30, 1976, Ser. No. 682,095

Claims priority, application Sweden, May 14, 1975, 7505552
Int. Cl.² G06F 9/10

U.S. Cl. 364-200

3 Claims



1. In a computer system having means for generating timing pulses which determine sequentially occurring instruction-read phases of equal duration, an instruction memory for storing instructions containing function-unit addresses and function-unit orders, said instruction memory being provided with means for sequentially reading instructions during successive read phases, a plurality of addressed function units for performing functions in accordance with received function-unit orders, said function units including means for receiving and transmitting data, and a bus system for transferring the function-unit addresses and orders from the instruction memory to the function units and for transferring data between the function units, the instructions being of two types, the first type having the steps of selecting by means of the function-unit address part of the instruction one of said function units and to order the performance of a function as determined by a function-unit order part of the instruction, and the second type of instruction including steps of selecting two of said function units by means of two addresses in the function-unit address part of the instruction, to transfer data between the two selected function units through the bus system and to order the function unit which receives data to use the received data in the performance of a function determined by the function-unit order parts of the instruction, the execution period of the second type of instruction being divided into a first part during which one of the two addressed function units is ordered to transmit data, a second part during which actual data are transferred from said one of the function units to the bus system and a third part during which the other of the two function units receives the data from the bus system and performs the required function thereupon.

an improved method for decreasing the operating time for performing a mixed sequence of instructions of the first and second type for said system comprising the steps of performing an instruction of said first type during a said read phase associated therewith and performing an instruction of the second type during two of said read phases wherein the first part of said instruction of the second type is performed during the first read phase associated with said instruction of the second type and the second and third parts of said instruction of the second type are performed during the second of said read phases associated therewith.

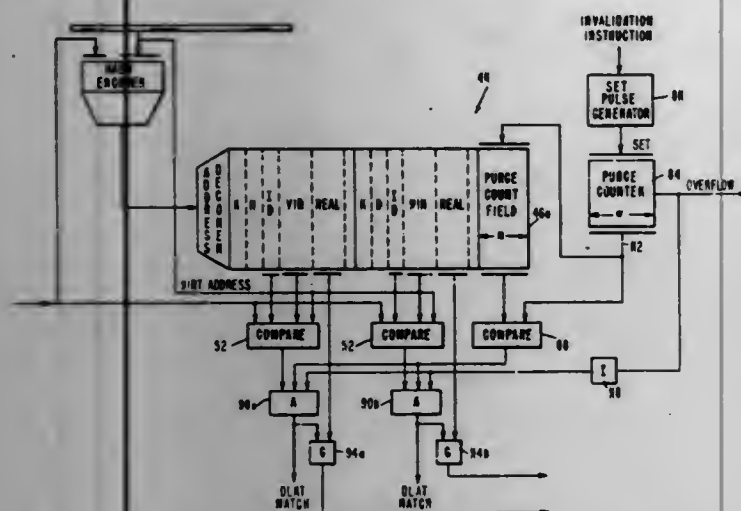
4,053,948

LOOK ASIDE ARRAY INVALIDATION MECHANISM
 Spurgeon Graves Hogan, and Carleton Edward Werve, both of
 Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk,
 N.Y.

Filed June 21, 1976, Ser. No. 697,817
 Int. Cl.² G06F 13/00; G11C 9/06

U.S. Cl. 364-200

3 Claims



1. In a data processing system which contains a central processing unit, a main memory system with a main storage unit having a storage control unit and a plurality of addressable locations each addressable by a storage address, addressing means providing virtual addresses, and means for translating virtual addresses to real addresses including a plurality of sets of conversion tables, and improved translation control means comprising:

counter means for numbering purge instructions received by the memory system,

table means for storing a plurality of previously used virtual addresses each with a real address which constitutes a translation of that virtual address using one of said sets of conversion tables, said table means having a field coupled to the output of the counter means for storing the count of the counter means with each translation so that each time a translation is entered into the table means the count of the counter means at the time of entry is placed in the table means along with the translation,

comparator means for comparing the output of the counter means with the output of the field in the table means when a translation is read from the table means to provide a signal indicating a match or mismatch of the output of the counter means at the time the translation is read from the table means with the count stored with the translation, and,

gate means controlling the transmission of the translation to the memory system as a function of said signal from the comparator means whereby invalidated translations cannot be used to address the memory system.

4,053,949

TELEPHONE SYSTEM AND METHOD FOR PROVIDING DIRECTORY ASSISTANCE/INTERCEPT INFORMATION

Frank A. Bocca, 6217 Lennal Beach Drive, Orlando, Fla. 32818, and David J. Winter, 3218 Castle Oak Ave., Orlando, Fla. 32808

Filed Apr. 28, 1976, Ser. No. 681,035
 Int. Cl.² G06F 15/16; 15/40; H04M 3/60

U.S. Cl. 364-200

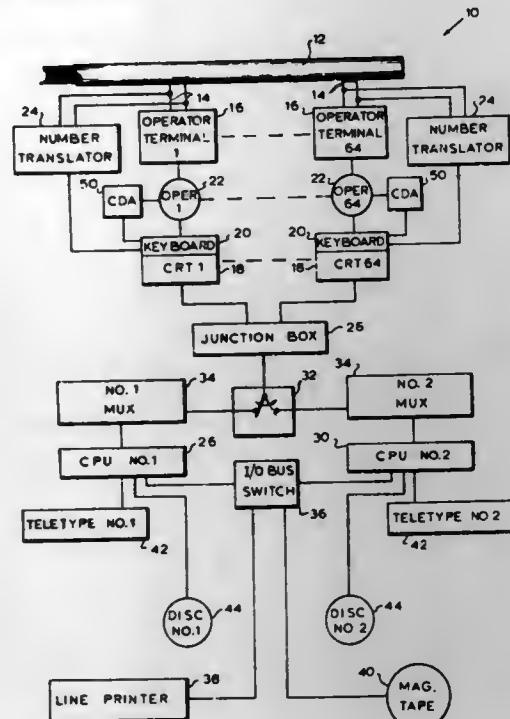
19 Claims

1. A system for use with a telephone intercept or directory assistance operator position for providing an indication of the status of a preselected telephone number, such system comprising:

first means for storing data representative of the status of the plurality of telephone numbers;

means collocated with said operator position for addressing said data storing means;

means collocated with said operating position and said addressing means for receiving an output from such storing means and providing an indication of the status of said telephone number;



second means for storing data representative of the status of said plurality of telephone numbers; and
 means for switching said addressing means and said indicating means between said first and second storing means.

4,053,950

RESIDUAL STATUS REPORTING DURING CHAINED CYCLE STEAL INPUT/OUTPUT OPERATIONS

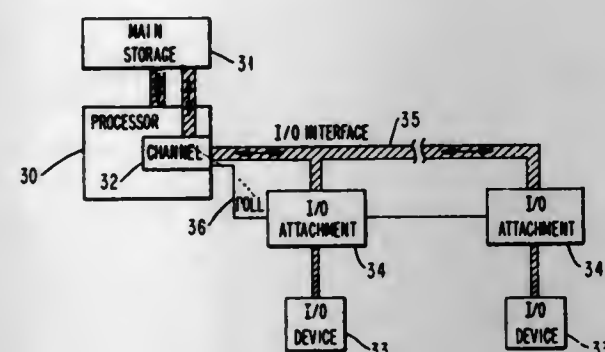
Donall Garrard Bourke, Boca Raton, and Louis Peter Vergari, Palm Springs, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,228

Int. Cl.² G06F 3/00

U.S. Cl. 364-200

4 Claims



1. A data processing system comprising:
 central storage means for data, program instructions, including operate I/O instructions, and peripheral device control blocks comprised of a plurality of control fields,
 a peripheral device control unit including peripheral storage means for a peripheral device control block,
 input/output interface logic including a data bus, address bus, and control signal lines interconnecting said central storage and peripheral device control unit,
 a central processor connected to said central storage and said input/output interface logic, responsive to each said operate I/O instruction for initiating operation of said central storage and said interface logic for transferring to said peripheral device control unit a peripheral device control block,

said peripheral device control block including in the control fields, a first field comprised of a plurality of control bits, a central storage data address field specifying a data field in central storage involved in the data transfer, a count field specifying the amount of data to be transferred, and a chained device control block address field specifying the central storage location of a succeeding device control block to be transferred after use of the current device control block;

said peripheral device control unit including, said device control block access means connected to said input/output interface logic, responsive to a predetermined state of one of said control bits and first signalling means indicating normal completion of use of the current device control block to access from said central storage the next succeeding device control block,

interrupt requesting means connected to said input/output interface logic, responsive to a second signalling means indicating unusual completion of use of the current device control block to signal an interrupt request to said central processor,

and status signalling means connected to said input/output interface logic, responsive to a predetermined state of another one of said control bits, and said second signalling means to inhibit operation of said interrupt requesting means, transfer status information to said central storage, and then render said device control block access means effective.

4,053,951

DATA ACQUISITION, STORAGE AND DISPLAY SYSTEM

Emmett L. Hudspeth; Philip C. Richardson; John L. Neathery, Jr.; Jerald P. Dykstra; Allen D. Boger, Jr.; William B. Sims, Jr.; Glean E. Hunt, and Tony M. Quisenberry, all of Austin, Tex., assignors to Amsco/Medical Electronics, Inc., Austin, Tex.

Continuation of Ser. No. 385,699, Aug. 6, 1973, Pat. No. 3,940,742. This application Nov. 3, 1975, Ser. No. 628,216 The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.² G06F 3/05

U.S. Cl. 364-415

14 Claims

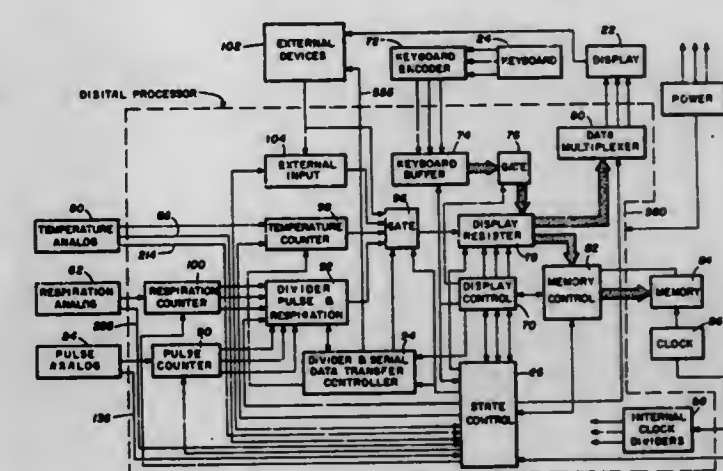
1. A medical data acquisition and storage system, comprising in combination:

display means for providing a visual presentation of input medical data,

input means responsive to externally generated data and generating a plurality of input signals, said input means including means sensing the physiological variables of a patient and generating physiological input signals, and further including manual means for generating patient related input signals and system control signals,

processor means responsive to the physiological input signals, said processor means including arithmetic means for converting the physiological input signals into binary codes representing measured variables of a patient, wherein a predetermined set of binary codes represents each measured variable,

a register for sequentially receiving and holding each set of binary codes from said processor means,



memory means having multiple address locations for storing binary codes holding in said register, and

a controller connected to said processor means, said register and said memory, and including:

first means responsive to the patient related input signals and a control signal to sequentially transfer one set of binary codes for one measured variable from said processor means to said register;

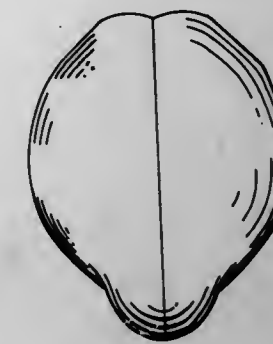
second means responsive to the transfer of codes to said register to connect said register to said display means; and

third means responsive to a control signal and the connection of said register to said display means to transfer the binary codes from said register to said memory means.

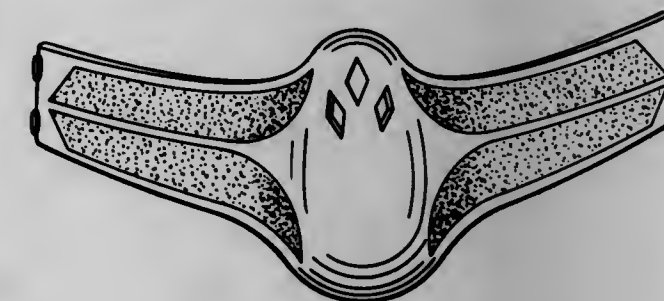
DESIGNS

OCTOBER 11, 1977

246,011
PROTECTOR FOR MALE GENITALS
 Harold Eckman, 49 Beacon St., Natick, Mass. 01760
 Filed Dec. 29, 1975, Ser. No. 644,524
 Term of patent 14 years
 Int. Cl. D2-01
 U.S. Cl. D2-1



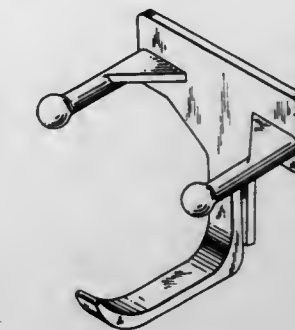
246,012
FACE GUARD ATTACHMENT FOR A HELMET
 Kalevi Minette, P.O. Box 28, Forssa, Finland
 Filed June 26, 1975, Ser. No. 590,682
 Term of patent 14 years
 Int. Cl. D2-03
 U.S. Cl. D2-233



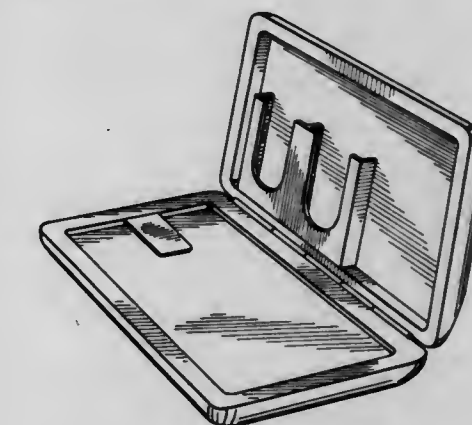
246,013
HOLDER FOR A FLAGSTAFF OR THE LIKE
 Alvin F. Morris, 2564 Navarra Drive, Carlsbad, Calif. 92008,
 and Richard E. Brown, Rte. 1, Box 69, Del Mar, Calif. 92014
 Filed Jan. 14, 1976, Ser. No. 649,050
 Term of patent 14 years
 Int. Cl. D2-07
 U.S. Cl. D2-400



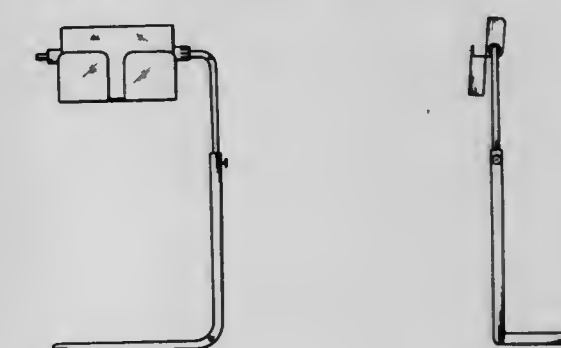
246,014
TENNIS BALL HOLDER
 Kenneth H. Conrad, Bristol, Conn., assignor to Poly Medical
 Systems, Inc., Forestville, Conn.
 Filed Oct. 9, 1975, Ser. No. 621,035
 Term of patent 14 years
 Int. Cl. D2-07
 U.S. Cl. D2-400



246,015
BELT BUCKLE HAVING A HIDDEN CURRENCY COMPARTMENT
 Harmon T. Wayne, 9763 Towne Lane, El Cajon, Calif. 92021,
 and Donald Tortolani, 1951 El Monte Drive, Thousand Oaks,
 Calif. 91360
 Filed Apr. 12, 1976, Ser. No. 675,910
 Term of patent 14 years
 Int. Cl. D2-07
 U.S. Cl. D2-406



246,016
READING STAND OR THE LIKE
 Joseph Daniel Brady, 7103 Inglewood Ave., Stockton, Calif.
 95207
 Filed Feb. 20, 1976, Ser. No. 659,654
 Term of patent 14 years
 Int. Cl. D6-99
 U.S. Cl. D6-25



246,017
SEAT

Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed June 11, 1976, Ser. No. 695,095
Term of patent 7 years
Int. Cl. D6-01

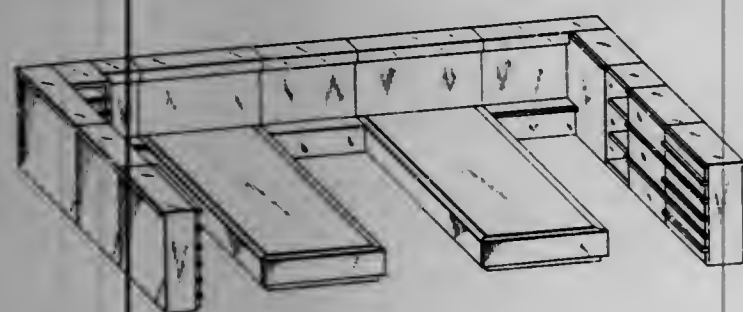
U.S. Cl. D6-43



246,018

COMBINED BED, SHELF AND CABINET UNIT
Franz Hero, and Karl Odermatt, both of Hinwil, Switzerland, assignors to Interlücke Gebr. Lübke KG, Rheda, Wiedenbrück, Germany
Filed Dec. 4, 1975, Ser. No. 637,858
Claims priority, application Germany, June 4, 1975, 762
Term of patent 14 years
Int. Cl. D6-05

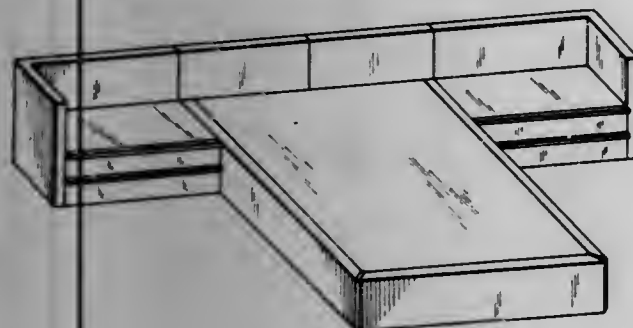
U.S. Cl. D6-80



246,019

COMBINED BED AND HEADBOARD UNIT
Franz Hero, and Karl Odermatt, both of Hinwil, Switzerland, assignors to Interlücke Gebr. Lübke KG, Rheda, Wiedenbrück, Germany
Filed Dec. 4, 1975, Ser. No. 637,859
Claims priority, application Germany, June 4, 1975, 762
Term of patent 14 years
Int. Cl. D6-05

U.S. Cl. D6-80

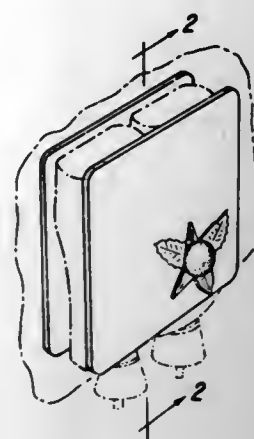


246,020

WALL MOUNTED HOLDER FOR BOTTLES OR THE LIKE

Marjorie Ann Gaines, 314 W. Van Wagoner, Flint, Mich. 48505
Filed Oct. 22, 1975, Ser. No. 624,999
Term of patent 14 years
Int. Cl. D23-02; D6-04

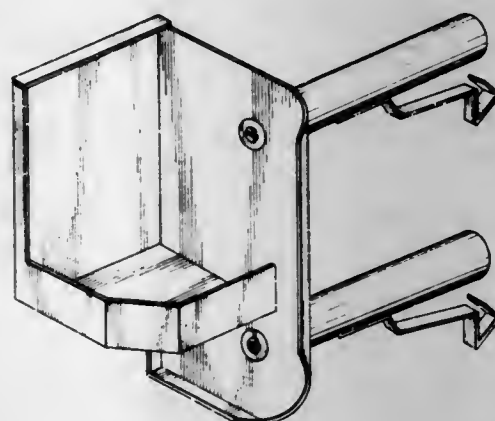
U.S. Cl. D6-86



246,021

COMBINED LIQUID DISPENSER HOLDER AND TOILET PAPER ROLL HOLDERS
Theodore W. Richards, 1936 Sloat Blvd., San Francisco, Calif. 94116
Filed May 5, 1975, Ser. No. 574,742
Term of patent 14 years
Int. Cl. D23-02

U.S. Cl. D6-91

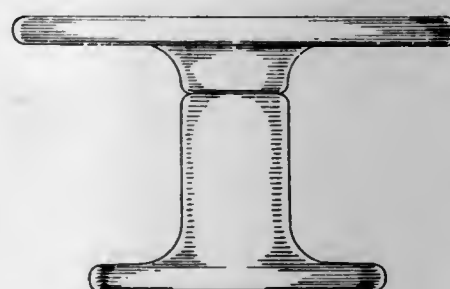


246,022

TABLE

Florence M. Mathur, 283 Mapledene Drive, Ancaster, Ontario, Canada
Filed Feb. 12, 1976, Ser. No. 657,400
Claims priority, application Canada, Jan. 29, 1976, 2901763
Term of patent 14 years
Int. Cl. D6-03

U.S. Cl. D6-146

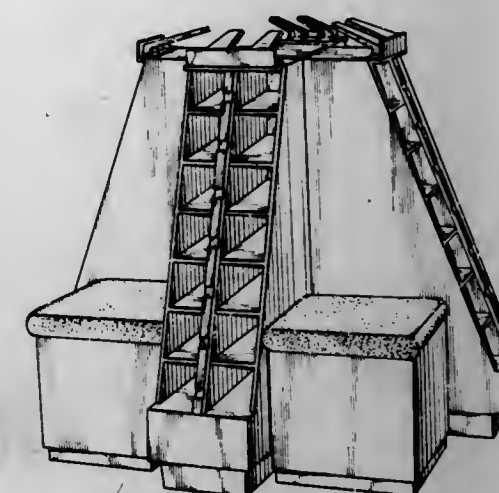


246,023

FOOTWEAR DISPLAY SYSTEM

Douglas C. Hillman, Orange, Conn., and Herbert J. Solomon, Beechhurst, N.Y., assignors to Uniroyal, Inc.
Filed Mar. 22, 1976, Ser. No. 669,126
Term of patent 14 years
Int. Cl. D20-02; D6-04

U.S. Cl. D6-189

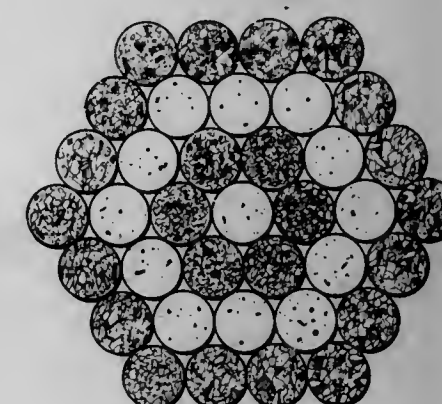


246,024

COASTER

William E. Hanke, 1076 Carol Lane, No. 25, Lafayette, Calif. 94549
Filed Oct. 2, 1975, Ser. No. 618,943
Term of patent 14 years
Int. Cl. D7-06

U.S. Cl. D7-45



246,025

ELECTRIC CREPE PAN

Robert K. Gooden, South Gate, Calif., assignor to Grandinetti Products, Inc., Lynnwood, Calif.
Filed Dec. 31, 1975, Ser. No. 645,719
Term of patent 14 years
Int. Cl. D7-02

U.S. Cl. D7-87

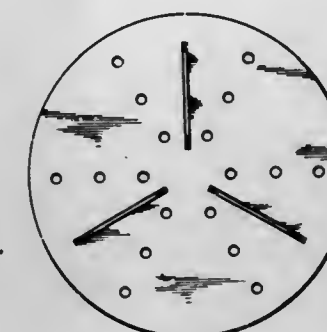


246,026

STORAGE BOWL LETTUCE SUPPORT OR LIKE ARTICLE

Alvin J. Stahel, Brighton, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Feb. 6, 1976, Ser. No. 655,948
Term of patent 14 years
Int. Cl. D7-99

U.S. Cl. D7-130

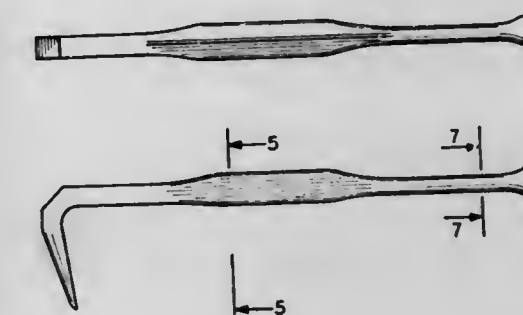


246,027

SOIL WORKING HAND TOOL

Richard O. Bartz, 7017 Mark Terrace Drive, Edina, Minn. 55435
Continuation-in-part of Ser. No. 532,676, Jan. 13, 1974, Pat. No. Des. 237,451. This application June 2, 1975, Ser. No. 583,050
Term of patent 14 years
Int. Cl. D8-99

U.S. Cl. D8-11



246,028
BOTTLE

Donald W. McNab, Long Beach, Calif., assignor to W. Braun Company, Chicago, Ill.

Filed Apr. 30, 1975, Ser. No. 573,263

Term of patent 14 years

Int. Cl. D9-01

U.S. Cl. D9-158



246,030

CAN OR SIMILAR ARTICLE

Edward W. Sexton, 20 Coolidge Ave., Cambridge, Mass. 02139, and Edward W. Sexton, Jr., 990 Massachusetts Ave., Arlington, Mass. 02149

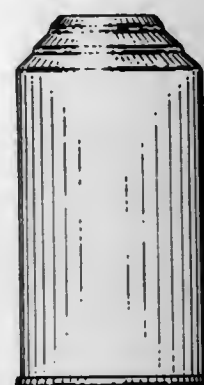
Filed Nov. 12, 1975, Ser. No. 631,069

The portion of the term of this patent subsequent to Oct. 4, 1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D9-03

U.S. Cl. D9-218



246,031

HEAT STRESS MONITOR

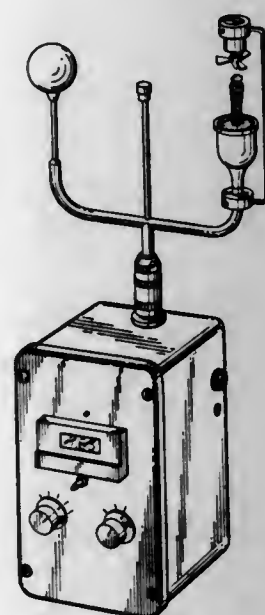
John C. Kroon, Chagrin Falls, and Frederick L. Glesius, Shaker Heights, both of Ohio, assignors to Ruster-Stokes, Inc.

Filed Nov. 17, 1975, Ser. No. 632,284

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-56



246,029

PACKAGING CONTAINER OR THE LIKE

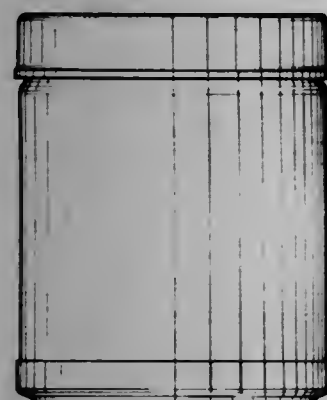
Elmer C. Lynn, Des Moines, Iowa, and Leonard Slaughter, Jr., Kansas City, Mo., assignors to Robb Container Corporation, Yorkville, Ill.

Filed Jan. 8, 1976, Ser. No. 647,354

Term of patent 14 years

Int. Cl. D9-03

U.S. Cl. D9-216



246,032

DIGITAL THERMOMETER

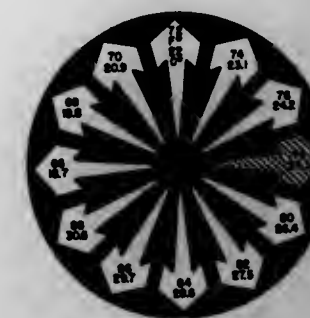
Allan L. McLeod, P.O. Box 18484, Wichita, Kans. 67218

Filed Oct. 14, 1975, Ser. No. 622,110

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-57



246,033

TEACHING PROTRACTOR

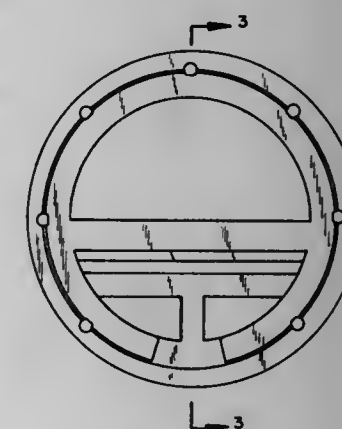
Dale E. King, 8799 La Zana, Fountain Valley, Calif. 92708

Filed Nov. 24, 1975, Ser. No. 634,627

Term of patent 14 years

Int. Cl. D10-04

U.S. Cl. D10-65



246,034

ORIGINAL AND ORNAMENTAL SECURITY CONSOLE

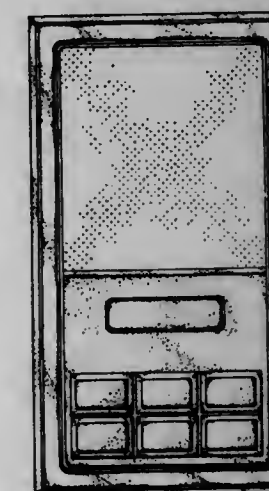
Walton E. Sparks, Pittsburgh, Pa., and Richard K. Weiss, Pittsburgh, N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 572,810, April 29, 1975, abandoned. This application May 27, 1976, Ser. No. 690,441

Term of patent 14 years

Int. Cl. D10-05

U.S. Cl. D10-106



246,035

SAILBOAT

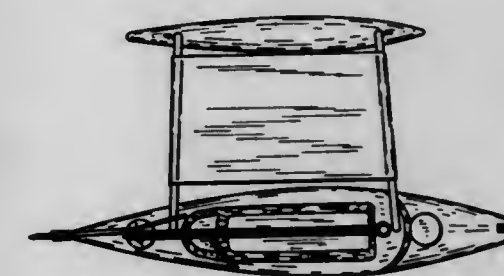
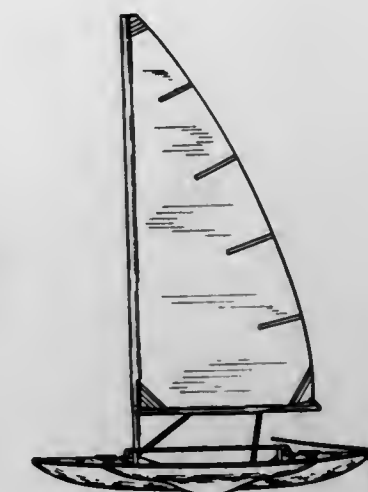
Rudolf Rudiger, 800 Andersen Drive, San Rafael, Calif. 94901

Filed Sept. 16, 1976, Ser. No. 723,741

Term of patent 14 years

Int. Cl. D12-06

U.S. Cl. D12-64



246,036

FOLDING WALKER

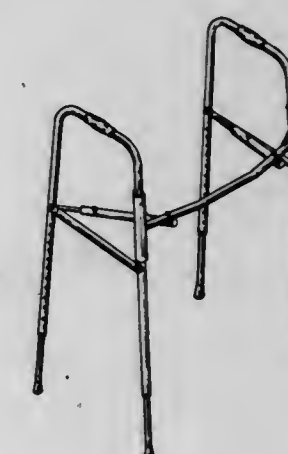
Morton I. Thomas, 101 Gedney St., Nyack, N.Y. 10960

Filed Sept. 15, 1975, Ser. No. 613,700

Term of patent 14 years

Int. Cl. D12-12

U.S. Cl. D12-130



246,037

OVERHEAD CONSOLE FOR AUTOMOBILES AND TRUCKS

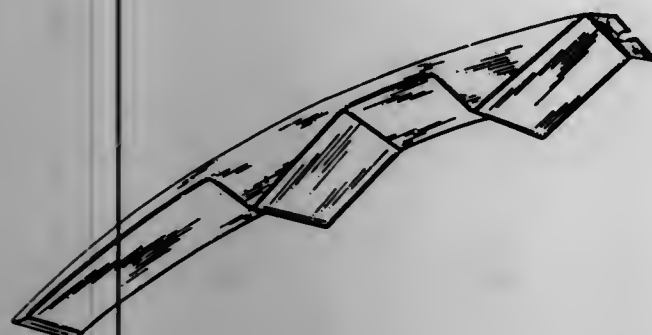
Jerry Robert Kelly, Apt. 206, 1717 N. Verdugo Road, Glendale, Calif. 91206

Filed Dec. 9, 1976, Ser. No. 748,958

Term of patent 14 years

Int. Cl. D12-16

U.S. Cl. D12-155



246,038

COMBINED MUFFLER AND SPARK ARRESTOR

Paul S. Miller, Dixon, Calif., assignor to Discojet Corporation, Davis, Calif.

Filed Jan. 16, 1976, Ser. No. 649,781

Term of patent 14 years

Int. Cl. D15-01

U.S. Cl. D12-194



246,039

DICTATION MACHINE OR SIMILAR ARTICLE

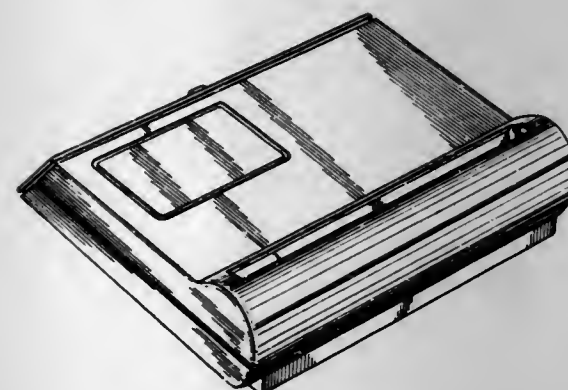
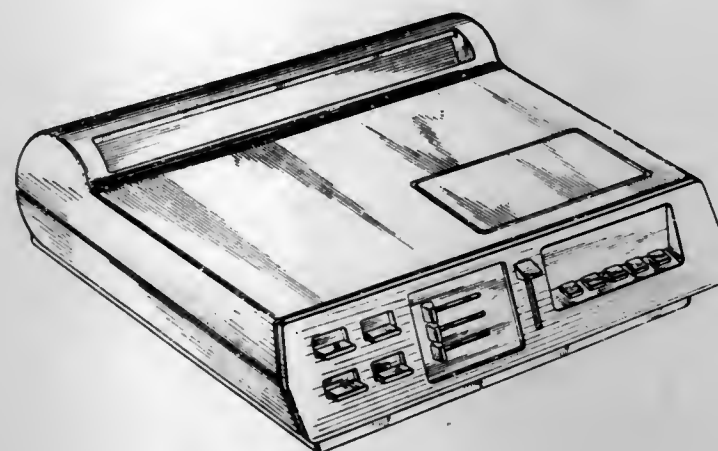
Arthur J. Pulos, Fayetteville; Michael Cridland, Manlius, and Joseph Moro, Ithaca, all of N.Y., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Oct. 21, 1975, Ser. No. 624,459

Term of patent 14 years

Int. Cl. D14-01

U.S. Cl. D14-3



246,040

COMBINED TAPE RECORDER, TUNER AND AMPLIFIER

Kunio Hoshino, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

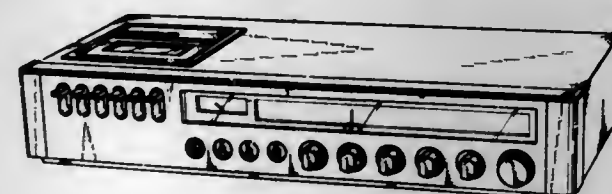
Filed Mar. 17, 1976, Ser. No. 667,801

Claims priority, application Japan, Sept. 19, 1975, 50-38372

Term of patent 14 years

Int. Cl. D14-01, 03

U.S. Cl. D14-5



246,041

CASSETTE-DECK

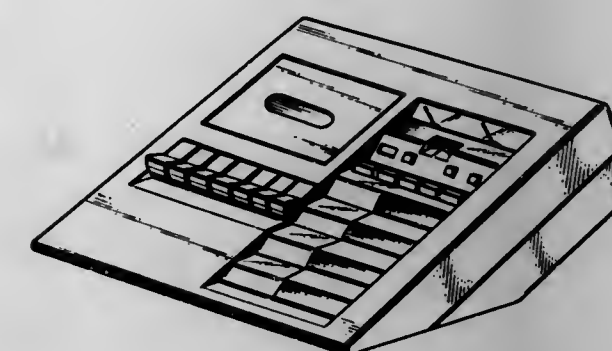
Mario Bellini, Lugano, Switzerland, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 15, 1975, Ser. No. 622,468

Term of patent 14 years

Int. Cl. D14-01

U.S. Cl. D14-6



246,043

VEHICULAR TELEPHONE APPARATUS OR SIMILAR ARTICLE

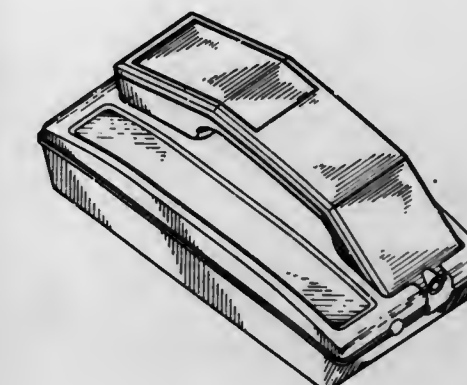
Terrance Nelson Taylor, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 12, 1976, Ser. No. 713,760

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-53

246,044
RADIO

Roland J. Susich, 30608 Vista Sierra, Malibu, Calif. 90265

Filed Sept. 17, 1975, Ser. No. 614,182

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-69



246,042

AUTOMATIC TELEPHONE DIALER

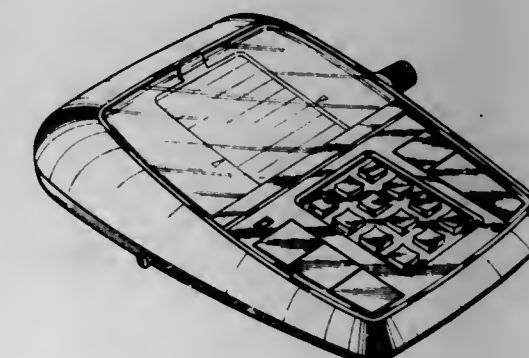
Gregory F. Fossella, Marshfield, and Peter K. Rhoads, Stow, both of Mass., assignors to DASA Corporation, Andover, Mass.

Filed Sept. 2, 1975, Ser. No. 609,661

Term of patent 14 years

Int. Cl. D14-03

U.S. Cl. D14-53



246,045

VIEWING GLASS FOR MICROFILM

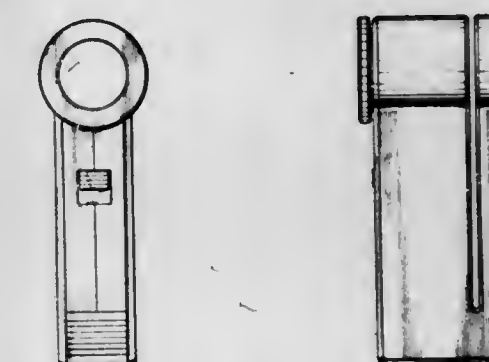
Sakuta Suzuki, Tokyo, Japan, assignor to UNIC Corporation, Tokyo, Japan

Filed May 14, 1976, Ser. No. 686,665

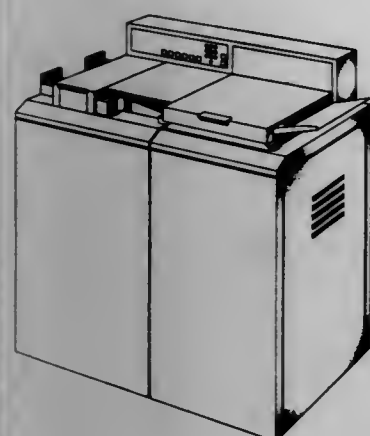
Term of patent 7 years

Int. Cl. D16-02; D26-02

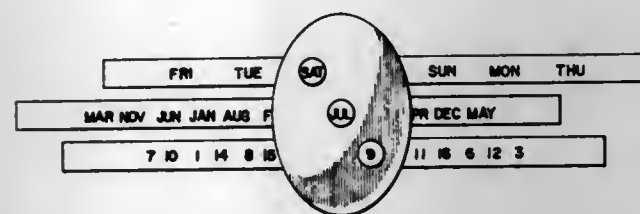
U.S. Cl. D16-11



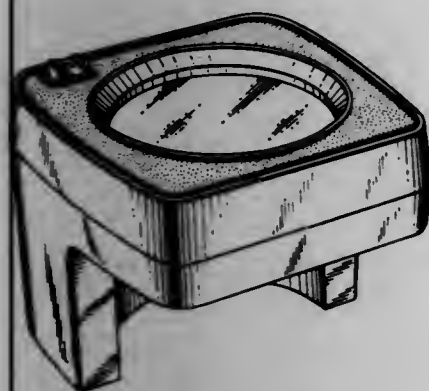
246,046
ELECTROPHOTOGRAPHIC APPARATUS OR SIMILAR ARTICLE
 Allen Dana Hawthorne, New Canaan, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.
 Filed Mar. 4, 1976, Ser. No. 663,644
 Term of patent 14 years
 Int. Cl. D16—03
 U.S. Cl. D16—30



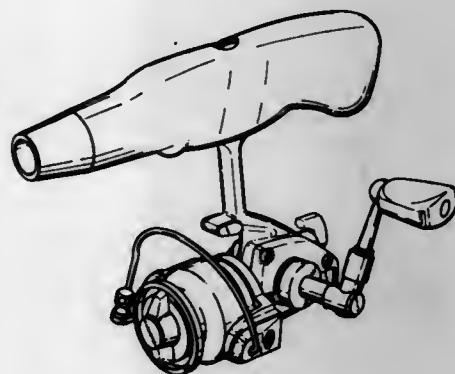
246,048
WALL CALENDAR
 Lee J. Damman, Rte. 1, Mount Horeb, Wis. 53572
 Filed Sept. 18, 1975, Ser. No. 614,489
 Term of patent 14 years
 Int. Cl. D19—03
 U.S. Cl. D19—25



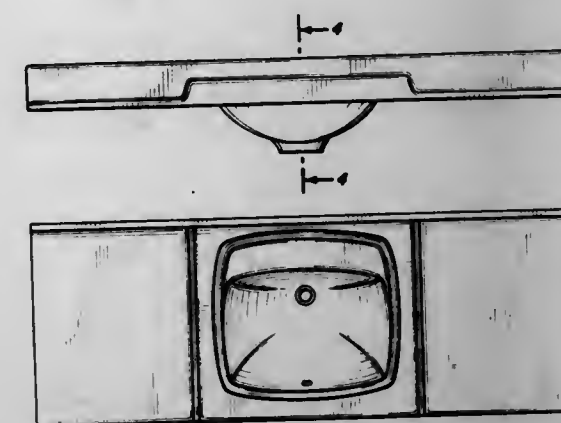
246,047
ILLUMINATED TABLE MAGNIFIER
 Alexander Zelman, 5202 Areca Palm Circle, Tamarac, Fla. 33319
 Filed Oct. 24, 1975, Ser. No. 625,714
 Term of patent 14 years
 Int. Cl. D16—06; D26—05
 U.S. Cl. D16—55



246,049
COMBINED FISHING REEL AND FISHING ROD GRIP
 Hideo Nakamura, Koganei, Japan, assignor to Daiwa Seiko, Inc., Higashi-Kurume, Japan
 Filed Dec. 8, 1976, Ser. No. 748,442
 Claims priority, application Japan, July 16, 1976, 5127550
 Term of patent 14 years
 Int. Cl. D22—05
 U.S. Cl. D22—26



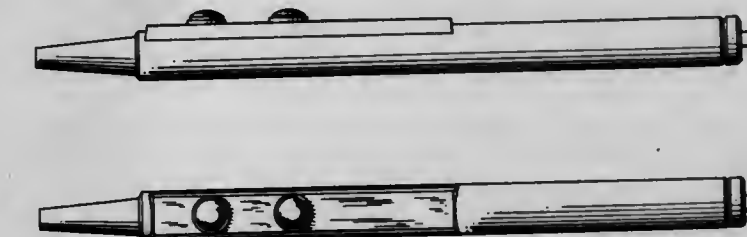
246,050
VANITY BOWL
 Louis A. Garasi, Canyon Country, Calif., assignor to Pinta's Cultured Marble Inc., Worth, Ill.
 Filed Nov. 11, 1976, Ser. No. 741,138
 Term of patent 14 years
 Int. Cl. D23—02
 U.S. Cl. D23—58



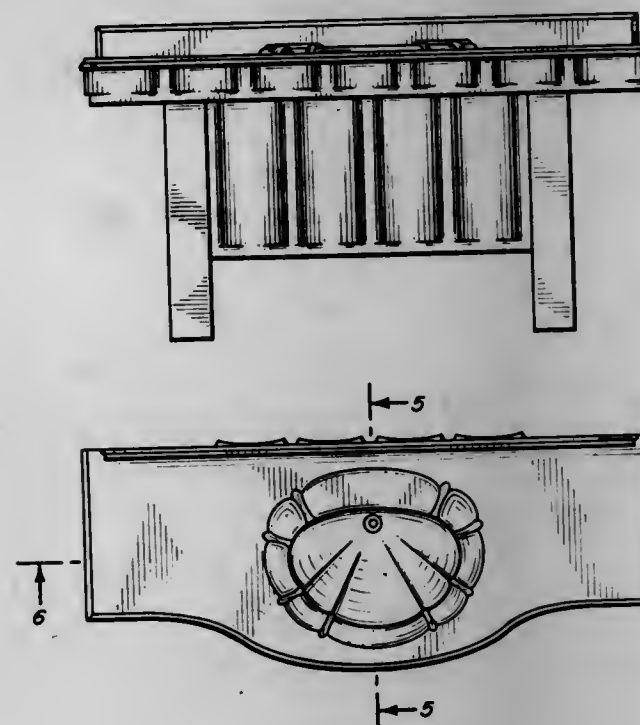
246,052
FUMIGATOR
 Yoshiaki Hatai, Kawaguchi, Japan, assignor to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan
 Filed June 30, 1976, Ser. No. 701,021
 Term of patent 14 years
 Int. Cl. D23—04
 U.S. Cl. D23—150



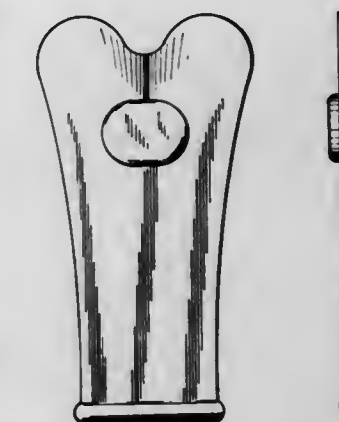
246,053
MONOPOLAR ELECTROSURGICAL DEVICE WITH HAND SWITCH
 David E. Staub, Clearwater, and Vernon H. Troutner, South St. Petersburg, both of Fla., assignors to Concept, Inc.
 Filed Feb. 23, 1976, Ser. No. 660,451
 Term of patent 14 years
 Int. Cl. D24—02
 U.S. Cl. D24—26



246,051
COMBINED VANITY BOWL AND STAND
 George S. Gruber, Hidden Hills, Calif., assignor to Dimensionetix, Inc., North Hollywood, Calif.
 Filed Dec. 8, 1976, Ser. No. 748,658
 Term of patent 14 years
 Int. Cl. D23—02
 U.S. Cl. D23—59



246,054
APPLIANCE FOR EXERCIZING THE TEETH AND GUMS
 Albert E. Bissonnette, 3782 S. Quebec, Denver, Colo. 80237
 Filed Oct. 20, 1975, Ser. No. 623,828
 Term of patent 14 years
 Int. Cl. D24—99; D28—03
 U.S. Cl. D24—36



246,055

SELF SUPPORTING DISPOSABLE BED PAN

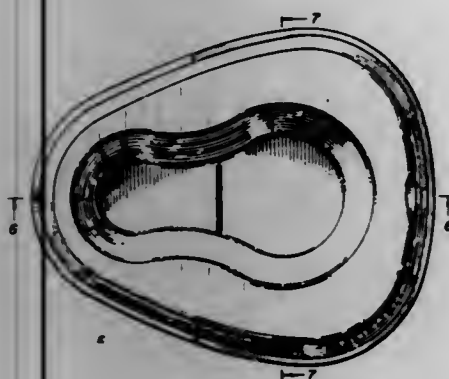
Kenneth Wilson Mills, 11 Redcar Road, Smithills Dean, Bolton, Lancashire, England

Filed Oct. 8, 1975, Ser. No. 620,584

Claims priority, application United Kingdom, May 27, 1975, 971240/75

Term of patent 14 years
Int. Cl. D24—04

U.S. Cl. D24—57



246,056

CONCRETE SLEEPER BLOCK

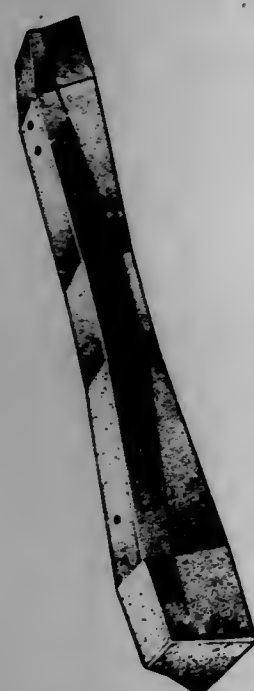
Stig Thim, and Chas Ahlquist, both of Vaxjo, Sweden, assignors to A-Betong AB, Vaxjo, Sweden

Filed July 30, 1976, Ser. No. 710,047

Claims priority, application Sweden, Feb. 13, 1976, 76-0340

Term of patent 14 years
Int. Cl. D25—01

U.S. Cl. D25—73



246,057

TRANSLUCENT INTER-LOCKING PANEL MEMBER FOR CEILINGS OR THE LIKE

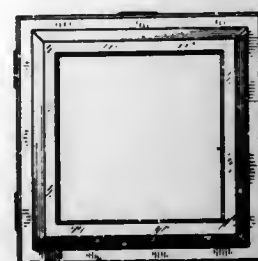
Edward J. Maresca, Fort Lauderdale, Fla., assignor to Cal-Mar Industries, Inc., Hollywood, Fla.

Filed Sept. 8, 1975, Ser. No. 611,086

Term of patent 14 years

Int. Cl. D25—01

U.S. Cl. D25—91

246,058
POOL

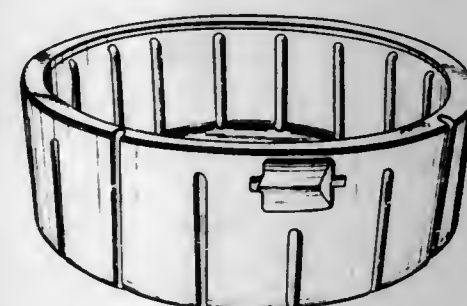
Kenneth Peter Burgess, Kew Surrey, and Timothy Sefton Elsdale, London, both of England, assignors to WCB Containers Limited, Stalybridge, England

Filed Aug. 19, 1975, Ser. No. 605,897

Claims priority, application United Kingdom, Feb. 19, 1975, 969945/75

Term of patent 14 years
Int. Cl. D21—03

U.S. Cl. D34—5 F



246,059

GAME TARGET

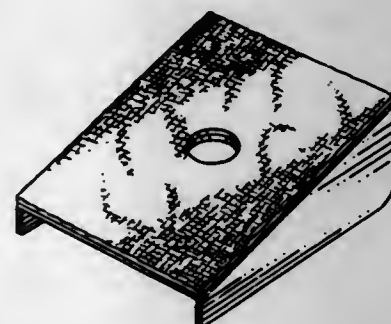
Jim E. Malish, 4435 Longvale, San Antonio, Tex. 78218

Filed Sept. 22, 1975, Ser. No. 615,811

Term of patent 3½ years

Int. Cl. D21—01

U.S. Cl. D34—5 PP



246,060

PLAYGROUND CLIMBER OR SIMILAR ARTICLES

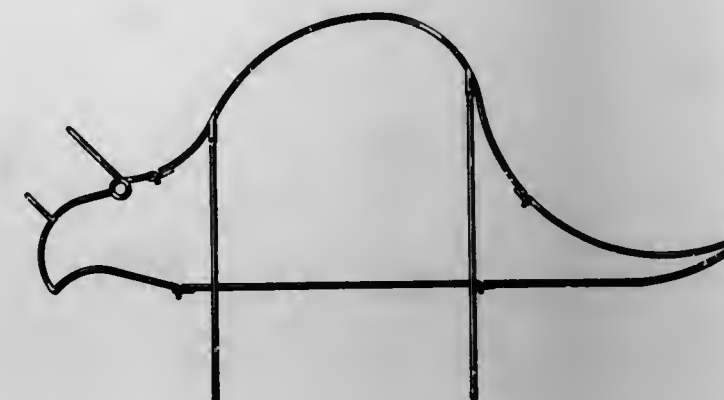
William Cook Murphy, Miami, Fla., assignor to William Cook Murphy, Miami, Fla.

Filed Oct. 29, 1975, Ser. No. 626,880

Term of patent 14 years

Int. Cl. D21—03

U.S. Cl. D34—5 H



246,061

RACKET FRAME

John E. Bianchi, 1601 Wilt Road, Fallbrook, Calif. 92028

Filed Nov. 21, 1975, Ser. No. 634,125

Term of patent 14 years

Int. Cl. D21—02

U.S. Cl. D34—5 ST



246,062

PLAYING CARD HOLDER

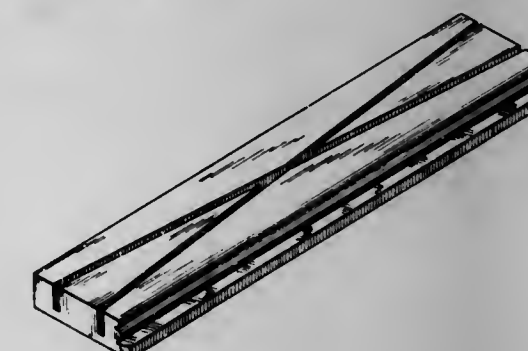
Robert R. Kowalski, 1161 N. Lincoln, Casper, Wyo. 82601

Filed Dec. 8, 1975, Ser. No. 638,752

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D34—13 A



246,063

AUDIBLE TOY

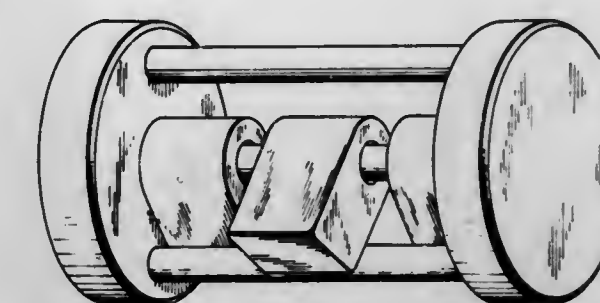
Kerstin Margaretha Hagland-Ahrnberg, Falun, Sweden, assignor to Brio Toy AB

Filed Jan. 5, 1976, Ser. No. 646,672

Claims priority, application Germany, July 8, 1975, URA447/75

Term of patent 14 years
Int. Cl. D21—01

U.S. Cl. D34—15 C



246,064

TOY BUILDING BLOCK MOLD

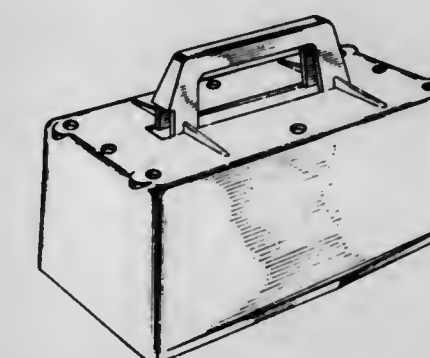
Jeffrey M. Koblick, Hopkins, Minn., assignor to K-tel International, Inc.

Filed Sept. 29, 1975, Ser. No. 617,387

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D34—15 V



246,065

SKATE BOARD

Edward L. Saul, 10350 Harvest, Santa Fe Springs, Calif. 90670

Filed Jan. 19, 1976, Ser. No. 650,548

Term of patent 14 years

Int. Cl. D21—01

U.S. Cl. D34—15 AJ

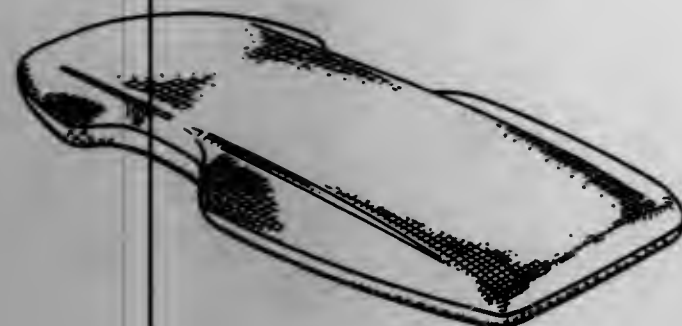


246,066

KICK BOARD

Kevin J. O'Farrell, San Francisco, Calif., assignor to Kranso Manufacturing, Inc., San Francisco, Calif.
 Filed Aug. 20, 1976, Ser. No. 716,123
 Term of patent 14 years
 Int. Cl. D21-02

U.S. Cl. D34-42

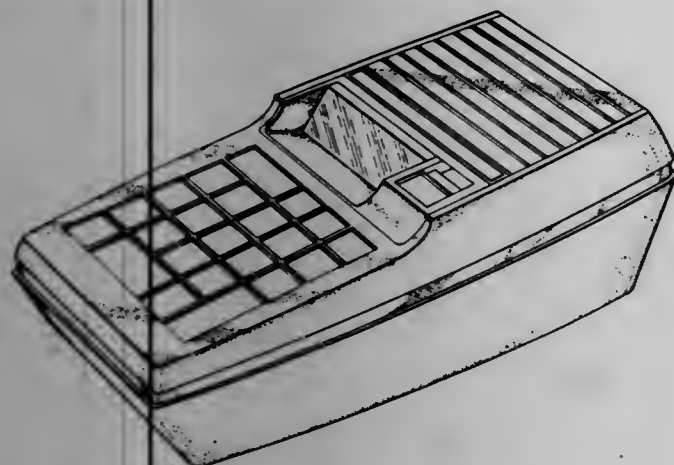


246,067

CALCULATOR CASING

Eugene Joseph Salek, Plano, Tex., assignor to Texas Instruments Incorporated
 Filed Apr. 28, 1975, Ser. No. 572,244
 Term of patent 14 years
 Int. Cl. D18-01

U.S. Cl. D64-11 B



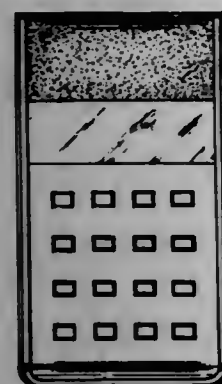
246,068

ELECTRONIC CALCULATOR

Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, both of Calif., assignors to Rockwell International Corporation
 Division of Ser. No. 487,061, July 10, 1974, Pat. No. Des. 240,737.

This application Apr. 2, 1976, Ser. No. 673,227
 Term of patent 14 years
 Int. Cl. D18-01

U.S. Cl. D64-11 B

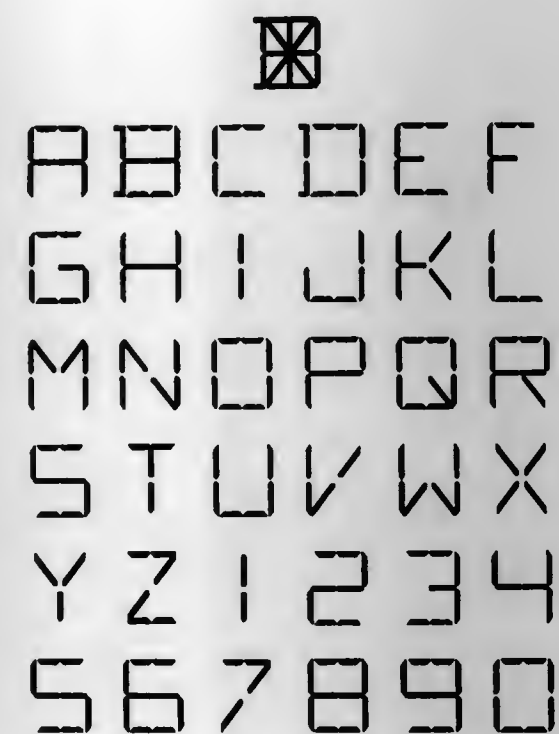


246,069

FONT OF CHARACTERS

Denis E. Bedel, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
 Filed Mar. 25, 1976, Ser. No. 670,581
 Term of patent 14 years
 Int. Cl. D18-03

U.S. Cl. D64-12 B



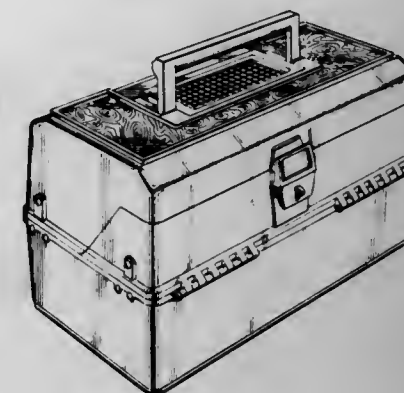
246,071

TACKLE BOX

Harper Landell, Fort Washington, and Anthony J. Souza, Lancaster, both of Pa., assignors to Woodstream Corporation, Lititz, Pa.

Filed Feb. 3, 1976, Ser. No. 654,776
 Term of patent 14 years
 Int. Cl. D22-05; D3-02

U.S. Cl. D87-1 R



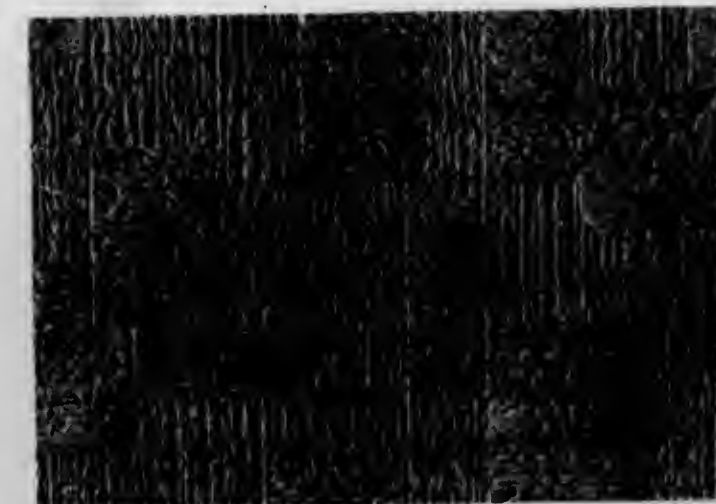
246,073

EMBOSSSED PLASTIC SHEET MATERIAL

Jared R. Kies, Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Mar. 12, 1976, Ser. No. 666,513
 Term of patent 14 years
 Int. Cl. D5-06

U.S. Cl. D87-3 G



246,074

EMBOSSSED PLASTIC SHEET MATERIAL

Jared R. Kies, Newark, Ohio, assignor to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed Mar. 12, 1976, Ser. No. 666,514
 Term of patent 14 years
 Int. Cl. D5-06

U.S. Cl. D87-3 G



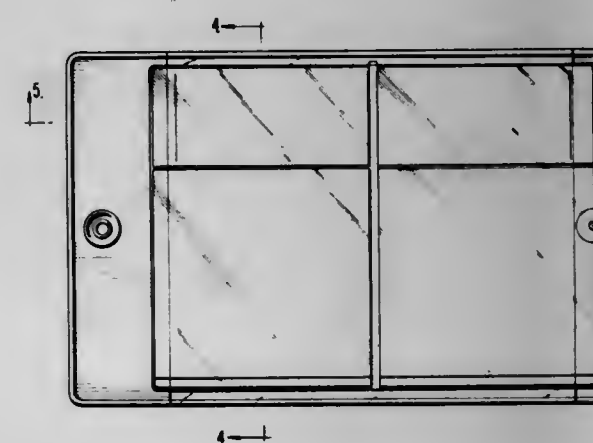
246,072

COMBINED MEDICATION AND INSTRUCTION CARD CARRIER CASE

Frank W. Jackson, Mechanicsburg, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed June 3, 1975, Ser. No. 583,433
 Term of patent 14 years
 Int. Cl. D3-01

U.S. Cl. D87-3 A



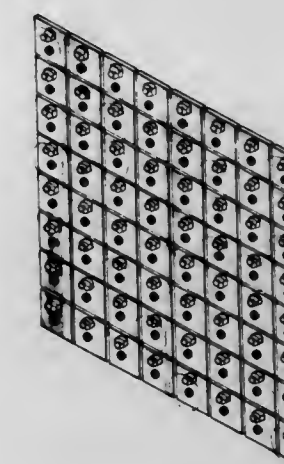
246,075

DISPLAY DEVICE FOR USE WITH COLORED FLICKER PLATES

Taketoshi Kato, 14-11 Ginza 1-chome, Chuo, Tokyo, Japan
 Filed June 22, 1976, Ser. No. 698,603

Term of patent 14 years
 Int. Cl. D20-03

U.S. Cl. D96-12 R



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF OCTOBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A G L Corporation: See—
George, Lyndell J. C.; and Shelly, Robert S., 4,053,238, Cl. 356-249.000.
- AB Kalle-Regulator, Industrivagen: See—
Kitsnik, Henrik Martin, 4,053,354, Cl. 162-198.000.
- AB Ostgota-Byggen: See—
Larson, Nils Osten Arnold, 4,052,825, Cl. 52-98.000.
- Abbott Laboratories: See—
Smith, Irvin Darrow; and Seymour, Eugene Wesley, 4,053,592, Cl. 424-181.000.
- Abernethy, Robert Ray. Fluorescent lamp simulator. 4,053,811, Cl. 315-95.000.
- Aboelfotoh, M. Osama, to International Business Machines Corporation. Dielectric for gas discharge panel. 4,053,804, Cl. 313-218.000.
- Aboutboul, Henri A.: See—
Krekeler, Jerome H.; Kirch, William; and Aboutboul, Henri A., 4,053,565, Cl. 423-338.000.
- Abrahams, Jacobus Hubertus, to U.S. Philips Corporation. Hot-gas reciprocating machine comprising two or more working spaces, provided with a control device for the supply of working medium to the said working spaces. 4,052,853, Cl. 60-521.000.
- ACF Industries, Inc.: See—
Niebrzydowski, John L., 4,053,542, Cl. 261-23.00A.
Pettitt, James H., 4,053,543, Cl. 261-121.00B.
- Acker, William F., to Honeywell Inc. Amplifier apparatus. 4,053,846, Cl. 330-279.000.
- Acres, Gary James Keith, to Johnson, Matthey & Co., Limited. Catalysis. 4,053,556, Cl. 423-239.000.
- Adamian, Michael R. Ignition arc monitor circuit. 4,053,823, Cl. 324-17.000.
- Adams, John Benjamin, Jr.; Ellis, Richard Lee; and Lin, Kang, to Du Pont de Nemours, E. I., and Company. Novel thiotriazinediones and their use as herbicides. 4,053,299, Cl. 71-93.000.
- Adams, Sally Lee; Cook, Michael M.; and Martin, Fred David, to Calgon Corporation. Method of using cementing composition having improved flow properties. 4,053,323, Cl. 106-100.000.
- Adams, Stewart Sanders; Armitage, Bernard John; Nicholson, John Stuart; and Blancafort, Antonio Ribera, to Boots Company Limited. The. Therapeutically active phenylalkane derivatives. 4,053,639, Cl. 424-343.000.
- Adaptronics, Inc.: See—
Mucciardi, Anthony N.; and Shankar, Ramesh, 4,052,889, Cl. 73-67.80S.
- Adolf A. Fleischmann, Firma: See—
Fleischmann, Werner; Reinkenobbe, Heinz-Otto; and Schmidt, Manfred, 4,053,278, Cl. 432-137.000.
- Advani, Jeram G.; Paganini, Bruno J.; and Hale, William J., to NCR Corporation. Automatic speaker verification systems employing moment invariants. 4,053,710, Cl. 179-1.05B.
- Aerodyne Research, Inc.: See—
Bien, Fritz; Camac, Morton; and Gersh, Michael Elliot, 4,053,233, Cl. 356-141.000.
- Aerosol Inventions & Development S.A. Aid SA: See—
DeBard, Andre, 4,053,086, Cl. 222-182.000.
- Agence Nationale de Valorisation de la Recherche (ANVAR): See—
Vidalin, Jacques M.; Suchard, Jean F.; and Quang, Hong H., 4,053,871, Cl. 340-146.200.
- Agency of Industrial Science & Technology: See—
Kato, Shuzo; Iga, Takeo; Hatano, Shogo; and Isawa, Yuichi, 4,053,579, Cl. 423-630.000.
- AGFA-Gevaert A.G.: See—
Feneberg, Paul, 4,052,916, Cl. 76-107.00R.
- AGFA-GEVAERT, N.V.: See—
Borginon, Hendrik Alfons; and Vanasche, Willy Joseph, 4,053,315, Cl. 96-63.000.
- Ahlgren, Sture: See—
Skafvenstedt, Bengt; Ahlgren, Sture; and Tschuertz, Eberhard, 4,053,901, Cl. 346-140.00R.
Skafvenstedt, Bengt; Ahlgren, Sture; and Tschuertz, Eberhard, 4,053,902, Cl. 346-140.00R.
- Ahrweiler, Karl-Heinz; Quos, Kurt; and Kusters, Eduard, to Kusters, Eduard. Press for exerting a pressure over an area. 4,053,276, Cl. 425-406.000.
- Aidu, Martin; and Wanka, Eberhard, to Siemens Aktiengesellschaft. Magnet system for an electromagnetic relay. 4,053,858, Cl. 335-276.000.
- Aihara, Sukeji: See—
Fujita, Yoshiji; Omura, Yoshiaki; Mori, Fumio; Itoi, Kazuo; Nishida, Takashi; Tamai, Yoshin; Aihara, Sukeji; Hosogai, Takeo; and Wada, Fumio, 4,053,380, Cl. 204-163.00R.
- Aikins, Warren A., to Swing-Shift Mfg. Co. Reversible reel unit. 4,053,118, Cl. 242-107.110.
- Ainoya, Koh; and Koyama, Nobuyuki, to Japan Tobacco and Salt Public Corporation. The. System for cyclic operation of self-running objects. 4,053,741, Cl. 364-478.000.
- Air Filters, Inc.: See—
Howard, Laurence M.; and Schaaf, Robert, 4,053,416, Cl. 210-227.000.
- Air Monitor Corporation: See—
DeBaun, Kenneth W., 4,052,897, Cl. 73-212.000.
- Air Quality Products, Inc.: See—
Gockel, Jack L., 4,052,966, Cl. 123-117.00A.
- Aisin Seiki Kabushiki Kaisha: See—
Yamazaki, Takeo; and Harada, Kuniyoshi, 4,052,768, Cl. 16-121.000.
- Aizawa, Hiroshi; Hosoe, Kazuya; Matsumoto, Seiichi; and Yokota, Hideo, to Canon Kabushiki Kaisha. Object distance measuring system for an optical instrument. 4,053,240, Cl. 356-4.000.
- Akzo N.V.: See—
Zengel, Hans; and Bergfeld, Manfred, 4,053,510, Cl. 260-557.00R.
- Akzona Incorporated: See—
Bos, Cornelis; and Daamen, Jacobus J. H. G., 4,053,277, Cl. 432-60.000.
Posch, Nancy Ann, 4,053,284, Cl. 23-259.000.
Wagener, Kenneth Boone; Spivey, Bron Walter, Jr.; and Chapman, James Mood, Jr., 4,053,441, Cl. 260-18.00N.
- Albatex A.G.: See—
Genini, Graziano, 4,052,906, Cl. 74-57.000.
- Albright, Alva Z. Method of harvesting trees. 4,053,005, Cl. 144-309.0AC.
- Albright & Wilson Limited: See—
Crowther, John C., 4,053,374, Cl. 204-51.000.
- Allen-Bradley Company: See—
Ray, Glen; and Leniewski, Leonard W., 4,053,801, Cl. 310-216.000.
- Allied Chemical Corporation: See—
Franz, Gerhard, 4,053,567, Cl. 423-386.000.
Harrer, T. S., deceased; Karsay, B. I.; and Sturtevant, R. L., 4,053,573, Cl. 423-540.000.
Schulze, Stephen R., 4,053,445, Cl. 260-31.20R.
- Allison, Anthony Clifford; and Gregoriadis, Gregory, to National Research Development Corporation. Immunological preparations. 4,053,585, Cl. 424-92.000.
- Alpha Systems Corporation: See—
Switzgabel, Harold, 4,053,395, Cl. 210-12.000.
- Alterman, Israel, to Environmental Engineering Dr. Ing. Alterman Ltd. Construction of underground tunnels and rock chambers. 4,052,860, Cl. 61-45.00B.
- Altschuler, Sidney J., to Dow Chemical Company. The. Geothermal energy from salt formations. 4,052,857, Cl. 60-641.000.
- Aluminum Company of America: See—
Cochran, C. Norman; Das, Subodh K.; and Milioto, Richard A., 4,053,303, Cl. 75-68.00A.
- Alza Corporation: See—
Bonsen, Pieter; Laver, Myron B.; and Morris, Kent C., 4,053,590, Cl. 424-177.000.
- Amana Refrigeration, Inc.: See—
Foerstner, Richard A., 4,053,731, Cl. 219-10.55D.
- Amaya, Yuji, to Fujitsu Ten Limited. Radio receiver. 4,053,838, Cl. 325-470.000.
- Amberg, Stephen W.; and Doherty, Thomas E., to Owens-Illinois, Inc. Method and apparatus for forming thermoplastic containers. 4,053,346, Cl. 156-446.000.
- Ambler, Frank E.; Duthler, Carl James; and Moise, Norton L., to Xonics, Inc. Metal detector with first and second nested rectangular coils. 4,053,828, Cl. 324-41.000.
- American Cyanamid Company: See—
Asato, Goro, 4,053,484, Cl. 260-332.30P.
Gordon, John Edson, 4,053,490, Cl. 260-397.70R.
Mohan, Arthur Gaudens, 4,053,430, Cl. 252-188.3CL.
Panzer, Hans Peter; and Bardoliwalla, Dinshaw Framroze, 4,053,512, Cl. 260-567.60P.
Schrider, Michael Stanley, 4,053,631, Cl. 424-304.000.
Walworth, Bryant Leonidas, 4,053,610, Cl. 424-273.00P.
Weston, Norma Ann; and Hillard, Ray Leonard, 4,053,518, Cl. 260-606.50P.
- American Hoechst Corporation: See—
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,053,599, Cl. 424-250.000.
- American Home Products Corporation: See—
Kao, Wenling; and Strike, Donald P., 4,053,467, Cl. 260-240.00R.
- American Hospital Supply Corporation: See—
Jasper, Mark Friedel, 4,053,052, Cl. 206-439.000.
- Salisbury, Thomas E., 4,053,280, Cl. 21-87.000.
- American Sign and Indicator Corporation: See—
Work, Gerald L., 4,053,340, Cl. 156-70.000.

Ametek, Inc.: See—
Schmidt, Ferenc J., 4,053,386, Cl. 204-264.000.
AMF Incorporated: See—
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- Boger, Allen D., Jr.: See—
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- Bolin, Philip C., to Westinghouse Electric Corporation. Method of fabricating compressed gas insulated cable. 4,053,338, Cl. 156-48.000.
- Boller, Arthur: See—
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- Cochran, Michael J., to Texas Instruments Incorporated. Low level field effect transistor amplifier, 4,053,795, Cl. 307-350.000.
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- Collins, Johnny, to Zenith Radio Corporation. Adaptive phase locked loop filter for television tuning, 4,053,933, Cl. 358-191.000.
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- Combs, Donald R., to Bumstead Woolford Co. Combination dust collector and heat exchanger, 4,053,293, Cl. 55-269.000.
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- Corbin, Edgar A., Jr., to Diamond Shamrock Corporation. Process for increasing cheese curd yield, 4,053,643, Cl. 426-40.000.
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- Cougar Instruments Corporation: See—
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- Crabtree, Philip G. Collapsible fish spear, 4,052,808, Cl. 43-6.000.
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- Cullinan, Robert L.; Jay, Ronald W.; Beck, Keith; and Miller, Lloyd J., to Fouls, Noah E. Pipe perforating machine, 4,052,880, Cl. 72-326.000.
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- Francesco, to Snam Progetti S.p.A. Asymmetrical hydrogenation by means of optically active aluminum hydride derivatives. 4,053,521, Cl. 260-618.00H.
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- Gits, Jacqueline; and Zygraich, Nathan, to SmithKline Corporation. Live Newcastle disease virus vaccines. 4,053,583, Cl. 424-90.000.
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- Glazier, Charles A. Warning light guard. 4,053,760, Cl. 362-186.000.
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- Holford, Kenneth, to U.S. Philips Corporation. Doppler radar system. 4,053,887, Cl. 343-9.000.
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- Howe, Robert K., to Monsanto Company. Alkoxy carbonylbenzyl-trialkylphosphonium salts. 4,053,501, Cl. 560-103.000.
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- Imperial Chemical Industries Limited: See—
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- Incerto, Robert James: See—
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- Hill, Brian; and Elwood, William Herbert, Jr., 4,053,578, Cl. 423-592.000.
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- Baptist, Brian Kent, 4,053,100, Cl. 229-43.000.
- Gaudish, Paul, 4,053,103, Cl. 229-37.00R.
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- Hart, John J., Jr., 4,053,101, Cl. 229-36.000.
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- Irani, Mazin R., to Stauffer Chemical Company. Removal of fluorine from phosphatic solutions. 4,053,561, Cl. 423-313.000.
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- J. I. Case Company: See—
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- J. J. & M.: See—
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- James, Lewis C., to Cities Service Research and Development Company. Start-up procedure for a residual oil processing unit. 4,053,390, Cl. 208-143.000.
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- Jasper, Mark Friedel, to American Hospital Supply Corporation. Packaged additive cap. 4,053,052, Cl. 206-439.000.
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- Jaworski, Eugene: See—
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- Jersak, Ulrich; and Scheuermann, Horst, to BASF Aktiengesellschaft. Manufacture of halonitrobenzenes. 4,053,527, Cl. 260-646.000.
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 Newman, Ferris E., to Baxter Travenol Laboratories, Inc. Embossed support member with high and low skip ribs. 4,053,417, Cl. 210-321,00B.
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Nishikawa, Masaji; and Kasuga, Muneco, to Olympus Optical Company Limited. Corona charge device. 4,053,769, Cl. 250-324.000.
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Modular programmable digital scan converter. 4,053,946, Cl. 364-200.000.
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Brug, James E.; and Heidelberg, Eric X., 4,053,551, Cl. 423-21.000.
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Pennell, William E.; and Rowan, William J., to United States of America, Energy Research and Development Administration. Nuclear reactor. 4,053,359, Cl. 176-61.000.
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Persik, James E.; and Persik, Gerald E., to J. J. & M. Stock-piercing punch mechanism. 4,052,871, Cl. 72-44.000.
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- Pfahler, Gerhard: See—
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- Pfizer Inc.: See—
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- Saylor, Lee H., to Sealed Power Corporation. Spacer-expander for a piston oil control ring. 4,053,164, Cl. 277-139.000.
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- Schadow, Klaus, to United States of America, Navy. Baffled combustion chamber. 4,052,846, Cl. 60-251.000.
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- Schmidt, Bradley J., to Illinois Tool Works Inc. Terminal cap. 4,053,705, Cl. 174-138.00F.
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- Schmidt, Ferenc J., to Ametek, Inc. Electrolytic filter for electrolytically filtering and recovering metals from colloidal suspensions. 4,053,386, Cl. 204-264.000.
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- Schrodter, Klaus: See—
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- Scully, Marian O., to University Patents, Inc. X-Ray laser utilizing gas jet, 4,053,783, Cl. 250-493.00G.
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- Sears, Roebuck and Co.: See—
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- Shaw, Frank D., to Swan Recreational Products Limited. Underwater swimming pool illumination systems, 4,053,758, Cl. 362-158.00G.
- Shaw, Richard A., to Richard A. Shaw, Inc. Package filling machine and method, 4,052,836, Cl. 53-25.00G.
- Shea, Lawrence E. Synthetic resin composition-method and product, 4,053,447, Cl. 260-38.00G.
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- Sherrill, John C. Pedometer distance-measuring device, 4,053,755, Cl. 364-561.00G.
- Shiba, Haruo, to TDK Electronics Co., Ltd. Tape cassette with flexible aperture closure, 4,053,935, Cl. 360-60.00G.
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- Shimizu, Tokihiko; Iijima, Yasuo; and Kusano, Makoto, to Matsushita Electric Industrial Co., Ltd. Oil impregnated electric device, 4,053,941, Cl. 361-319.00G.
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- Shively, Lawrence A. Apparatus and method for winding armatures, 4,052,783, Cl. 29-597.00G.
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- Shuster, Esther B.; and Shuster, Jacob. Insect catching device, 4,052,811, Cl. 43-136.00G.
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- Siano, James N.: See—
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- Siegert, Klaus: See—
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- Siegmund, Frederik W. Device for changing anode blocks, crust breaking and charging aluminum furnaces, 4,053,384, Cl. 204-244.00G.
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- Beckmann, Oskar, 4,053,894, Cl. 343-225.00G.
- Bodlaj, Viktor, 4,053,227, Cl. 356-4.00G.
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- Sigma Scientific Development, Inc.: See—
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- Silver, H. Graham: See—
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- Simko, Richard T., to Intel Corporation. Method for forming a narrow gap, 4,053,349, Cl. 156-628.00G.
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- Simmons, Walter John; and Willis, Frank Marsden, to Du Pont de Nemours, E. I., and Company. Tampable chub cartridge, 4,052,939, Cl. 102-24.00R.
- Simone, John: See—
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- Sims, David L., to United States of America, Air Force. Cylindrical deaerator, 4,053,291, Cl. 55-204.00G.
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- Singer Company, The: See—
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- Rydz, John Stephen; and Wurst, John Whilldin, 4,052,946, Cl. 112-158.00E.
- Singh, Baldev: See—
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- Sircom, Richard C., to Federal Pacific Electric Company. Ground fault interrupters, 4,053,815, Cl. 361-42.00G.
- Sisson, Albert E.; and Dorsett, Henry, to Bendix Corporation, The. Pressure limiter means for controlling the operation of a solenoid valve, 4,053,033, Cl. 188-112.00G.
- Sjoqvist, Erik Ivar: See—
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- Skratic, Damir Josip Miroslav: See—
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- Slater Electric Inc.: See—
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- Slater, Robert Anthony: See—
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- Slater Steel Industries Limited: See—
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- Slote, Lawrence: See—
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- Slusarenko, John A. Scaffold including reversible and adjustable driving and steering unit, 4,053,025, Cl. 180-2.00R.
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- Smith, Bruce W., to Lockheed Aircraft Corporation. Stiffened structural laminate and method of molding laminate with stiffener beads, 4,053,667, Cl. 428-36.00G.
- Smith, Donald J., to Smith-Schreyer & Assoc., Inc. Clamping connector, 4,053,703, Cl. 174-78.00G.
- Smith, Donald J., to Smith-Schreyer & Assoc., Inc. Plug and kit of parts including same for use in forming a moisture-proof cable splice enclosure, 4,053,704, Cl. 174-87.00G.
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- Smith, Irvin Darrow; and Seymour, Eugene Wesley, to Abbott Laboratories. Animal growth promotant, 4,053,592, Cl. 424-181.00G.
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- Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,053,473, Cl. 260-250.00B.
- Smith, Leward N. Dredging system and methods of dredging, 4,052,801, Cl. 37-64.00G.
- Smith-Schreyer & Assoc., Inc.: See—
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- Smith, Donald J., 4,053,704, Cl. 174-87.00G.
- SmithKline Corporation: See—
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- Smyres, Gary A.; Haskett, Philip R.; Scheiner, Bernard J.; and Lindstrom, Roald E., to United States of America, Interior. Recovery of copper and silver from sulfide concentrates, 4,053,305, Cl. 75-104.00G.
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- Societe Francaise d'Equipements pour la Navigation Aeriennne S.F.E.N.A.: See—
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- Societe Nationale des Poudres et Explosifs: See—
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- Rice, Robert L.; and Mast, Aquila D., 4,052,841, Cl. 56-341.00G.
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- Spivey, Bron Walter, Jr.: See—
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- Sprague Electric Company: See—
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- Stedman, Robert N., to Caterpillar Tractor Co. Motor grader blade lift and control mechanism and method. 4,053,016, Cl. 172-1.000.
- Stedman, Robert N., to Caterpillar Tractor Co. High lift mounting means for loader buckets. 4,053,075, Cl. 214-770.000.
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- Stepe, Visvaldis A.: See—
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- Lesher, George Y.; and Singh, Baldev, 4,053,475, Cl. 260-256.40N.
- Stevens, Doin E., to Bausch & Lomb Incorporated. Support for an ophthalmic instrument. 4,053,213, Cl. 351-38.000.
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- Stichting Bedrijven Van Het Nederlands Instituut voor Zuivelonderzoek: See—
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- Stickl, Helmut Anton. Attenuated fowl pox virus preparation for the treatment of infectious diseases, method for the manufacture thereof, and its use. 4,053,582, Cl. 424-89.000.
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- Carmalm, Bert Sigfrid Emanuel; Lindberg, Ulf Henrik Anders; de Paulis, Tomas; Ross, Svante Bertil; Sjernerstrom, Nils-Erik; Ulf, Carl Bengt Johan; and Ogren, Sven-Ove, 4,053,637, Cl. 424-330.000.
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- Strange, Robert F., to Bausch & Lomb Incorporated. Electrographic printer recording medium loading assembly. 4,053,900, Cl. 346-136.000.
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- Straza, George Thomas; and Parr, Edward Leon, to Straza Enterprises, Ltd. Method and apparatus for making rectangular corrugated expansion joints. 4,052,948, Cl. 113-116.00B.
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- Strike, Donald P.: See—
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- Tamai, Yoshin: See—
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- Tanabe Seiyaku Co., Ltd.: See—
Kawazu, Mitsutaka; Wagatsuma, Mitsuyoshi; Seto, Masahiko; Miyagishima, Toshikazu; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,053,609, Cl. 424-271.000.
- Tanaka, Hiroshi; Takahashi, Shinkichi; Takahashi, Touru; Tsukada, Shusei; and Marushima, Giichi, to Canon Kabushiki Kaisha. A.C. corona discharging device. 4,053,770, Cl. 250-324.000.
- Tappan Company, The: See—
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- Tarbox, Edward Albert, to Union Carbide Corporation. Dispensing package. 4,053,055, Cl. 206-554.000.
- Tatara, Seiji; Morita, Yasuo; Nishonomiya, Makoto; and Kumoda, Masashi, to Nippon Soda Company, Limited. Safety-calcium hypochlorite composition. 4,053,429, Cl. 252-187.00H.
- Tatsumi, Youji, to Kabushiki Kaisha Daini Seikosha. Grinding method and apparatus with metal removal rate control. 4,053,289, Cl. 51-281.00R.
- Taylor, Carl A. Self-adjusting spacer for centrifugal pumps. 4,053,255, Cl. 415-127.000.
- Taylor, Challen E., to Goodyear Tire & Rubber Company, The. Vulcanization method. 4,053,550, Cl. 264-347.000.
- Taylor, Clarence R. Combined golf bag and cart mechanism. 4,053,169, Cl. 280-37.000.
- Taylor, Douglas E., to Hoffman, Sidney. Alarm system for warning of unbalance or failure of one or more phases of a multi-phase high-current load. 4,053,876, Cl. 340-253.00H.
- Taylor, Edwin Michael: See—
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- Taylor, George F. Shelling machine. 4,052,992, Cl. 130-30.00H.
- Taylor, Lynn J.; and Troy, Neal, to Owens-Illinois, Inc. Recoverable, recyclable, and reusable composite container. 4,053,666, Cl. 428-35.000.
- TDK Electronics Co., Ltd.: See—
Shiba, Haruo, 4,053,935, Cl. 360-60.000.
- Wasawa, Kiyoshi; Kita, Toru; Sugisaki, Takao; and Higurashi, Minoru, 4,053,826, Cl. 324-34.00D.
- Teagno, Vladimir, to AMP Incorporated. Electrical connector. 4,053,197, Cl. 339-99.00R.
- Teetz, Wolfgang, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Pattern control mechanism for embroidering machine. 4,052,945, Cl. 112-86.000.
- Teichner, Otwald; and Born, Manfred, to Optische Werke G. Rodenstock. Test disk for eye examination. 4,053,212, Cl. 351-32.000.
- Teijin Limited: See—
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- Tekken Construction Co. Ltd.: See—
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- Teldix GmbH: See—
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- Telefonaktiebolaget L M Ericsson: See—
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- Carlsson, Karl-Johan Werner; and Sjoqvist, Erik Ivar, 4,053,947, Cl. 364-200.000.
- Telephon- und Telegraphen-Fabriks-Aktiengesellschaft Kapsch & Sohne in Wien: See—
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- Teramoto, Iwao: See—
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- Texaco Inc.: See—
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- Itria, Oswald A., 4,053,027, Cl. 181-118.000.
- Kerr, Edwin R.; Dorawala, Tansukhlal G.; and Reinhard, Russell R., 4,053,531, Cl. 260-672.00R.
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- Texas Instruments Incorporated: See—
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- Edwards, Colin Raymond, 4,053,794, Cl. 307-216.000.
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- Thiel, Max: See—
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- Thillet, Antoine; and Morello, Tomaso. Machine for opening a severed bovine or ovine head. 4,052,769, Cl. 17-23.000.
- Thiokol Corporation: See—
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- Thomas, Albert L., Jr.: See—
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- Robin, Leon; and Hawkes, Thaddeus, 4,053,888, Cl. 343-13.00R.
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- Thordarson, Petur, to Thor Instrument Company, Inc. Pressure sensor. 4,052,903, Cl. 73-406.000.
- Thorne, David Edward; and Engel, Kurt, to Beecham Group Limited. Aryloxypropidine for treating hyperglycaemia. 4,053,607, Cl. 424-263.000.
- Thorpe, Donald H., to Hooker Chemicals & Plastics Corporation. Process for the preparation of Diels-Alder adducts of halogenated cyclopentadienes. 4,053,528, Cl. 260-648.00C.
- Thueringer, Stephen E. Air-actuated stapling gun improvement. 4,053,093, Cl. 227-5.000.
- Thun, Floyd A. Dental floss applicator. 4,052,994, Cl. 132-92.00R.
- Tiepel, Erich W.; Wu, Christopher K.; and Kitzes, Arnold S., to Westinghouse Electric Corporation. Volume reduction of spent radioactive ion-exchange material. 4,053,432, Cl. 252-301.10W.
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- Tkac, Alexander; and Cvengros, Jan, to Rektorat Slovenskej vysokej školy technickej. Arrangement for multistage vacuum molecular distilling. 4,053,006, Cl. 159-6.00W.

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- Tokyo Shibaura Electric Co., Ltd.: See—
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- Tol-O-Matic, Inc.: See—
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- Tolmon, Francis: See—
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- Tomita, Shiro: See—
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- Tumagday, Fidel G.: See—
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- Tumavicus, Julius W.: See—
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- Turnbull, Andrew Alfred; and Sewell, Harry, to U.S. Philips Corporation: See—
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- Evers, Robert C.: See—
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- Malagisi, Carmen S.: See—
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- Morrow, Scott I.: See—
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- Van Scott, Eugene J.: See—
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- James, Bertram G.: See—
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- Marlor, Guy A.: See—
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- Yamaguchi, Totaro: See—
Kawazu, Mitsutaka; Wagatsuma, Mitsuyoshi; Seto, Masahiko; Miyagishima, Toshikazu; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,053,609, Cl. 424-271.000.
- Yamaguti, Namio; Miyata, Minoru; and Yamamoto, Keisuke, to Matsushita Electric Industrial Co., Ltd. Ghost signal eliminating system, 4,053,932, Cl. 358-167.000.
- Yamamoto, Keisuke: See—
Yamaguti, Namio; Miyata, Minoru; and Yamamoto, Keisuke, 4,053,932, Cl. 358-167.000.
- Yamanaka, Tsutomu; Kobayakawa, Toshihiro; Konishi, Mitsuhiro; and Ikeda, Kuniki, to Yoshitomi Pharmaceutical Industries, Ltd. 2,5-Disubstituted 4-oxazolealkanoic acids and esters, 4,053,478, Cl. 260-295.00R.
- Yamasaki, Tsuyoshi; and Kogame, Kunio, to Kuraray Co., Ltd. Method of making a leather-like sheet material by coagulating two polymers, 4,053,546, Cl. 264-49.000.
- Yamashita, Keizo; Wada, Tatsuo; Okamura, Yukio; and Safranek, William H., to Koito Manufacturing Company Limited. Process for the fabrication of printed circuits, 4,053,370, Cl. 204-13.000.
- Yamazaki, Masami: See—
Ando, Masahisa; Katow, Keigo; and Yamazaki, Masami, 4,052,969, Cl. 123-119.00A.
- Yamazaki, Takeo; and Harada, Kuniyoshi, to Aisin Seiki Kabushiki Kaisha. Handle of a window regulator for vehicles, 4,052,768, Cl. 16-121.000.
- Yamazoe, Hisamitsu: See—
Mizunuma, Tokuchio; Yamazoe, Hisamitsu; and Matsuno, Isao, 4,052,972, Cl. 123-191.00R.
- Yanagimoto, Samon: See—
Yoshiwara, Seishiro; Kawaharada, Minoru; and Yanagimoto, Samon, 4,052,874, Cl. 72-209.000.

- Yancey, Charles R. Ground anchor and foundation support. 4,052,827, Cl. 52-156.000.
- Yanik, Stephen Joseph: See—
Paraskos, John Angelo; and Yanik, Stephen Joseph, 4,053,391, Cl. 208-210.000.
- Yanofsky, Daniel N.: See—
Nebiker, Arthur W.; and Yanofsky, Daniel N., 4,053,223, Cl. 355-75.000.
- Yanus, John F.: See—
Limburg, William W.; Yanus, John F.; and Pai, Damodar M., 4,053,311, Cl. 96-1.0PC.
- Yasunaga, Sochiro. Curve reading method and apparatus. 4,053,734, Cl. 235-61.00A.
- Yeasting, Maynard Charles, to Rexnord Inc. Electromagnetic vibrator. 4,053,817, Cl. 318-128.000.
- Yee, Clifford S. L., to Wallace Murray Corporation. Double spider stiffening assembly for fan blades. 4,053,260, Cl. 416-210.00R.
- Yen, Chung H., to G. D. Searle & Co. 5-(1,1-Diphenyl-3-(4-phenyl-piperidino)propyl)-2-methyl-1,3,4-oxadiazole and related compounds. 4,013,477, Cl. 260-293.670.
- Yeung, Reginald S.: See—
Saletan, David I.; Yeung, Reginald S.; and Pledger, William R., 4,053,515, Cl. 260-635.00E.
- Yevick, George Johannus, to Personal Communications, Inc. Multiple function recording and readout system. 4,053,206, Cl. 350-96.00R.
- Yokota, Hideo: See—
Aizawa, Hiroshi; Hosoe, Kazuya; Matsumoto, Seiichi; and Yokota, Hideo, 4,053,240, Cl. 356-4.000.
- Okuno, Youichi; and Yokota, Hideo, 4,053,912, Cl. 354-225.000.
- York, Lyle E.; and Brinkmann, Dale C., to Caterpillar Tractor Co. Platform - operator tilting resilient mounting for earthmoving vehicles. 4,053,78, Cl. 296-28.00C.
- Yoshimura, Shoji; Takahashi, Susumu; Ichino, Motonobu; and Nakamura, Tokuro, to Kohjin Co., Ltd. (E)-2-[p-(β -substituted-vinyl)phenyl]alkanoic acids. 4,053,466, Cl. 542-454.000.
- Yoshioka, Mitsuru; Murakami, Masayuki; and Sando, Yuji, to Shionogi & Co., Ltd. 7-Acylamino-3-oximinomethyl-3-cephem-4-carboxylic acids. 4,053,469, Cl. 544-21.000.
- Yoshioka, Yuschi; and Sanka, Tsugio, to Honda Giken Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Keihin Seiki Seisakusho. Fast-idle cam apparatus in a carburetor. 4,053,449, Cl. 261-44.00R.
- Yoshitomi Pharmaceutical Industries, Ltd.: See—
Yamanaka, Tsutomu; Kobayakawa, Toshihiro; Konishi, Mitsuhiro; and Ikeda, Kuniki, 4,053,478, Cl. 260-295.00R.
- Yoshiwara, Seishiro; Kawaharada, Minoru; and Yanagimoto, Samon, to Nippon Steel Corporation. Method of producing tubular body in a press roll piercing mill. 4,052,874, Cl. 72-209.000.
- Young, James Clair, Jr.: See—
DeJohn, Patrick Fred; Hoff, Charles Edwin; Tennison, Robert Douglas; and Young, James Clair, Jr., 4,053,752, Cl. 235-302.100.
- Young, James R., to General Electric Company. Ionization chamber type gas leak detector operating in the high voltage avalanche region. 4,053,825, Cl. 324-33.000.
- Younger, Graeme William: See—
Brown, Thomas Graham; Skrgatic, Damir Josip Miroslav; Younger, Graeme William; and Fortune, John Cook, 4,052,888, Cl. 73-67.80S.
- Youngstown Sheet and Tube Company: See—
Halase, John F., III; Halsey, Homer P.; and Troup, Robert L., 4,053,742, Cl. 364-506.000.
- Younkin, James R. Gyro slaving/boot strap amplifier. 4,053,818, Cl. 318-562.000.
- Yu, Ruey J.; and Van Scott, Eugene J. Treatment of body odor and disturbed keratinization. 4,053,630, Cl. 424-289.000.
- Zacouto, Fred. Method of stimulating the heart. 4,052,991, Cl. 128-419.0PG.
- Zahradnik, Franz: See—
Cordes, Claus; and Zahradnik, Franz, 4,053,457, Cl. 260-78.00L.
- Zamarco, Gino. Thread-guiding mechanism for flat-bed knitting machine. 4,052,865, Cl. 66-128.000.
- Zawislak, Phyllis D., to Raymond Lee Organization, Inc., The, a part interest. Baby life preserver. 4,052,762, Cl. 9-337.000.
- Zdanys, John: See—
Hufford, James N.; and Zdanys, John, 4,052,786, Cl. 29-610.00R.
- Zeck, Walter Maria; deMarshall, August Cesar; and Wybou, Andre Prosper, to Mobay Chemical Corporation; and Bayer Aktiengesellschaft. Synergistic composition for the control of insects. 4,053,595, Cl. 424-216.000.
- Zengel, Hans; and Bergfeld, Manfred, to Akzo N.V. Process for the production of aromatic and cycloaliphatic dicarboxylic acid diamides. 4,053,510, Cl. 260-557.00R.
- Zenith Radio Corporation: See—
Collins, Johnny, 4,053,933, Cl. 358-191.000.
- Maskell, Roy; and Marino, Armando V., 4,052,776, Cl. 29-25.110.
- Ziegler, James F.: See—
Burr, Peter; Joy, Richard C.; and Ziegler, James F., 4,053,925, Cl. 357-64.000.
- Zilges, Franz Josef; and Siegert, Klaus, to Schldemann-Siemag Aktiengesellschaft. Extrusion press for indirect extrusion. 4,052,877, Cl. 72-253.00A.
- Zima, Jiri: See—
Jungr, Vaclav; Stoy, Artur; Stoy, Vladimir; and Zima, Jiri, 4,053,442, Cl. 260-29.60R.
- Zimmer, Richard Allen: See—
Milberger, Lionel John; and Zimmer, Richard Allen, 4,052,884, Cl. 73-12.000.
- Zimmermann, Detlef: See—
Debortoli, George; and Zimmermann, Detlef, 4,053,719, Cl. 179-98.000.
- Zito, Ralph, Jr.; and Kunz, Lawrence J., Jr., to GEL, Inc. Method of operating a fuel cell. 4,053,684, Cl. 429-15.000.
- Zwirblis, Henry G.: See—
Kushner, Jack; and Zwirblis, Henry G., 4,052,904, Cl. 73-421.00R.
- Zygraich, Nathan: See—
Gits, Jacqueline; and Zygraich, Nathan, 4,053,583, Cl. 424-90.000.

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977	B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 79,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977	B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977	B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 382,120	4,013,639	Mar. 23, 1976	Feb. 22, 1977
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977	B 385,631	3,982,924	Jan. 27, 1976	Dec. 28, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 311,779	4,013,481	Feb. 10, 1976	Nov. 22, 1977	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977	B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977	B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976	B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976	B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977	B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977	B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976	B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977	B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976	B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977	B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976	B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976	B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976	B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977	B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976	B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976	B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977	B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977	B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976	B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976	B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977	B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976	B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976	B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976	B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976	B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976	B 445,166	4,001,252	Mar. 2, 1976	Nov. 2, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976	B 445,459	3,988,889	Feb. 3, 1976	Nov. 30, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977	B 445,493	3,994,903	Mar. 2, 1976	Dec. 28, 1976
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976	B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977	B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977	B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977	B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977	B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 452,915	3,994,719	Mar. 30, 1976	Mar. 22, 1977
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 452,938	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 452,944	4,005,394	Mar. 16, 1976	Dec. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 453,031	3,998,678	Mar. 23, 1976	Jan. 25, 1977
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 453,067	4,005,394	Mar. 2, 1976	Dec. 14, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 14, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977	B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976	B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977	B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976	B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977	B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976	B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976	B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977	B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976	B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976	B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976	B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976	B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977	B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976	B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976	B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977	B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977	B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976	B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977	B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976	B 478,234	4,010,431	Mar. 30, 1976	Mar. 1, 1977
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976	B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976	B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976	B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976	B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976	B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977	B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977	B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976	B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976	B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976	B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977	B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976	B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976	B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976	B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976	B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976	B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976	B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976	B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977	B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976	B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977	B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976	B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976	B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976	B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976	B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976	B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976	B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976	B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976	B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976	B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976	B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977	B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976	B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977	B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977	B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977	B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977	B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976	B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976	B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977	B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976	B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976	B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976	B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977	B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976	B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977	B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977	B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977	B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976	B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976	B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976	B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976	B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 471,681	4,012,844	Feb. 13, 1976	Mar. 22, 1977	B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 471,735	3,989,408	Apr. 3, 1976	Nov. 2, 1976	B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976	B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976	B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977	B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 487,078	D 241,895	Mar. 30, 1976	Mar. 22, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976	B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976	B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976

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PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976	B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977	B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977	B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976	B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976	B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976	B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976	B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976	B 498,775	3,996,611	Feb. 10, 1976	Nov. 2, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976	B 498,205	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976	B 498,500	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977	B 498,775	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977	B 498,820	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 489,585	3,984,085	Feb. 24, 1976	Oct. 5, 1976	B 498,951	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976	B 499,171	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976	B 499,209	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977	B 499,227	4,001,375	Jan. 27, 1976	Jan. 4, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976	B 499,324	3,981,391	Mar. 16, 1976	Sep. 21, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976	B 499,352	4,013,544	Jan. 27, 1976	Mar. 22, 1977
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976	B 499,370	3,990,058	Mar. 30, 1976	Nov. 2, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976	B 499,718	4,000,663	Jan. 27, 1976	Jan. 4, 1977
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976	B 500,171	3,997,262	Mar. 16, 1976	Dec. 14, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976	B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976	B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976	B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976	B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976	B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976	B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976	B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977	B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976	B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976	B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977	B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976	B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976	B 501,583	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976	B 501,588	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976	B 501,597	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977	B 501,975	3,988,466	Jan. 13, 1976	Sep. 21, 1976
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976	B 501,993	3,981,606	Mar. 23, 1976	Dec. 21, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976	B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977	B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976	B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976	B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977	B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976	B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976	B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977	B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976	B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977	B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977	B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976	B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977	B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 493,686	3,989,830	Mar. 9, 1976	Nov. 2, 1976	B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 493,955	3,990,165	Mar. 9, 1976	Nov. 9, 1976	B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 493,981	4,034,002	Mar. 23, 1976	July 5, 1977	B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 494,138	3,983,808	Feb. 10, 1976	Oct. 5, 1976	B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 494,234	4,001,255	Mar. 16, 1976	Jan. 4, 1977	B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 494,339	3,991,289	Feb. 3, 1976	Nov. 9, 1976	B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976	B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976	B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 494,806	3,992,469	Feb. 3, 1976	Nov. 2, 1976	B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976	B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976	B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976	B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976	B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976	B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976	B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976	B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976	B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976	B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977	B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976	B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976	B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976	B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976	B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976	B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 497,194	3,988,267	Feb. 3, 1976	Nov. 30, 1976	B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976	B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
				B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976

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PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977	B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976	B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 508,961	3,987,477	Feb. -3, 1976	Oct. 19, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976	B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976	B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977	B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976	B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976	B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977	B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977	B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976	B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977	B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976	B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976	B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976	B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976	B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976	B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976	B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977	B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977	B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976	B 520,384	3,986,592	Jan. 27, 1976	Oct. 26, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976	B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976	B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 511,911	3,992,336	Feb. 10, 1976	Nov. 16, 1976	B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 511,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976	B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976	B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976	B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976	B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976	B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976	B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976	B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977	B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976	B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976	B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976	B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976	B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976	B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976	B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977	B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976	B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976	B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976	B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976	B 521,326	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976	B 521,480	3,982,665	Jan. 27, 1976	Sep. 21, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977	B 521,600	3,981,458	Mar. 9, 1976	Dec. 28, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976	B 521,612	4,000,251	Mar. 9, 1976	Oct. 5, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976	B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976	B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976	B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977	B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976	B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977	B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977	B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976	B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977	B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976	B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976	B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977	B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976	B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976	B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977	B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976	B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976	B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976	B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976	B 522,626	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976	B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976	B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 516,236	3,984,404	Feb. 3, 1976	Oct. 5, 1976	B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 516,597	3,996,784	Feb. 17, 1976	Dec. 14, 1976	B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977	B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 535,437	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 536,675	3,985,773	Jan. 20, 1976	Feb. 12, 1977
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 529,156	3,989,178	Jan. 13, 1976	Nov. 2, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 530,174	3,993,635	Feb. 24, 1976	Nov. 2, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 541,501	4,005,826	Apr. 13, 1976	Oct. 12, 1976
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 541,517	3,986,156	Jan. 13, 1976	Nov. 30, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977	B 541,710	3,994,472	Feb. 24, 1976	Oct. 19, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 542,135	3,986,939	Feb. 10, 1976	Sep. 21, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976	B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977	B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977	B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977	B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976	B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976	B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 533,964	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 534,014	3,983,381	Feb. 3, 1976	Sep. 28, 1976	B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 534,311	3,981,675	Jan. 27, 1976	Sep. 21, 1976	B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976	B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 534,331	3,981,480	Feb. 17, 1976	Sep. 21, 1976	B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 548,440	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 548,462	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 549,394	3,986,111	Jan. 27, 1976	Sep. 21, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 549,931	3,981,641	Jan. 20, 1976	Oct. 12, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 565,275	3,990,299	Jan. 6, 1976	Nov. 9, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 575,855	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977	B 576,859	3,991,532	Feb. 24, 1976	Nov. 16, 1976
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977	B 576,903	3,995,026	Feb. 3, 1976	Nov. 30, 1976
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976	B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976	B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976

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PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM
AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977				

LIST OF REISSUE PATENTEEES

TO WHOM

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NOTE—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- Arenco-KM AB: See—
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- Asea Aktiebolag: See—
Bergdahl, Sven Gunnar; and Wangdahl, Torsten, Re. 29,435, Cl. 73-290.00V.
- Bergdahl, Sven Gunnar; and Wangdahl, Torsten, to Asea Aktiebolag. Method of supervising the filling level in hoppers, shafts, silos and the like for miscellaneous materials and means for performing the method. Re. 29,435, Cl. 73-290.00V.
- Bolliger, Alfred R. Assembly for testing shock absorbers incorporated in a vehicle. Re. 29,434, Cl. 73-11.000.
- Bowmar Instrument Corporation: See—
Durkee, Gilbert H.; Wareberg, Per G.; and Yoder, Alan C., Re. 29,440, Cl. 200-5.00A.
- Calmac Manufacturing Corporation: See—
MacCracken, Calvin D.; and Schmidt, Helmut J., Re. 29,438, Cl. 165-46.000.
- Canron, Inc.: See—
Hurni, Hans, Re. 29,437, Cl. 104-7.00B.
- Durkee, Gilbert H.; Wareberg, Per G.; and Yoder, Alan C., to Bowmar Instrument Corporation. Calculator keyboard switch with disc spring contact and printed circuit board. Re. 29,440, Cl. 200-5.00A.
- Elektriska Svetsningsaktiebolaget: See—
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- Ericsson, Rolf, to Elektriska Svetsningsaktiebolaget. Direct current power supply for manual arc welding. Re. 29,441, Cl. 219-135.000.
- Eriksson, Curt: See—
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- Ferrero, John: See—
Hulle, Robert M.; Ferrero, John; and Pannullo, Gerald, Re. 29,436, Cl. 73-387.000.
- Fisons Limited: See—
Parsons, John Henry, Re. 29,439, Cl. 260-302.0SD.
- Hulle, Robert M.; Ferrero, John; and Pannullo, Gerald, to Trans-Cal Industries, Inc. Encoder for altimeters and the like instruments. Re. 29,436, Cl. 73-387.000.
- Hurni, Hans, to Canron, Inc. Device for the vertical and lateral displacement of railway track. Re. 29,437, Cl. 104-7.00B.
- Kuroda, Hiroshi: See—
Nakajima, Yasuo; Oguri, Takeji; and Kuroda, Hiroshi, Re. 29,433, Cl. 60-290.000.
- Leander, Leif; and Eriksson, Curt, to Arenco-KM AB. Method and apparatus for measuring and positioning of fish at head cutting. Re. 29,432, Cl. 17-63.000.
- MacCracken, Calvin D.; and Schmidt, Helmut J., to Calmac Manufacturing Corporation. Apparatus for creating and maintaining an ice slab. Re. 29,438, Cl. 165-46.000.
- Nakajima, Yasuo; Oguri, Takeji; and Kuroda, Hiroshi, to Nissan Motor Company, Limited. Air-pollution preventive arrangement. Re. 29,433, Cl. 60-290.000.
- Nissan Motor Company, Limited: See—
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- Oguri, Takeji: See—
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- Pannullo, Gerald: See—
Hulle, Robert M.; Ferrero, John; and Pannullo, Gerald, Re. 29,436, Cl. 73-387.000.
- Parsons, John Henry, to Fisons Limited. Certain 1,2,4-Oxa- and -thiadiazol-5-ylthioalkanoic acid derivatives. Re. 29,439, Cl. 260-302.0SD.
- Schmidt, Helmut J.: See—
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- Trans-Cal Industries, Inc.: See—
Hulle, Robert M.; Ferrero, John; and Pannullo, Gerald, Re. 29,436, Cl. 73-387.000.
- Wangdahl, Torsten: See—
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- Wareberg, Per G.: See—
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- Yoder, Alan C.: See—
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- Jessel, Walter H., Jr.; and Duffett, William E., 4,123, Cl. 77.000.
- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,122, 10-11-77, Cl. 79.000.
- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,123, 10-11-77, Cl. 77.000.
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- Rohde, Hans Joachim, 4,125, Cl. 68.000.
- Pan-American Plant Company: See—
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- Rohde, Hans Joachim, to Mikkelsen, Inc. Begonia plant. 4,125, 10-11-77, Cl. 68.000.
- Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named Lexington. 4,126, 10-11-77, Cl. 74.000.
- Yoder Brothers, Inc.: See—
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- Jessel, Walter H., Jr.; and Duffett, William E., 4,123, Cl. 77.000.

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- A-Betong AB: See—
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- Bartz, Richard O. Soil working hand tool. 246,027, 10-11-77, Cl. D8-11.000.
- Bedel, Denis E., to Westinghouse Electric Corporation. Font of characters. 246,069, 10-11-77, Cl. D64-12.00B.
- Bellini, Mario, to Nippon Gakki Seizo Kabushiki Kaisha. Cassette-deck. 246,041, 10-11-77, Cl. D14-6.000.
- Bianchi, John E. Racket frame. 246,061, 10-11-77, Cl. D34-5.0ST.
- Bissonnette, Albert E. Appliance for exercising the teeth and gums. 246,054, 10-11-77, Cl. D24-36.000.
- Brady, Joseph Daniel. Reading stand or the like. 246,016, 10-11-77, Cl. D6-25.000.
- Brio Toy AB: See—
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- Brown, Richard E.: See—
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Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, to WCB Containers Limited. Pool. 246,058, 10-11-77, Cl. D34-5.00F.
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CLASSIFICATION OF PATENTS

ISSUED OCTOBER 11, 1977

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CLASS 21	87	423	293	4,052,878	51 M	CLASS 126	198	4,053,353
CLASS 23	230 PC	4,053,281	318	4,052,879	58.3	2 V	86	4,053,354
230 R	230 R	4,053,282	326	4,052,880	CLASS 96	2.05 P	86	4,053,010
252 R	252 R	4,053,283	439	4,052,881	1 PC	2.1 Z	97	4,053,011
259	259	4,053,284	11	4,052,882	1 SD	18	254	4,053,012
102 SL	102 SL	4,052,771	12	4,052,883	1 TE	36	CLASS 165	46
163 FC	163 FC	4,052,772	38	4,052,884	3	57	86	Re.29,438
163 K	163 K	4,052,773	67.8 S	4,052,885	49	140 N	86	4,053,013
201 A	201 A	4,052,774	115 P	4,052,886	63	142.7	150	4,053,014
230 A	230 A	4,052,775	139	4,052,887	115 P	173 R	302	4,053,015
CLASS 29	25.11	4,052,776	355	4,052,888	CLASS 99	260	CLASS 166	1
120	120	4,052,777	81	4,052,889	355	335.5	CLASS 172	4.5
429	429	4,052,778	144	4,052,890	CLASS 101	349 R	1	4,053,016
358	358	4,052,780	149	4,052,891	11	419 PG	4.5	4,053,017
560	560	4,052,781	155	4,052,892	93.07	CLASS 130	99	4,053,018
572	572	4,052,782	189	4,052,893	147	30 H	713	4,053,019
597	597	4,052,783	194 A	4,052,894	291	9	801	4,053,020
599	599	4,052,784	194 VS	4,052,895	CLASS 102	CLASS 131	801	4,053,021
605	605	4,052,785	212	4,052,897	24 R	CLASS 132	21 C	4,053,700
610 R	610 R	4,052,786	290 V	4,052,899	33	92 R	48	4,053,701
626	626	4,052,787	300	4,052,899	39	CLASS 134	73 R	4,053,702
749	749	4,052,788	313	4,052,900	65.2	167 R	78	4,053,703
764	764	4,052,788	387	4,052,901	103	CLASS 136	87	4,053,704
CLASS 30	276	4,052,789	406	4,052,902	CLASS 104	89 CC	138 F	4,053,705
287	287	4,052,790	421 R	4,052,903	7 B	405,326	149 R	4,053,706
315	315	4,052,791	483	4,052,905	CLASS 106	405,327	209	4,053,707
CLASS 32	14 A	4,052,792	57	4,052,906	CLASS 108	CLASS 137	CLASS 175	5
CLASS 33	180 R	4,052,793	57	4,052,907	2	1	5	4,053,022
CLASS 34	10	4,052,794	89.22	4,052,908	57	85	7	4,053,023
12	12	4,052,795	230.17 E	4,052,909	99	312	19 R	4,053,355
60	60	4,052,796	231 P	4,052,910	100	625.5	30	4,053,356
242	242	4,052,797	482	4,052,911	288 B	158	37	4,053,357
CLASS 35	9 A	4,052,798	501 R	4,052,912	304	CLASS 139	50	4,053,358
48 R	48 R	4,052,799	512	4,052,913	CLASS 108	436	61	4,053,359
CLASS 37	58	4,052,800	572	4,052,914	43	CLASS 141	225	4,053,024
64	64	4,052,801	750 B	4,052,915	86	2	CLASS 178	69.1
129	129	4,052,804	798	4,052,915	158 E	95	CLASS 179	1
141 R	141 R	4,052,802	11	4,053,301	158 R	144	1 GO	4,053,711
			68 A	4,053,302	CLASS 113	162 R	1 SB	4,053,710
			104	4,053,303	116 B	309 AC	15 AF	4,053,715
			123 J	4,053,306	121 C	CLASS 148	15 AL	4,053,714
			130.5	4,053,307	CLASS 114	6.15 R	15 BC	4,053,713
			171	4,053,308	222	6.15 Z	15.55 T	4,053,712
			257	4,053,304	CLASS 115	11.5 F	18 AD	4,053,709
			107 R	4,052,916	24.1	120	18 GF	4,053,716
					41 HT			

CLASSIFICATION OF PATENTS

41 A	4,053,717	534	4,053,055	44.1 R	4,053,097	187 H	4,053,429	899 R	4,053,537	351	4,053,799
90 B	4,053,718					188.3 CL	4,053,430	960	4,053,538		
98	4,053,719	CLASS 288		CLASS 229		299	4,053,431	878 R	4,053,539	26	4,053,189
99	4,053,720	88	4,053,387	23 R	4,053,098	301.1 W	4,053,432	897 B	4,053,540	72	4,053,190
100.41 K	4,053,721	89	4,053,388	28 R	4,053,099	408	4,053,433	937	4,053,541	206	4,053,191
170 NC	4,053,722	139	4,053,389	36	4,053,101	432	4,053,434				
175.3 R	4,053,723	143	4,053,390	37 E	4,053,102	451	4,053,435	CLASS 261		CLASS 310	
		210	4,053,391	37 R	4,053,103	452	4,053,436	23 A	4,053,542		
CLASS 180		354	4,053,392	43	4,053,100	458	4,053,437	44 R	4,053,543	43	4,053,800
2 R	4,053,045			CLASS 233		522	4,053,438	121 B	4,053,543	216	4,053,801
98	4,053,046			11	4,053,104			143	4,053,544		
CLASS 181		73	4,053,056	CLASS 235		105	4,053,138	CLASS 264		CLASS 312	
118	4,053,057	211	4,053,393	61.11 D	4,053,736	190 R	4,053,139	46.4	4,053,545	107	4,053,192
CLASS 182		8	4,053,394		4,053,737			49	4,053,546	209	4,053,193
1	4,053,058	12	4,053,395	61.6 A	4,053,734	CLASS 256		102	4,053,547		
CLASS 183		17	4,053,396	61.9 R	4,053,735	19	4,053,140	230	4,053,548	55	4,053,802
39	4,053,059	34	4,053,397	92 PB	4,053,738	CLASS 260		293	4,053,549	198	4,053,809
CLASS 184		41	4,053,398	302.1	4,053,752	2.5 AJ	4,053,439	347	4,053,550	201	4,053,803
71.8	4,053,060	44	4,053,399	302.3	4,053,751	4 R	4,053,440	218	4,053,804	229	4,053,805
71.9	4,053,061	62	4,053,401	CLASS 236		18 N	4,053,441	388	4,053,806	228	4,053,807
77 R	4,053,062	63 R	4,053,403	100	4,053,105	29.6 F	4,053,443	409	4,053,807	458	4,053,808
112	4,053,063	71	4,053,404	CLASS 237		30.2	4,053,444	CLASS 315			
206 R	4,053,064	74	4,053,405	8 R	4,053,106	31.2 R	4,053,445	3.6	4,053,810		
CLASS 191		79	4,053,406	CLASS 238		37 N	4,053,446	95	4,053,811		
45 A	4,053,065	104	4,053,407	349	4,053,107	38	4,053,447	169 TV	4,053,812		
CLASS 192		117	4,053,408	CLASS 239		40 R	4,053,448	206	4,053,813		
13 R	4,053,066	130	4,053,409	150	4,053,108	45.75 C	4,053,451	248	4,053,814		
43.1	4,053,067	132	4,053,410	542	4,053,109	45.75 M	4,053,452	CLASS 318			
67 A	4,053,068	146	4,053,411	CLASS 241		45.75 N	4,053,454	128	4,053,817		
CLASS 193		169	4,053,412	1	4,053,110	45.75 R	4,053,455	562	4,053,818		
35 R	4,053,069	227	4,053,416	107.4 A	4,053,112	47 P	4,053,456	636	4,053,819		
CLASS 194		321 B	4,053,417	107.4 R	4,053,113	78 L	4,053,457	CLASS 324			
59 R	4,053,070	386	4,053,419	107.7 A	4,053,114	79.5 A	4,053,458	17	4,053,823		
CLASS 195		435	4,053,420	107.7 R	4,053,115	112 B	4,053,459	29.5	4,053,824		
29	4,053,071	528	4,053,421	107.7 R	4,053,116	112.5 R	4,053,460	33	4,053,825		
66 R	4,053,072	126	4,053,057	107.7 R	4,053,117	125	4,053,461	34 D	4,053,826		
103.5 M	4,053,073	107.7 R	4,053,058	107.7 R	4,053,118	145 B	4,053,462	34 TK	4,053,827		
103.5 R	4,053,074	1 R	4,053,059	107.7 R	4,053,119	154	4,053,463	41	4,053,828		
CLASS 197		6.7	4,053,061	107.7 R	4,053,120	174	4,053,464	46	4,053,829		
53	4,053,062	58 R	4,053,061	107.7 R	4,053,121	207.3	4,053,465	51	4,053,830		
168	4,053,063	199	4,053,061	107.7 R	4,053,122	240 R	4,053,467	142	4,053,832		
CLASS 198		1 P	4,053,062	107.7 R	4,053,123	243 C	4,053,468	158 R	4,053,833		
334	4,053,064	2.5	4,053,063	107.7 R	4,053,124	250 BN	4,053,473	CLASS 325			
499	4,053,065	6 M	4,053,064	107.7 R	4,053,125	256.4 N	4,053,475	46	4,053,834		
CLASS 200		7	4,053,065	107.7 R	4,053,126	256.5 R	4,053,476	51	4,053,835		
5 A	Re-29,440	18 R	4,053,066	107.7 R	4,053,127	289 D	4,053,477	51	4,053,836		
51 R	4,053,774	147 G	4,053,067	107.7 R	4,053,128	293.67	4,053,478	320	4,053,837		
81 R	4,053,775	505	4,053,068	107.7 R	4,053,129	295 R	4,053,479	323	4,053,838		
148 A	4,053,777	506	4,053,069	107.7 R	4,053,130	302 A	4,053,480	479	4,053,843		
159 R	4,053,778	512	4,053,070	107.7 R	4,053,131	302 SD	4,053,481	CLASS 328			
267	4,053,779	515	4,053,071	107.7 R	4,053,132	306.8 D	4,053,482	38	4,053,839		
288	4,053,780	770	4,053,072	107.7 R	4,053,133	307 A	4,053,483	151	4,053,840		
CLASS 201		13	4,053,344	107.7 R	4,053,134	325 R	4,053,484	103	4,053,841		
CLASS 202		100	4,053,345	107.7 R	4,053,135	332.3 P	4,053,485	CLASS 329			
227	4,053,346	227	4,053,346	107.7 R	4,053,136	340.7	4,053,486	151	4,053,842		
CLASS 203		2	4,053,347	107.7 R	4,053,137	345.9 S	4,053,487	CLASS 330			
10	4,053,348	10	4,053,348	107.7 R	4,053,138	369	4,053,488	2	4,053,844		
52	4,053,349	52	4,053,349	107.7 R	4,053,139	377.5	4,053,489	53	4,053,845		
CLASS 204		13	4,053,350	107.7 R	4,053,140	397.7 R	4,053,490	277	4,053,846		
20	4,053,351	43 A	4,053,079	107.7 R	4,053,141	410.6	4,053,491	CLASS 331			
43 S	4,053,352	103.5 D	4,053,731	107.7 R	4,053,142	412.4	4,053,492	65	4,053,849		
43 T	4,053,353	103.5 F	4,053,730	107.7 R	4,053,143	448 C	4,053,493	91	4,053,850		
49	4,053,354	365	4,053,732	107.7 R	4,053,144	448.2 E	4,053,494	94.5 G	4,053,851		
51	4,053,355	494	4,053,733	107.7 R	4,053,145	448.8 R	4,053,495	94.5 PE	4,053,852		
59 R	4,053,356	3	4,053,080	107.7 R	4,053,146	453 RW	4,053,496	73 W	4,053,853		
67	4,053,357	3.6	4,053,081	107.7 R	4,053,147	456 P	4,053,497	82 R	4,053,854		
103	4,053,358	202	4,053,082	107.7 R	4,053,148	459 P	4,053,498	CLASS 333			
106	4,053,359	229	4,053,083	107.7 R	4,053,149	463 P	4,053,499	91	4,053,855		
149	4,053,360	378	4,053,084	107.7 R	4,053,150	466.5 P	4,053,500	147	4,053,857		
199.19	4,053,361	182	4,053,085	107.7 R	4,053,151	557 R	4,053,501	276	4,053,858		
160.1	4,053,362	278	4,053,086	107.7 R	4,053,152	563 P	4,053,502	CLASS 334			
163 R	4,053,363	312	4,053,087	107.7 R	4,053,153	567.6 P	4,053,503	91	4,053,859		
195 F	4,053,364	382	4,053,088	107.7 R	4,053,154	570 D	4,053,504	164	4,053,860		
195 M	4,053,365	445 T	4,053,089	107.7 R	4,053,155	570 R	4,053,505	165	4,053,861		
225	4,053,366	456	4,053,090	107.7 R	4,053,156	583 P	4,053,506	221	4,053,862		
244	4,053,367	456	4,053,091	107.7 R	4,053,157	585 A	4,053,507	CLASS 335			
254	4,053,368	456	4,053,092	107.7 R	4,053,158	586 D	4,053,508	147	4,053,857		
264	4,053,369	456	4,053,093	107.7 R	4,053,159	606.5 P	4,053,509	276	4,053,858		
45.2	4,053,047	456	4,053,094	107.7 R	4,053,160	607 AL	4,053,510	CLASS 336			
106	4,053,048	456	4,053,095	107.7 R	4,053,161	610 A	4,053,511	91	4,053,859		
274	4,053,049	456	4,053,096	107.7 R	4,053,162	618 H	4,053,512	164	4,053,860		
318	4,053,050	456	4,053,097	107.7 R	4,053,163	619 A	4,053,513	165	4,053,861		
361	4,053,051	456	4,053,098	107.7 R	4,053,164	621 G	4,053,514	221	4,053,862		
438	4,053,052	456	4,053,099	107.7 R	4,053,165	631 H	4,053,515	CLASS 337			
439	4,053,053	456	4,053,100	107.7 R	4,053,166	635 E	4,053,516	15	4,053,863		
441	4,053,054	456	4,053,101	107.7 R	4,053,167	645	4,053,517	22 SD	4,053,864		
534	4,053,055	456	4,053,102	107.7 R	4,053,168	646 C	4,053,518	180	4,053,865		

CLASSIFICATION OF PATENTS

177 R	4,053,200	31	4,053,908	319	4,053,941	214	4,053,257	4,053,606	153	4,053,660		
218 R	4,053,201	105	4,053,909	385	4,053,942	CLASS 416		4,053,607	185	4,053,661		
272 UC	4,053,202	120	4,053,910	399	4,053,943	134 A	4,053,258	4,053,608	250	4,053,662		
CLASS 340			152	4,053,911	CLASS 362		208	4,053,259	267	4,053,614		
5 H	4,053,867	225	4,053,912	4	4,053,757	210 R	4,053,260	4,053,615	379	4,053,664		
52 F	4,053,868	244	4,053,913	7	4,053,756	244 A	4,053,261	4,053,616	385 C	4,053,665		
64	4,053,869	CLASS 355			158	4,053,758	CLASS 417		4,053,617	CLASS 428		
146.2	4,053,870	4	4,053,216	186	4,053,760	424	4,053,262	4,053,618	35	4,053,666		
173 R	4,053,873	15	4,053,218	218	4,053,759	CLASS 418		4,053,619	36	4,053,667		
173 TP	4,053,872	27	4,053,219	223	4,053,762	CLASS 418		4,053,621	95	4,053,668		
244 R	4,053,874	45	4,053,220	301	4,053,766	201	4,053,263	4,053,619	151	4,053,669		
248 P	4,053,875	60	4,053,221	413	4,053,761	CLASS 423		4,053,620	136	4,053,670		
253 H	4,053,876	71	4,053,222	CLASS 363		21	4,053,351	4,053,622	157	4,053,671		
258 R	4,053,877	75	4,053,223	44	4,053,820	100	4,053,352	4,053,623	207	4,053,672		
324 AD	4,053,878	76	4,053,224	60	4,053,821	210.5	4,053,353	4,053,611	283	4,053,673		
351	4,053,879	104	4,053,230	129	4,053,945	205	4,053,354	4,053,624	310	4,053,674		
365 R	4,053,880	115	4,053,225	172	4,053,823	239	4,053,355	4,053,625	369	4,053,677		
CLASS 343			121	4,053,226	CLASS 364		240	4,053,356	4,053,626	419	4,053,678	
5 EM	4,053,881	CLASS 356			200	4,053,944	261	4,053,357	275	4,053,679		
5 SA	4,053,882	4	4,053,227	415	4,053,946	302	4,053,358	4,053,627	285	4,053,680		
	4,053,886		4,053,240	424	4,053,947	313	4,053,359	4,053,628	286	4,053,681		
	4,053,886	71	4,053,228	478	4,053,948	303	4,053,360	4,053,629	289	4,053,682		
7.3	4,053,883	103	4,053,229	494	4,053,949	312	4,053,361	4,053,630	423	4,053,681		
7.7	4,053,884	106 S	4,053,231	500	4,053,950	320	4,053,362	4,053,631	460	4,053,682		
	4,053,885	118	4,053,232	501	4,053,951	321 S	4,053,363	4,053,632	8	4,053,683		
9	4,053,887	141	4,053,233	506	4,053,952	328	4,053,364	4,053,631	15	4,053,684		
13 R	4,053,888	156	4,053,234	510	4,053,948	338	4,053,365	4,053,635	68	4,053,685		
17.2 PC	4,053,889	188	4,053,235	540	4,053,949	386	4,053,366	4,053,636	91	4,053,686		
17.7	4,053,890	189	4,053,236	540	4,053,950	419 P	4,053,367	4,053,637	94	4,053,687		
106 R	4,053,892	209	4,053,237	540	4,053,951	445	4,053,368	4,053,638	98	4,053,688		
112 PT	4,053,893	249	4,053,238	540	4,053,952	462	4,053,369	4,053,633	102	4,053,689		
225	4,053,894	250	4,053,239	540	4,053,953	462	4,053,370	4,053,639	112	4,053,690		
700 MS	4,053,895	CLASS 357			500	4,053,944	490	4,053,371	163	4,053,691		
709	4,053,896	17	4,053,914	506	4,053,945	540	4,053,372	4,053,372	173	4,053,692		
785	4,053,897	22	4,053,915	540	4,053,946	573 G	4,053,373	8	4,053,264	181	4,053,693	
CLASS 346			23	4,053,916	575	4,053,947	575	4,053,374	20	4,053,265		
1	4,053,898		4,053,917	575	4,053,948	575	4,053,375	73	4,053,266	223	4,053,694	
68	4,053,899	30	4,053,918	575	4,053,949	575	4,053,376	78	4,053,267	225	4,053,695	
136	4,053,900		4,053,919	575	4,053,950	592	4,053,377	84	4,053,268	CLASS 432		
140 R	4,053,901	38	4,053,920	575	4,053,951	630	4,053,378	113	4,053,269	60	4,053,277	
	4,053,902		4,053,921	575	4,053,952	CLASS 424		144	4,053,270	137	4,053,278	
CLASS 350			51	4,053,922	575	4,053,953	302.1	4,053,271	222	4,053,279		
96 GN	4,053,204	63	4,053,923	575	4,053,954	15	4,053,380	357	4,053,272	CLASS 526		
	4,053,205	64	4,053,924	575	4,053,955	68	4,053,381	381	4,053,273	65	4,053,696	
96 R	4,053,206		4,053,925	575	4,053,956	89	4,053,382	389	4,053,274	142	4,053,697	
117	4,053,207	8	4,053,926	575	4,053,957	90	4,053,383	406	4,053,275	CLASS 536		
150	4,053,208		4,053,927	575	4,053,958	92	4,053,384	562	4,053,276	1	4,053,698	
160 R	4,053,209	29	4,053,928	575	4,053,959	95	4,053,385	562	4,053,277	114	4,053,699	
259	4,053,211	51	4,053,929	575	4,053,960	131	4,053,386	562	4,053,278	CLASS 542		
262	4,053,212	96	4,053,930	575	4,053,961	177	4,053,387	562	4,053,279	434	4,053,466	
310	4,053,241	126	4,053,931	575	4,053,962	200	4,053,388	562	4,053,280	CLASS 544		
CLASS 351			133	4,053,932	180	4,053,389	216	4,053,389	562	4,053,464	21	4,053,286
32	4,053,212	134	4,053,933	180	4,053,390	181	4,053,390	562	4,053,465	25	4,053,469	
38	4,053,213	167	4,053,934	181	4,053,391	200	4,053,391	562	4,053,466	133	4,053,470	
CLASS 352			191	4,053,935	216	4,053,392	216	4,053,392	562	4,053,467	23	4,053,471
191	4,053,214	213	4,053,936	216	4,053,393	244	4,053,393	562	4,053,468	139	4,053,472	
CLASS 353			60	4,053,937	244	4,053,394	244	4,053,394	562	4,053,469	CLASS 548	
116	4,053,215	62	4,053,938	244	4,053,395	244	4,053,395	562	4,053,470	336	4,053,482	
CLASS 354			77	4,053,939	244	4,053,396	244	4,053,396	562	4,053,471	CLASS 560	
1	4,053,903	37	4,053,940	244	4,053,397	244	4,053,397	562	4,053,472	4	4,053,504	
	4,053,904	42	4,053,941	244	4,053,398	244	4,053,398	562	4,053,473	53	4,053,502	
	4,053,905	62	4,053,942	244	4,053,399	244	4,053,399	562	4,053,474	60	4,053,500	
	4,053,906	68	4,053,943	244	4,053,400	244	4,053,400	562	4,053,475	103	4,053,501	
29	4,053,907	171	4,053,944	244	4,053,401	244	4,053,401	562	4,053,476	202	4,053,503	
CLASS 355			127	4,053,945	244	4,053,402	244	4,053,402	562	4,053,477	CLASS 560	
	4,053,908	161	4,053,946	244	4,053,403	244	4,053,403	562	4,053,478	4	4,053,504	
	4,053,909	171	4,053,947	244	4,053,404	244	4,053,404	562	4,053,479	53	4,053,502	
	4,053,910	171	4,053,948	244	4,053,405	244	4,053,405	562	4,053,480	60	4,053,500	
	4,053,911	171	4,053,949	244	4,053,406	244	4,053,406	562	4,053,481	103	4,053,501	
	4,053,912	171	4,053,950	244	4,053,407	244	4,053,407	562	4,053,482	202	4,053,503	
	4,053,913	171	4,053,951	244	4,053,408	244	4,053,408	562	4,053,483	202	4,053,503	
	4,053,914	171	4,053,952	244	4,053,409	244	4,053,409	562	4,053,484	202	4,053,503	
	4,053,915	171	4,053,953	244	4,053,410	244	4,053,410	562	4,053,485	202	4,053,503	
	4,053,916	171	4,053,954	244	4,053,411	244	4,053,411	562	4,053,486	202	4,053,503	
	4,053,917	171	4,053,955	244	4,053,412	244	4,053,412	562	4,053,487	202	4,053,503	
	4,053,918	171	4,053,956	244	4,053,413	244	4,053,413	562	4,053,488	202	4,053,503	
	4,053,919	171	4,053,957	244	4,053,414	244	4,053,414	562	4,053,489	202	4,053,503	
	4,053,920	171	4,053,958	244	4,053,415	244	4,053,415	562	4,053,490	202	4,053,503	
	4,053,921	171	4,053,959	244	4,053,416	244	4,053,416	562	4,053,491	202	4,053,503	
	4,053,922	171	4,053,960	244	4,053,417	244	4,053,417	562	4,053,492	202	4,053,503	
	4,053,923	171	4,053,961	244	4,053,418	244	4,053,418	562	4,053,493	202	4,053,503	
	4,053,924	171	4,053,962	244	4,053,419	244	4,053,419	562	4,053,494	202	4,053,503	
	4,053,925	171	4,053,963	244	4,053,420	244	4,053,420	562	4,053,495	202	4,053,503	
	4,053,926	171	4,053,964	244	4,053,421	244	4,053,421	562	4,053,496	202	4,053,503	
	4,053,927	171	4,053,965	244	4,053,422	244	4,053,422	562	4,053,497	202	4,053,503	
	4,053,928	171	4,053,966	244	4,053,423	244	4,053,423	562	4,053,498	202	4,053,503	
	4,053,929	171	4,053,967	244	4,053,424	244	4,053,424	562	4,053,499	202	4,053,503	
	4,053,930	171	4,053,968	244	4,053,425	244	4,053,425	562	4,053,500	202	4,053,503	
	4,053,931	171	4,053,969	244	4,053,426	244	4,053,426	562	4,053,501	202	4,053,503	
	4,053,932	171	4,053,970	244	4,053,427	244	4,053,427	562	4,053,502	202	4,053,503	
	4,053,933	171	4,053,971	244	4,053,428	244	4,053,428	562	4,053,503	202	4,053,503	
	4,053,934	171	4,053,972	244	4,053,429	244	4,053,429	562	4,053,504	202	4,053,503	
	4,053,935	171	4,053,973	244	4,053,430	244	4,053,430	562	4,053,505	202	4,053,503	
	4,053,936	171	4,053,974	244	4,053,431	244	4,053,431	562	4,053,506	202	4,053,503	
	4,053,937	171	4,053,975	244	4,053,432	244	4,053,432	562	4,053,507	202	4,053,503	
	4,053,938	171	4,053,976	244	4,053,433	244	4,053,433	562	4,053,508	202	4,053,503	
	4,053,939	171	4,053,977	244	4,053,434	244	4,053,434	562	4,053,509	202	4,053,503	
	4,053,940	171	4,053,978	244	4,053,43							

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,053,174	4,053,042	4,053,766	4,053,011	4,053,045	4,053,823
4 : 4,053,919	4,053,052	4,053,768	4,053,050	4,053,055	4,053,843
4,052,717	4,053,053	4,053,774	4,053,257	4,053,075	4,053,868
4,052,810	4,053,098	4,053,780	4,053,299	4,053,076	4,053,933
4,052,910	4,053,100	4,053,797	4,053,316	4,053,082	Re: 29,440
4,053,045	4,053,104	4,053,810	4,053,612	4,053,084	4,052,786
4,053,346	4,053,121	4,053,821	4,053,634	4,053,090	4,052,820
4,053,649	4,053,123	4,053,828	4,053,651	4,053,091	4,052,851
4,053,718	4,053,125	4,053,832	4,053,745	4,053,103	4,052,868
4,053,785	4,053,156	4,053,844	4,052,753	4,053,120	4,052,919
4,053,783	4,053,167	4,053,849	4,052,758	4,053,131	4,053,033
4,053,817	4,053,177	4,053,851	4,052,790	4,053,139	4,053,039
4,053,884	4,053,187	4,053,852	4,052,829	4,053,158	4,053,111
4,053,889	4,053,215	4,053,857	4,052,879	4,053,159	4,053,150
4,053,896	4,053,219	4,053,863	4,052,899	4,053,162	4,053,260
4,053,915	4,053,231	4,053,865	4,053,933	4,053,166	4,053,698
4,053,943	4,053,238	4,053,867	4,053,013	4,053,170	4,052,797
5 : 4,053,288	4,053,284	4,053,910	4,053,017	4,053,171	4,052,902
4,053,318	4,053,288	4,053,918	4,053,189	4,053,172	4,053,058
4,053,294	4,053,294	4,053,919	4,053,191	4,053,178	4,053,282
6 : Re: 29,456	4,053,309	4,053,924	4,053,191	4,053,179	4,053,290
4,052,756	4,053,349	4,053,926	4,053,255	4,053,188	4,053,071
4,052,799	4,053,351	4,053,928	4,053,264	4,053,191	4,052,814
4,052,764	4,053,353	4,053,931	4,053,291	4,053,192	4,052,849
4,052,778	4,053,362	4,053,936	4,053,295	4,053,193	4,053,059
4,052,782	4,053,362	4,053,944	4,053,299	4,053,194	4,052,955
4,052,787	4,053,362	4,053,946	4,053,299	4,053,194	4,053,005
4,052,803	4,053,362	4,053,946	4,053,299	4,053,194	4,053,063
4,052,813	4,053,362	4,053,946	4,053,299	4,053,194	4,053,574
4,052,822	4,053,362	4,053,946	4,053,299	4,053,194	4,052,811
4,052,824	4,053,362	4,053,946	4,053,299	4,053,194	4,052,889
4,052,836	4,053,362	4,053,946	4,053,299	4,053,194	4,052,927
4,052,846	4,053,362	4,053,946	4,053,299	4,053,194	4,052,943
4,052,858	4,053,362	4,053,946	4,053,299	4,053,194	4,053,081
4,052,864	4,053,362	4,053,946	4,053,299	4,053,194	4,053,110
4,052,864	4,053,362	4,053,946	4,053,299	4,053,194	4,053,229
4,052,892	4,053,362	4,053,946	4,053,299	4,053,194	4,053,327
4,052,896	4,053,362	4,053,946	4,053,299	4,053,194	4,053,337
4,052,897	4,053,362	4,053,946	4,053,299	4,053,194	4,053,377
4,052,912	4,053,362	4,053,946	4,053,299	4,053,194	4,053,406
4,052,924	4,053,362	4,053,946	4,053,299	4,053,194	4,053,735
4,052,931	4,053,362	4,053,946	4,053,299	4,053,194	4,053,886
4,052,948	4,053,362	4,053,946	4,053,299	4,053,194	4,053,890
4,052,949	4,053,362	4,053,946	4,053,299	4,053,194	4,053,916
4,052,951	4,053,362	4,053,946	4,053,299	4,053,194	4,053,917
4,052,966	4,053,362	4,053,946	4,053,299	4,053,194	4,053,936
4,052,973	4,053,362	4,053,946	4,053,299	4,053,194	4,052,817
4,052,974	4,053,362	4,053,946	4,053,299	4,053,194	4,052,901
4,052,975	4,053,362	4,053,946	4,053,299	4,053,194	4,052,928
4,052,980	4,053,362	4,053,946	4,053,299	4,053,194	4,053,077
4,052,984	4,053,362	4,053,946	4,053,299	4,053,194	4,053,085
4,052,994	4,053,362	4,053,946	4,053,299	4,053,194	4,053,105
4,053,007	4,053,362	4,053,946	4,053,299	4,053,194	4,053,132
4,053,037	4,053,362	4,053,946	4,053,299	4,053,194	
4,053,040	4,053,362	4,053,946	4,053,299	4,053,194	

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

PI 57

	4,053,233	32 :	4,053,305	36 :	4,053,940	4,053,883	4,052,886	4,052,915
	4,053,319		4,053,386		4,052,762	4,053,895	4,052,895	4,052,944
	4,053,338	33 :	4,052,891		4,052,766	4,053,903	4,052,898	4,052,995
	4,053,603		4,053,195		4,052,792	4,053,904	4,052,911	4,053,023
	4,053,669		4,053,860		4,052,793	4,053,906	4,052,913	4,053,027
	4,053,682	34 :	Re: 29,438		4,052,794	4,053,922	4,052,922	4,053,043
	4,053,684		4,052,941		4,052,806	4,053,934	4,052,925	4,053,062
	4,053,692		4,052,946		4,052,816	4,053,942	4,053,008	4,053,097
	4,053,711		4,052,981		4,052,854	4,053,948	4,053,038	4,053,140
	4,053,805		4,052,985		4,052,856	4,052,818	4,053,051	4,053,145
	4,053,814		4,052,988		4,052,904	4,052,983	4,053,067	4,053,235
	4,053,850		4,052,997		4,052,909	4,053,441	4,053,068	4,053,285
	4,053,861		4,053,047		4,052,921	4,053,644	4,053,078	4,053,306
	4,053,864		4,053,048		4,052,923	4,053,646	4,053,133	4,053,343
	4,053,905		4,053,066		4,052,926	4,053,708	4,053,176	4,053,356
26 :	4,052,775		4,053,161		4,052,970	4,052,783	4,053,182	4,053,363
	4,052,801		4,053,204		4,052,982	4,052,819	4,053,184	4,053,365
	4,052,857		4,053,206		4,052,987	4,052,821	4,053,194	4,053,376
	4,052,883		4,053,269		4,052,989	4,052,894	4,053,199	4,053,388
	4,052,905		4,053,274		4,053,101	4,052,936	4,053,247	4,053,393
	4,052,967		4,053,286		4,053,106	4,052,938	4,053,249	4,053,422
	4,052,998		4,053,324		4,053,128	4,052,979	4,053,303	4,053,424
	4,053,001		4,053,350		4,053,142	4,053,112	4,053,323	4,053,513
	4,053,049		4,053,373		4,053,151	4,053,135	4,053,325	4,053,520
	4,053,070		4,053,387		4,053,154	4,053,136	4,053,329	4,053,522
	4,053,102		4,053,390		4,053,169	4,053,137	4,053,331	4,053,525
	4,053,146		4,053,395		4,053,198	4,053,160	4,053,332	4,053,533
	4,053,157		4,053,396		4,053,202	4,053,196	4,053,333	4,053,535
	4,053,163		4,053,396		4,053,205	4,053,242	4,053,347	4,053,538
	4,053,164		4,053,397		4,053,213	4,053,250	4,053,355	4,053,553
	4,053,164		4,053,400		4,053,214	4,053,270	4,053,358	4,053,599
	4,053,173		4,053,416		4,053,216	4,053,275	4,053,359	4,053,853
	4,053,193		4,053,425		4,053,217	4,053,342	4,053,372	4,053,899
	4,053,230		4,053,426		4,053,218	4,053,345	4,053,386	4,053,900
	4,053,252		4,053,430		4,053,220	4,053,346	4,053,391	4,053,923
	4,053,253		4,053,445		4,053,221	4,053,357	4,053,391	4,053,951
	4,053,267		4,053,459		4,053,224	4,053,428	4,053,421	4,052,831
	4,053,371		4,053,468		4,053,226	4,053,451	4,053,432	4,053,552
	4,053,385		4,053,471		4,053,228	4,053,452	4,053,435	4,053,263
	4,053,389		4,053,484		4,053,232	4,053,453	4,053,439	4,052,826
	4,053,404		4,053,486		4,053,262	4,053,454	4,053,444	4,052,961
	4,053,423		4,053,487		4,053,262	4,053,455	4,053,456	4,053,015
	4,053,470		4,053,490		4,053,310	4,053,458	4,053,467	4,053,056
	4,053,485		4,053,493		4,053,311	4,053,498	4,053,479	4,053,060
	4,053,500		4,053,514		4,053,312	4,053,544	4,053,499	4,053,092
	4,053,502		4,053,518		4,053,313	4,053,551	4,053,538	4,053,153
	4,053,543		4,053,530		4,053,334	4,053,560	4,053,571	4,053,237
	4,053,587		4,053,532		4,053,335	4,053,565	4,053,605	4,053,636
	4,053,611		4,053,534		4,053,378	4,053,572	4,053,663	4,053,884
	4,053,633		4,053,548		4,053,381	4,053,629	4,053,679	4,052,780
	4,053,683		4,053,554		4,053,394	4,053,638	4,053,686	4,052,808
	4,053,736		4,053,563		4,053,399	4,053,666	4,053,701	4,052,832
	4,053,790		4,053,567		4,053,438	4,053,701	4,053,710	4,052,835
27 :	4,052,760		4,053,570		4,053,443	4,053,742	4,053,725	4,052,903
	4,052,767		4,053,573		4,053,450	4,053,757	4,053,728	4,053,072
	4,052,935		4,053,578		4,053,475	4,053,803	4,053,762	4,053,093
	4,053,002		4,053,581		4,053,528	4,053,809	4,053,772	4,053,118
	4,053,004		4,053,589		4,053,531	4,053,811	4,053,776	4,053,124
	4,053,036		4,053,591		4,053,549	4,053,817	4,053,786	4,053,180
	4,053,279		4,053,596		4,053,561	4,053,830	4,053,833	4,053,244
	4,053,433		4,053,599		4,053,593	4,052,893	4,053,866	4,053,293
	4,053,519		4,053,600		4,053,671	4,052,996	4,053,894	4,053,340
	4,053,545		4,053,602		4,053,689	4,053,914	4,052,755	4,053,348
	4,053,575		4,053,606		4,053,691	4,053,014	4,053,030	4,053,555
	4,053,576		4,053,610		4,053,754	4,053,129	4,053,339	4,053,641
	4,053,699		4,053,613		4,053,764	4,053,369	4,053,559	4,053,775
	4,053,702		4,053,616		4,053,773	4,053,436	4,052,809	4,052,885
	4,053,730		4,053,631		4,053,792	4,053,515	4,053,069	4,052,939
	4,053,789		4,053,652		4,053,804	4,053,524	4,053,673	4,052,788
	4,053,872		4,053,654		4,053,813	4,053,533	4,053,674	4,052,871
	4,053,897		4,053,655		4,053,825	4,053,535	4,053,761	4,052,954
29 :	4,053,192		4,053,657		4,053,834	4,053,536	4,052,754	4,053,032
	4,053,290		4,053,676		4,053,839	4,053,645	4,052,771	4,053,183
	4,053,412		4,053,712		4,053,842	4,053,025	4,052,781	4,053,664
	4,053,501		4,053,722		4,053,845	4,053,302	4,052,799	4,052,954
	4,053,505		4,053,746		4,053,855	4,053,630	4,052,827	4,053,801
	4,053,542		4,053,748		4,053,873	4,052,752	4,052,838	4,053,820
	4,053,643		4,053,822		4,053,875	4,052,773	4,052,861	4,053,938
	4,053,787		4,053,841		4,053,879	4,052,841	4,052,884	
	4,052,785		4,053,891		4,053,880	4,052,867		
30 :	4,052,880		4,053,920		4,053,882	4,052,881		
31 :								

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

October 18, 1977

Volume 963

Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Trademark Rules of Practice

The ninth edition of the Trademark Rules of Practice, dated December 1976, is now available. It replaces the previous edition in its entirety.

The Rules are in looseleaf form so as to accommodate revisions. New subscriptions may be ordered from:

Superintendent of Documents
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The charge is \$5.00 for domestic mailing and \$8.25 for foreign mailing. Prior subscribers were sent a notice of expiration by the Government Printing Office in January, 1977.

The Rules booklet is available only by subscription. When revisions are issued, they are a part of the subscription and are mailed automatically. Revisions are announced in the OFFICIAL GAZETTE of the Patent and Trademark Office.

BERNARD A. MEANY,

Sept. 16, 1977. Assistant Commissioner for Trademarks.

Availability of Foreign Language Oaths and Declarations for Patent Applications

The changes in the Rules of Practice in Patent Cases published earlier this year in the Federal Register of January 28, 1977 (42 F.R. 5588) and the OFFICIAL GAZETTE of February 22, 1977 (955 O.G. 1054) added a new rule 1.69 which requires in paragraph (a) that whenever an individual making an oath or declaration cannot understand English, the oath or declaration must be in a language that such individual can understand. Paragraph (b) provides that unless the text of any oath or declaration in a language other than English is a form provided or approved by the Patent and Trademark Office, it must be accompanied by or have filed later a verified English translation. New rule 1.69 becomes effective on January 1, 1978.

The purpose of this notice is to set forth procedures for obtaining copies of non-English language forms and translations from the Patent and Trademark Office.

The Patent and Trademark Office currently has available for free distribution on a one copy per language basis, copies of non-English language declaration forms for use in original patent applications. These copies should be kept as masters from which additional copies may be made and used as needed.

Application declaration forms are available in the following thirteen languages:

German	Spanish
Japanese	Danish
French	Finnish
Swedish	Norwegian
Italian	Czech
Dutch	Hungarian
Russian	

Single copies may be obtained from the receptionist in the lobby of Building 3 of Crystal Plaza, Jefferson Davis Highway, Arlington, Virginia and by mail from the Correspondence and Mail Branch. The address is:

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Distributions of these forms is also being made in various patent associations around the country.

The Office also has available from the same sources on a single copy basis, translations of the original application declaration into the following languages:

Portuguese	Chinese
Romanian	Polish
Greek	Bulgarian
Korean	Indonesian
Arabic	

A looseleaf booklet of full size forms is currently being developed. This booklet will provide master forms which

may be copied on office copiers. The forms to be included are oath and declaration forms in all of the languages mentioned above as well as most of the English language patent and trademark forms used by the public. It is expected that the booklet should be available early in 1978. A further notice will be issued when the printing date and sales price are known.

Since a booklet including all languages will soon be available, copies of forms in only those languages for which a need is clearly expected should be ordered in order to keep Office costs to a minimum.

RENE D. TEGTMEYER,

Sept. 28, 1977. Assistant Commissioner for Patents.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,335,958, A. L. Parker, SEALING AND ANTI-SEIZE COMPOSITION AND ARTICLE COATED THEREWITH; 2,421,105, R. F. Warren, Jr., LOCK NUT; 3,008,177, J. P. Viljo, THREAD LOCK AND METHOD OF MAKING THE SAME, filed June 4, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1514, USM Corporation v. Standard Pressed Steel Co.

2,421,105. (See 2,335,958.)

3,040,196, J. F. Grado, ELECTRO-MECHANICAL TRANS-DUCER, filed May 26, 1976, D.C., S.D.N.Y., Doc. 76-C-2369, Joseph F. Grado v. Ortofon, Inc. Defendant is hereby permanently enjoined from infringing said patent, subject to conditions of settlement agreement, entered May 26, 1977.

3,093,177. (See 2,335,958.)

3,193,404, C. Davis, ASSOCIATED DYE SALTS AND METHOD OF FORMING COLORED INDICIA THEREWITH; 3,278,327, same, COLORLESS RECORDING PAPER, filed May 27, 1977, D.C. Del. (Wilmington), Doc. 77-199, Scott Paper Company v. Moore Business Forms, Inc.

3,232,581, J. S. Swearingen, ADJUSTABLE TURBINE INLET NOZZLES; 3,360,239, same, OIL FREE TURBINE ASSEMBLY; 3,375,903, same, ANTI-CAVITATIONAL ROTATIONAL POWER ABSORBER AND BEARING LUBRICATION SYSTEM THEREFOR; 3,495,921, same, VARIABLE NOZZLE TURBINE; 3,647,606, same, METHOD OF AND APPARATUS FOR DETECTING DEPOSITION IN TURBO-EXPANDER; 3,895,589, Garner and Webb, SEED PLANTING APPARATUS, filed Mar. 23, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77-1088-HP, Roto-Flow Corp. v. Mast-Trench Corp. et al.

3,278,327. (See 3,193,404.)

3,299,534, Stull and Ferguson, FRICTIONLESS TRACK AND GLIDERS HAVING AIR BEARING SURFACES FOR DEMONSTRATING MECHANICAL PRINCIPLES, filed May 18, 1977, D.C. Mass. (Boston), Doc. CA77-1423-T, The Ealing Corporation v. Deadalon Corporation.

3,309,459, D. S. Donigian, COLOR TELEVISION SERVING INSTRUMENT, filed Aug. 31, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2261, Donald S. Donigian v. Zenith Radio Corporation. Final Order dismissing action with prejudice, entered June 5, 1975.

3,343,014, A. R. D. Giles, SYNCHRONOUS MOTORS, filed May 24, 1977, D.C. Mass. (Boston), Doc. CA77-1479-S, Plessey-UK Limited v. Sigma Instruments Inc.

3,360,239. (See 3,232,581.)

3,375,903. (See 3,232,581.)

3,495,921. (See 3,232,581.)

3,432,372, J. Avot, MANUFACTURE OF CORRUGATED CARDBOARD, filed in the U.S. District Court, Del. (Wilmington), Doc. 4617, International Paper Company v. Fibreboard Corporation. It is hereby stipulated that this action and all pleadings herein be dismissed with prejudice, Jan. 24, 1977.

3,547,606. (See 3,232,581.)

OCTOBER 18, 1977

U. S. PATENT AND TRADEMARK OFFICE

963 OG 17

3,690,836, Bulsiere, Colobert and Montagnon, DEVICE FOR USE IN THE STUDY OF CHEMICAL AND BIOLOGICAL REACTIONS AND METHOD OF MAKING SAME, filed May 27, 1977, D.C., S.D.N.Y., Doc. 77-C-2636, American Home Products Corp. v. Inolex Corporation et al.

3,895,589. (See 3,232,581.)

3,942,157, L. L. Azure, DATA GATHERING FORMATTING AND TRANSMITTING SYSTEM HAVING PORTABLE DATA COLLECTING DEVICE; 4,016,542, same, ELECTRONIC NOTEBOOK FOR USE IN DATA GATHERING, FORMATTING AND TRANSMITTING SYSTEM, filed May 19, 1977, D.C., W.D. Wash. (Seattle), Doc. C77-3758 Azur-data Incorporated v. MSI Data Corporation.

4,016,542. (See 3,942,157.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,478,746, Re. S.N. 824,799, Filed Aug. 15, 1977, Cl. 128/421, CARDIAC IMPLANTABLE DEMAND PACE-MAKER, Wilson Greatbatch, Owner of Record: Medtronic, Inc., Minneapolis, Minn., Attorney or Agent: Tom Arnold, et al., Ex. Gp.: 335

3,586,413, Re. S.N. 827,117, Filed Aug. 23, 1977, Cl. 350/7, APPARATUS FOR PROVIDING ENERGY COMMUNICATION BETWEEN A MOVING AND A STATIONARY TERMINAL, Dale A. Adams, Owner of Record: Baxter Laboratories, Inc., Morton Grove, Ill., Attorney or Agent: Paul C. Flattery, et al., Ex. Gp.: 257

3,653,494, Re. S.N. 791,539, Filed Apr. 27, 1977, Cl. 198/195, ARTICULATED LINK CONVEYOR, Eldon S. Miller, Owner of Record: Inventor, Attorney or Agent: Alfred C. Body, Ex. Gp.: 313

3,697,559, Re. S.N. 827,719, Filed Aug. 25, 1977, Cl. 260/397.2, 1,25-DIHYDROXYCHOLECALCIFEROL, Hector F. De Luca, et al., Owner of Record: Wisconsin Alumni Research Foundation, Madison, Wis., Attorney or Agent: Howard W. Bremer, Ex. Gp.: 124

3,767,706, Re. S.N. 828,682, Filed Aug. 29, 1977, Cl. 260/561 N, HYDRATION OF ALIPHATIC NITRILES TO AMIDES USING COPPER METAL CATALYSTS PROTECTED FROM OXYGEN, Clarence E. Habermann, et al., Owner of Record: The Dow Chemical Company, Midland, Mich., Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 117

3,873,884, Re. S.N. 828,650, Filed Aug. 29, 1977, Cl. 315/267, ELECTRODELESS DISCHARGE LAMP AND POWER COUPLER THEREFOR, Fred C. Gabriel, Owner of Record: The Perkin-Elmer Corporation, Norwalk, Conn., Attorney or Agent: James H. Callahan, et al., Ex. Gp.: 256

3,890,452, Re. S.N. 820,830, Filed Aug. 1, 1977, Cl. 426/321, METHOD OF REDUCING THE AFLATOXIN CONTACT OF OILSEED MEAL PRODUCTS, Jean Brandt, et al., Owner of Record: Etablissements V. Q. Petersen & Cie, Senegal, West Africa, Attorney or Agent: Robert E. Burns, et al., Ex. Gp.: 172

3,899,581, Re. S.N. 822,695, Filed Aug. 8, 1977, Cl. 424/241, TRIAMCINOLONE ACETONIDE DERIVATIVE,

Agustin Agusti, Owner of Record: J. Uriach & Cia S. A., Barcelona, Spain, Attorney or Agent: Michael J. Striker, Ex. Gp.: 124

3,934,823, Re. S.N. 828,913, Filed Aug. 29, 1977, Cl. 239/472, LOW DRIFT SPRAY NOZZLE, Kenneth E. Reed, Owner of Record: Delavan Manufacturing Company, West Des Moines, Iowa, Attorney or Agent: George B. Newitt, et al., Ex. Gp.: 313

3,938,440, Re. S.N. 819,795, Filed July 28, 1977, Cl. 102/38, MIXED PROPELLANT CHARGE, James K. Dooley, et al., Owner of Record: Olin Corporation, New Haven, Conn., Attorney or Agent: Paul J. Lerner, et al., Ex. Gp.: 221

3,948,401, Re. S.N. 823,994, Filed Aug. 12, 1977, Cl. 214/301, METHOD AND APPARATUS FOR STORING AND DISPLAYING FRUIT, Charles E. Spencer, Owner of Record: Inventor, Attorney or Agent: Peter P. Price, et al., Ex. Gp.: 314

3,948,444, Re. S.N. 828,912, Filed Aug. 29, 1977, Cl. 239/11, LOW DRIFT SPRAY METHOD, Kenneth E. Reed, Owner of Record: Delavan Manufacturing Company, West Des Moines, Iowa, Attorney or Agent: George B. Newitt, et al., Ex. Gp.: 313

3,954,574, Re. S.N. 827,958, Filed Aug. 26, 1977, Cl. 204/43 T, TRIVALENT CHROMIUM ELECTROPLATING BATHS AND ELECTROPLATING THEREFROM, Jeffrey Gyllenspetz, et al., Owner of Record: Albright & Wilson Limited, Warley, England, Attorney or Agent: Robert D. Flynn, et al., Ex. Gp.: 114

3,959,591, Re. S.N. 824,629, Filed Aug. 15, 1977, Cl. 179/6 R, TELEPHONE ANSWERING APPARATUS, James R. Darwood, Owner of Record: T. A. D. Avanti, Inc., Paramount, Calif., Attorney or Agent: Keith D. Beecher, Ex. Gp.: 235

3,959,681, Re. S.N. 825,361, Filed Aug. 17, 1977, Cl. 313/188, DISPLAY PANEL HAVING ROWS AND COLUMNS OF COPLANAR SCAN AND DISPLAY CATHODES AND LARGE-AREA ANODE, Edgar L. Harvey, Owner of Record: Burroughs Corporation, Detroit, Mich., Attorney or Agent: Robert A. Green, Ex. Gp.: 252

3,963,103, Re. S.N. 829,300, Filed Aug. 31, 1977, Cl. 190/52, COMBINED CARRYING BAG AND RACKET CARRIER, Arthur T. Cowen, III, Owner of Record: Inventor, Attorney or Agent: Hubert T. Mandeville, et al., Ex. Gp.: 241

3,966,540, Re. S.N. 824,853, Filed Aug. 15, 1977, Cl. 162/13, MANUFACTURE OF FIBERBOARD ACCORDING TO THE WET METHOD WITH CLOSED BACKWATER SYSTEM, Stig Daniel Selander, et al., Owner of Record: Isorel S. A., Puteaux, France and Stig Daniel Selander, Stockholm, Sweden, Attorney or Agent: Eric Y. Munson, Ex. Gp.: 173

4,038,222, Re. S.N. 822,772, Filed Aug. 8, 1977, Cl. 260/8, UNTRIAXONAPEPTIDE WITH OPIATE ACTIVITY, Choh Hao Li, Owner of Record: Hoffman-La Roche Inc., Nutley, N.J., Attorney or Agent: Samuel L. Welt, et al., Ex. Gp.: 143

PATENT NOTICES

Certificates of Correction for the Week of Oct. 18, 1977

P.P. 3,937	3,967,446	4,014,330
D. 241,688	3,971,438	4,015,016
3,924,632	3,972,418	4,015,108
3,978,051	3,972,612	4,015,349
3,988,705	3,972,727	4,016,121
3,721,718	3,972,758	4,016,155
3,763,480	3,972,985	4,016,865
3,783,735	3,974,109	4,016,877
3,867,454	3,975,314	4,017,317
3,877,423	3,975,415	4,017,488
3,884,673	3,975,458	4,017,620
3,899,377	3,975,477	4,018,215
3,902,939	3,975,490	4,018,272
3,906,455	3,975,514	4,018,591
3,912,656	3,975,527	4,018,644
3,914,634	3,975,530	4,018,809
3,919,031	3,975,570	4,018,818
3,927,146	3,975,648	4,019,383
3,932,470	3,976,040	4,019,622
3,933,888	3,976,421	4,020,082
3,939,566	3,976,488	4,021,800
3,940,396	3,977,175	4,022,301
3,948,380	3,977,790	4,022,470
3,951,945	3,978,092	4,022,797
3,952,770	3,980,791	4,022,846
3,955,116	3,982,204	4,022,848
3,955,977	3,982,325	4,022,977
3,957,204	3,982,476	4,023,882
3,957,696	3,983,570	4,024,271
3,957,719	3,984,529	4,025,404
3,958,284	3,985,549	4,025,623
3,958,531	3,985,773	4,025,655
3,960,701	3,991,080	4,027,405
3,960,858	3,991,710	4,027,836
3,963,424	3,993,826	4,028,096
3,963,661	3,995,809	4,028,401
3,963,699	3,995,903	4,029,049
3,963,752	4,000,823	4,029,209
3,964,608	4,001,240	4,029,225
3,964,785	4,006,770	4,029,433
3,965,112	4,009,200	4,029,645
3,965,562	4,009,435	4,029,768
3,965,734	4,010,461	4,030,065
3,965,785	4,011,830	4,030,180
3,965,873	4,011,975	4,030,211
3,966,798	4,012,962	4,030,435
3,967,058	4,013,594	4,030,914

Disclaimers

3,384,050.—*Marcel A. R. Point*, Grenoble, France. ELECTRO-STATIC COATING SYSTEM. Patent dated May 21, 1968. Disclaimer filed Apr. 29, 1977, by the assignee, *Societe Anonyme de Machines Electrostatiques*.

Hereby enters this disclaimer to claims 1, 2, 3 and 4 of said patent.

3,770,711.—*Martval John Hartig and John Edward Hansen*, Wilmington, Del. ORIENTED STRUCTURES OF TETRAFLUOROETHYLENE/PERFLUORO (ALKYL VINYL ETHER) COPOLYMER. Patent dated Nov. 6, 1973. Disclaimer filed Aug. 26, 1977, by the assignee, *E. I. du Pont de Nemours and Company*.

Hereby enters this disclaimer to claim 3 of said patent.

3,874,386.—*Theodore F. Kosak*, Peekskill, N.Y. PRESSURE-SENSITIVE TAPE FASTENER FOR DISPOSABLE DIAPERS. Patent dated Apr. 1, 1975. Disclaimer filed Aug. 18, 1977, by the assignee, *Union Carbide Corporation*.

Hereby enters this disclaimer to claims 1 through 6 of said patent.

3,948,789.—*William T. Brooks*, Midland, Mich. ELECTRICAL DEVICES CONTAINING IMPROVED DIELECTRIC FLUIDS. Patent dated Apr. 6, 1976. Disclaimer filed Aug. 29, 1977, by the assignee, *Dow Corning Corporation*.

Hereby enters this disclaimer to claims 1 through 5, inclusive, of said patent.

4,004,158.—*David Keith Morgan*, Flemington, N.J. KEYED COMPARATOR. Patent dated Jan. 18, 1977. Disclaimer filed Aug. 11, 1977, by the assignee, *RCA Corporation*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,016,043.—*Antonius H. W. M. Schuur, Bauke K. Van Weemen, and Gerrit Wolters*, Oss, Netherlands. ENZY-MATIC IMMUNOLOGICAL METHOD FOR THE DETERMINATION OF ANTIGENS AND ANTIBODIES. Patent dated Apr. 5, 1977. Disclaimer filed June 20, 1977, by the assignee, *Akzona Incorporated*.

The term of this patent subsequent to Feb. 12, 1991, has been disclaimed.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 27, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director.....	8-30-76
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director.....	9-17-76
Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director.....	6-1-76
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director.....	10-21-76
Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director.....	10-6-76
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director.....	7-26-76
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director.....	6-7-76
Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director.....	8-17-76
Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director.....	3-8-77
Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director.....	6-25-76
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	
DESIGNS, GROUP 290—C. D. QUARFORTH, Director.....	1-15-76
Industrial Arts; Household, Personal and Fine Arts.	
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director.....	10-5-76
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director.....	11-24-76
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director.....	9-3-76
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director.....	9-16-76
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director.....	1-3-77
Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	

Expiration of patents: The patents within the range of numbers indicated below expire during August 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,947,001 to 2,951,243, inclusive
Plant Patents..... Numbers 1,963 to 1,969, inclusive

REISSUE PATENTS

GRANTED OCTOBER 18, 1977

ERRATA

For
CLASS

340-150

See
PATENT NO.

29,450

REISSUES

OCTOBER 18, 1977

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,442

APPARATUS FOR PRODUCING CARTONS

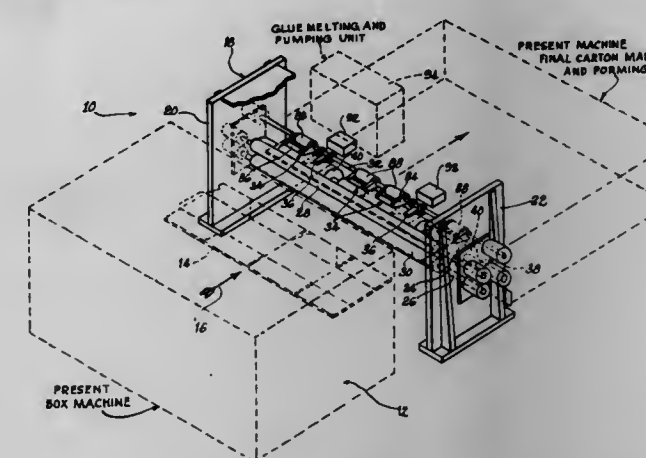
Walter J. Stolkin, Chicago; William A. Riley, Woodridge, both of Ill., and Henry J. Sejda, Munster, Ind., assignors to Stolmar Corporation, Chicago, Ill.

Original No. 3,884,130, dated May 20, 1975, Ser. No. 454,256, Mar. 25, 1974. Continuation-in-part of Ser. No. 350,936, April 13, 1973, abandoned. Application for reissue Apr. 23, 1976, Ser. No. 679,650

Int. Cl.² B31B 1/36

U.S. Cl. 93—49 R

26 Claims



1. An apparatus for producing a folded carton comprising a bed for supporting a carton blank, said blank including side panels and bottom panels connected to the side panels, means defined by said bottom panels for holding the bottom panels together when the carton is unfolded, said bottom panels being situated in side-by-side relationship in said blank, flaps defined by at least one of said bottom panels, first folding means for folding the bottom panels in over-lying relationship relative to adjacent side panels, *including flippers engaging said bottom panels to move the bottom panels upwardly, said flaps being formed on a pair of bottom panels, second folding means aligned with said first folding means in a direction transverse to the movement of said carton blank for [engaging] restraining said flaps to thereby reversely fold said flaps over onto the bottom panels carrying the flaps, said second folding means including a pair of stationary ploughs positioned in line with said flaps and engaging said flaps during upward movement of the bottom panels, said flaps being driven against the ploughs to fold the flaps over onto the associated panels, means for applying adhesive to selected surface portions of said bottom panels, third folding means for folding each end of the blank over onto inside portions of the blank, each blank end comprising a side and bottom panel, the adhesive on said blank being positioned for contact with said flaps to secure said ends in the folded position, and means for securing said ends together.*

Re. 29,443

FIREPLACE ASSEMBLY FOR MOBILE HOMES

Charles O. Vaughn, c/o Richard J. Hammond, 2345 Partridge Lane, Lancaster, Pa. 17601

Original No. 3,970,067, dated July 20, 1976, Ser. No. 545,980, Jan. 31, 1975. Application for reissue Feb. 15, 1977, Ser. No. 768,900

Int. Cl.² F24B 1/18

U.S. Cl. 126—120

8 Claims

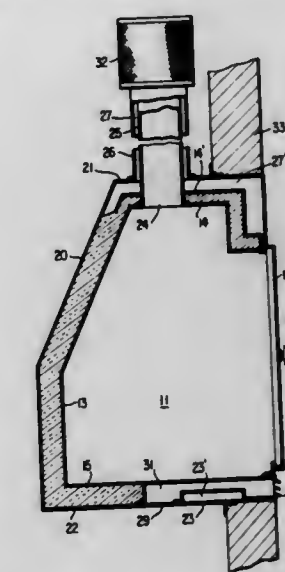
1. A fireplace assembly particularly suited for use with a mobile home or the like, which fireplace assembly comprises in combination:

- A. a firebox housing secured to an exterior wall and communicating with the interior of the mobile home;
- B. a chimney communicating with the interior of the firebox

housing for conducting away the products of combustion formed therein to the exterior of the mobile home;

C. a continuous annular spacing formed in the walls of said firebox housing and said chimney;

D. a combustion air intake means connected to said firebox housing for conducting exterior air directly into the interior of a mobile home *and thereby inhibiting thermosyphonic aspiration* said combustion air intake means including a [first] conduit formed within the lower portion of the firebox housing;



- E. a cooling air intake means connected to said firebox housing for conducting exterior air into said annular spacing for cooling the firebox housing and chimney [said cooling air intake means including a second conduit formed within said first conduit, and thereby inhibiting thermosyphonic aspiration];
- F. a closure means for controlling the passage of combustion air from the interior of the mobile home to the interior of the firebox housing.

Re. 29,444

FASTENER TOOL

Robert H. Alexander, Columbia, S.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Original No. 3,821,991, dated July 2, 1974, Ser. No. 252,479, May 11, 1972. Continuation-in-part of Ser. No. 104,209, Jan. 6, 1971. Application for reissue Mar. 20, 1975, Ser. No. 560,554

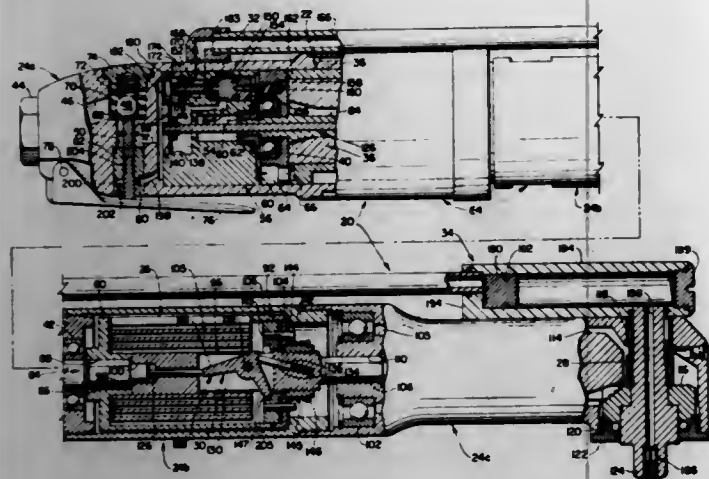
Int. Cl.² B25B 23/14

U.S. Cl. 173—12

27 Claims

1. A tool for tightening fasteners comprising: an output member adapted to have a fastener engaging member attached thereto; a motor; means drive-connecting said motor to said output member; means for supplying operating energy to the motor; torque responsive means operable as the fastener being tightened reaches a selected torque to concomitantly produce a signal to indicate that the fastener has been tightened to the selected torque and to interrupt the flow of operating energy

to the motor; and means activatable by the signal generated by the signal generating means to provide on or in the proximity



of the fastener which has been tightened a visual indication of the reaching of the selected torque by the fastener.

Re. 29,445

PUMP AND ELECTRIC DRIVE MOTOR UNIT

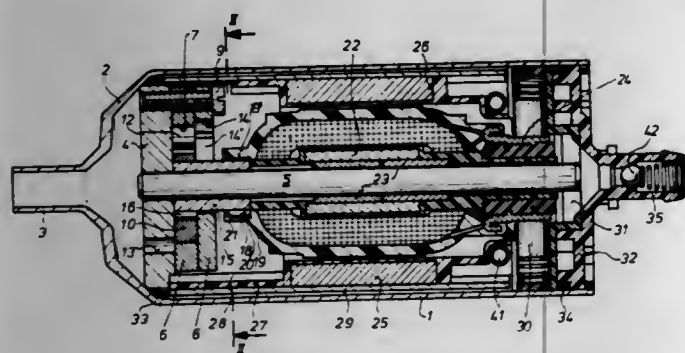
Hermann Nusser, Asperg, Germany; Hendricus van Eeden, Johannesburg, South Africa, and Jurgen Ebert, Stuttgart-Ost, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Original No. 3,801,231, dated Apr. 2, 1974, Ser. No. 282,780, Aug. 22, 1972. Application for reissue Mar. 4, 1976, Ser. No. 663,812

Claims priority, application Germany, Aug. 24, 1971, 2142258 Int. Cl.² F04B 17/00

U.S. Cl. 417—366

13 Claims

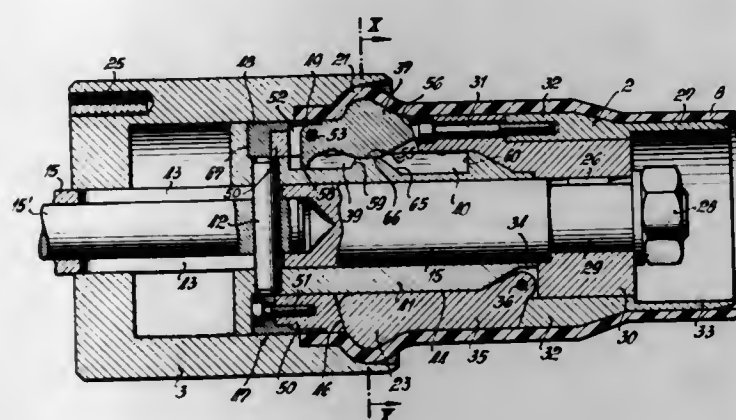


1. A pump-and-motor unit comprising, in combination:
 - A. an elongated external housing having an inlet opening at one end and an outlet opening at the other end;
 - B. a base body contained in said external housing and formed of
 1. a metal disc secured [at one end] within said external housing adjacent one of said openings and
 2. a stationary shaft affixed to said metal disc and extending within said external housing [substantially along the entire length thereof] toward said other opening;
 - C. an electrical motor including an armature [axially spaced from] located between said metal disc and said other opening and journaling on said stationary shaft and being exposed to the [flow of] liquid [medium through said pump-and-motor unit] flowing from said inlet opening to said outlet opening;
 - D. a pump rotor member disposed within said external housing; and
 - E. means rotationally coupling said pump rotor member to said armature.

Re. 29,446
APPARATUS FOR SHAPING THE END OF A TUBE
 Max Sonleitner, Oberaltaich, near Bogen; Karl Hermann Wolf, Bogen, and Johann Gutthuber, Irlbach, near Straubing, all of Germany, assignors to Thyssen Plastik Anger, Germany
 Original No. 3,205,535, dated Sept. 14, 1965, Ser. No. 176,179, Feb. 23, 1962. Application for reissue July 19, 1976, Ser. No. 706,672
 Claims priority, application Germany, Nov. 22, 1961, K 45267 Int. Cl.² B29C 17/14

U.S. Cl. 425—297

8 Claims



1. Apparatus for processing a settable material comprising extrusion means including a core for extruding material to the form of a hollow tube; means for urging said material through said extrusion means at a determinable speed; treating means adjacent said extrusion means to cause material emerging from the latter to set at least in part; drawing means to engage the material treated by said treating means and to convey the material away from said extrusion means at a speed having a determinable relationship to said determinable speed; control means to regularly and periodically vary said relationship whereby an accumulation of said material is effected in successive portions of the extruded hollow tube, said extrusion means comprising means engaging the hollow tube thus formed along the outer surface thereof to form the tube with a constant outer diameter such that the accumulation of material is formed along the inner surface of the tube at regular intervals along said tubes; means for severing the tube at the locations therein whereat there is an accumulation of material to thereby form a plurality of tubular units having a uniform outer diameter and at least one end with an increased thickness; means for receiving the units one by one; and means related to the extrusion means for deforming the units at the ends of increased thickness in relation to the magnitude of said increased thickness to produce units each with widened ends having substantially the same thickness and the remainder of the unit, said means for deforming the units comprising a plurality of angular spaced first core sections distributed about a determinable axis, means supporting said sections for movement in respective radial planes related to said axis, said core sections being of wedge-shaped cross-section, a plurality of second core sections distributed about said axis, means supporting the second core sections for movement in radial planes related to said axis, said second core sections being positioned for interdigitation with the first core sections to constitute a core, means for radially displacing the second core sections into and out of positions for engaging with the first core sections, and means to move the core sections relatively along said axis into and out of engagement with each other.

Re. 29,447

SELF-SEALING FILTER TUBE

Roger M. Farrow, Watlingtonbury; Anthony B. Kimber, Maidstone; John Barrington Cole, Pease Pottage, near Crawley; John Walter Miles, Sunnyside, and Graham Ernest Griffiths, Horsbarn, all of England, assignors to Whatman Reeve Angel Limited, Maidstone, England

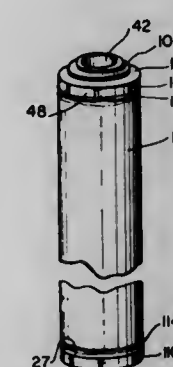
Original No. 3,767,054, dated Oct. 23, 1973, Ser. No. 213,833, Dec. 29, 1971. Division of Ser. No. 46,343, June 15, 1970, Pat. No. 3,698,562. Application for reissue May 13, 1974, Ser. No. 469,295

Claims priority, application United Kingdom, June 17, 1969, 30646/69

Int. Cl.² B01D 27/04

U.S. Cl. 210—232

33 Claims



1. A cartridge filter, which filter comprises in combination:
 - a. a rigid, cylindrical, porous support core characterized by an axial flow passage therethrough, and further characterized by a plurality of flow passages on the cylindrical wall of the core, which flow passages provide communication between the axial flow passage and the outer wall of the support core;
 - b. a semirigid, cylindrical, unitary, porous, filter tube, the tube composed of a plurality of overlapping nonwoven fibers having an average diameter of from about 0.001 to 10.0 microns, the fibers having interstices [therebetween] to define the porosity of the tube, the fibers containing at the junctions of the fiber crossovers a hardened material to provide a semirigid, self-supporting structure throughout the body of the filter tube, the filter tube disposed in a close-fitting relationship surrounding the support core, the fibers at the peripheral edge of each end of the filter tube adapted to be compressed together into a sealing relationship upon the application of an axial force; and
 - c. end elements positioned at each end of the support core, the elements having outwardly extending flanges thereon extending outwardly from the external surface of the core at least the thickness of the filter tube, the flanges each having a facing surface which [abuts] abuts each edge of the ends of the filter tube, at least one of which end elements is adjusted in relationship with the support core for axial movement in relationship to the support core, and at least one of each end elements is adapted to be removed from the support core to permit the removal and replacement of a filter tube on the support tube, the fibers across the entire edge width of the filter tube and adjacent each facing surface compressed about the periphery by axial force due to the axial movement and position of the end elements, the fibers compressed together by being forced against the facing surface of each flange in the immediate peripheral region adjacent to the facing surface of each flange to provide a peripheral fluid-tight seal between the facing surfaces, and the body of the filter tube.
16. A cartridge filter, which filter comprises in combination:
 - a. a semirigid, cylindrical, porous filter tube, the tube composed of a plurality of overlapping nonwoven fibers having an average diameter of from about 0.001 to 10.0 microns, the fibers having interstices therebetween to define the porosity of the

tube, the fibers containing at the junctions of the fiber crossovers a hardened material to provide a semirigid, self-supporting structure throughout the body of the filter tube, the fibers at the peripheral edge of each end of the filter tube adapted to be compressed together into a sealing relationship upon the application of an axial force;

- b. elements positioned at each end of the filter tube, the elements having flanges extending outwardly at least the thickness of the filter tube, at least one of said elements characterized by an aperture therein to permit a fluid to be introduced into or withdrawn from the interior of the filter tube, the flanges each having a facing surface which abuts each edge of the ends of the filter tube, at least one of which end elements is adjustable for axial movement in relationship to the filter tube, and at least one of each end elements is adapted to be removed to permit the removal and replacement of the filter tube, the fibers across the entire edge width of the filter tube and adjacent each facing surface compressible about the periphery by axial force due to the axial movement and position of the end elements, the fibers compressible together by being forced against the facing surface of each flange in the immediate peripheral region adjacent to the facing surface of each flange to provide a peripheral fluid-tight seal between the facing surfaces and the body of the filter tube; and
- c. means to move axially at least one of the end elements in relationship to at least one end of the filter tube, whereby an axial force may be applied to compress the fibers together into a fluid-tight seal to the end element.

Re. 29,448

METHOD AND APPARATUS FOR ASSEMBLING AND JOINING THERMOPLASTIC CONTAINER SECTIONS BY FRICTION WELDING

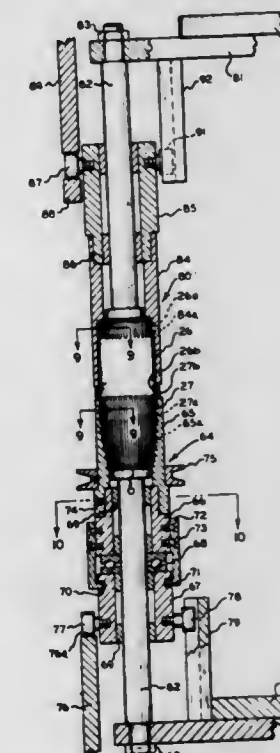
Gaylord W. Brown; Donald J. Rise, and Robert T. Johnson, all of Milwaukee, Wis., assignors to Koehring Company, Milwaukee, Wis.

Original No. 3,297,504, dated Jan. 10, 1967, Ser. No. 264,809, Mar. 13, 1963. Application for reissue Jan. 17, 1977, Ser. No. 760,081

Int. Cl.² B32B 31/20

U.S. Cl. 156—73.5

17 Claims



3. A method of forming thin-walled, thermoplastic containers comprising: differential pressure forming container upper sections in a web; differential pressure forming container lower sections in another web of a size such that said upper and lower sections would be received one by the other with an interference fit; advancing said webs to a separation station and separating at said separation station said upper and lower sections from said webs and forming openings in the tops of said upper sec-

tions [joining together open ends of the sections formed by their separation from the webs; applying a drive to bring certain of the sections] while said webs are at said separation station; advancing said separated upper and lower sections to a joining station; axially aligning mating pairs of upper and lower sections in axially spaced alignment with each other at said joining station and advancing the aligned sections through said joining station; driving one of each set of an aligned upper and lower section in rotation while said sections are moving through said joining station to bring the rotated section to a predetermined state of relative rotation with [their] its mating [sections] releasing said drive while permitting said certain sections] section; discontinuing driving of the rotating section and permitting the rotating section to spin freely; and moving said [certain sections] freely rotating section and its mating [sections] section relatively axially while said [certain sections are] rotating section is spinning to bring the end edges [thereof] of said mating sections into interference fitting, lapped engagement to generate a frictional heat which weld said sections together in a circular seam.

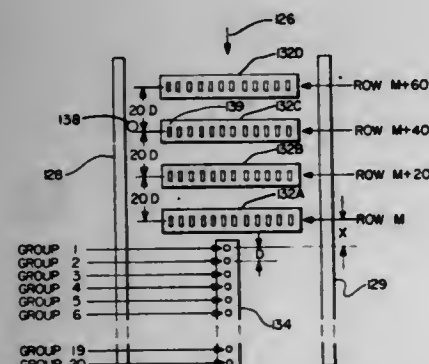
Re. 29,449 CARD READER

Richard A. Gorgeas, Bedford, Mass., assignor to Incoterm Corporation, Wellesley Hills, Mass.
Original No. 3,961,160, dated June 1, 1976, Ser. No. 455,928, Mar. 28, 1974. Application for reissue Mar. 28, 1977, Ser. No. 751,742

Int. Cl.² G06K 7/14, 19/06

U.S. Cl. 235—61.11 E

24 Claims



1. Apparatus for reading the information stored on a card in a plurality of information positions forming a data matrix, said matrix having M rows by N columns with each information position being characterized by one of two states representing a binary 0 or a binary 1, comprising:

guide means for accepting a manually inserted card and guiding said card in a first direction along a predetermined path as said card is inserted in said guide means at an arbitrary speed;

a first linear array of data detection elements extending in said first direction and positioned adjacent to said guide means, said elements being spaced apart [in a fixed relation to] by the same distance as the spacing between rows of information positions on said card, the number of said data detection elements being less than M;

a second array of data detection elements having N columns comprising at least two spaced apart rows, each of said rows extending in a direction perpendicular to said first direction, said second array being positioned to underlie said matrix of information positions when said card is passed in a first direction along said guide means, said rows of detection elements being spaced apart in said first direction by a distance related to the spacing between said rows of information positions on said cards, and

circuit means coupled to the elements of said first and second arrays and providing, as the leading edge of a card passes over each detection element in said first array at said arbitrary speed, that the detection elements of said second array are read out to provide output signals indicating the binary value of each information position for predetermined ones of the rows of said data matrix on said card overlying said second array.

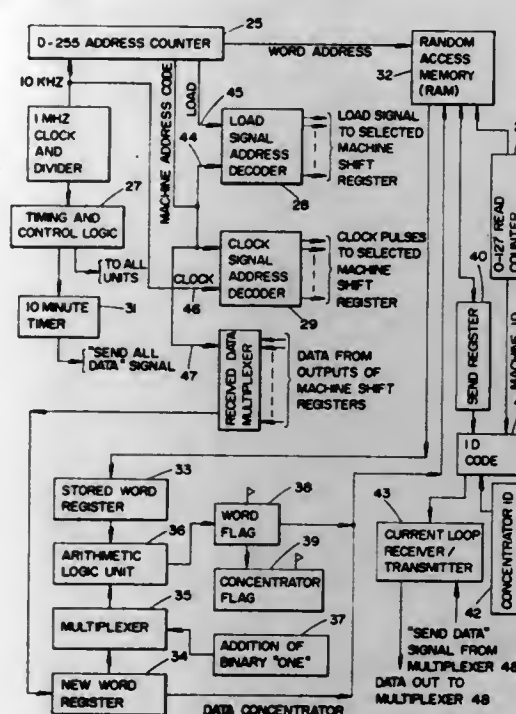
Re. 29,450 MACHINE OPERATING CONDITION MONITORING SYSTEM

Arthur F. Goldsby, Morrison; Frank J. Haberl, Denver, and Satish K. Anand, Golden, all of Colo., assignors to Martin Marietta Corporation, Bethesda, Md.
Original No. 3,858,181, dated Dec. 31, 1974, Ser. No. 407,388, Oct. 17, 1973. Application for reissue Sept. 23, 1976, Ser. No. 725,687

Int. Cl.² H04Q 9/00; G08B 25/00

U.S. Cl. 340—150

7 Claims



1. A system for monitoring a plurality of machines having widely spaced locations comprising:
a plurality of [binary] sensors connected to each machine;
a plurality of local data storage and processing units, each corresponding to a separate group of machines and connected to every machine in that group;
means to sequentially feed [binary] information from sensors in each machine of a group to said local data storage and processing unit corresponding to that group;
comparison means in said local data storage and processing unit for comparing received sensor information with previous information received from the same sensor and determining and indicating the existence of a change;
a central processing unit;
scanning means for scanning said local data storage and processing units and selectively retrieving from them [only] changed information; and
transmission means for transmitting said changed information to said central processing unit.

Re. 29,451 LIGHT COLORED MAGNETIC RUBBER

Max Baermann, 506 Bensberg Bezirk, Cologne, Germany
Original No. 3,873,954, dated Mar. 23, 1975, Ser. No. 494,631, Aug. 5, 1974. Application for reissue Sept. 24, 1976, Ser. No. 726,154

Claims priority, application Germany, Mar. 7, 1974, 2410902

Int. Cl.² H01F 7/02

U.S. Cl. 335—303

12 Claims

1. A light colored, rubber-like flexible permanent magnet comprised of a mixture of a rubber-like flexible binder, a permanent magnet material of high coercivity, as e.g., barium-, strontium-, or lead ferrite powder, and a material capable of giving the magnet a light color said permanent magnet material consisting essentially of relatively coarse grains having a grain size of 0.06 - 0.35 mm, the grain size mainly ranging from 0.1 - 0.3 mm, and the proportion of fine and finest permanent magnet powder particles, with respect to the grain size, being minimized to a negligibly small amount.

PLANT PATENTS

GRANTED OCTOBER 18, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,127 BEGONIA PLANT

Hans Joachim-Rohde, Nürtingen, Germany, assignor to Mikelsens, Inc., Ashtabula, Ohio

Filed Aug. 17, 1976, Ser. No. 715,142

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—68

1 Claim

1. A new and distinct cultivar of begonia plant characterized particularly as to uniqueness by the combined characteristics of orange flower; double flowers with odd number of tepals; compact and relatively short growing habit, and long lasting individual flowers which last up to 2 months.

4,128 CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 18, 1976, Ser. No. 715,233

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium*; Ramat, known by the cultivar name Festoon and particularly characterized as to uniqueness by the combined characteristics of daisy inflorescence type; flat inflorescence form; medium yellow inflorescence color; diameter across face of inflorescence from 70 to 85 mm. at maturity; uniform eight week flowering response to photoperiodic short-day control; tall plant height; and semi-spreading branching pattern.

4,129 CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 23, 1976, Ser. No. 716,438

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat, known by the cultivar name Frost and particularly characterized as to uniqueness by the combined characteristics of flat inflorescence form; spooned daisy inflorescence type; white ray floret color, with no pink discoloration with age or with cool (below 60° F) temperature finishes; yellow-green (immature) to yellow (mature) disc floret color;

uniform nine week flowering response to photoperiodic short day control; minimal pollen development; diameter across face of inflorescence from 80 to 95 mm. at maturity; semi-spreading branching pattern; and medium plant height.

4,130 CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 23, 1976, Ser. No. 716,439

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—78

1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat, plant known by the cultivar name Plume and particularly characterized as to uniqueness by the combined characteristics of flat inflorescence form; spider inflorescence type; medium yellow inflorescence color, oxidizing to light yellow at maturity; diameter across face of inflorescence ranging from 90 to 140 mm. at maturity; uniform nine week photoperiodic flowering response to short days; medium plant height; and semi-upright branching pattern.

4,131 CHRYSANTHEMUM PLANT

William H. Egan, Brooks, Oreg.; Jack M. Meek, Barberton, and William E. Duffett, Akron, both of Ohio, assignors to William H. Egan, Brooks, Oreg.

Filed Sept. 3, 1976, Ser. No. 720,501

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—75

1 Claim

1. A new and distinct cultivar of chrysanthemum known by the cultivar name Yellow Cloud-9 and characterized particularly as to uniqueness by the combined characteristics of incurved inflorescence form, reflexing rapidly with age; decorative inflorescence type; dark yellow inflorescence color with minimal color oxidation; diameter across face of inflorescence up to 130 mm.; permanence of inflorescence ranging up to 10 days; short plant height; spreading branching pattern; average natural season flower date of Sept. 15; and average flowering response period of 7 weeks in photoperiodic controlled flowering programs.

PATENTS

GRANTED OCTOBER 18, 1977

ERRATA

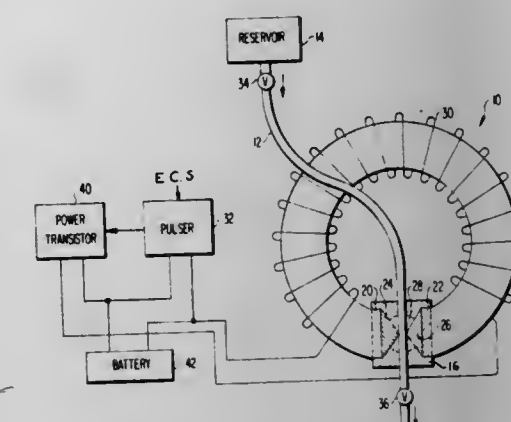
For CLASS	See PATENT NO.
015-415 R	4,053,962
361-098	4,053,996
260-045.9 KB	4,054,162
366-143	4,054,270
366-070	4,054,271
366-343	4,054,272
366-069	4,054,273
312-250	4,054,338
356-199	4,054,377
106-052	4,054,472
264-045.3	4,054,550
544-021	4,054,564
560-025	4,054,592
560-012	4,054,593
560-032	4,054,594
560-121	4,054,595
560-150	4,054,596
364-106	4,054,780
364-442	4,054,781
364-555	4,054,782
364-418	4,054,783
364-479	4,054,784
364-726	4,054,785
364-575	4,054,786
364-748	4,054,787
364-786	4,054,788
362-080	4,054,789
362-264	4,054,790
362-035	4,054,791
362-267	4,054,792
362-127	4,054,793
363-028	4,054,827
331-094.5 G	4,054,852
343-792.5	4,054,886
354-329	4,054,902
179-016 F	4,054,941
179-017 A	4,054,942
318-166	4,054,943
335-207	4,054,944
273-085 R	4,054,945
313-346 R	4,054,946

PATENTS

GRANTED OCTOBER 18, 1977

GENERAL AND MECHANICAL

4,053,952
**MAGNETIC FLUID ACTUATED CONTROL VALVE,
 RELIEF VALVE AND PUMP**
 Seth R. Goldstein, Bethesda, Md., assignor to The United States
 of America as represented by the Secretary of the Department
 of Health, Education and Welfare, Washington, D.C.
 Continuation of Ser. No. 621,543, Oct. 10, 1975, abandoned.
 This application Apr. 8, 1977, Ser. No. 786,486
 Int. Cl.² A21F 1/24; F04B 43/00
 U.S. Cl. 3-1.1 15 Claims



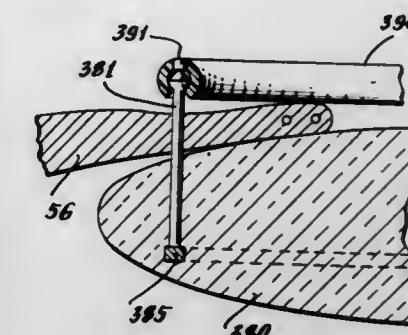
1. A magnetic fluid actuated relief valve for human implan-
 tation for controlling flow of liquid at pressures below a pre-
 selected value from an upstream position to a downstream posi-
 tion, comprising
 means to define a passageway having an upstream end and a
 downstream end, said passageway having an occludable
 portion of variable cross-section; and
 means to occlude said occludable portion of variable cross-
 section of said passageway, said means comprising a mag-
 netic fluid in contact with the exterior of said occludable
 variable cross-section portion, and magnetizing means for
 providing a magnetic field of preselected magnitude for
 generating a preselected first pressure in said magnetic
 fluid sufficient to occlude said variable cross-section por-
 tion only when the upstream pressure in said passageway
 is below said preselected first value,
 whereby said relief valve opens against the force exerted by
 said first pressure of said magnetic fluid when the up-
 stream pressure reaches a second pressure which exceeds
 said preselected first pressure.

4,053,953
**POSTERIOR CHAMBER ARTIFICIAL INTRAOCULAR
 LENS WITH RETAINING MEANS AND INSTRUMENTS
 FOR USE THEREWITH ADAPTED TO PROVIDE
 EXTRAOCULAR CONFIRMATION OF OPERATIVE
 ENGAGEMENT**

Leonard Flom, Arlen Road, Westport, Conn. 06880, and
 Kenneth J. Rodgers, 83 Melville Ave., Fairfield, Conn.
 06430
 Continuation-in-part of Ser. No. 648,936, Jan. 14, 1976, Pat. No.
 3,991,426, which is a continuation-in-part of Ser. No. 549,853,
 Feb. 14, 1975, abandoned. This application Oct. 12, 1976, Ser.
 No. 731,139
 Int. Cl.² A61F 1/16, 1/24, 9/00

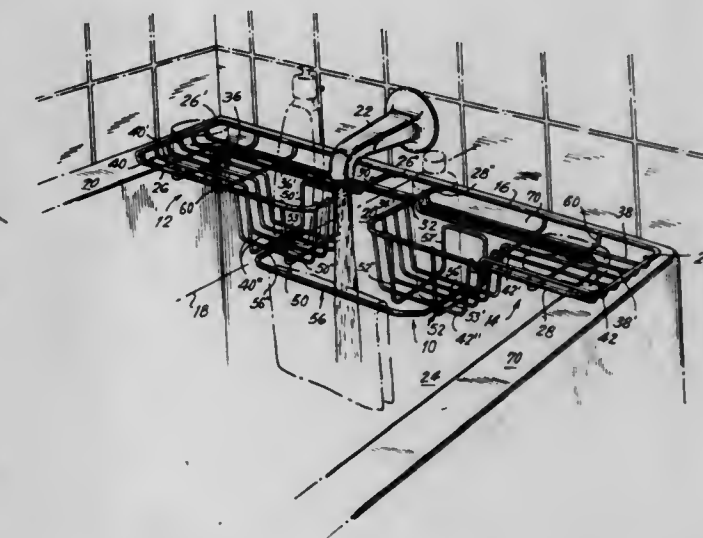
U.S. Cl. 3-13 18 Claims
 1. An artificial intraocular lens for implantation into the
 posterior chamber of an eye, the artificial intraocular lens
 comprising an optical zone portion fabricated of transparent
 material and shaped similar to a natural lens, and retaining
 means having a plurality of posts attached thereto and extend-
 ing rearwardly therefrom, the ends of said posts adapted to be
 operatively engaged with said optical zone portion, wherein
 said optical zone portion may be implanted in the posterior

chamber of an eye and said retaining means may be positioned
 in the anterior chamber of the eye with the posts protruding
 rearwardly from said retaining means through the iris and into
 the posterior chamber of the eye where said posts are opera-
 tively engaged with said optical zone portion, said retaining
 means and posts thereby together holding and positioning the



artificial intraocular lens within the eye, and wherein the posts
 of said retaining means and the optical zone portion have
 conductive surfaces which contact upon operative engage-
 ment and which are adapted for connection into an electrical
 circuit providing a signal upon such contact, said signal com-
 prising extra-ocular confirmation of the operative engagement.

4,053,954
BATHTUB CADDY
 George Chapman, 1712 Park Blvd., Cherry Hill, N.J. 08002
 Filed June 17, 1976, Ser. No. 697,239
 Int. Cl.² A47K 3/12 7 Claims
 U.S. Cl. 4-185 AB



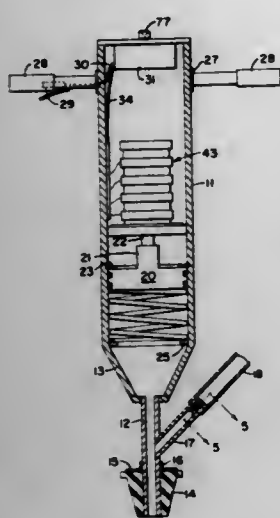
1. A bathtub caddy comprising a first section and second
 section corresponding in shape to one another; means support-
 ing said first and second sections in a spaced relation to each
 other, said means comprising a supporting bar extending along
 and between said sections; each of said first and second sec-
 tions comprising first and second shelf portions depending
 from said supporting bar and being of different depths and
 being adapted for the storage of bath articles thereon, said
 supporting bar supporting said first and second sections in said
 spaced relation so that water from a tap of a bathtub may pass
 therebetween, each of said first and second sections further
 comprising a plurality of U-shaped bars extending in parallel
 with said supporting bar constituting part of said first shelf
 portion and a plurality of multi-level bars also parallel with
 said supporting bar constituting part of said first shelf portion
 and said second shelf portion.

4,053,955 DRAIN CLEANING TOOL

Morris H. Canham, 621 E. Prospect, Kewanee, Ill. 61443
Filed Jan. 2, 1976, Ser. No. 645,989
Int. Cl.² E03D 11/00

U.S. Cl. 4—255

5 Claims



1. An hydraulic plunger for cleaning a clogged drain pipe comprising: a casing having an open end, an axially shiftable reciprocal piston retained therein, said piston having a boss on one side thereof with an axial opening therein; an electromagnetic unit in said casing on said one side of the piston and having an axially extending electromagnetically energized driven member with one end thereof seated in the opening of said boss and engageable with the piston, said end being axially offset from the piston to permit the member when energized to shift axially in the opening to thereby accelerate prior to engagement with and shifting of the piston toward the opposite end of said casing; a water inlet to the casing on the opposite side of the piston for passing water into said casing and through said open end; a check valve in the inlet for blocking water from flowing out of said casing via the inlet; a fitting on said casing at said open end and opening into said casing, said fitting being adapted to seat against a drain opening; a stop on the casing engageable with the piston for retaining the piston in axial offset relation with said end of said member; means for shifting the piston against the stop; and control means mounted on said casing for operating the electromagnetic unit in the casing to shift the driven member.

4,053,956 SPRING ASSEMBLY

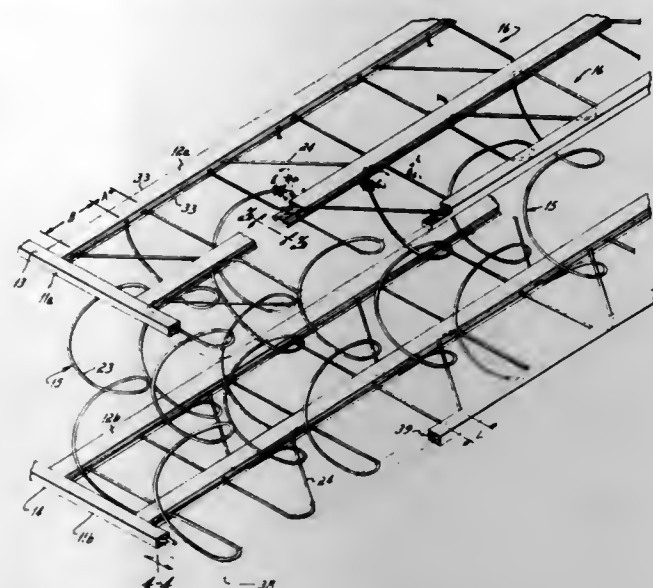
Larry Higgins, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.
Filed June 24, 1976, Ser. No. 699,481
Int. Cl.² A47C 23/02, 23/04

U.S. Cl. 5—255

9 Claims

1. An improved spring assembly comprising a plurality of springs disposed in matrix-like fashion in a plurality of rows, at least one linear border connector strip in at least one of the upper and lower planes of said spring assembly, said border connector strip connecting the peripheral springs in said spring assembly one with the other, said connector strip being fabricated of a thermoplastic material, said connector strip defining jaw structure that receives a segment of each peripheral spring in gripping relation therewith, and said border strip jaw structure being heat welded around each peripheral spring segment for locking each adjacent peripheral spring to said border connector strip, and a linear row connector strip between at least one pair of adjacent rows of springs in that one of said planes in which said border connector strip is disposed, each of said row connector strips connecting the two adjacent rows of springs in each pair one with the other, said row connector

strip also being fabricated of a thermoplastic material, said row connector strip defining jaw structure on both side edges of said strip from one end thereof to the other, said row jaw structure receiving a segment of each spring in the adjacent rows of each pair in gripping relation therewith, and said row jaw structure also being heat



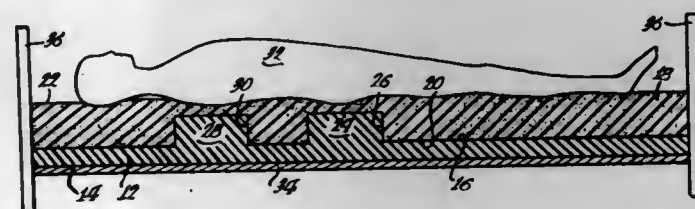
welded around each row spring segment for locking each adjacent row spring to said row connector strip, said border connector strips and said row connector strips thereby establishing a thermoplastic strip grid by which said plurality of springs are tied together one with another in that one of the upper and lower planes of said spring assembly.

4,053,957 MULTI-LAYERED MATTRESS

John J. Regan, 2316 N. Harlem Ave., Elmwood Park, Ill. 60635
Filed June 1, 1976, Ser. No. 691,464
Int. Cl.² A47C 23/00

U.S. Cl. 5—355

4 Claims



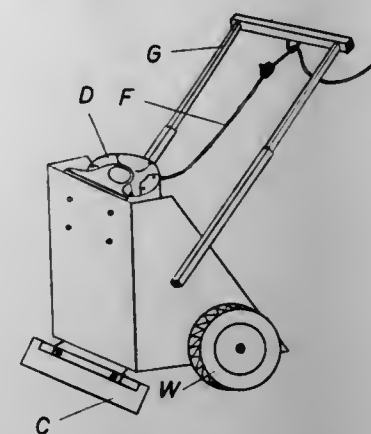
1. In a multi-layered mattress, including, a lower layer having a support engaging bottom surface and a generally planar top surface, and an upper layer having a bottom surface engaging the top surface of the lower layer and a top, body supporting surface, the resiliency of the material of the upper layer being greater than that of the lower layer, the improvement which comprises: a first rib of less resiliency than the upper layer extending transversely across and upwardly from the planar top surface of the lower layer into a complementary recess in the bottom surface of the upper layer; and a second rib of less resiliency than the upper layer spaced longitudinally on the mattress from the first rib and extending transversely across and upwardly from the top planar surface of the lower layer into a complementary recess in the bottom surface of the upper layer, said first and second ribs being spaced apart longitudinally of the mattress and positioned to support the shoulders and buttocks of one lying on the mattress, the lesser resiliency of the ribs complementing the greater resiliency of the upper layer to support the body lying on the mattress in a straight condition.

4,053,958 SURFACE PREPARATION MACHINE

Leland Z. Taylor, P.O. Box 756, Wichita, Kans. 67201
Filed Dec. 22, 1975, Ser. No. 643,612
Int. Cl.² A47L 11/12

U.S. Cl. 15—93 R

5 Claims



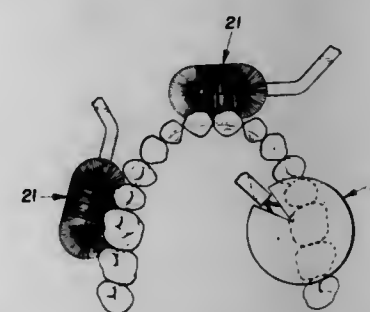
1. A surface preparation machine for removing material adhered to a planar surface, the machine comprising: a wheeled frame having an upper portion and lower portion; a motor mounted to the upper portion of said frame; a vertical shaft attached at one end to said motor and extending downwardly therefrom; an annular shaped flywheel attached to said shaft, said shaft offset from the center of said flywheel and extending therethrough; a horizontal base plate attached to the lower portion of said frame, said base plate having an aperture therein for receiving said shaft therethrough; a horizontal tool holding plate disposed below said base plate and parallel thereto, the other end of said shaft attached to said tool holding plate, said plate having a tool mounted thereon for removing the material; and coupling means for attaching said plate to said base plate and suspending said plate therefrom; said motor rotating said flywheel and said shaft, said shaft providing an eccentric motion in providing an orbital movement of said tool holding plate in a horizontal plane.

4,053,959 BRUSH FOR TEETH AND GUMS

Corless W. Wiley, 1505 Junior Drive, Dallas, Tex. 75208
Filed Jan. 30, 1976, Ser. No. 654,023
Int. Cl.² A46B 9/04

U.S. Cl. 15—106

9 Claims



1. A brush for use in brushing of teeth and gums comprising an elongated narrow handle and an enlarged brush head disposed at one end of said handle; said brush head dimensioned to be fully received within the mouth of the user; said head comprising a ring-shaped, generally planar, twisted-wire core with bristles radiating outwardly in all directions from the wire of said core; said radiating bristles being of generally uniform length, and of sufficient length to enter embrasures between the teeth; said core being of a diameter that said head has substantially no opening at the center; said brush head thereby defining opposite

generally flat faces, parallel with said core plane, and a rounded peripheral surface; and said bristles having a uniform thickness, and having a thickness in the range of about 0.001 inch to 0.005 inch.

4,053,960 BACK SCRUBBER

Henry Kingswell, 64 Samba Drive, Weston, Ontario, Canada (M9M 2N1)

Filed Mar. 17, 1976, Ser. No. 667,714
Int. Cl.² A47K 7/03

U.S. Cl. 15—104.92

3 Claims



1. An improved back scrubber device adapted to be removably secured to a wall, said device comprising in combination: a base portion including a back and four side walls integral with and extending perpendicularly from said back to define an opening remotely disposed from said back; a plurality of suction type securing devices affixed to the exterior surface of said back, said suction devices adapted to removably secure said base portion to said wall; a cover including a porous sponge portion affixed to and encircled by an open frame, said cover adapted to be removably mounted on said back portion by a compression fit between the interior surfaces of said frame and the exterior surface of the walls of said base portion to close said opening, said porous portion being of such porosity that it permits the passage therethrough of a soap and water solution introduced into said base portion through an access opening on one of said side walls upon the introduction of external pressure on said porous portion in a direction toward said back but prevents the passage therethrough of said solution in the normal unstressed condition; a drying element comprising a section of towelling material, and means to secure the drying element to said base portion.

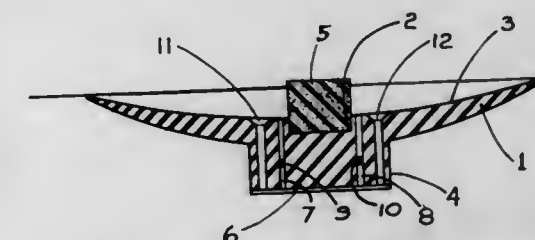
4,053,961 APPARATUS FOR HOLDING OPEN A DOOR OR THE LIKE

Murray Vincent Wilson, 20 Tyndalls Park Road, Bristol 8, and Norman Henry Pearce, 111 Henbury Road, Westbury on Trym, Bristol, both of England

Filed Feb. 5, 1976, Ser. No. 655,382
Int. Cl.² E05F 5/00

U.S. Cl. 16—84

3 Claims



1. Apparatus for retaining a closure member in an open position in which position said member lies in face-to-face relationship with a fixed surface, comprising a suction pad adapted for attachment to one of said member and surface

whereby when said member is opened, the suction pad retains it in an open position, said suction pad having air-leakage means to automatically break the suction between the pad and the other of said member and surface a predetermined time after the formation of said suction, the pad having a boss thereon for attachment to said one of said member and surface, said air-leakage means comprising a passageway extending through said boss, and a further passageway extending along the surface of said boss thereby to provide communication between the area of the suction and the atmosphere when the pad is secured to said one of said member and surface, said further passage comprising a groove along the surface of the boss that contacts said one of said member and surface.

4,053,962

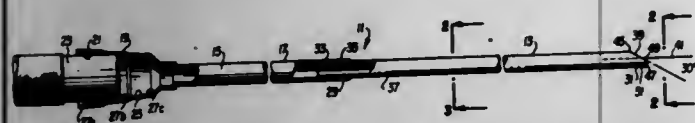
SUCTION-CLEANING DUST RETRIEVER

Robert V. McDowell, 160 Melrose Drive, Danville, Va. 24541
Filed Dec. 16, 1975, Ser. No. 641,282

Int. Cl.² A47L 9/02

U.S. Cl. 15-415 R

8 Claims



1. A vacuum-cleaner hose attachment comprising: an attaching portion having walls for defining an open cavity having a circular cross-sectional shape, said open cavity being of a size for receiving a hose member from a vacuum cleaner, said walls forming a tapered, stepped cavity for force fitting onto hose members of various sizes from vacuum cleaners; and an elongated tube rigidly connected to said attaching portion with a bore thereof communicating with said attaching-portion cavity, said elongated tube including a working-end portion, said working-end portion having an oblong cross-sectional shape taken in a plane perpendicular to its axis of elongation such that it includes long sidewalls and shorter endwalls, said working-end portion's outer tip defining an opening therein the periphery of which defines a plane having an angle of more than 20°, but not more than 60° with the axis of elongation and extending approximately perpendicular to said long sidewalls.

4,053,963

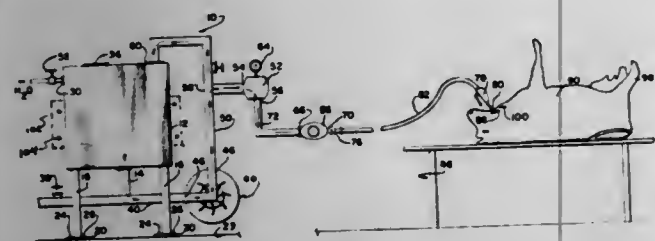
PORTABLE APPARATUS FOR USE IN THE TREATMENT OF SLAUGHTERED ANIMALS

Guillermo R. Matheu, 2a Avenida 9-03 Zona 9, Guatemala City, Guatemala
Filed Dec. 29, 1975, Ser. No. 645,310

Int. Cl.² A22B 5/00

U.S. Cl. 17-1 R

8 Claims



1. A portable apparatus (10) for use in the treatment of slaughtered animals by administering liquid solution thereto according to the weight of the animal, said apparatus essentially comprising a tank (12), with an outlet (14) in the bottom, a pump (44) having an intake opening (46) and an outflow orifice 48, a pipe connecting from the outlet of the tank to the intake opening of the pump, a pipe-size reducing means (52) having an inlet and an outlet (56), a pipe connecting from the outflow orifice of the pump to the inlet of pipe-size reducing means, a manometer operatively mounted and coupled to the

pipe-size reducing means for indicating visually the pressure of liquid therein, water meter means having an inlet and an outlet and operatively mounted and coupled by conduit means from the outlet of the pipe-size reducing means to the inlet of the water meter means for indicating visually the quantity of liquid passing there through, an ON-OFF valve (76) coupled to the outlet of the water meter means, a flexible conduit coupled from the ON-OFF valve to a nozzle, and a further ON-OFF valve (78) operatively mounted and coupled at the nozzle.

4,053,964

HARD-SHELLED CRUSTACEAN MEAT RECOVERY PROCESS

James E. Rutledge, 13543 Honey Drive, Baton Rouge, La. 70808
Filed May 26, 1976, Ser. No. 690,287

Int. Cl.² A22C 29/00

U.S. Cl. 17-48

3 Claims

1. A process for pretreating hard shelled crustaceans to facilitate removal of uncooked meat from the hard shelled crustaceans' shells which comprises first freezing the uncooked hard shelled crustacean and then thawing, without cooking, the frozen hard shelled crustacean.

4,053,965

TIGHTENING BAND

Jacques R. Marchou, 38 ter rue Saint-Hilaire, 94210 - La Varenne St. Hilaire, France
Filed May 25, 1976, Ser. No. 689,827

Claims priority, application France, June 10, 1975, 75.8082

Int. Cl.² B65D 63/02

U.S. Cl. 24-20 TT

6 Claims



1. A fastening member of the tightening band type comprising an elongated tape having opposed first and second end portions and a generally uniform transverse cross-sectional area between said end portions except at said first end portion whereby said tape has substantially the same strength to resist stress all along its length, said first and second end portions including free ends and having complementary cooperating attachment means formed thereon inwardly of said free ends for holding said end portions together in any of a plurality of relative positions, said first and second end portions each also including prehension means for cooperating with a tightening tool to enable said first and second end portions to be moved with respect to each other in adjacent relation thereby to engage said cooperating attachment means in a desired relative position, said first end portion of the tape having at least one zone of smaller cross-sectional area than the remainder of the tape defining a zone of least resistance whose strength to resist stress is less than that of the remainder of the tape and being located between the attachment means and the prehension means of said first end portion of the tape.

4,053,966

BUCKLE APPARATUS

Lawrence A. Dieleman, 2119 Tulip Lane, Jenison, Mich. 49428
Filed Feb. 2, 1976, Ser. No. 654,200

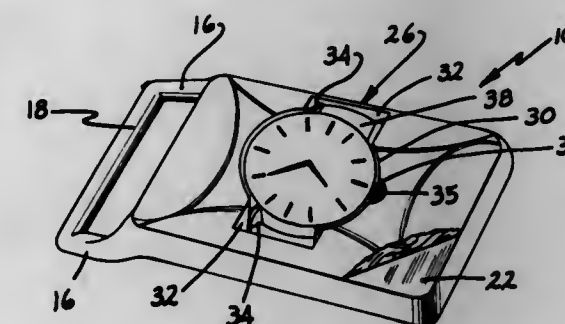
Int. Cl.² A44B 11/00

U.S. Cl. 24-163 R

18 Claims

1. A combination belt buckle and decorative instrument housing comprising: a first base portion having front and back surfaces and means formed thereon for receiving and attaching the ends of a belt; a second decorative portion laid over and secured to said

front surface of said first portion as a separate member, said second decorative portion being generally coextensive with said front surface of said first base portion and extending away from said front surface of said first portion to form a decorative surface;
a chamber formed in said second decorative portion, said chamber being generally centrally located in said second decorative portion and adapted to receive an instrument from the front of said buckle and housing combination



while providing surface areas around said chamber which may be decorated as desired;
means associated with at least one of said first and second portions for securing an instrument in said chamber such that the instrument may be read directly from the exterior of said buckle and housing combination without manipulation or handling, said second decorative portion including means for extending around an instrument when secured in said chamber to protect the instrument.

4,053,967

APPARATUS FOR FLATTENING THE BENT-UP EDGE OF A SHEET WORKPIECE

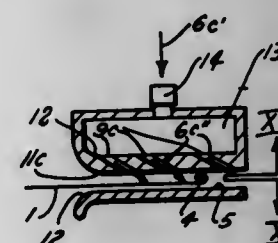
Franz Mair, Augsburg, Germany, assignor to Erhard & Leimer KG, Augsburg, Germany
Filed Dec. 17, 1975, Ser. No. 641,656

Claims priority, application Germany, Dec. 18, 1974, 2459862; Sept. 30, 1975, 2543568

Int. Cl.² D06C 3/00

U.S. Cl. 26-98

9 Claims



1. An apparatus for flattening a sheet workpiece having and edge bent over on one face of said workpiece toward the center thereof and being continuously displaced in a transport direction generally parallel to the bent-over edge, said apparatus comprising:

a flat support surface lying against the other face of said workpiece at said bent-over edge;
a guide surface juxtaposed with and generally parallel to said support surface and spaced therefrom to overlie said one face of said workpiece;
a two-dimensional array of orifices formed in said guide surface and inclined in a flow direction extending transversely to said transport direction, outwardly from said center, said orifices forming nozzles trained toward said support surface for directing respective jets of air against the bent-over edge for unfolding same; and means for supplying air under pressure to said array of orifices in common for forming an air current passing over said edge in said flow direction.

4,053,968

TOOL SUPPORT FOR TOOL INTERCHANGE SYSTEM

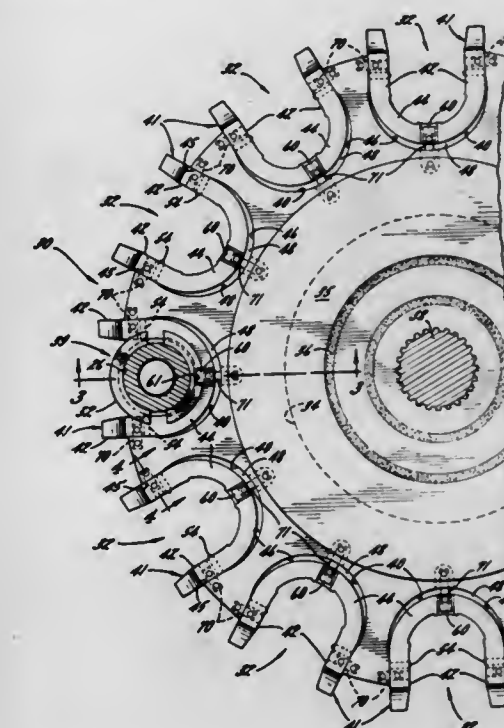
Earl E. Johnson, Kaukana, and Calvin Gladoske, Fond du Lac, both of Wis., assignors to Gliddings & Lewis, Inc., Fond du Lac, Wis.

Division of Ser. No. 341,971, March 16, 1973, Pat. No. 3,911,540. This application Aug. 6, 1975, Ser. No. 602,293

Int. Cl.² B23Q 3/155

U.S. Cl. 29-26 A

1 Claim



1. A tool support arrangement for use in machine tools having a storage magazine formed with at least one open-ended socket comprising a shoe releasably mountable in one of said magazine sockets, said shoe being formed with a pair of outwardly extending laterally spaced legs, a tool adapter upon which said tool is fixed, said tool adapter having a tapered shank portion, a cylindrical portion, and a circular radially extending support flange between said portions, said cylindrical portion having an outer diameter which is less than the lateral spacing of said shoe legs by a predetermined relatively small amount to permit ready positioning of said cylindrical portion into said shoe, and said support flange having an outer diameter which is greater than the lateral spacing of said shoe legs but less than the width of the opening of said magazine socket so that said adapter flange may be supported by said shoe when said cylindrical portion is positioned therein but will permit downward vertical movement of said tool adapter and shoe through said magazine socket upon release of said shoe.

4,053,969

HEAT EXCHANGER

Gaston Bayard, Toulouse, France, assignor to Societe Anonyme Microturbo, Toulouse Cedex, France
Filed Mar. 8, 1976, Ser. No. 664,973

Claims priority, application France, Mar. 10, 1975, 75.07463

Int. Cl.² B23P 15/26

U.S. Cl. 29-157.3 D

7 Claims

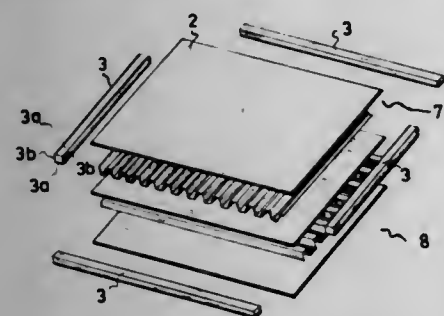
1. A process for the manufacture of a heat exchanger unit having a stack of metallic elements such as corrugated sheets, thin interposed plates, and edging rods, these elements presenting contacting surfaces flush with their faces and in certain instances recessed surfaces, the unit being provided on its sides with connecting metal sheets, consisting essentially of:
 - a. forming a thin deposit of a brazing composition only on the recessed surface of said elements;
 - b. stacking said elements in an appropriate fashion on a lower press plate with which removable guide members are associated, these guide members being rigid and spaced apart to constitute a guiding form inside which said

elements are positioned in a manner such that their edges are supported against said guide members, the edging rods coming to rest against at least two of said guide members to ensure the lateral and longitudinal guiding of said rods, placing an upper press plate on the stack and pressing the upper and lower press plates together by means of connecting tightening columns provided with tightening means in a manner such that said upper and lower press plates can later be removed,

d. applying a limited tightening pressure on the press plates of (c) so as to stabilize the stack,

e. removing the said guide members, and placing the entire stack under pressure,

f. exerting on said press plates a pressure the value of which



is such that the space between the two press plates will be reduced to a given dimension,

g. locking the tightening means, then stopping the application of pressure on said press plates so as to obtain a compact stack which can be transported held together by said press plates which have a predetermined and constant distance between them,

h. soldering or welding on the edge of the stack connecting and aligning sheets of metal,

i. after said welding or soldering operation of (h), placing the whole assembly into a brazing oven, under conditions suitable to bring about the brazing of the contact surfaces of the elements of the stack, and

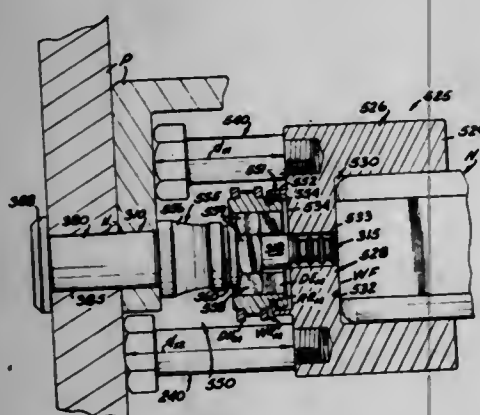
j. unlocking the tightening means and removing said press plates and the tightening columns.

4,053,970 PRELOAD ADAPTER

John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30342
Division of Ser. No. 542,077, Jan. 17, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,422
Int. Cl.² B23P 19/04

U.S. Cl. 29—240

3 Claims



1. A preload adapter for use with a lockbolt installation gun having a nose assembly to install a fastener in holes through work pieces where the fastener has a threaded engagement section to be engaged by an internally threaded nut and a pulling section projecting beyond the threaded engagement section to be engaged by the nose assembly to exert an axial loading force on the fastener, said preload adapter comprising: a body defining a bearing face thereon adapted to be engaged by the working end of the nose assembly and an

opening therethrough slidably receiving the pulling section of the fastener therethrough for engagement by the nose assembly while bearing against said bearing face; spacing means operatively connected to said body adapted to engage the work pieces about the holes, said spacing means adapted to space said body a prescribed distance from said work pieces so that sufficient clearance is provided to allow the nut on the threaded engagement section of the fastener to be tightened where the nose assembly is supported by said bearing face while the nose assembly engages the pulling section of the fastener to pull the fastener and work pieces together by exerting a force in a first direction on the work pieces through said spacing means while exerting a force in the opposite direction on the fastener to allow the nut to be screwed onto the threaded engagement section;

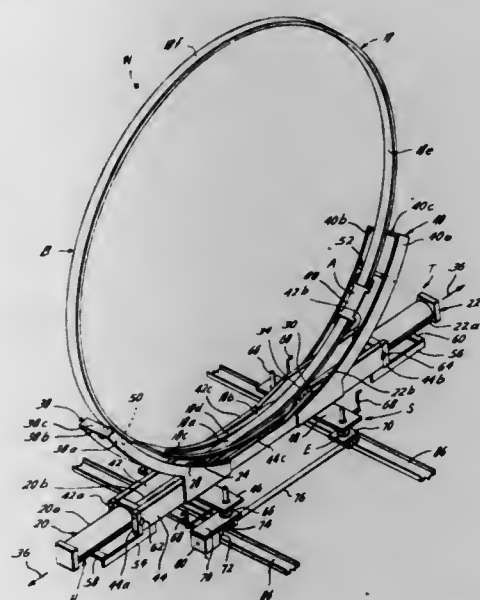
a wrench for selectively and drivingly engaging the nut to tighten the nut on the fastener while the nose assembly axially loads the fastener through said preload adapter; and,

captivating means for preventing movement of said wrench toward and away from said bearing surface while allowing relative rotational movement between said wrench and said body to permit the nut to be tightened on the fastener by said wrench.

4,053,971
WRAPPING MACHINE FOR LAYERED VESSELS
Raymond E. Pechacek, Houston, Tex., assignor to Hahn & Clay
Filed Aug. 9, 1976, Ser. No. 712,831
Int. Cl.² B23P 19/04

U.S. Cl. 29—252

9 Claims



1. A wrapping machine for use in constructing layered vessels having at least one layer formed of adjoining vessel sections wherein vessel sections are welded together along adjoining longitudinal edges thereof by weldments, comprising: band means adapted to encircle sections of the layered vessel for positioning the vessel sections adjacent one another on a layer therebelow for forming one layer of the layered vessel;

tightening means for tightening said band means about the adjoining vessel sections to insure close engagement of the adjoining vessel sections with the outer surface of the layer therebelow;

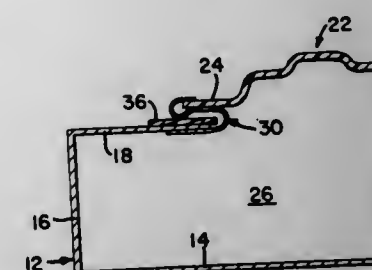
said band means being interlooped for applying concentric loading of the layered vessel by said tightening means when drawing the vessel sections together; and,

anti-galling means for preventing galling of said band means by the longitudinal edges of the vessel sections or weldments thereof as said tightening means constricts said band means about the vessel sections, said anti-galling means mounted with said band means.

4,053,972
METHOD OF CONSTRUCTING INSULATED DOOR
Myron G. Kordes, Parkville, Mo., assignor to Hobart Corporation, Troy, Ohio
Filed Aug. 4, 1976, Ser. No. 711,453
Int. Cl.² B23P 17/00

U.S. Cl. 29—423

6 Claims



1. A method of constructing an insulated door comprising the steps of:

providing an open, tray-like face having an outer wall, side wall portions extending from said outer wall and a rim extending from said side wall portions inwardly over said outer wall in spaced relationship thereto and terminating in an inner edge defining an opening into said tray-like face,

positioning a drum having an outer periphery over said opening in said tray-like face,

loosely engaging said face rim and said drum periphery with additional separate means restraining relative movement of said face and said drum away from each other while permitting said rim and said periphery to be spaced from each other to define a cavity around said door,

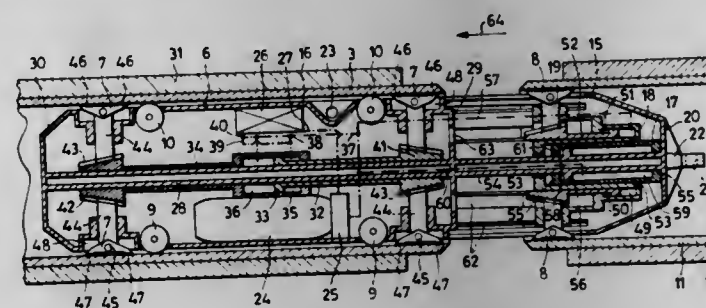
introducing into the space defined by said opposing portions of said drum and said face a foamed in situ insulating material which expands and hardens and adheres to surfaces of said drum, said face and said restraining means, and

subsequent to hardening of said insulating material, attaching a peripheral gasket to said insulated door by inserting an anchoring portion of said gasket into said cavity between said face rim and drum periphery.

4,053,973
PIPE-HANDLING APPARATUS
Fausto Meli, Carpaneto (Piacenza), Italy, assignor to Saipem S.p.A., Milan, Italy
Filed Mar. 26, 1976, Ser. No. 670,653
Claims priority, application Italy, Mar. 28, 1975, 21777/75
Int. Cl.² B23P 19/04

U.S. Cl. 29—252

13 Claims



1. An apparatus for attachment to, alignment of, bringing together and maintaining together during welding, a first and a second pipe to be butt-welded, comprising: an elongate body having a first portion and a second portion located along a unitary shaft lying on the axis of the elongate body;

first actuatable attachment means operatively connected to said shaft, which means slide in a radial direction in the first portion of the apparatus, for attachment to the first

pipe and for symmetrical alignment of the first pipe about the first portion;

second actuatable attachment means operatively connected to said shaft, which means slide in a radial direction in the second portion of the apparatus, for attachment to the second pipe and for symmetrical alignment of the second pipe about the second portion;

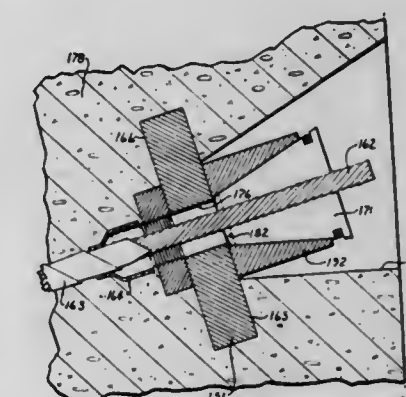
actuating means operatively connected to said shaft and slidably connected to said first and second attachment means for sliding said first and second attachment means into attachment with the first and second pipe and for symmetrical alignment of the pipes about the first and second portions of the apparatus; and

sliding means slidably mounted on said shaft in the first portion of the apparatus, and cooperating with said first attachment means for moving said first attachment means toward said second portion, to cause the first pipe to be brought into substantial abutment with the second pipe.

4,053,974
METHOD OF FORMING A CONCRETE STRUCTURE WITH A RECESS TO RECEIVE AN ANCHORAGE
George H. Howlett, and James W. Howlett, both of Oakland, Calif., assignors to Conenco International Limited, Toronto, Canada
Division of Ser. No. 119,710, March 1, 1971, Pat. No. 3,936,256, which is a continuation-in-part of Ser. No. 816,583, April 16, 1969, Pat. No. 3,605,361. This application Jan. 30, 1976, Ser. No. 654,050
Int. Cl.² B23P 11/02

U.S. Cl. 29—452

2 Claims



1. A method of forming a cast-in-place concrete structure with a recess for receiving an anchorage for securement of a concrete reinforcing tendon including the steps of positioning a bearing plate formed with an opening dimensioned to receive said tendon around said tendon in spaced relation to a concrete form, positioning spacing means formed with an opening therein dimensioned to receive said tendon around said tendon with said opening in said spacing means in axial alignment with said opening in said bearing plate, securing said bearing plate in fixed spaced relation to said form with said spacing means in abutting relation with said bearing plate and, with said frame, pouring concrete into said form about said tendon, bearing plate and spacing means and allowing said concrete to harden, and removing said form and said spacing means, wherein the improvement in said method of forming a cast-in-place concrete structure with a recess for receiving an anchorage comprises the step of:

after removing said form and said spacing means, inserting a tendon anchorage formed to receive convergently actuating gripping means into said recess formed by said spacing means around said tendon and against said bearing plate.

4,053,975

METHOD OF MAKING A SELF-SUPPORTING WIRE COIL

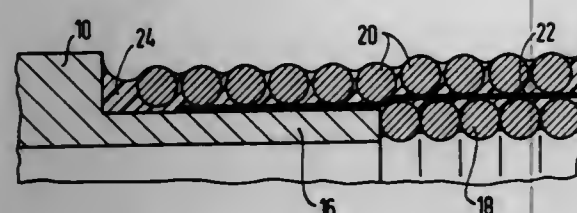
Otto Olbrich, Munich, and Wilhelm Brand, Neubaldham, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 31, 1976, Ser. No. 719,165

Claims priority, application Germany, Sept. 15, 1975, 2541084
Int. Cl.² H02K 15/04; H01F 41/06

U.S. Cl. 29—596

10 Claims



1. A method of producing a wire coil which is self-supporting over at least a principal part of its length, comprising the steps:

- winding the wire into a first annular layer of axially-abutting turns with a uniform lead in a first direction;
- winding the wire into a second annular layer of turns overlying the first layer and having a lead in a second direction, the turns being spaced slightly apart from one another in a direction axial of the coil formed thereby; and
- applying a casting agent to the coil, whereby the agent penetrates about and between the turns of the second and first layers of the coil before hardening.

4,053,976

METHOD OF MAKING Nb₃Sn COMPOSITE WIRES AND CABLES

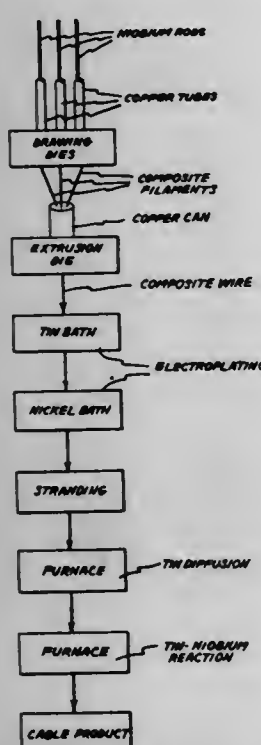
Ronald M. Scanlan, Schenectady, N.Y., and William A. Fietz, Oak Ridge, Tenn., assignors to General Electric Company, Schenectady, N.Y.

Filed June 27, 1975, Ser. No. 590,819

Int. Cl.² H01V 11/00

U.S. Cl. 29—599

9 Claims



1. In the method of producing Nb₃Sn composite wire by forming a niobium-copper composite wire in which the niobium is in the form of elongated filaments in a copper matrix, coating the wire with tin, heating the coated wire and diffusing the tin into the wire and thereafter heating the wire to cause reaction of the tin to form Nb₃Sn in the wire, the combination of the step of depositing on the tin-coated wire a layer from

about 0.1 to 1.0 micron thick of nickel or copper prior to the diffusion-heating step.

4,053,977

METHOD FOR ETCHING THIN FOILS BY ELECTROCHEMICAL MACHINING TO PRODUCE ELECTRICAL RESISTANCE ELEMENTS

Paul René Simon, and Bernard Le Grives, both of Nice, France, assignors to Societe Francaise de l'Electro-Resistance, Nice Cedex, France

Filed Apr. 26, 1976, Ser. No. 679,929

Claims priority, application France, Mar. 18, 1976, 76.07889
Int. Cl.² H01C 17/06

U.S. Cl. 29—620

13 Claims



1. A process for producing a resistor from a thin film or foil of an electrically conducting resistive alloy comprising the steps of:

- bonding said thin film or foil to a relatively thick layer of an electrically conductive material;
- securing the combination of said bonded film or foil and said material to a carrier substrate;
- securing an insulating mask to an exposed surface of said film or foil, said mask having a pattern of open portions and shaped boundaries;
- electrolytically attacking said masked resistive alloy in an electrolytic cell under electromachining conditions to remove the exposed portions of said resistive film or foil; and
- securing said foil after electrolytic attack to a substrate, whereby a precision resistor is formed.

10. A resistor made by the process of claim 1.

4,053,978

METHOD OF PREPARING IRON DISULFIDE ELECTRODES

John S. Dunning, Warren, and Thompson G. Bradley, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1976, Ser. No. 746,822

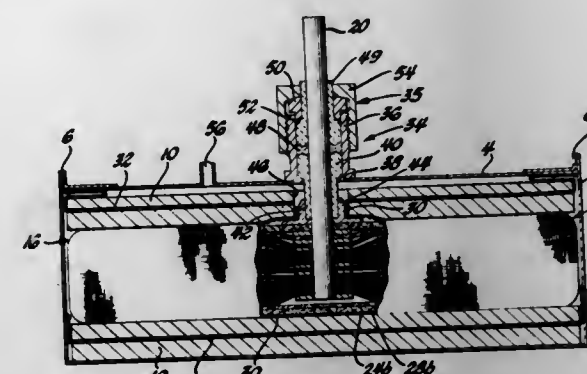
Int. Cl.² H01M 4/04

U.S. Cl. 29—623.5

4 Claims

1. A method for fabricating laminated FeS₂ electrodes for molten salt galvanic cells comprising the steps of: spreading a substantially homogeneous slurry of granular FeS₂ and molten sulfur into sheets; cooling said sheets to solidify said sulfur; sandwiching said sheets between electrically conductive, porous laminae which are permeable to said molten salt

and are inert to the cells' thermal, chemical and electrochemical environment, and



heating the thusly formed sandwich for a time and at a sufficient temperature and pressure to volatilize and remove said sulfur from said sandwich.

4,053,979

SUTURE CUTTER

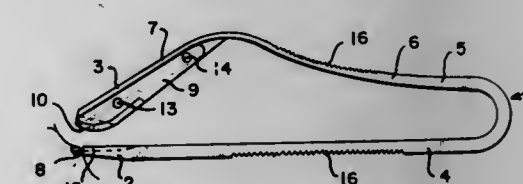
Harlan L. Tuthill, Tuxedo Park, N.Y., and John O. Freeborn, New Fairfield, Conn., assignors to International Paper Company, New York, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,667

Int. Cl.² A61B 17/32

U.S. Cl. 30—124

5 Claims



1. A disposable suture cutter for slicing a suture held thereby comprising:

- a resilient member including first and second elongated arms terminating respectively in first and second opposed free ends and adapted to be held between the fingers and thumb respectively, said first free end being shaped for insertion in cutting position under a suture without lateral motion;
- suture retaining means carried by said first free end for holding a suture aligned transversely on said first free end including a lateral slot for seating the suture extending across the full width of the interior surface of said first free end in opposition to said second free end and inwardly of the tip of said first free end;
- cutting means carried by said second free end and including a cutting blade having a longitudinally extending convex edge for slicing a suture held by said suture retaining means without lateral motion of said first free end; and
- guide means on said first free end for preventing lateral motion of said cutting means including a groove extending longitudinally along a portion of the interior surface of said first arm and intersecting said lateral slot on said first free end, said groove of said first free end lying in aligned opposition to the cutting blade carried by said second free end, said longitudinal groove and said blade lying in a common plane substantially medially of the width of said arms,

said second arm being movable without lateral motion toward said first arm to move said cutting blade toward said first free end in a direction transverse to the axis of a suture held in said lateral slot and being deformable when bearing against said first arm to move said cutting blade longitudinally parallel to said groove through the intersection of said slot and said groove to slice the suture held by said suture retaining means when pressure is exerted to displace said second arm toward said first arm and deform said second arm against said first arm, said first and second

arms having end portions opposite their free ends, a generally semi-circular section connecting said opposite end portions of said arms one to the other, said first arm being substantially planar and extending generally linearly; said second arm having a generally linearly extending first section generally inclined away from said first arm and extending from said semi-circular section, said second arm having a generally linearly extending second section inclined inwardly from said first section toward said first arm to terminate in said second free end aligned at an acute angle to said first free end, said second section having a mounting projection with a planar surface for mounting said cutting blade; said second section being movable transversely and downwardly relative to the axis of a suture held in said lateral slot to move said cutting edge of said blade longitudinally in a direction toward the tip of said first free end.

4,053,980

CHAIN SAW INCLUDING AN OVERTORQUE RELEASING CLUTCH

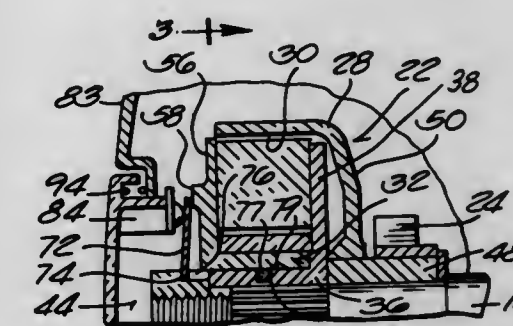
Arthur G. Poehlman, West Bend, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 16, 1976, Ser. No. 723,819

Int. Cl.² B23D 57/02; F16D 23/00

U.S. Cl. 30—381

14 Claims



1. A chain saw comprising a frame, an engine mounted on said frame, a drive shaft rotatably mounted on said frame and driven by said engine, a chain sprocket mounted for rotation coaxially with said drive shaft, a cutter bar supported by said frame, a saw chain trained around said sprocket and said cutter bar, a clutch including a drive member mounted for common rotation with said drive shaft and having one or more clutch teeth, a driven member having one or more clutch teeth adapted to be drivingly engaged by said drive member clutch teeth and being mounted for rotation coaxially with said drive member, one of said drive and driven members being mounted for axial movement relative to the other between a released position wherein said drive and driven members are disengaged and a driving position wherein said drive and driven members are in driving engagement to afford transmission of torque therebetween with said clutch teeth coacting to produce a separating force directed axially in one direction and tending to axially displace said one of said drive and driven members toward said released position, means for drivingly connecting said driven member to said sprocket in response to rotation of said drive shaft, and a resilient element interacting with said one of said drive and driven members and being movable between a first position wherein said resilient element yieldably resists axial displacement of said one of said drive and driven members toward said released position and a second position which is spaced from said first position so as to permit movement of said one of said drive and driven members to said released position, said resilient element moving from said first position to said second position when the axially directed separating force exceeds a predetermined level, said resilient element remaining in said second position in the absence of a reset force applied thereto in the direction opposite from said one direction.

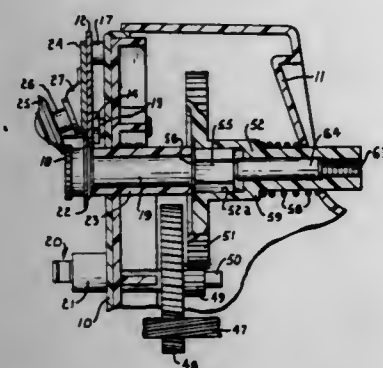
4,053,981

**POWER OPERATED CAN OPENER HAVING
AUTOMATIC SHUTOFF MEANS, A REMOVABLE HAND
LEVER ASSEMBLY, AND A MANUAL CRANK**
James B. Aberer, Lake Winnebago, Mo., assignor to Rival
Manufacturing Company, Kansas City, Mo.

Filed Apr. 15, 1976, Ser. No. 677,501
Int. Cl.² B67B 7/38

U.S. Cl. 30—419

22 Claims



5. In a can opener having an upright frame presenting an aperture therein, a can feed wheel supported for rotation on said frame at a location forwardly thereof, and means for rotating said feed wheel, the combination therewith of:

- a hand lever;
- a pin member extending from said hand lever and insertable in said frame aperture to mount said lever for pivotal movement on the frame;
- a cutting element coupled to said hand lever for movement therewith toward and away from said feed wheel;
- a latch supported on said frame and having a latching surface spaced forwardly of the frame at a location substantially between said feed wheel and frame; and
- an edge portion of said hand lever located in a substantially common plane with the remainder of the hand lever, said edge portion being received between said frame and latching surface and remaining therebetween throughout a substantial pivot arc of said lever to retain said pin member in said aperture, said edge portion withdrawing from between said frame and latching surface upon pivotal movement of said lever beyond said pivot arc.

17. A can opener comprising:
- an upright frame;
 - cutting means for shearing a can;
 - a feed wheel supported for rotation on said frame to feed a can relative to said cutting means;
 - a motor;
 - drive linkage drivingly coupling said motor to said feed wheel, said drive linkage being disengageable to uncouple said motor from said feed wheel;
 - yieldable means for biasing said drive linkage against disengagement;
 - a manual crank member;
 - means for coupling said crank member to said feed wheel to manually drive the latter; and
 - means for disengaging said drive linkage to uncouple said motor from said feed wheel when said crank member is coupled thereto.

4,053,982

DENTAL ANCHOR

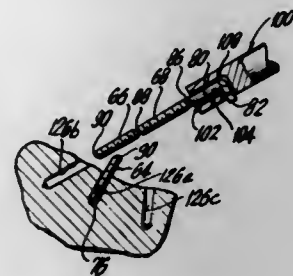
Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017
Filed Mar. 23, 1976, Ser. No. 669,688
Int. Cl.² A61K 5/02

U.S. Cl. 32—15

5 Claims

1. A dental anchor for insertion into a channel in a tooth in combination with a dental attachment, said dental anchor comprising elongated anchoring means, manipulating means having a portion thereof that is non-concentrically integral with one end of said anchoring means for rotating said anchoring means about a longitudinal axis thereof and for moving said

anchoring means axially into the channel of the tooth, at least a first frangible reduced thickness portion intermediate said anchoring means and said manipulating means, at least a portion of said anchoring means being threaded, said manipulating means being generally L-shaped and including an elongated guide means section immediately adjacent and integral at one end thereof with said anchoring means, said manipulating means further including an elongated torque transferring means section integral with an opposite end of said guide means section that is remote from said anchoring means, an axis of said torque transferring means section being substantially perpendicular to an axis of said guide means section, said guide means section being cylindrical and said torque transferring means section having at least two opposed flattened surfaces, a dimension between said flattened surfaces being less than a diameter of said cylindrical guide means section, said dental attachment comprising coupling means for operative association with a power tool, said coupling means including



an elongated member having a first end that is adapted to be received by the power tool and a second end having a socket for operative association with said L-shaped manipulating means, said socket in said second end of said coupling means providing control means defined by an L-shaped slot extending through a wall of said socket, said slot comprising a first axially extending opening starting at said second end of said coupling means and a second partially circumferential opening contiguous with an opposite end of said first opening, a diameter of said socket being larger than a diameter of said guide means section, a width of said first and second openings of said slot being larger than said dimension between the two opposed flattened surfaces of said torque transferring means section, and said width of said first opening of said slot being smaller than said diameter of said guide means section so that said guide means section is prevented from passing through said first opening of said slot to hold said guide means section within said socket.

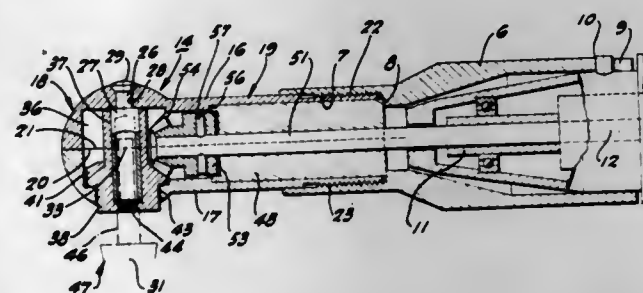
4,053,983

**PROPHYLACTIC ANGLE HEAD FOR USE WITH A
DENTAL HANDPIECE**

Lloyd P. Flatland, 15 Quisisana Drive, Kentfield, Calif. 94904
Filed Apr. 23, 1976, Ser. No. 679,734
Int. Cl.² A61C 1/10

U.S. Cl. 32—27

5 Claims



1. A prophylactic angle head for a dental handpiece comprising an upper housing shell having a planar face and having a first end portion enclosing an upper half-chamber and having a first shank portion enclosing an upper half-tube, a lower housing shell having a planar face and having a second end

portion enclosing a lower half-chamber and having a second shank portion enclosing a lower half-tube, means for holding said upper housing shell and said lower housing shell with said planar faces in abutment and with said half-chambers and said half-tubes facing each other, a bearing sleeve in said half-tubes and substantially abutting said shells, a stationary journal pin fixed in said first end portion and extending through said upper half-chamber and substantially through said lower half-chamber, a hollow gear hub rotatably mounted on said pin and extending substantially through said upper half-chamber and said lower half-chamber, a first bevel gear fast on said gear hub, a shaft extending through said bearing sleeve, and a second bevel gear fast on said shaft and engaging said first bevel gear.

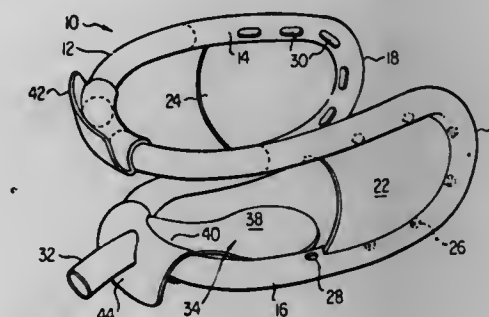
4,053,984

MOUTH PROP

Dan E. Moss, 247 Ridge Road, Cedar City, Utah 84720
Filed Aug. 5, 1976, Ser. No. 711,825
Int. Cl.² A61C 7/00

U.S. Cl. 32—33

10 Claims



1. A dental mouth prop comprising:
- a. a support having an upper U-shaped section with first and second ends, a lower U-shaped section with first and second ends, a first curved connecting section joining the first end of said upper U-shaped section to the first end of said lower U-shaped section, a second curved connecting section joining the second end of said upper U-shaped section to the second end of said lower U-shaped section;
 - b. first and second cheek deflectors respectively secured to different sides of said upper and lower U-shaped sections, said cheek deflectors being curved generally to a contour approximating the cheek surface of the mouth, said cheek deflectors holding the patient's cheeks away from the dental arches when said mouth prop is inserted into the patient's mouth.

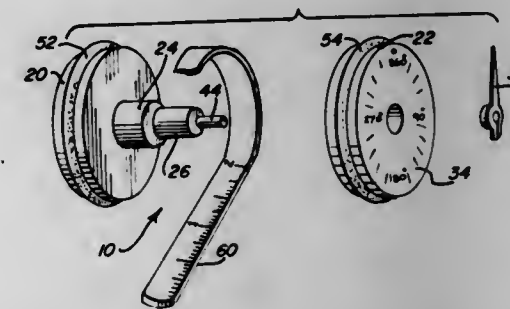
4,053,985

MECHANICAL PROTRACTOR

Nick E. Spentzas, 594 Rozanne Drive, Addison, Ill. 60101
Filed Apr. 21, 1976, Ser. No. 679,015
Int. Cl.² G01B 3/12, 5/00, 7/00

U.S. Cl. 33—1 N

18 Claims



1. Apparatus for measuring angles comprising:
- first and second spaced wheels;
 - a shaft between said first and second wheels, said wheels being mounted on said shaft for independent rotation; and
 - means for indicating the difference in rotation of said first

and second wheels including a pointer attached to said shaft, means for rotating said pointer proportionally with the rotation of said first wheel and indicia disposed on a surface of said second wheel adjacent to said pointer.

8. Apparatus for measuring angles on a surface comprising: means for travelling along said surface including first and second independently rotatable members for engaging said surface;
- a first rotatable element;
 - a second rotatable element;
 - means for rotating said first rotatable element proportionally to the rotation of said first rotatable member;
 - means for rotating said second rotatable element proportionally to the rotation of said second rotatable member; and
 - means affixed to said first and second elements for visually indicating the angle travelled along said surface, said indicating means including an indicator and indicia calibrated to indicate said angle, said indicator and indicia being mounted for relative movement in response to the relative rotation of said elements.

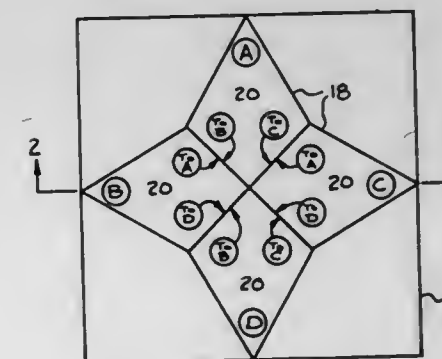
4,053,986

METHOD OF PRODUCING PATCHWORK

Claire B. Axelrod, 100 E. Hartsdale Ave., Hartsdale, N.Y. 10530
Filed May 21, 1976, Ser. No. 688,841
Int. Cl.² A41H 3/00; D05B 97/12

U.S. Cl. 33—17 R

4 Claims



1. The method of making patchwork which comprises (a) attaching to fabric to be used in making a desired patch a patch pattern comprising a sheet of material corresponding in shape to the desired patch, by means of a strippable adhesive which adheres more strongly to said material than to said fabric, said material being substantially stiffer than said fabric; (b) cutting said fabric to produce a patch piece sufficiently larger than the desired patch to provide a seam skirt; (c) positioning said patch next to another similarly prepared patch in the desired design sequence and sewing the seam skirts together while using the edges of said stiffer material to properly position said patches; and (d) thereafter stripping the said stiffer material and accompanying adhesive from the sewn patchwork.

4,053,987

MULTI-PURPOSE DRAWING INSTRUMENT

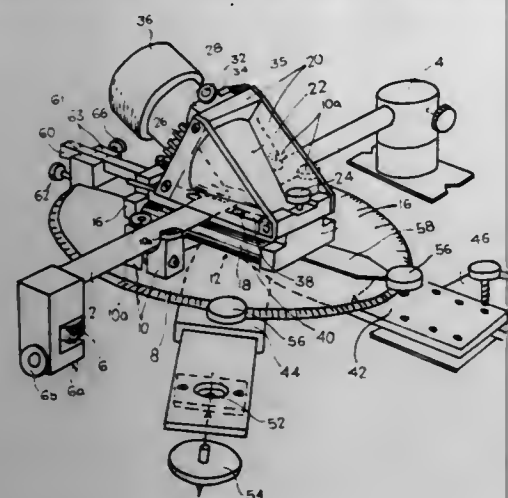
Mayya Narayan Ram, 8th Dwarka Kunj, Plot 509, 12th Road, Chembur, Bombay 400 071 AS, Maharashtra, India
Filed Aug. 17, 1976, Ser. No. 715,208
Int. Cl.² B43L 13/24

U.S. Cl. 33—81

12 Claims

1. A multi-purpose drawing instrument comprising a guide rod supported horizontally on upright end supports; a slide disc including roller support means which slidably engage said guide rod so that the disc is slidable along said guide rod; a carriage slidably supported on said guide rod above said slide disc, a conical member, means rotatably supporting said conical member on said slide disc with the side wall of the conical member in pressure contact with the guide rod so that when said conical member is turned the carriage moves along

the guide rod, tightening means on said carriage for varying the contact pressure of the conical member on the guide rod; adjustment means for adjusting the position of the carriage transversely of said guide rod and for engaging the carriage with the slide disc when said carriage or slide disc is moved



along the guide rod; a horizontally-disposed radial arm one end of which is rotatably connected to the center of the slide disc so that it can be rotated thereat and the free end of which is connectable to a foot ruler, and clamping means for clamping said horizontally disposed radial arm to said slide disc at any desired angle relative to the guide rod or said carriage.

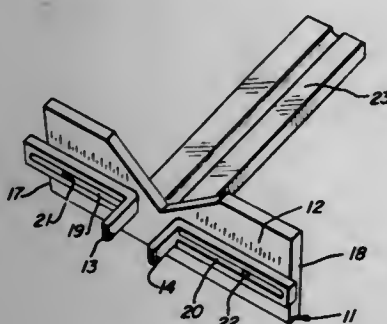
4,053,988 ECCENTRICITY MEASURING DEVICE

Kenneth A. Budic, Wauwatosa, Wis., assignor to Will Ross, Inc., Milwaukee, Wis.

Filed May 28, 1976, Ser. No. 691,054
Int. Cl.² G01B 5/25

U.S. Cl. 33—174 Q

3 Claims



1. A device for measuring eccentricity of an object comprising:

- a base for supporting said object to be measured;
- a scale on said base for indicating a measure of said object;
- measuring head supported on said base perpendicular to said scale and movable along said scale for contacting an outermost portion of said object;
- support member perpendicular to said base and extending outwardly from the backside of said base;
- first groove on said base at the origin of said scale; and
- second groove on said support member aligned with said first groove and extending substantially the length of said support member, whereby said grooves serve to locate said object at the origin of said scale.

4,053,989 CO-ORDINATES MEASURING APPARATUS FOR AN EXCLUSIVE PROPELLER PROCESSING MACHINE

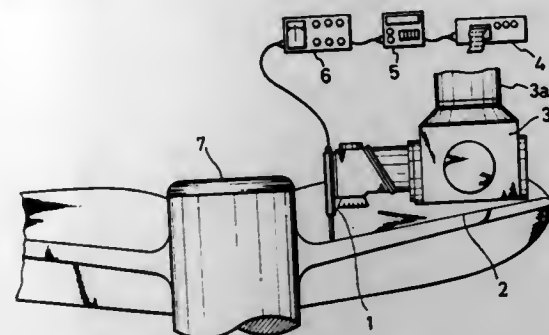
Hiroshi Yamaji, and Kiyoshi Furukawa, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 465,480, April 30, 1974, abandoned.
This application Oct. 6, 1975, Ser. No. 620,226

Int. Cl.² G01B 7/02

U.S. Cl. 33—174 PC

12 Claims



1. A propeller measuring machine, comprising a probe moving means responsive to feed signals and coupled to the probe for moving the probe, said probe having a first portion secured to said moving means and a second portion which is held by the first portion and which projects from the first portion and which includes a tip displaceable relative to the first portion when the probe contacts a solid member with the second portion, guidance means coupled to said moving means for producing feed signals which cause said moving means to move the probe to the predetermined locations near the surface of the propeller being measured and at each location to move the moving means so that the probe travels toward contact with the surface of the propeller, detecting means coupled to said probe and said guidance means for starting the observance of feed signals from the guidance means at the time the tip is displaced in response to contact with the propeller and for continuing the observance of the feed signals until the feed signals emitted by the guide means are sufficiently great to have caused movement of the moving means toward the surface to a reference position located a predetermined distance relative to a desired propeller shape, and recording means coupled to said detecting means for recording the output of said detecting means.

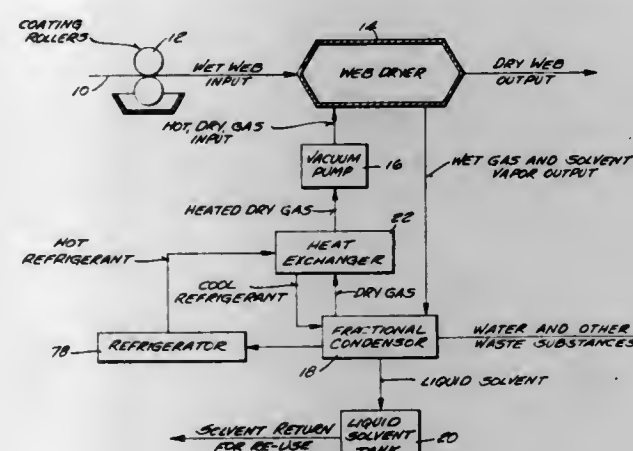
4,053,990 DIFFERENTIAL PRESSURE DRYING AND SOLVENT RECOVERY UNIT

George D. Bielinski, Appleton, Wis., assignor to Sav-Sol Drying Systems, Inc., Appleton, Wis.

Filed Mar. 3, 1976, Ser. No. 663,445
Int. Cl.² F26B 3/00, 5/12, 13/30

U.S. Cl. 34—23

28 Claims



1. The method of removing solvent from a web of material bearing such solvent which comprises:

- a. introducing a web of material bearing solvent through an opening and into an internal chamber of a web dryer, in which chamber dry gas is being introduced to enhance the vaporization of the solvent and carry solvent vapor from the web;
- b. passing said web through at least one solvent stripping slot which further promotes the vaporization of solvent from the web, said web being exposed while passing through said slot to a stream of gas flowing downstream relative to the movement of said web;
- c. next introducing said web into a vacuum chamber in which reduced pressure enhances the vaporization of the solvent from the web;
- d. then removing said web from the vacuum chamber through at least one additional solvent stripping slot and into a second chamber in which dry gas is being introduced, said web being exposed while passing through the additional slot to a stream of dry gas moving upstream relative to the movement of the web; and
- e. then collecting the upstream and downstream stream of gas in the vacuum chamber and exhausting such gas from the web dryer.

4,053,992 APPARATUS AND METHOD FOR CONDITIONING FIBROUS MATERIALS, UTILIZING AND ABRADABLE CONDITIONING AGENT FASTENED TO THE INTERIOR OF AN AUTOMATIC LAUNDRY DRYER DOOR

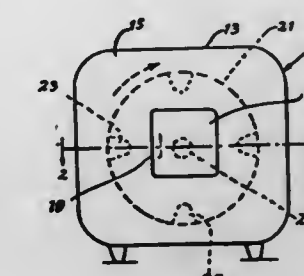
Henry P. Furgal, Bernardsville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 82,235, Oct. 20, 1970, abandoned. This application Mar. 2, 1973, Ser. No. 337,353

Int. Cl.² F26B 19/00

U.S. Cl. 34—60

3 Claims



1. An apparatus for softening laundry which comprises an automatic laundry dryer of a substantially horizontally rotating tumbling drum type, having a door at the front thereof which is substantially vertical and stationary during rotation of the drum, with said door having fastened to the inside thereof in form-retaining relationship therewith in such position as to be contactable by tumbling laundry to be softened, a conditioning article comprising a hemisphere base of a polymer means to adhesively secure said base to the dryer door and a conditioning agent coating external to the base and abrasively removable therefrom on contact with tumbling laundry to be conditioned during drying of such materials in the automatic laundry dryer, said conditioning agent being selected from the group consisting of synthetic organic surface active anionic, nonionic, cationic, anionic-nonionic and cationic-nonionic fabric softeners and being held in form-retaining relationship with the base said coating being characterized such that about 3 grams thereof per 8 lb. load of laundry are abraded from the surface of the coating unto the fabrics during the drying of the tumbling laundry.

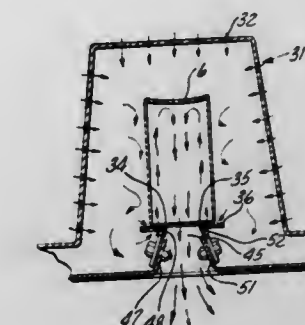
4,053,993 OVEN FOR A PROCESSION OF CONTAINERS

Alex J. Schregenberger, Neshanic Station, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed May 24, 1976, Ser. No. 689,410
Int. Cl.² F26B 25/00

U.S. Cl. 34—105

13 Claims



1. A method for storing seed grains in a grain bin having air impervious sidewalls, a roof, a grain storage chamber, means within said grain storage chamber for sensing the temperature of grain within said grain storage chamber, plenum chambers disposed on opposite sides of said grain storage chamber, one of said plenum chambers being an intake and the other an exhaust, said plenum chambers having air pervious means where the plenum chambers are in communication with the grain storage chamber, means for sensing the temperature of atmospheric air, fan means attached to said grain bin for selectively supplying atmospheric air to the intake plenum chamber, an exhaust means in the grain bin in communication with the exhaust plenum chamber, said method comprising: activating said fan means when the temperature differential between the atmospheric air and the stored grain exceeds a predetermined amount; and, deactivating said fan means when the temperature differential between the atmospheric air and the stored grain is less than or equal to said predetermined amount.

1. Apparatus for treating a procession of similar containers each of which has an open end and a closed end comprising: a conveyor providing support along a path for a procession of the containers while traversing an elongate treatment region with the open ends thereof engaged with the conveyor in an approximate plane forming one extremity of said region; enclosure means having an elongate intake port means of substantially less width than said open ends, said port

means opening along, and extending centrally along, said path for the passage of air or other gas centrally through the conveyor into the enclosure means along a central linear portion of said path substantially narrower than said open ends;

said conveyor comprising uniformly spaced support means for the containers moving concurrently along opposite sides of said intake port means;

inlet means located transversely outwardly of said inlet port means providing space for passage of air into portions of the open ends of said containers extending transversely beyond said intake port means; and

air pumping means for producing a drop in air pressure at said intake port means such that the pressure is lower inside said enclosure means than at said inlet means.

4,053,994

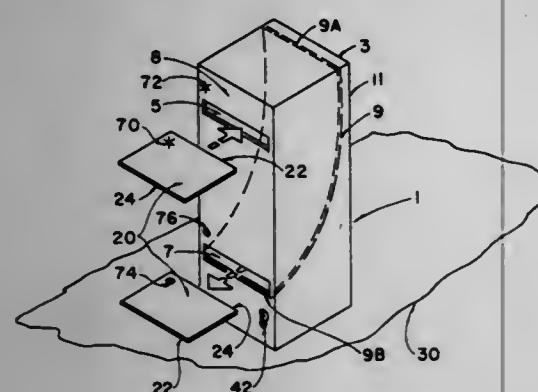
EDUCATIONAL DEVICE

Diane Marlene Gess, 16 Charnwood Drive, Suffern, N.Y. 10901
Filed Mar. 10, 1976, Ser. No. 665,511

Int. Cl.² G09B 3/00

U.S. Cl. 35—9 R

10 Claims



1. An educational device adapted to receive a card in an obverse position, said card having information printed on both sides thereof, and of delivering said card reverse face-up which educational device comprises an enclosed frame having an upright attitude position, said frame having:

a. A narrow inlet opening for receiving said card edgewise therethrough into said frame with said obverse face showing;

b. A narrow outlet opening for delivering said card outside of said frame, said outlet opening being spaced below said inlet opening; and

c. Stationary guide means for selectively moving said card from said inlet opening to said outlet opening so that said card is delivered to said outlet opening edgewise with its reverse face-up; whereby said card inserted into said inlet opening in an obverse position by an operator is delivered to said outlet opening reverse face-up.

4,053,995

ORTHOPEDIC SHOE

Melvin Shein, 6406 Regal Road, Louisville, Ky. 40222

Filed July 23, 1976, Ser. No. 708,140

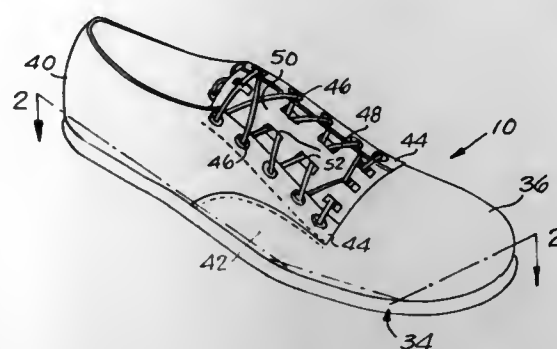
Int. Cl.² A43B 7/14, 23/26, 13/12

U.S. Cl. 36—88

18 Claims

1. An orthopedic shoe comprising in combination: a flat, level sole whose periphery has the same shape as that of the bottom horizontal plane of a foot and includes an anterior transverse arch portion which is broad and of substantially constant width, a rapidly inwardly curving and narrowing metatarsal portion, and a heel portion, said sole including a compressible, permanently foot conformable layer; and an upper including a heel counter, a vamp for embracing the sides and under the metatarsal arch, said vamp having a pair of widely spaced forwardly projecting flaps for extending along the upper parts of the sides of a foot, each flap including a longitudinal row of fastener devices, and a toe portion having a broad rearwardly extending tongue to cover the metatarsal

arch, said tongue having upper and lower connected layers and at least one large transverse opening to freely pass an adjustable fastener therethrough for cooperation with said fastener



devices, whereby the shoe closely conforms to the shape of a foot and supports all parts of the same in a uniform natural manner.

4,053,996

POWER AMPLIFIER PROTECTION CIRCUIT

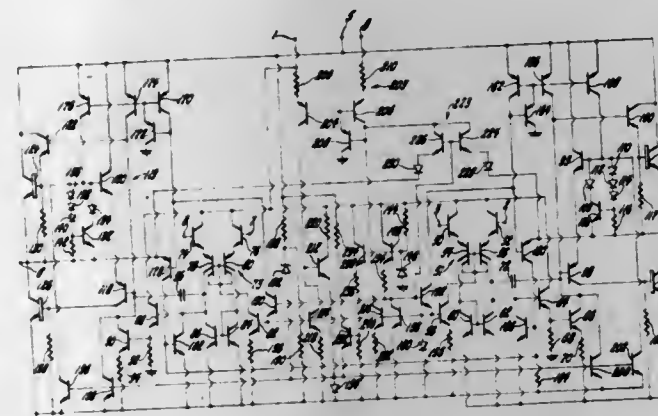
Burton D. Schertz, Kokomo, and Fredrick A. Aldridge, Russiaville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1976, Ser. No. 669,899

Int. Cl.² H02H 7/20

U.S. Cl. 361—98

4 Claims



1. A protection circuit for a power amplifier having an output stage including a pair of transistors serially connected between respective positive and negative supply terminals of a direct current supply and providing an output terminal intermediate the transistors for connection to a load, the protection circuit comprising:

generating means effective to supply a constant value reference voltage;

a voltage comparator coupled with the generating means and the output terminal of the power amplifier effective to supply a control signal when the voltage at the output terminal of the power amplifier attains a predetermined relationship relative to the constant value reference voltage, the predetermined relationship representing a short of the output terminal of the power amplifier to the positive supply terminal of the direct current supply; and

circuit means coupled to the voltage comparator and the transistor in the output stage that is connected to the negative supply terminal of the direct current supply effective to bias the last mentioned transistor non-conductive in response to a control signal supplied by the voltage comparator, the current through the transistor coupled to the negative supply terminal being limited by the circuit means in response to a detected short of the output terminal to the positive terminal of the direct current supply so as to protect the power amplifier from damage to excess current resulting from said short.

4,053,997

SCRAPER ELEVATOR WITH LOWER DRIVE SPROCKETS

Howard E. Stuller, and Glenn E. Walser, both of Lubbock, Tex., assignors to Clark Equipment Company, Buchanan, Mich.

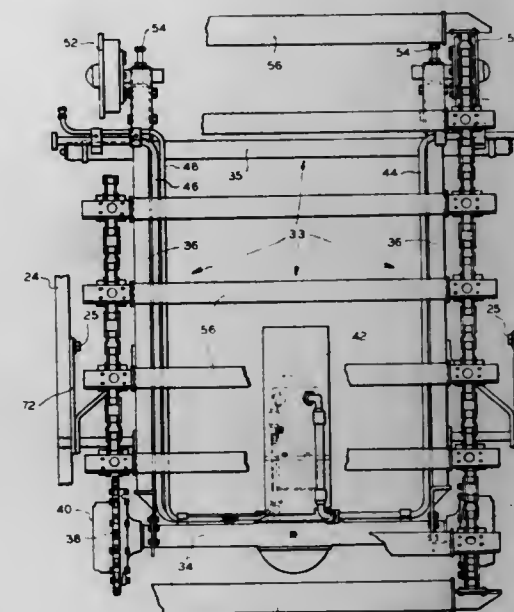
Continuation of Ser. No. 167,764, July 30, 1971, abandoned.

This application Oct. 18, 1973, Ser. No. 407,694

Int. Cl.² E02F 1/00

U.S. Cl. 37—8

13 Claims



1. A mobile earth-moving scraper having an earth material receiving space defined on at least three sides by wall and floor members leaving an open front, a forwardly and downwardly inclined scraper blade extending transversely of the space and carried by said members at said open front and discharging into said space, an inclined endless scraper-type elevator mounted between said wall members, elevator mounting means yieldably supporting the elevator permitting it to rise and fall as a unit of mass substantially isolated from the remaining scraper mass, said elevator unit of mass comprising a pair of endless chains, flights connected between said chains for contacting the dirt and pulling it into the space behind the blade, a pair of idlers located remotely from the blade over which the respective endless chains operate, a pair of driving sprockets for driving the respective chains located adjacent the blade and elevator drive means connected to the drive sprockets contributing substantial mass to the elevator unit of mass below the transverse centerline of the elevator such that the center of gravity of the elevator unit of mass is below the centerline.

4,053,998

MULTI-BLADE DITCHING MACHINE

Takujji Ezoe, Tokyo, Japan, assignor to Kokusai Cable Ship Co., Ltd., Tokyo, Japan

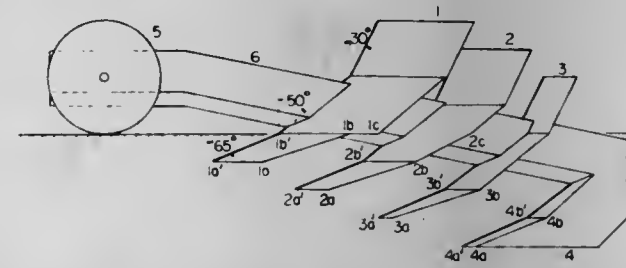
Filed Dec. 3, 1975, Ser. No. 637,188

Claims priority, application Japan, Dec. 27, 1974, 50-148882

Int. Cl.² E02F 5/02

U.S. Cl. 37—98

3 Claims



1. A multi-blade ditching machine having a plurality of blades adapted for ditching and pushing soil disposed along the longitudinal axis thereof substantially at uniform intervals; the blades which are positioned at the rear portion of said ditching machine having a greater vertical length and smaller horizon-

tal extent transverse to the direction of movement than the more forwardly disposed blades and adapted to ditch more deeply with narrower ditching widths, said ditching machine being further characterized in that at least the two most forward of the blades have a ditching means for ditching soil and a soil-pushing means for pushing said soil substantially horizontally in a direction lateral to moving direction of the ditching machine, said soil-pushing means being at the top of said ditching means and having a wider horizontal width as seen from front of the ditching machine than that of said ditching means when the ditching machine is in a normal operating posture the width of the soil pushing and ditching means of each of said most forward blades being respectively narrower proceeding consecutively from the front to the rear of the machine.

4,053,999

AUTOMATIC GRAB CRANE

Charles S. Kelley, 253 Bradwell Road, Barrington, Ill. 60010, and James A. Westlund, 1685 Portage Pass, Deerfield, Ill. 60015

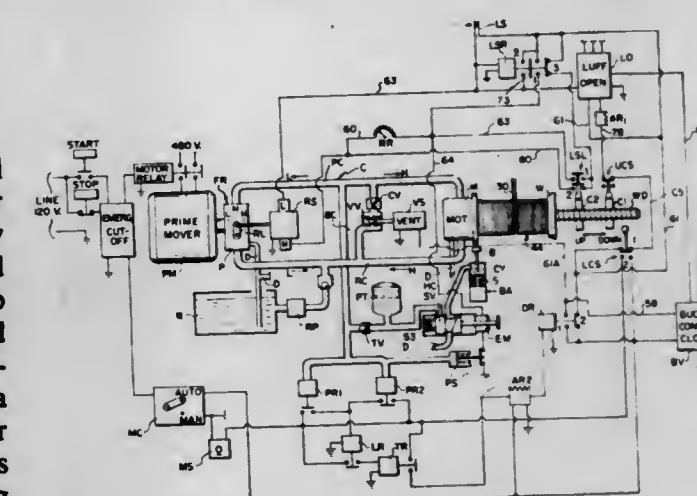
Division of Ser. No. 508,274, Sept. 23, 1974, Pat. No. 3,967,394.

This application May 20, 1976, Ser. No. 689,350

Int. Cl.² E02F 1/00

U.S. Cl. 37—195

7 Claims



1. The method of controlling the timing and limiting of the quantity of submerged material picked up by a crane grab each load including lowering the grab open on a hoist line under its own weight at a predetermined substantially constant rate; passing the lowering grab in open condition through water above the material to lessen and render constant its effective weight upon the hoist line; automatically detecting the moment of initial substantial contact between the grab and work material as indicated by the final reduction of grab weight upon the hoist line; continuing the lowering of the hoist line for a predetermined set period of time after said detection to remove substantially all grab weight from the hoist line and penetrate the work material in depth; arresting movement of the hoist line at the end of said period of time to provide limited slack in the hoist line; limiting the digging depth of the grab by taking up the slack while closing said grab; and, thereafter freeing and raising the closed grab and load by the hoist line.

4,054,000

LAWN MARKER

Carolyn L. Lisle, 2236 Benita Drive, Rancho Cordova, Calif. 95670

Filed Mar. 31, 1976, Ser. No. 672,298

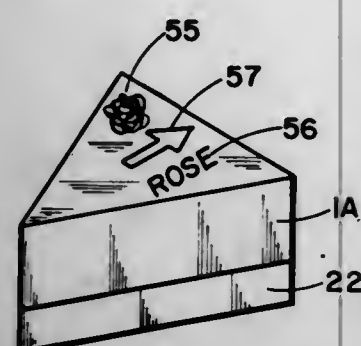
Int. Cl.² G09F 19/00, 3/02

U.S. Cl. 40—124.5

17 Claims

1. A marker for installation in a lawn or garden, comprising: a. a solid first portion having at least one upstanding side wall, a top and a bottom surface, said portion having been formed by casting of an acrylic or methacrylic polymer in a mold, and having carved information areas therein, carved from one surface, said areas having a filling of a

- putty therein to aid in visually defining said areas and said carved and filled areas viewable from the surface opposite to and in the same general plane as the carved surface of said solid;
- b. a solid second portion laminated on one side to the carved surface of said solid first portion and having a surface area

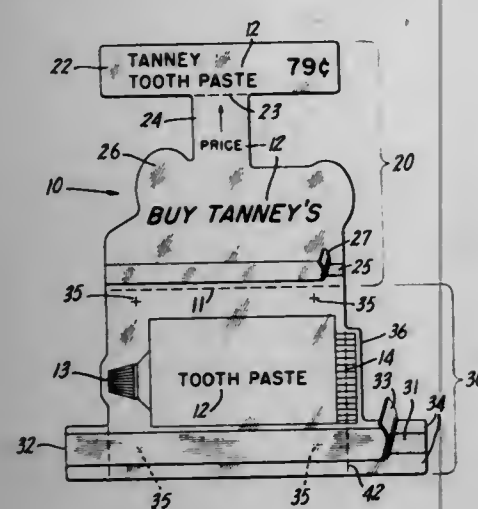


on the side laminated at least equal to that of the surface of the front portion to which it is affixed; wherein the combination of said (a) and (b) portion constitute the entire marker and further including indicia embedded in the first portion and viewable from the exterior of the marker.

4,054,001
THREE DIMENSIONAL HANGING DISPLAY DEVICE
George De Pinna, Forest Hills, N.Y., assignor to Goodren Products Corporation, N.J.

Filed Aug. 23, 1976, Ser. No. 716,388
Int. Cl.² G09F 19/00

U.S. Cl. 40—126 A



1. A display device for arrangement into a three-dimensional configuration, comprising:
- a. unitary, thin, flexible sheet having a front information display surface and a back surface, the sheet having a first section and a second section with a dividing line therebetween, said first section having a dangle portion adjacent said dividing line which is connected to a support portion remote from said dangle portion by an elongated spine portion, said spine portion is relatively narrow compared to said support portion, said second section having at least one tab extending from each of its edges that are perpendicular to the dividing line, said tabs being located adjacent the edge that is parallel to and remote from the dividing line;
- first adhesive means located on the front of said dangle portion in a strip that is parallel to and adjacent the dividing line; and
- second adhesive means located on the front of said second section in a strip that is parallel to the dividing line and extends between the tabs, whereby upon arrangement of said device in its three-dimensional configuration, said first adhesive means secures together the front surfaces of the first and second sections adjacent a crease along the dividing line, said second adhesive means secures the front

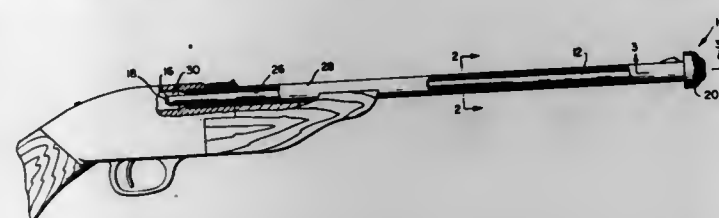
surface of the second section remote from the dividing line to the back of the second section adjacent the dividing line and also secures the front of the tabs onto the back of the bottom of the first section in order to form a three-dimensional shape that is mounted on the front of the dangle portion, said support portion being sharply bent toward said spine portion at its intersection with the spine portion so that when the device is in its display position, the spine portion arches away from the bottom of the support portion and suspends the dangle portion containing the three-dimensional shape.

4,054,002
DESICCATING DEVICE FOR FIREARM
Carmen J. Latona, Jr., 81½ New Alexander St., Wilkes Barre, Pa. 18702

Filed Jan. 2, 1976, Ser. No. 646,374
Int. Cl.² F41C 27/08

U.S. Cl. 42—1 N

10 Claims

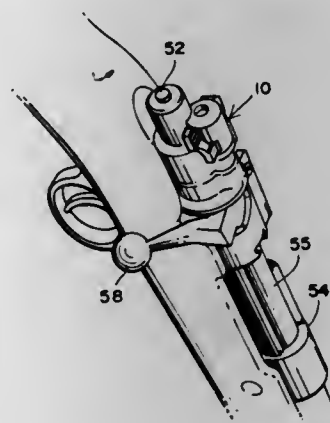


1. For use in a firearm having a firing chamber and a barrel with a muzzle end and a bore extending from the muzzle end to the firing chamber, a desiccating device comprising a substantially rigid, moisture pervious tubular member adapted to extend into the bore of the barrel, particulate desiccant means contained within said tubular member and adapted to absorb moisture from within the barrel, and closure means attached to one end of said tubular member and adapted to retain said member in the barrel and close the muzzle end of the barrel.

4,054,003
FIREARM SAFETY DEVICE
Hugh R. Wilson, 10840 SW. 120th St., Miami, Fla. 33176
Filed Oct. 7, 1976, Ser. No. 730,647
Int. Cl.² F41C 17/04

U.S. Cl. 42—70 F

4 Claims



1. A firearm safety mechanism comprising a holding and release means for releaseably engaging a firing pin, said holding and release means comprising a pivoted holding member for movement between first and second positions for holding and releasing a firing pin, respectively, shaft means mounted on said holding and release means, for movement between first and second positions, lever means mounted on said shaft means for movement between first and second positions, depressing means mounted on said shaft means for moving said holding member to its second position when said shaft means is moved to its second position, said holding member being movable to its first position after having moved

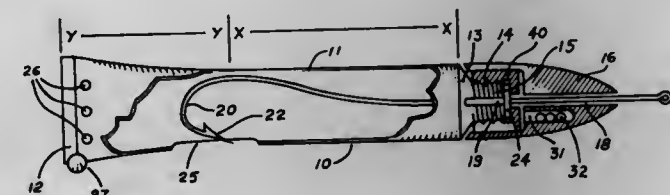
to its second position when said shaft means is moved to a first position after having been moved from a first position to a second position, whereby when said shaft means is moved to its second position said holding member moves to its second position engaging a firing pin and holding said firing pin in a safe position and when said shaft means is moved from its second position to its first position said holding member is movable to its first position and a firing pin released to an unlocked position.

4,054,004
WEEDLESS FISHING LURE
William Donald Schott, 150 Dexter Drive, Monroeville, Pa. 15146

Filed July 9, 1976, Ser. No. 703,954
Int. Cl.² A01K 85/00

U.S. Cl. 43—42.09

9 Claims

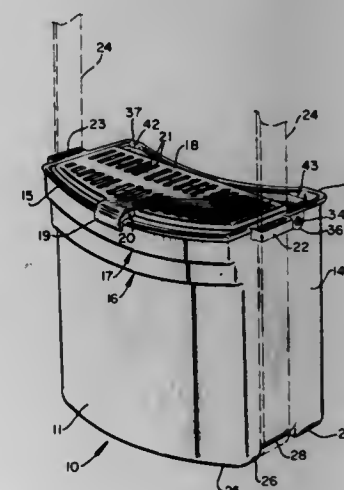


1. A weedless fishing lure comprising:
- a. a hollow semi-rigid resilient body having a substantially uniform wall thickness;
- b. a threaded neck integrally formed with said body;
- c. a head threaded on said neck;
- d. a hook enclosed within said body;
- e. an aperture in the wall of said body, said hook and said aperture being in substantial alignment to provide for exposure of the hook when said body is flexed;
- f. means for removably fixing the position of said hook and said aperture with relation to each other including a disk permanently mounted to said hook, said disk being frictionally fixed between said head and said threaded neck; and
- g. means for attaching said lure to a fishing line.

4,054,005
LIVE-BAIT PACK
Andrew O. Lightfoot, 2848 Bonnywood, Dallas, Tex. 75233
Filed July 9, 1976, Ser. No. 703,808
Int. Cl.² A01K 97/04

U.S. Cl. 43—55

9 Claims



1. A portable live-bait container comprising a unitary body member with arcuately formed, generally concentric, front face and back walls contiguous with side walls and a container base, said back wall being concavely extended between respective side walls to substantially conform to the body of a wearer, said front face wall being extended outwardly by plural steps at the upper extreme thereof with an upper-most

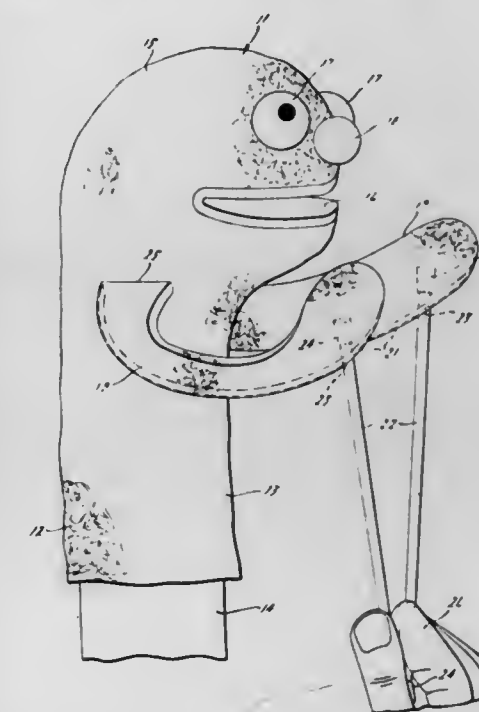
step wall terminated in a container upper-edge extending lip, each said step comprising a step base having formed therein a plurality of through-slots each providing a fluid communication between container confines and the outside of said container; and container lid means pivotally mounted to said container body member.

4,054,006
PUPPET OPERATED BY BOTH HANDS
John P. Estlund, Port Huron, Mich., assignor to Marjac Inc., Port Huron, Mich.

Filed Mar. 24, 1976, Ser. No. 670,041
Int. Cl.² A63H 3/14

U.S. Cl. 46—154

4 Claims



1. A puppet having a head with a mouth and a downwardly extending portion for receiving a hand and arm, respectively, of an operator, said mouth being actuated by said hand extending into the head, at least one flexible arm means secured to said downwardly extending portion, said arm means being formed of flexible material having rod means secured thereto and extending downwardly near the free end thereof to be manipulated by the other hand of the operator to move the arm means adjacent to said head, and said rod means comprising a rod having an elastomeric cap forced over one end with the cap disposed and secured in an opening provided in the arm means permitting the rod to be freely movable with the arm, said rod and cap being constructed of materials whereby the rod is only removable from the cap upon an excessively abnormal amount of force being applied thereto.

4,054,007
ROW-CROP TILLAGE AND TREATING DEVICE
John O. Moore, Helena, Ark., assignor to Sprayrite Manufacturing Company, Helena, Ark.

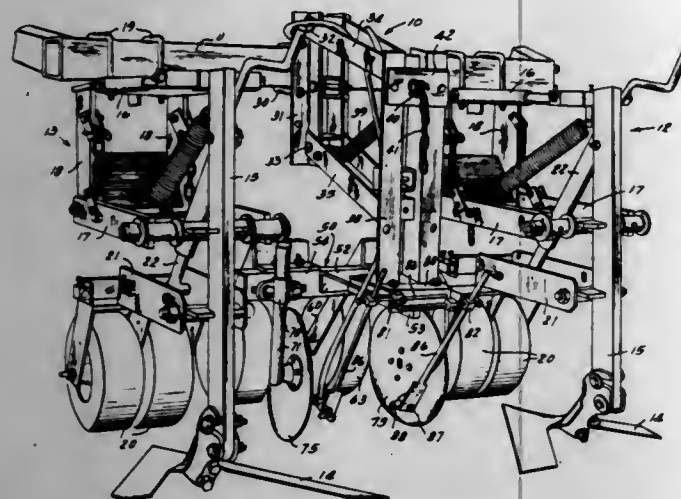
Filed Apr. 15, 1976, Ser. No. 677,449
Int. Cl.² A01C 23/04

U.S. Cl. 47—1.7

10 Claims

1. A row crop tillage and treating device adapted to be towed along a crop row by a towing means, said device comprising:
- a pair of spaced-apart, parallel frame members;
- a pair of parallel, spaced-apart link members pivotally joining said frame members and forming a parallelogram linkage therewith;
- a first one of said frame members being attachable to said towing means;
- a second one of said frame members comprising a mounting portion;

a pair of transversely-spaced gauging wheels carried by said mounting portion, the wheels being spaced to straddle said crop row;
a pair of shanks affixed vertically to said mounting portion on either side thereof to straddle said crop row;



a disc blade carried by each of said shanks upon an axis transverse to said shank; and
at least one crop treating device carried by said mounting portion and extending adjacent said crop row.

4,054,008

AUTOMATIC DOOR OPENING ARRANGEMENT

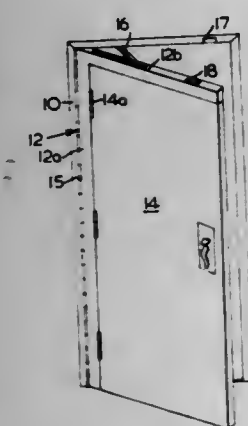
Richard Edwin Phillips, Vancouver, Canada, assignor to R. E. Phillips Limited, Vancouver, Canada

Filed Mar. 24, 1976, Ser. No. 670,514

Int. Cl.² E05F 15/20

U.S. Cl. 49—31

4 Claims



1. In a frame providing a doorway therethrough and having a door therefor, the improvement comprising an emergency arrangement for automatic opening of said door from said doorway to permit ingress and egress through said doorway, said arrangement including means for hingedly supporting said door within said doorway in a closed position of alignment with said frame of said doorway and in a manner to open from said doorway by hinged movement thereof in a given direction with respect to said doorway, a member hingedly supported within said doorway in a closed position of alignment with the frame of said doorway and said door and in a manner to open from said doorway on hinged movement thereof in the same said given direction as that by which said door hingedly moves to open from said doorway, said member having means engageable with said door for preventing hinged movement of said door with respect thereto other than in said given direction of hinged movement thereof by which said door moves to open from said doorway, said door being otherwise mounted for hinged opening and closure thereof independent of said member, latch means for releasable latching interconnection of said door with said member in a closed position of alignment herewith, an opening device acting between the frame of said doorway and said member to urge said member from a closed position in which said member is aligned with the frame of said

doorway to a position open from said doorway, a retaining device mounted on the frame of said doorway and interengageable with and normally holding said member in a closed position of alignment with the frame of said doorway and releasable from interengagement with said member on receipt of a given signal and thereby permitting said opening device to urge said member from a closed position of alignment with the frame of said doorway to a position open from said doorway, said means of said member engageable with said door for preventing hinged movement of said door with respect thereto other than in said given direction of hinged movement thereof by which said door moves to open from said doorway acting to cause said door to open from said doorway and preventing closure of said door to a closed position of alignment with the frame of said doorway so long as said member is open from said doorway.

4,054,009

MACHINE FOR SURFACE GRINDING

Sergei Georgievich Redko, Naberezhnaya Kosmonavtov, 2, kv. 19; Albert Viktorovich Korolev, Bolskaya Gornaya, 170, kv. 8; Anatoly Fedorovich Maxjushin, Naberezhnaya, dom 1a, kv. 48; Moisel Solomonovich Kreps, ulitsa Gorkogo, 28, kv. 1, and Fedor Vasilievich Gorokhov, Vologodskaya ulitsa, 13, kv. 15, all of Saratov, U.S.S.R.

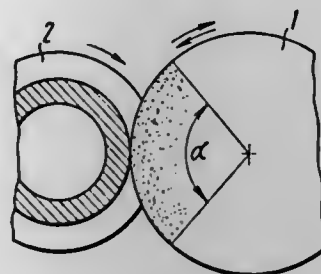
Division of Ser. No. 421,635, Dec. 4, 1973, Pat. No. 3,958,371.

This application Nov. 7, 1975, Ser. No. 629,785

Int. Cl.² B24B 5/00

U.S. Cl. 51—3

4 Claims



1. A grinding machine comprising:
 - a. a bed with a pair of sets of guides;
 - b. a table for positioning thereon a workpiece to be machined, said table being installed in one of said sets of guides;
 - c. a spindle with a grinding wheel thereon mounted in the other of said sets of guides;
 - d. a first mechanism to impart a rotary motion to at least one of said spindle and the workpiece; and
 - e. a second mechanism to impart a rocking motion to said spindle in the plane of rotation of said wheel, said second mechanism including a rack, a drive to impart a reciprocating motion to said rack, and a gear which is kinematically coupled with said spindle interlinked with said rack.

4,054,010

APPARATUS FOR GRINDING EDGES OF PLANAR WORKPIECES

Vern D. Shipman, Garland, Tex., assignor to Headway Research, Inc., Garland, Tex.

Filed Jan. 20, 1976, Ser. No. 650,698

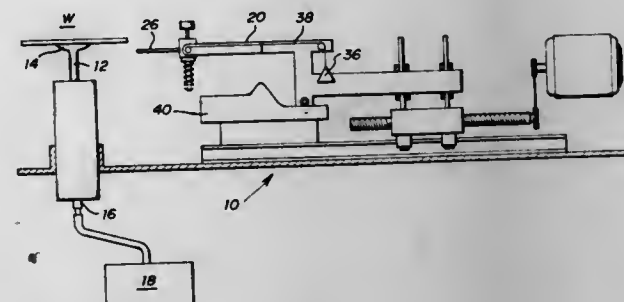
Int. Cl.² B24B 9/00

U.S. Cl. 51—55

19 Claims

1. Apparatus for grinding the generally planar edges of a frangible and disc-shaped workpiece, comprising:
 - a. a chuck for holding the disc-shaped workpiece near the center thereof, such that its entire periphery is exposed for being ground;
 - b. a flexible and generally planar substrate supported in a

cantilevered fashion and having a grinding surface on one side for contacting a peripheral portion of the workpiece;
c. means for rotating the workpiece with respect to the grinding surface when they are in contact, with said means being effective to rotate the workpiece at a speed of at least several hundred revolutions per minute;
d. carriage means for bringing the chuck and the substrate



toward one another at a relative angle so as to bring the grinding surface into contact with the workpiece near the periphery of the workpiece; and
e. means for changing the angle of inclination at which the workpiece engages the grinding surface during the time they are in contact with each other, whereby a planar grinding surface is effective in achieving a ground edge which does not lie in a singular plane.

4,054,011

CARAVAN

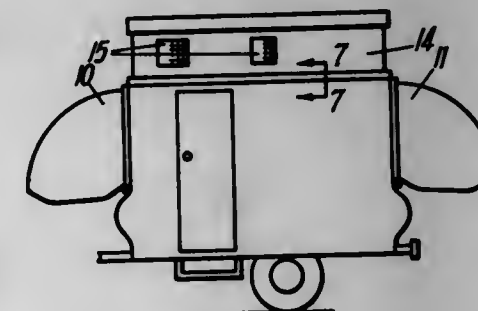
Gerardus Johannes Ensink, Noble Park, and Klaas Burtel van Geest, Dandenong, both of Australia, assignors to Siddons Industries Limited, Victoria, Australia

Filed June 20, 1975, Ser. No. 588,880

Int. Cl.² B62C 1/06

U.S. Cl. 52—66

3 Claims



1. A caravan including a movable roof, a flexible wall portion connecting said movable roof to the remainder of the caravan, and at least one extendible compartment pivotally mounted to a wall of the caravan and being operatively connected to said movable roof such that, in use, said movable roof extends when said at least one extendible compartment is extended outwardly, said roof being provided with a peripheral downstanding skirt to which is connected the upper end of said flexible wall portion, the lower end of said flexible wall portion being connected to a retaining means mounted on a support section mounted in the caravan wall, there being provided a linkage having one end pivotally connected to each of the side walls and the other end pivotally connected to said peripheral downstanding skirt, said support section further including an upper surface member having two holes therein for the passage therethrough of the linkages, a strengthening structure, and a second retaining means retaining an upper seal engaging with the top of said at one extendible compartment; said peripheral downstanding skirt resting on said upper surface member when the roof is not extended.

4,054,012

STARTER STRIP FOR METAL SIDING

Remo Santi Paradisi, 965 Beach Blvd., Hamilton, Ontario, and Robert William Rogaski, 45 Burningham Crescent, Pickering, Ontario, both of Canada

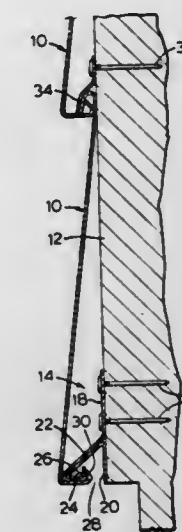
Filed June 28, 1976, Ser. No. 700,511

Claims priority, application Canada, July 18, 1975, 231812

Int. Cl.² E04D 1/34, 1/00

U.S. Cl. 52—544

8 Claims



1. A starter strip in combination with a siding strip having a hooked lower end, the starter strip comprising an elongated nailing portion having a front face and a rear face for application to an associated structure with the rear face contacting the said structure, a downwardly-outwardly-extending main flange portion extending from the said front face so as to be spaced progressively from the front face, and a return flange portion extending from the main flange portion toward the said front face to provide between itself and the main flange portion a recess into which the top of the hooked lower end of an installed siding strip enters, the tip of the return flange portion being overlaid by the hooked lower end of an installed siding strip to prevent downward movement of the siding strip lower end out of engagement with the return flange.

4,054,013

METAL BEAM SYSTEM FOR STEEL-CONCRETE STRUCTURES

Ernesto Pitto, via G. Paganini 21/1, and Giuseppe Borneto, via Corsica 14/11, both of Genoa, Italy

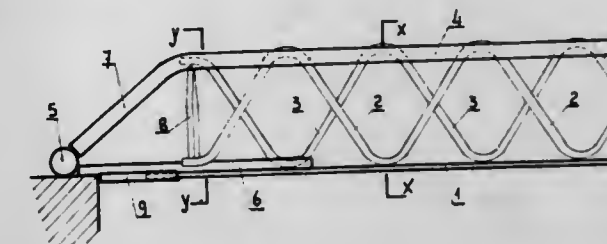
Filed Apr. 2, 1976, Ser. No. 673,097

Claims priority, application Italy, Apr. 14, 1975, 12568/75

Int. Cl.² E04H 12/18; E04B 1/343

U.S. Cl. 52—641

3 Claims



1. A metal beam for steel-concrete structures, comprising an elongated plate, a pair of elongated sinusoidal metal wire means each having first and second curved portions on opposite sides thereof, the first curved portions of each wire means being spaced from each other and joined to opposite sides of the elongated plate, the second curved portions of both wire means being joined together to form a triangle having the wire means and the elongated plate as its sides, a pair of elongated bar means on either side of and joined to the second curved portions of each sinusoidal wire means, a metal rod means for supporting the metal beam spaced from each end of the plate

and trunk means joining each rod means to the adjacent plate, the bar means terminating at each end in bent portions that are joined to said rod means, a slidable metal member at each end of said plate mounted for movement towards and away from said rod means to compensate for expansion and contraction of said beam, and a loop-shaped means for strengthening the bar means, said loop-shaped means being connected to the bar means at the loop portion and to the trunk means at the end portions thereof.

4,054,014

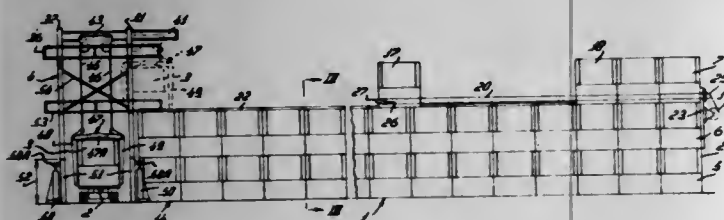
METHODS OF ERECTING PREFABRICATED BUILDINGS AND EQUIPMENT EMPLOYED IN SUCH METHODS

Cornelis van der Lely, 7, Bruchsenrain, Zug, Switzerland
Continuation of Ser. No. 389,740, Aug. 20, 1973, abandoned.
This application Sept. 4, 1975, Ser. No. 610,292
Claims priority, application Netherlands, Aug. 21, 1972, 7211386

Int. Cl.² B65G 67/02

U.S. Cl. 52—745

28 Claims



1. An improvement in the method of assembling a prefabricated building from a plurality of box-shaped building sections each having dimensions compatible with being transported on highways by transport vehicles, which comprises the steps of performing the functions of: positioning a plurality of said sections to make up one story at the building site, whereby said one story has at least one longer side and at least one shorter side as seen in plan view; disposing overhead lifting means proximate said shorter side, said lifting means including a lifting tower that extends upwardly from ground level positioning one of said transport vehicles carrying one of said sections directly under said lifting means and proximate said shorter side, engaging said one section by said lifting means and elevating same thereby vertically from said transport vehicle to above the height of the next story of the building which is being assembled, whereby its bottom is higher than the adjacent top of said one story; placing said one section on at least one further section of said one story by moving said lifting means laterally to a location whereby said one section is spaced above said further section, lowering and disengaging said one section from said lifting means onto said further section whereby it is received and directly supported at least in substantial part by said further section; and providing said one story with means for further laterally moving said one section, laterally shifting said one section across said one story to its appointed position in said next story by said moving means, and thereafter disengaging said one section from said moving means for the subsequent shifting of further said sections by said moving means to make up said next story, the height of said lifting tower being increased as the erection of the building progresses by elevating said tower and inserting further supports at the foot thereof.

4,054,015

CHIP PACKING APPARATUS AND METHOD

Lorne A. Rowell, Victoria, Canada, assignor to Imasco, Ltd., San Mateo, Calif.

Filed May 17, 1976, Ser. No. 687,008

Int. Cl.² B65B 35/50, 57/10

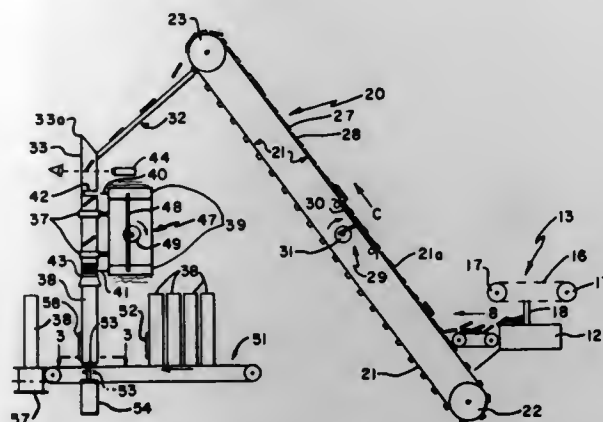
U.S. Cl. 53—26

13 Claims

8. In a method for orienting and stacking rigid food chips

from a source of randomly oriented chips in a cylindrical container, the steps of:

- directing the randomly oriented chips into recesses of an inclined moving conveyor at the conveyor infeed end to translate the chips into continuous tandem alignment,
- feeding the aligned chips from the conveyor into the top of an essentially upright cylindrical stacking tube disposed below the outlet end of said conveyor and gravitating said



chips onto a lower retractable chip blocking blade across said stacking tube in a manner that said chips are permitted to form a vertical stack,

- positioning the open end of an empty cylindrical container in an essentially upright position in a chip receiving station below said stacking tube, and
- retracting said lower blade to permit a chip stack of predetermined size to gravitate into said container.

4,054,016

DEVICE FOR FILLING BAGS

Frans van Keulen, Emmeloord, Netherlands, assignor to Francisco N.V., Willemstad, Netherlands Antilles

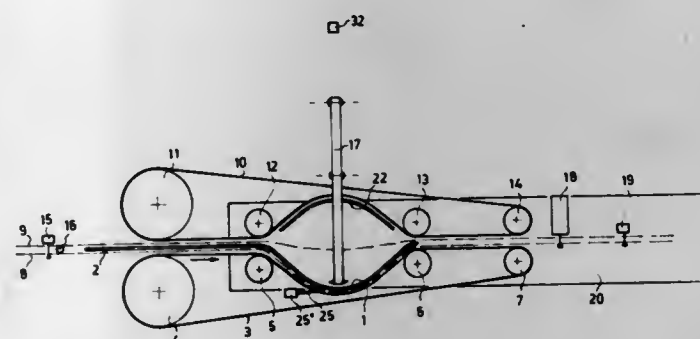
Filed Sept. 20, 1976, Ser. No. 725,107

Claims priority, application Netherlands, Sept. 19, 1975, 7511133

Int. Cl.² B65B 57/02, 43/26

U.S. Cl. 53—64

9 Claims



1. In a device for filling bags formed from webs of material, wherein the webs are positioned with a pair of horizontally extending top and bottom edge portions and generally vertically oriented planar portions and wherein the webs are connected along their bottom edges and joints extend vertically upwardly from the bottom edges of the webs, the improvement comprising:

- a pair of endless transport belts;
- a first driving means for concurrently driving said belts;
- a pair of stationary guide members, each having a concave horizontal portion adjacent one of said transport belts, each of said horizontal portions opposed to each other to define a spout portion, the top edge of one web interposed between one of said guide members and one of said transport belts, the other web top edge remaining freely disposed within said spout portion;
- a pair of guide roller means, each said guide roller means

to guide a transport belt along one of said guide members; and

- pulling means movably mounted in said spout portion for grasping said freely disposed web edge and pulling it in a direction traverse to said guide members to place the bag in a position ready for filling.

4,054,018

BAG FILLING APPARATUS

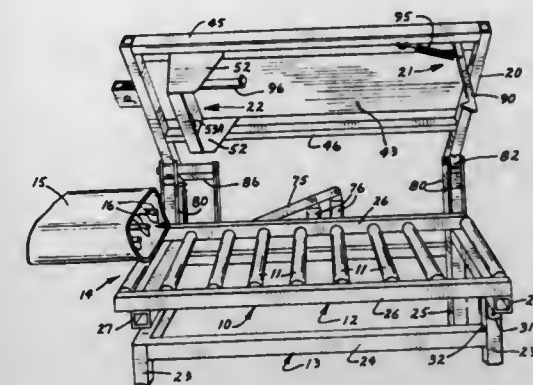
Chester G. Neukom, Jamestown, N. Dak., assignor to Haybuster Manufacturing, Inc., Jamestown, N. Dak.

Filed Dec. 9, 1976, Ser. No. 749,052

Int. Cl.² B65B 1/20

U.S. Cl. 53—124 B

15 Claims



APPARATUS FOR PRODUCTION OF A BOTTLE-SHAPED CONTAINER, FILLED, SEALED AND READY FOR SHIPMENT

Wilhelm Naumann, Ettlingen, Germany, assignor to PMD Entwicklungswerk für Kunststoff-maschinen GmbH & Co. KG., Ettlingen, Germany

Division of Ser. No. 409,714, Oct. 25, 1973, Pat. No. 3,911,071.

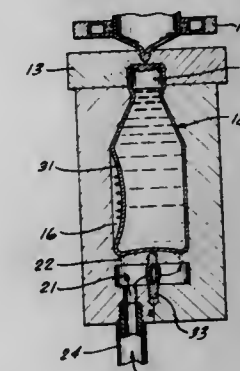
This application Apr. 28, 1975, Ser. No. 572,334

Claims priority, application Germany, Nov. 20, 1972, 2256884

Int. Cl.² B29D 23/03

U.S. Cl. 53—112 A

2 Claims



1. An apparatus for producing a bottle-shaped container package, filled, sealed and ready for shipment, comprising: a blow mold formed with a pair of mold halves and defining a bottle-shaped mold cavity in a closed position of said mold halves, said cavity having a bottom and a neck; means for introducing a flexible-wall parison between said mold halves whereby closure of said mold halves encloses said parison in said mold cavity and seals said parison at said bottom of said cavity; means for blowing said parison through said neck with a blowing gas to expand said parison to the shape of said cavity thereby forming said parison into a bottle-shaped container in said cavity; a distribution chamber formed in said blow mold beneath said bottom; a plurality of channels formed in said blow mold and extending upwardly from said chamber to said bottom of said cavity and communicating between said chamber and said cavity; a hose connected to said distribution chamber for supplying a pressure medium thereto to cause said pressure medium to traverse said channels and enter said mold cavity between a wall of said mold cavity and a wall of said container, thereby deforming said wall of said container inwardly to express blowing gas from said container, said channels being distributed uniformly around said bottom of said mold cavity along the periphery thereof; means for filling said container through said neck with a liquid and pressing said wall of said container outwardly during the filling thereof; and means for sealing said container at said neck.

1. A bag filling apparatus comprising a filling spout of size to fit within the opening of a bag to be filled, support means for a bag to be filled comprising a first member for supporting a collapsed bag to be filled in a position extending from the filling spout, and a second member mounted with respect to said support means and positioned to overlie said first member, means on said second member comprising a packer head having an edge positioned adjacent said first member whereby a bag in collapsed condition only may be positioned between said edge and said first member, and said packer head having a surface facing the filling spout, and bias means resiliently permitting said packer head to move away from said filling spout as a bag is filled to thereby cause packing of contents in a bag at a density as desired.

4,054,019

ARTICULATED TAMPER AND CONFINER

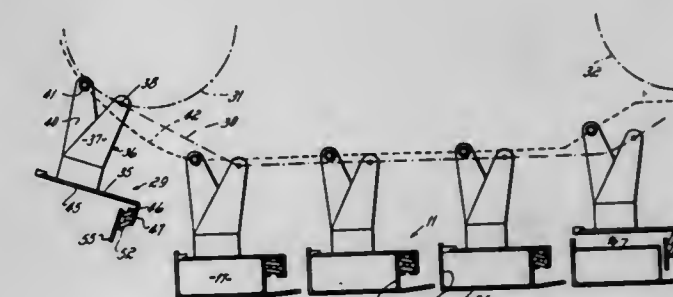
Robert J. Weichand, Fort Mitchell, and Charles W. Adams, Walton, both of Ky., assignors to R. A. Jones & Co. Inc., Covington, Ky.

Filed Dec. 6, 1976, Ser. No. 748,062

Int. Cl.² B65B 63/02

U.S. Cl. 53—124 D

4 Claims



4. In a cartoner comprising an L-shaped product bucket having a horizontal wall and a trailing vertical wall, a tamper-confiner overlying said product bucket and having an upper horizontal wall, and means for moving said tamper-confiner relative to said product bucket to engage a product in said bucket, the improvement comprising: a vertical plate, a vertical member depending from said upper horizontal wall, means hinging said vertical plate to said vertical member for vertical movement relative to said upper horizontal wall, whereby when said tamper-confiner moves relatively toward said product bucket, said hinged vertical plate first

engages said bucket horizontal wall and then slides toward said product finally enclosing the product in a generally rectangular tube formed by said product bucket and tamper-confiner, respectively.

4,054,020

APPARATUS FOR INSERTING SPACER MEMBERS BETWEEN TWO UPRIGHT ARTICLES

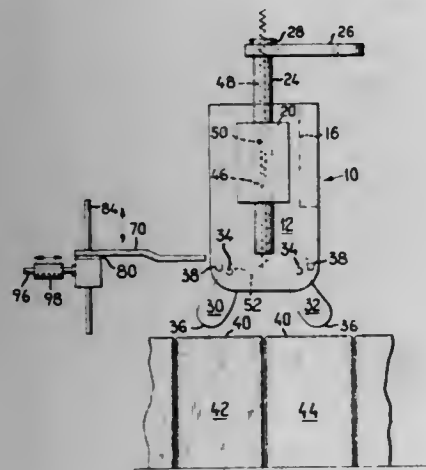
Roy Joseph Devilbiss, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,859

Int. Cl.² B65B 61/00

U.S. Cl. 53—128

17 Claims



1. Apparatus for inserting a panel spacer member intermediate the juxtaposed ends of two upright articles arranged in side-by-side alignment, said apparatus comprising an inserter head unit, means for supporting said head unit for vertical movement between a first upper position and a second lower position and vice versa, a vertically disposed string of panel spacer members, the lowermost spacer member in said string being disposed in said head unit and there being means for releaseably holding said lowermost spacer member in said head unit against the action of gravity and when said head unit is in its first position, means carried at the lower part of said head unit and operable during movement of said head unit from its first to second positions for engaging the tops of said articles and applying force thereto tending to tilt same in opposite directions away from each other to thereby provide an enlarged space between their juxtaposed ends, said spacer holding means being operable during movement of said head unit from its first to second positions for releasing said lowermost spacer member from its held position in said head unit whereby said lowermost spacer member drops into said enlarged space, an elongated plunger blade member, means disposed adjacent said head unit for supporting said blade member for vertical and horizontal travel relative to said head unit, and means imparting both vertical and horizontal movement to said blade member during the course of movement of said head unit from its first to second positions for positioning a tip end of the blade member between said lowermost spacer member and that next above in the said string after said head unit has moved a predetermined distance from its first to second positions and thereafter applying with said tip end a downward thrust to said lowermost spacer to fully insert it between said articles, said motion imparting means further being operative to retain the tip end of said blade member positioned below said next above spacer member when said head is moved upwardly from its second to first positions.

4,054,021 APPARATUS FOR SIMULTANEOUSLY PACKAGING A SERIES OF ELONGATE BODIES

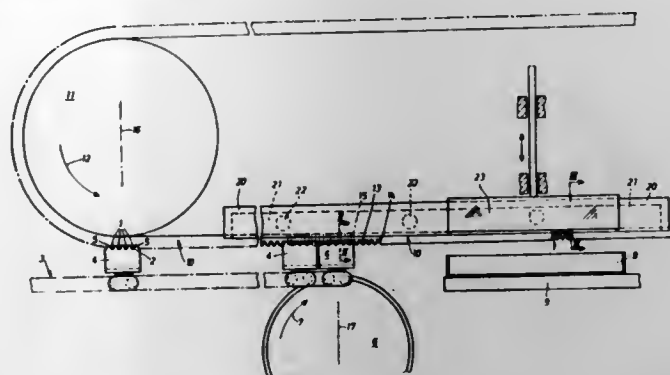
Karl Fassbind, Appisbergstrasse 20, Mannedorf, Switzerland
Filed July 15, 1976, Ser. No. 705,584

Claims priority, application Switzerland, July 18, 1975, 9476/75

Int. Cl.² B65B 5/10, 19/34

U.S. Cl. 53—236

4 Claims



1. An apparatus for simultaneously packaging a series of elongate bodies, comprising in combination, means defining a packaging station, approximately horizontal support means which bear the bodies for delivering the same to the packaging station, a lengthwise movable, endless toothed belt arranged above the support means, said toothed belt possessing teeth and intermediate thereof tooth gaps, said teeth and tooth gaps confronting said support means, suction channel means, disposed for maintaining a continuous suction, said toothed belt being provided with openings for communicating the tooth gaps with the suction channel means in order to suck-up bodies bearing upon the support means and for placing the same into said tooth gaps, an elevationally displaceable stripper means provided at the packaging station for lowering a series of bodies out of the suction-held tooth gaps of the toothed belt into a package located beneath the stripper means, and wherein said support means comprises an endless lengthwise movable transport chain, said transport chain comprising chain links constituting sections of a gear rack, said chain links having teeth and therebetween tooth gaps which confront the toothed belt, the tooth gaps of the transport chain serving to receive the elongate bodies.

4,054,022

LAWN MOWER PLANETARY GEAR BLADE CLUTCH AND BRAKE

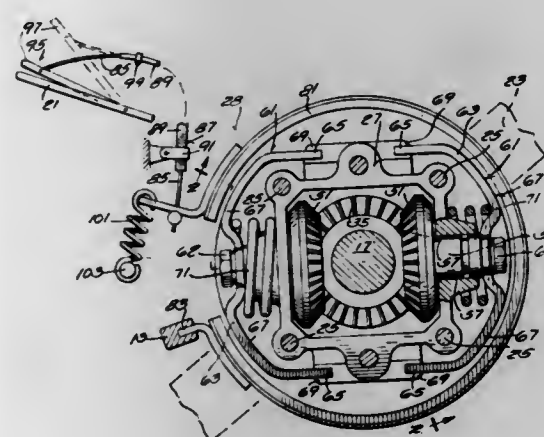
Gerald H. Wick, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed July 12, 1976, Ser. No. 704,283

Int. Cl.² A01D 69/10

U.S. Cl. 56—11.3

14 Claims



1. A lawn mower comprising a housing supported for movement along the ground, a cutter blade assembly including a

cutter blade, and a gear housing fixed to said cutter blade and including therein a first pinion, and a second pinion in mesh with said first pinion, a drive shaft extending into said gear box and having fixed thereon said first pinion, and means mounting said second pinion in said gear box about a rotary axis fixed with respect to said gear box, said mounting means including means operable for selectively preventing and permitting rotation of said second pinion relative to said gear box.

4,054,023

GRASS COLLECTION APPARATUS

Eugene C. Carpenter, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

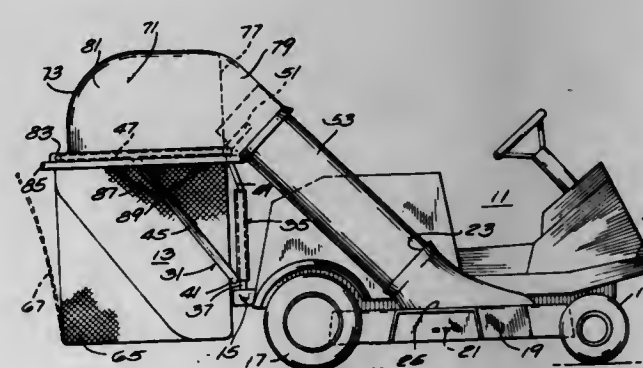
Continuation of Ser. No. 503,348, Sept. 5, 1974, Pat. No. 3,958,401. This application Oct. 1, 1975, Ser. No. 618,473

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.² A01D 35/22

U.S. Cl. 56—202

7 Claims



1. A grass collection apparatus comprising a bracket which is of inverted "U" shape in one plane and which includes two spaced legs and a cross bar connecting said legs, said cross bar being channel shaped in a plane perpendicular to said one plane and having spaced arms extending in the same direction as said legs, said legs being channel-shaped in facing relation to each other in a plane perpendicular to said one plane, a frame connected to said bracket, means on said frame spaced from said bracket for supporting a grass clipping collection bag, and means on said frame spaced from said bracket and adapted to be connected to the grass clipping discharge outlet of a rotary lawn mower.

4,054,024

APPARATUS FOR STOPPING AND RESTARTING THE OPERATION OF AN OPEN-END SPINNING SYSTEM

Kazuo Tsubata, Kyoto, and Hironori Hirai, Nagaokakyo, both of Japan, assignors to Hironori Hirai, Nagaokakyo, Japan

Filed Dec. 26, 1974, Ser. No. 536,368

Claims priority, application Japan, Sept. 30, 1974, 49-112951; Oct. 4, 1974, 49-115053

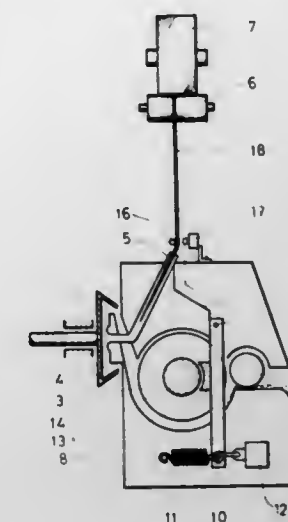
Int. Cl.² D01H 1/20

U.S. Cl. 57—78

2 Claims

1. An apparatus for stopping and restarting the operation of a spinning system consisting of a large number of spinning units, each including a spinning tube, driving roller, a wind-up package and a combing roller, in such a way that the terminal portion of spun yarn resulting from preceding spinning at each said spinning unit may be used as an end yarn capable of being pieced up with fresh sliver supplied into the spinning rotor, said apparatus comprising a common mounting shaft to which the driving rollers for the wind-up packages of the respective spinning units are mounted securely, a single yarn defective rod extending on top of the respective spinning units, said rod carrying yarn defective guides each being designed to maintain the terminal portion of the yarn of each spinning unit in the deflected position, a first clutch, a second, reversible clutch, a drive device for said defective rod, a driving shaft connected to said common mounting shaft through said first clutch and to said drive device for said defective rod through said second,

reversible clutch, braking means associated with each of the combing rollers of the respective spinning units for simultaneous, sudden and positive braking of the combing rollers to prevent useless supply of slivers to the rotor which may result



4,054,025

PROCESS FOR THE PRODUCTION OF FILAMENT YARNS WITH STATISTICALLY DISTRIBUTED, BROKEN INDIVIDUAL FILAMENTS

Harry Kubitzek; Wolfgang Liedtke, both of Dormagen, and Herbert Pelousek, Dormagenhaken-broich, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 20, 1976, Ser. No. 707,054

Claims priority, application Germany, July 23, 1975, 2532843

Int. Cl.² D02J 1/08, 1/12

U.S. Cl. 57—157 TS

5 Claims

1. A process for the production of filament yarns with projecting ends of broken individual filaments which comprises first interlacing filament yarns which have been partially but not fully drawn and subsequently subjecting said filament yarns to partial thermal overstressing on a contact heater and, finally, fully drawing of said filament yarns.

4,054,026

BOTTLE-TIMER ASSEMBLY

Robert S. Goodrich, 27901 S. Golden Meadow Drive, Rancho Palos Verdes, Calif. 90274

Filed July 30, 1976, Ser. No. 710,276

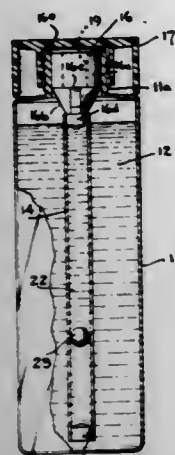
Int. Cl.² G04F 7/08; G04B 37/02, 37/12

U.S. Cl. 58—1 R

12 Claims

1. A bottle-timer assembly comprising: a transparent bottle, a transparent tube having a substantially smaller outside diameter than said bottle, means for sealing the opposite ends of said tube, the means for sealing one of the ends of said tube comprising a member having smaller and larger diameter cylindrical portions interconnected by a conical portion, the smaller diameter cylindrical portion forming a plug which is fitted within and attached to said one tube end, said member being attached to said bottle and thereby supporting said tube within said bottle, a fluid contained in said tube, and an object contained in said tube having a diameter less than the inside diameter of said tube,

the specific gravities of said fluid and said object being different whereby said object moves along said tube at a predetermined rate when the tube is placed in a generally vertical orientation, to provide a timing indication.



4,054,027

CONVERTIBLE HYDROGENATOR AND GAS TURBINE

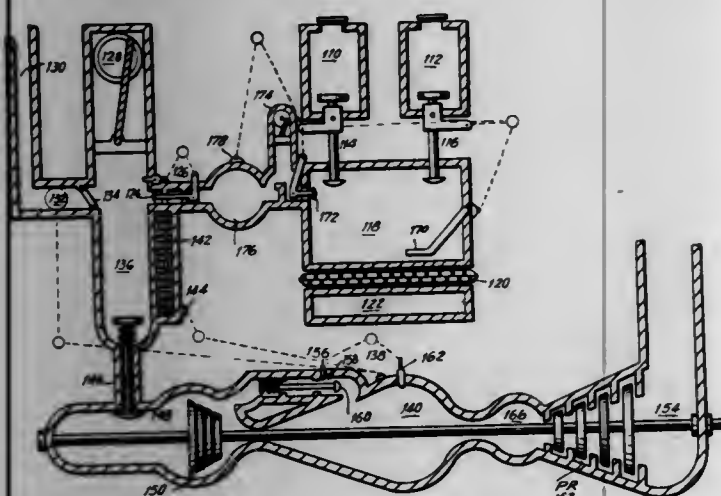
Gustave A. Manzato, and Camille B. Manzato, both of 28 Mountain Ave., Rockaway, N.J. 07866

Continuation-in-part of Ser. No. 540,137, Jan. 28, 1975, Pat. No. 3,956,882. This application Feb. 11, 1976, Ser. No. 657,238. The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.² F02C 3/22, 7/22

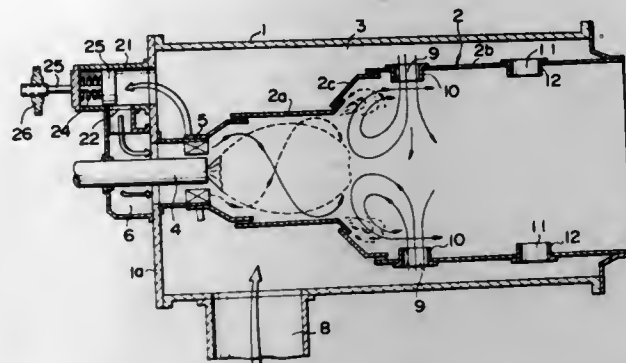
U.S. Cl. 60—39.12

2 Claims



1. A hydrogen motor comprising: first chamber means for containing a hydrogen-producing reactant; second chamber means for containing a hydrogen-replacing reactant, for producing hydrogen gas; reactant chamber means in fluid communication with said first and said second chamber means for receiving at least a portion of the contents thereof; reservoir means in fluid communication with said reactant chamber means for receiving the hydrogen gas; first means for discharging the hydrogen gas from said reactant chamber means into said reservoir means; gas mixing chamber means in fluid communication with said reservoir means for receiving the hydrogen gas and in fluid communication with a source of an oxidizing reactant gas, said gas mixing chamber means including substantially one-way inlet valve means intermediate the interior thereof and the source of the oxidizing reactant gas; a rate-of-feed control valve means intermediate said inlet valve means and the source of oxidizing reactant gas; means for heating the contents of said gas mixing chamber; compressor means in fluid communication with said gas mixing chamber means for compressing the gaseous content thereof; second means for discharging the contents of said gas mixing chamber into said compressor means; combustion chamber means for receiving and igniting the compressed contents of said gas

4,054,028
FUEL COMBUSTION APPARATUS
Katsuyuki Kawaguchi, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 28, 1975, Ser. No. 608,503
Claims priority, application Japan, Sept. 6, 1974, 49-101950
Int. Cl.² F02C 3/00
U.S. Cl. 60—39.23
7 Claims



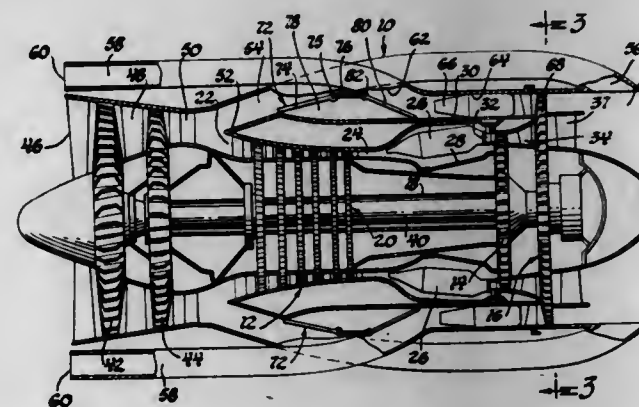
1. A fuel combustion apparatus comprising an outer shell defining an enclosed hollow chamber, an inner shell composed of an upstream small-diameter section located within said chamber, a downstream large-diameter section extending in part outwardly of one end of said outer shell and a conically shaped connecting section between the two sections of different diameters, all said sections being aligned and connected together on a common axis and spaced from said outer shell, duct means extending through said outer shell for the supply of air to the space between said shells, a fuel injection valve and a first air supply port in communication with the space between said shells equipped with swirl blades surrounding the injection valve, said injection valve and air supply port being both provided at the upstream end of the small-diameter section of the inner shell, both the cylindrical wall of the small-diameter section and the conical wall of the connecting section of the inner shell being not perforated for air supply, second air supply ports in communication with the space between said shells formed in the cylindrical wall portion of the large-diameter section close to the connecting section, each of said second ports being shrouded with scoops extending at an angle into the large-diameter section at least perpendicularly to the direction of flow of said fuel, and means installed on the upstream side of the first air supply port for controlling the rate of air supply from said duct to the said first port whereby the flow of air supply to said first port relative to said second ports may be regulated.

4,054,029
NUCLEAR BLAST-RESISTANT ROCKET MOTOR CASES
David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 29, 1975, Ser. No. 645,870
Int. Cl.² G21F 1/10; F02K 9/04; E08K 3/12
U.S. Cl. 60—253
5 Claims

1. In combination with a solid propellant rocket motor of the type that employs a solid propulsion system having a composite motor case constructed of filaments or fibers selected from glass, boron, graphite, and carbon with said filaments or fibers impregnated with a resinous product, the improvement to said composite motor case including a metal that is integral with the resin molecule of the resinous product which is effective in imparting an ability to stop or slow the passage of photon energy because of its capacity to absorb such energy; said improvement being effective in regulating the amount of damage that radiation from a nuclear blast would inflict upon the

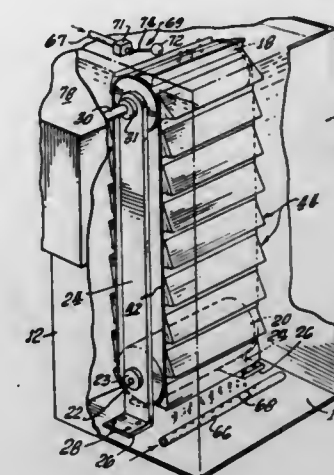
propulsion system to a level which is below the threshold damage value for the system to remain operable; said metal that is integral with the resin molecule being in the form of an organometallic prepolymer selected from the prepolymers consisting of bis(2-propenyl)-3,4-bis(dihydrostannano)-1,6-hexanedioate crosslinked with about 1 to 2 weight percent of a crosslinking agent selected from dimethyltin dihydride and tin tetrahydride and bis(2-propenyl)-3,4-bis(dihydrostannano)-1,6-hexanedioate reacted in ratio of about 90 parts to 10 of acrylic acid using an organic peroxide as a copolymerization catalyst to form a copolymerization product that is subsequently crosslinked with about 1-2 weight percent of the crosslinking agent 4,5-epoxycyclohexylmethyl-4',5'-epoxycyclohexylcarboxylate.

4,054,030
VARIABLE CYCLE GAS TURBINE ENGINE
George H. Pedersen, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Apr. 29, 1976, Ser. No. 681,464
Int. Cl.² F02K 3/06, 3/12
U.S. Cl. 60—262
4 Claims



1. In a gas turbine engine having a first fan bypass duct with a bypass fan located therein and operative to produce a first bypass pressure ratio between the inlet and outlet of the first duct, the improvement comprising, means for driving said bypass fan and including a first shaft, a low pressure turbine on one end of said first shaft, a second fan bypass duct, a dual bypass turbine and compressor unit connected on said one end of said first shaft and including a blade row located thereon within said second fan bypass duct, an auxiliary air inlet duct and variable geometry valve means coacting for directing air into said second fan bypass duct during a first mode of engine operation, a second shaft, means including a high pressure turbine for driving said second shaft, gasifier means on said second shaft, first combustor means receiving gas from said gasifier means and operative during the first mode of engine operation to direct combustion products across said high and low pressure turbines to drive said bypass fan and said gasifier means along with said blade row within said second fan bypass duct to produce a first turbojet stream from said engine and a first predetermined fan bypass pressure ratio across the first and second fan bypass ducts, second combustor means for receiving compressed air from said bypass fan, and means including said variable geometry valve means for blocking said auxiliary air inlet and directing air flow from said bypass fan through said second combustor means and across said blade row during a second engine operating mode to produce a power input to said first shaft supplemental to that of said low pressure turbine.

4,054,031
POWER UNIT
Charles M. Johnson, 9451 E. Ave. T-12, Littlerock, Calif. 93543
Filed Feb. 19, 1976, Ser. No. 659,590
Int. Cl.² F03B 9/00; F03G 7/00
U.S. Cl. 60—496
15 Claims

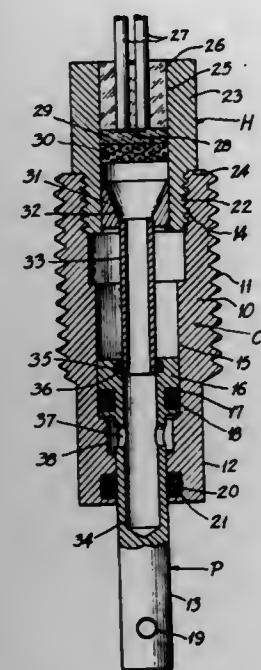


1. A power unit, comprising: a pair of rotatable rollers spaced vertically apart, said rollers having axial shafts extending outwardly thereof; fixed means for supporting the rollers in vertical alignment with each other; an endless belt operably disposed on said rollers, a portion of said belt being adapted to move upwardly and an opposite portion being adapted to move downwardly; a plurality of collapsible air buckets attached to said belt, said buckets extending transversely of said belt and spaced apart longitudinally thereon; said buckets including a movable panel hinged along one horizontal edge and attached to the belt so that said panel swings away from and toward the belt, the buckets on the portion of the belt moving upwardly opening downwardly and said buckets opening upwardly on the opposite downwardly moving portion of the belt; means for operably closing the ends of the bucket; air-discharge means adjacent the lower roller for discharging air upwardly into the buckets as said buckets move past said means; an air pump connected to one of said rollers, said air pump having an inlet and an outlet; means operably connecting the outlet of the air pump to the air-discharge means for delivering air under pressure thereto.

4,054,032
EXPLOSIVE ACTUATED PIN PULLER
Mihai D. Patrichi, Los Angeles, Calif., assignor to Networks Electronic Corporation, Chatsworth, Calif.
Filed Sept. 3, 1976, Ser. No. 720,365
Int. Cl.² F02N 13/00
U.S. Cl. 60—632
10 Claims

1. An explosive actuated pin puller comprising: a piston having a head and a stem projecting from the back side thereof, said piston having an axial bore extending through said head and into said stem; a housing having a chamber in which said head is axially slidable, said stem extending through one end of said housing for axially sliding movement; a header closing the other end of said housing, said header defining an explosion chamber in its inner end portion; an explosive charge contained within said header in association with said chamber such as to deliver explosion gases thereto; an ignition element in igniting association with said charge; means for energizing said ignition element so as to ignite said explosive charge;

and a transfer tube having one end sealed in said inner end portion of said header and its opposite end sealed in said piston bore;
said housing having a pressure applying chamber at the back side of said piston head, and said piston stem having a port providing communication between its said bore and said chamber;



whereby, upon explosion of said charge, the resulting gas will be directed through said transfer tube into said piston bore and thence through said port into said chamber, so as to apply its pressure to the back side of said piston head and thereby to cause the piston to be drawn into said housing.

4,054,033

RETAINING PANEL

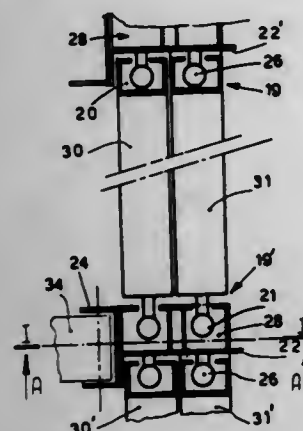
Roberto Pillosio, Feletto Umberto, Italy, assignor to Pillosio, S.p.A., Feletto Umberto, Italy

Filed Mar. 1, 1976, Ser. No. 662,439

Claims priority, application Italy, Mar. 10, 1975, 60333/75; Jan. 27, 1976, 60322/76

Int. Cl.² E21D 5/00

U.S. Cl. 61-41 A



1. An excavated wall retainer comprising vertical guides, at least one retaining panel, each said guides consisting of a substantially T-shaped section to which is attached on the outer side of the head of the T in spaced relationship strut anchoring means and to which is attached on one side of the stem of the T two adjacent male connection means and on the other side of the stem of the T two adjacent female connection means, one pair of male and female connection means extending the entire height of the guides, one pair of male and female connection means extending only on the upper one-half of said guides, said retaining panel comprising an inner carrying structure composed of vertical sections and horizontal sections connected to each other and at least one covering surface for one side of said

structure, one outer vertical section defining a male connection means, one outer vertical section defining a female connection means and means to stop one of said panels from moving the entire height of said guide, said panel being vertically slidable within one pair of said male and female connection means for its full height.

4,054,034

METHOD FOR CASTING CONCRETE TANKS IN WATER

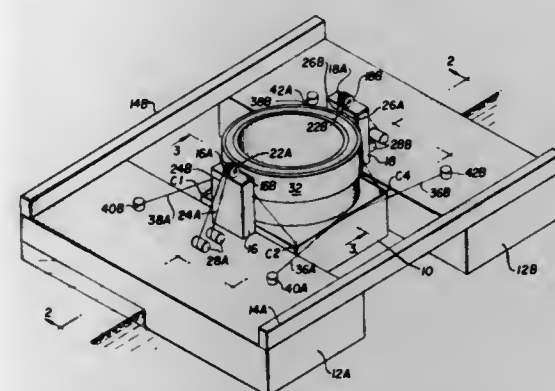
Robert Warren Hyre, 4056 Brookfield Circle, East Ridge, Tenn. 37412, and Hal Coburn Shook, Rte. No. 1, Box No. 114, Kensington, Ga. 30727

Filed July 1, 1976, Ser. No. 701,676

Int. Cl.² E02D 23/00

U.S. Cl. 61-86

10 Claims



1. A method of forming and casting elongate, closed-ended hollow tanks in ocean-depth water comprising: casting a bottom-end closure slab and a short axial-length portion of the tank side-wall on a normally floatable and submersible tank end-closure form suspended by suspension means extending between diametrically spaced points thereof disposed on opposite sides of said form and laterally spaced-apart, substantially higher level points than said form points and which are subject to wave and/or current action, whereby said form, said formed end-closure and said formed partial length portion of the tank side-wall may together partake of pendular motion relative to said higher level points; permitting said form, formed end-closure and tank portion to submerge while continuing the tank side-wall forming and casting operation, to a depth such that the tank body has acquired substantial axial length and, during the course thereof, maintaining the tank body suspended as aforesaid and in a substantially vertical and stabilized position from said higher level points; causing said tank end-closure form to disengage and float away from said tank-end and the so-formed tank body; and continuing the tank side-wall forming and casting operations as may be necessary to the tank being cast to the desired axial length.

4,054,035

VENTILATION AIR TEMPERING DEVICE

Stephen W. Trelease, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Aug. 16, 1976, Ser. No. 714,479

Int. Cl.² F25B 43/00

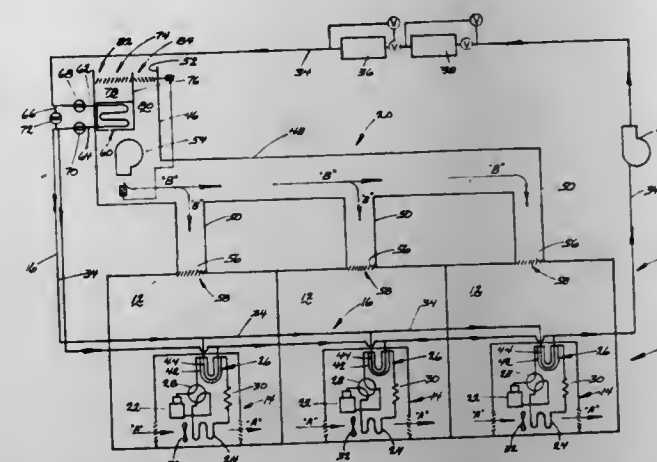
U.S. Cl. 62-83

3 Claims

1. In a heating and cooling system of the type comprising at least one reversible cycle air cooling and heating unit of the type comprising at least one refrigerant-water contacted coil; and, refrigerant control means operable to selectively cause the refrigerant-water contacted coil to operate as a refrigerant condenser or to act as a refrigerant evaporator;
a closed loop water circulation circuit connected with the refrigerant-water contacted coil to achieve heat with the refrigerant flowing therethrough so that heat extracted from the refrigerant flowing through the refrigerant-water contacted coil accumulates in the water flowing through the closed loop water circulation circuit; and,

an outdoor ventilation system for supplying outdoor air to the zones served by the cooling and heating unit;
the improvement which comprises:

at least one water-air contacted coil disposed in liquid flow communication in the closed loop water circulation circuit and selectively in heat exchange relationship with only a ventilation air stream flowing in the outdoor ventilation



lation system for selectively heating only outdoor ventilation air before the outdoor ventilation air is discharged to the served zone continuously; and,
means for allowing a selected amount of outdoor ventilation air to pass through the water-air contacted coil and allowing a selected amount of outdoor ventilation air to bypass the water-air contacted coil.

4,054,036

CONSTANT BOILING MIXTURES OF 1,1,2-TRICHLOROTRIFLUOROETHANE AND CIS-1,1,2,2-TETRAFLUOROCYCLOBUTANE

Kevin P. Murphy, Orchard Park, and Richard F. Stahl, Hamburg, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 21, 1976, Ser. No. 753,053

Int. Cl.² C09K 5/04; F25B 9/00

U.S. Cl. 62-114

4 Claims

1. Constant boiling mixtures consisting essentially of about 73.0 weight % 1,1,2-trichlorotrifluoroethane and about 27.0 weight % of cis-1,1,2,2-tetrafluorocyclobutane.

4,054,037

PORTABLE APPARATUS FOR SEQUENTIALLY COOLING A PLURALITY OF CONTAINERS OF BEVERAGES AND THE LIKE

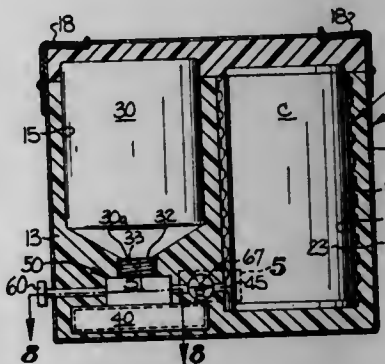
Michael C. Yoder, Lincolnton, N.C., assignor to Paul C. Rhyne, Jr., Lincolnton, N.C., a part interest

Filed July 9, 1975, Ser. No. 594,204

Int. Cl.² F25D 3/10, 3/08

U.S. Cl. 62-224

10 Claims



1. A portable, open cycle, refrigeration apparatus for sequentially cooling containers of beverages and the like and having a capacity for a plurality of sequential cooling operations comprising:

a portable housing;
evaporator means carried by said housing for receiving and circulating a refrigerant therethrough during each cooling operation and including venting means for releasing the refrigerant after circulation to the atmosphere and defining therewithin a receptacle for receiving a container to be cooled in close heat-conducting relation thereto;
a refrigerant supply tank carried by said housing for initially containing a supply of a pressurized refrigerant sufficient for a plurality of sequential cooling operations;
conduit means carried by said housing and communicating with said evaporator means and said refrigerant supply tank for transmitting the pressurized refrigerant from said tank to said evaporator means; and
valve means carried by said housing and forming a part of said conduit means and including means for actuating said valve means to allow the flow of pressurized refrigerant from said refrigerant supply tank and pressure responsive means responsive to the flow of a predetermined quantity of less than the total supply of refrigerant from said supply tank sufficient for a single cooling operation for deactuating said valve means to stop the flow of refrigerant from said supply tank and provide the predetermined quantity of refrigerant to said evaporator for a single cooling operation.

4,054,038

SLIDING CONSTANT VELOCITY UNIVERSAL JOINT
Koichi Takahashi, Yokohama; Nobuteru Hitomi, Yokosuka, and Taisuke Kizu, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

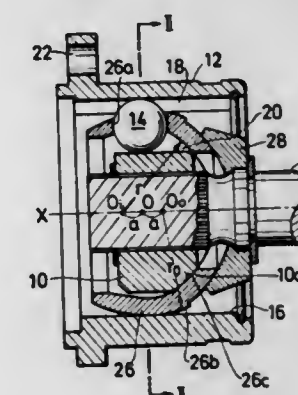
Filed Apr. 2, 1976, Ser. No. 672,936

Claims priority, application Japan, Apr. 15, 1975, 50-44795

Int. Cl.² F16D 3/30

U.S. Cl. 64-21

6 Claims



1. A sliding constant velocity universal joint comprising:
an outer member having an interior surface defining an axial bore, said interior surface of said outer member having a plurality of axially extending grooves and a plurality of axially extending flat portions corresponding in number to the plurality of grooves, each of said plurality of axially extending flat portions extending between and merging into the adjacent two of said axially extending grooves, said plurality of axially extending flat portions forming the sides of a substantially regular polygonal bore;
a ball cage within said axial bore, said cage having a curved exterior surface which engages a portion of each of said flat portions intermediate the adjacent two axially extending grooves to provide two spaces between said curved exterior surface and said flat portion on opposite sides of said flat portion;
an inner member within said ball retaining cage having a plurality of grooves corresponding in number to the number of grooves of said outer member; and
a plurality of balls corresponding in number to the number of grooves of said outer member, each of said balls being mounted between a respective one of said grooves of said

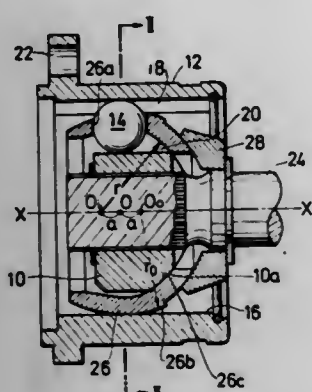
outer member and a respective one of said grooves of said inner member and retained by said cage.

4,054,039

SLIDING CONSTANT VELOCITY UNIVERSAL JOINT
 Kichichi Takahashi, Yokohama; Nobuteru Hitomi, Yokosuka, and Taisuke Kizu, Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan
 Filed Apr. 2, 1976, Ser. No. 672,943
 Claims priority, application Japan, Apr. 22, 1975, 50-48794
 Int. Cl.² F16D 3/30

U.S. Cl. 64—21

4 Claims



1. A sliding constant velocity universal joint comprising: an outer member having an interior surface defining an axial bore having a plurality of axially extending portions and a plurality of axially extending grooves corresponding in number to the plurality of axially extending portions, each of said grooves being located between two adjacent axially extending portions; a ball retaining cage within said axial bore, said cage having an exterior surface; an inner member within said ball retaining cage having a plurality of grooves corresponding in number to the grooves in said outer member; and a plurality of balls corresponding in number to the grooves in said outer member, each of said balls being retained by said ball retaining cage and being mounted between a respective one of said grooves in said outer member and a respective one of said grooves in said inner member; each of said axially extending portions having an intermediate axially extending section which makes contact with said exterior surface of said ball cage to provide two spaces between said exterior surface of the ball cage and the axially extending portions on opposite sides of the intermediate section.

4,054,040

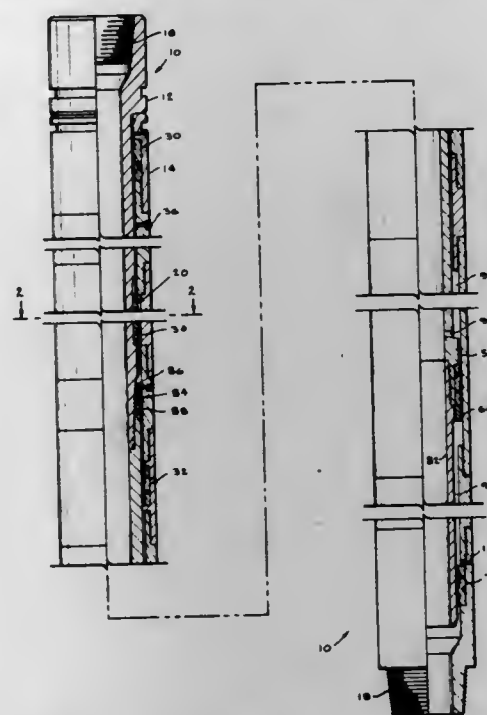
TELESCOPING TORQUE TRANSMISSION APPARATUS
 Weldon L. Medders, Houston, Tex., assignor to A-Z International Tool Company, Houston, Tex.
 Filed Feb. 21, 1974, Ser. No. 444,329
 Int. Cl.² F16D 3/06

U.S. Cl. 64—23

6 Claims

1. A torque transmission tube, comprising a mandrel, a sleeve surrounding said mandrel and slidable axially thereon, said sleeve having a plurality of recesses therein along a portion of its length, said mandrel having a plurality of splines extending therefrom along a portion of its length, said recesses having a circumferential width greater than the circumferential width of said splines, a pair of driving keys positioned in each of said recesses and interposed between the sidewalls of said recess and of said splines,

said mandrel includes an upper section, a lower section, and means locking said upper and lower sections together, and said locking means includes a lock nut, a keyed ring, said lock nut being threaded onto the lower end of said upper section, said upper section having said splines thereon, said lower section having an abutment adapted to engage a shoulder on said sleeve to limit the axial movement of said sleeve on said mandrel sections,



said keyed ring engaging with the splines of said upper sections and having depending teeth, said lower section being threaded on said upper section and having upwardly extending teeth adapted to engage the teeth on said keyed ring, said lock nut adapted to be threaded down on said upper section to retain said keyed ring teeth in engagement with said lower section teeth to thereby prevent unthreading of said lower section.

4,054,041

PATTERN WHEEL OPERATED SELECTING JACKS ARMS

Jaromir Kucera; Jindrich Novacek; Gustav Voda; Otokar Chladek; Jan Kollmann, and Pavel Brada, all of Trebic, Czechoslovakia, assignors to Elitex, Koncern textilniho strojirenstvi, Laverce, Czechoslovakia
 Filed Apr. 2, 1976, Ser. No. 672,841
 Claims priority, application Czechoslovakia, Apr. 3, 1975, 2267/75

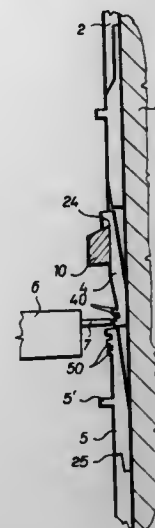
Int. Cl.² D04B 15/76

U.S. Cl. 66—50 A

3 Claims

1. A knitting machine having multiple yarn feeds, a needle cylinder in which a plurality of needles are mounted in respective grooves, each displaceable into knitting positions in cooperation with a sinker or opposed needle by a cooperating cam system, and a needle selecting system, said needle selecting system comprising a pair of rockable selector jacks mounted in tandem in each needle groove below the needle retained therein, control butts formed on the adjacent ends of each of said selector jacks of said pair, a patterning wheel mounted adjacent the needle cylinder having projecting elements engageable selectively with said butts which cause the selector jacks to engage in appropriate paths of the cam system and be

moved to displace the needle, said cam system having retracting surfaces which push back the selected selector jacks into



their original position formed in front of the clearing point for each yarn feed.

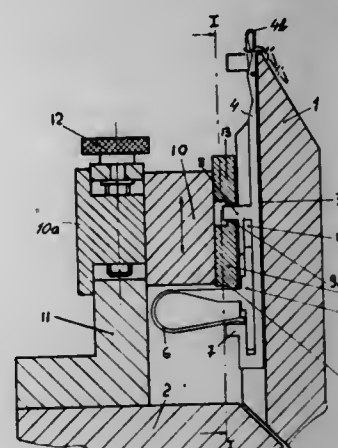
4,054,042

APPARATUS FOR ACCELERATING A KNITTING NEEDLE DURING ITS STITCH DRAWING STROKE
 Gerard Durville, Le Lignon, Switzerland, assignor to Battelle Memorial Institute, Geneva, Switzerland
 Filed Jan. 20, 1976, Ser. No. 650,684
 Claims priority, application Switzerland, Jan. 31, 1975, 1186/75

Int. Cl.² D04B 15/32

U.S. Cl. 66—57

12 Claims



1. A knitting machine comprising: a needle carrier formed with a multiplicity of parallel guide channels; a support provided with cam means forming a first and a second ramp surface, said support and said needle carrier being relatively movable in a direction substantially transverse to said guide channels; a multiplicity of knitting needles respectively received in said guide channels for longitudinal displacement therein under the control of said cam means, each of said needles being provided with a heel engaging said first ramp surface and with a hook for drawing a thread into loops to form a succession of stitches, said first ramp surface being effective to advance each needle in a forward stroke of a stitch-forming cycle; a slide individual to each needle limitedly movable in the associated guide channel and engaging said second ramp surface; and resilient link means individual to each needle coupling the respective slide with the respective needle for retracting the latter in a return stroke of a stitch-forming cycle, said resilient link means storing a needle-retracting force during an initial phase of said return strokes and releasing the stored force during a terminal phase of said return stroke

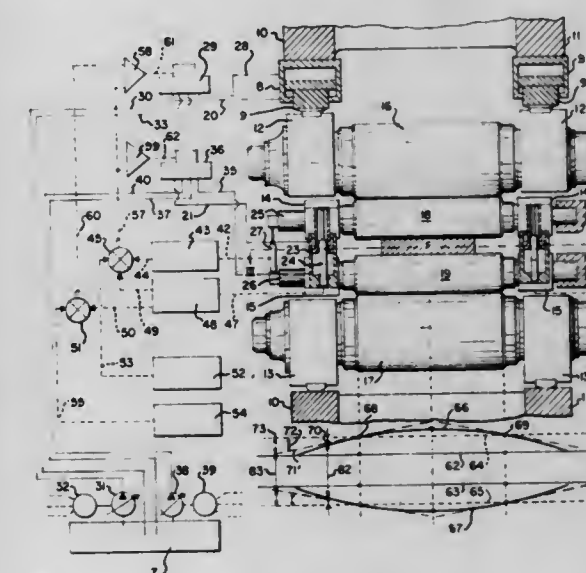
with resulting acceleration of the needle, said first and second ramp surfaces diverging from each other in one part of a cam section, effective during said initial phase, for stressing said resilient link means and converging toward each other in another part of said cam section, effective during said terminal phase, for relaxing said link means.

4,054,043

CLOSED LOOP INTEGRATED GAUGE AND CROWN CONTROL FOR ROLLING MILLS
 Werner W. Elbe, McCandless Township, Allegheny County, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.
 Filed Dec. 2, 1976, Ser. No. 746,848
 Int. Cl.² B21B 37/08

U.S. Cl. 72—8

14 Claims



10. The method of controlling rolling pressure and roll bending pressure in a rolling mill stand so as to provide independent adjustment of work gauge and flatness, comprising continuously measuring the separation between work rolls, converting that measurement to a gauge signal, continuously determining the inclination of a work roll axis to the horizontal, converting that determination to a crown signal opposite in direction to the gauge signal, applying bending pressure to the work roll necks corresponding to the algebraic sum of the gauge and the crown signals, and applying rolling pressure to the work rolls corresponding to the gauge signal and to the algebraic sum of the gauge and the crown signals.

4,054,044

SEALS FOR THE PASSAGE OF WIRE BETWEEN REGIONS OF DIFFERENT PRESSURE

Joseph Brian Wareing, Chester, and Herbert Hall, Wakefield, both of England, assignors to The Electricity Council and Johnson & Nephew (Non-Ferrous) Limited, both of England
 Filed June 21, 1976, Ser. No. 697,807
 Claims priority, application United Kingdom, June 24, 1975, 26799/75

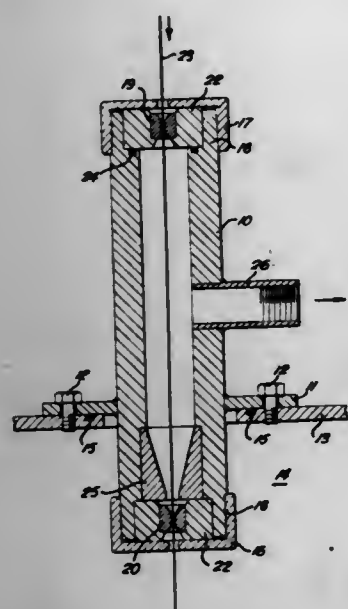
Int. Cl.² B21D 37/16; C23C 13/10; F27D 1/00

U.S. Cl. 72—38

11 Claims

1. A seal for permitting the feeding of wire of predetermined uniform section through a wall separating regions at different pressures comprising a tube extending through and sealed to said wall, a pair of die-shaped elements positioned in a pair of holders located one in each end of said tube, said die-shaped elements being of hard rigid material and having a bore with clearance for the passage of the wire, said die-shaped elements furthermore being smoothly curved in any axial section to have a convergent entry portion leading to the narrowest portion and a divergent exit portion, means for pumping air

from said tube and an internal wire guide located adjacent one of said holders and having an internal diameter decreasing



gradually from the end remote from the holder towards the end nearer said holder.

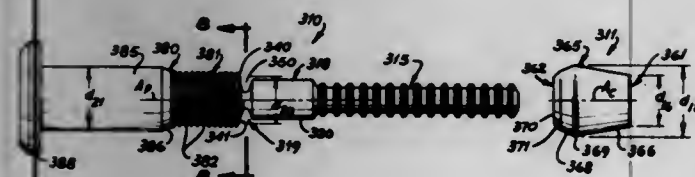
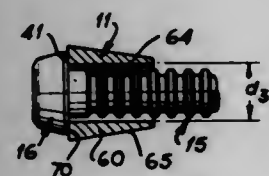
4,054,045

TWO-PIECE MANDREL ASSEMBLY FOR DEFORMING
John O. King, Jr., 3990 N. Ivy Road, Atlanta, Ga. 30342
Continuation of Ser. No. 542,077, Jan. 17, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,423

Int. Cl.² B21B 45/02; B21C 43/00

U.S. Cl. 72-40

23 Claims



1. A hole expansion mandrel assembly for use in expanding a pilot hole with a prescribed hole diameter through a work piece comprising:

- an elongate drive pin having a support central axis, and including a pulling section adjacent the leading end of said drive pin and an annular driving shoulder rearwardly of said pulling section, said pulling section having a first outside diameter a prescribed amount smaller than the hole diameter and said shoulder defining an annular driving face on that side facing the leading end of said drive pin having a second outside diameter a second prescribed amount larger than said first outside diameter; and,
- a seamless annular expansion collet defining a central passage therethrough about a collet central axis and an outside expansion surface about said collet central axis that tapers outwardly from the leading end of said collet, said central passage having a third inside diameter at least as large as said first diameter of said pulling section and smaller than said second outside diameter of said driving face, said expansion surface having a fourth minor outside diameter smaller than the hole diameter and a fifth major outside diameter larger than said second outside diameter of said driving face and larger than the hole diameter by a

fifth prescribed amount, said collet further defining an annular abutting surface on the trailing end thereof, said collet slidably received over said pulling section with said abutting surface engaged by said driving face of said shoulder so that said pulling section can be inserted through the hole, leading end, first, until said expansion surface on said collet engages one side of the work piece about the hole and the pulling section can be gripped from the opposite side of the work piece to force the collet through the hole without significantly changing the size of said collet to expand the hole.

4,054,046

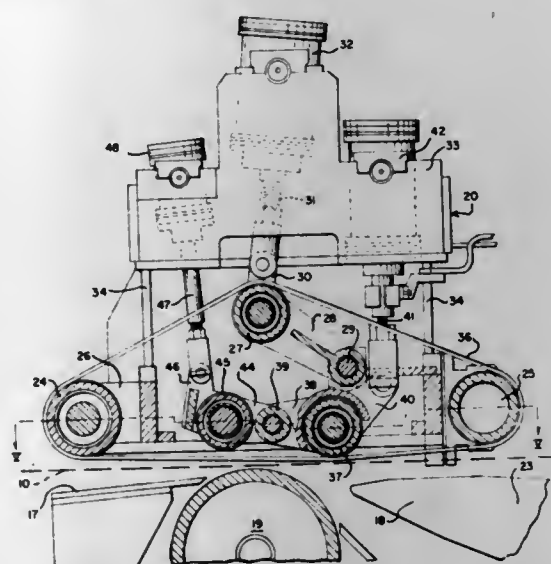
STRIP DEFLECTOR UNIT

Werner W. Eibe, Pittsburgh, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.
Division of Ser. No. 668,059, March 18, 1976, Pat. No. 4,000,635. This application Sept. 7, 1976, Ser. No. 720,847

Int. Cl.² B21C 47/04, 47/14

U.S. Cl. 72-130

2 Claims



1. The method of causing the leading end of cold rolled metal strip traveling in a horizontal path to bridge the entry to a coiler positioned below that path comprising moving a flexible belt spaced above the path of travel of the strip along a path inclined to the strip path so as to make contact between the lower surface of the belt and the upper surface of the strip, wrapping the belt upwardly around an arc of a first rotating roll having its lower surface positioned below the horizontal path of travel of the strip, directing the strip upwardly against the belt by a second rotating roll positioned below the horizontal strip path and tangent thereto behind the first rotating roll and ahead of the coiler, so as to impart to the strip an upward curl away from the coiler, and severing the strip ahead of the first rotating roll, then moving the belt away from the second rotating roll and strip.

4,054,047

DEVICE FOR RECEIVING AND DISCHARGING ROLLED BARS AND THE LIKE

Ferruccio Scilippa, Udine, Italy, assignor to Simac S.p.A., Udine, Italy

Filed Oct. 13, 1976, Ser. No. 732,147

Claims priority, application Italy, Oct. 13, 1975, 83459/75

Int. Cl.² B21B 43/08; B65G 29/00

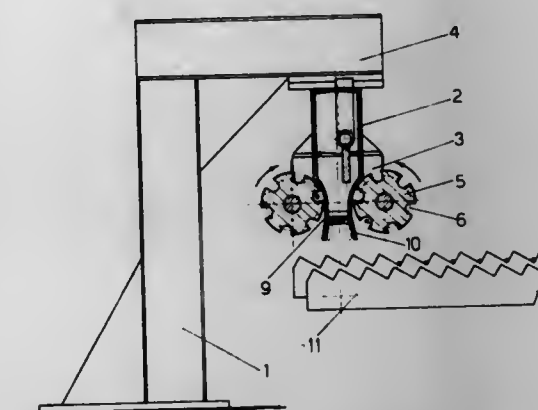
U.S. Cl. 72-201

7 Claims

1. A discharge device for reception in the axial direction of rolled bars and the like and transverse discharge of same, the device comprising, in combination:

- a first and a second rotatable drum positioned in close vicinity to one another, each said drum being provided with an equal number of symmetrical, external, longitudinal grooves which are to receive respective ones of the bars and the like;

a pair of axles for rotating said rotatable drums in opposite directions;
a wall means positioned between said drums, said wall means including two, outwardly facing, respective curved surfaces adjacent respective said drums and forming therewith respective transfer paths and transfer pockets for bars and the like which are to be moved while positioned in said grooves as these grooves move past said curved surfaces;



means for driving said axles in opposite directions of rotation;
deviating means for delivering alternately individual bars and the like to said first drum and to said second drum; and
means beneath said drums for receiving bars and the like alternately discharged one at a time from said first drum and said second drum.

4,054,048

ROTARY METAL EXTRUSION APPARATUS

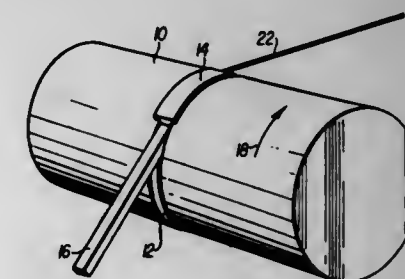
Kenneth C. Hagerman, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sept. 24, 1976, Ser. No. 726,234

Int. Cl.² B21C 23/00

U.S. Cl. 72-262

25 Claims



1. A method of extruding metal by operating rotary metal extrusion apparatus comprising a drum rotatable about an axis and having a curved peripheral surface with a circumferential groove therein, a curved shoe located adjacent said peripheral surface of said drum, said shoe having a projecting portion projecting into said groove to form a passageway with the surfaces of said groove, said shoe also having shoulder portions adjacent said projecting portion, said shoulder portions mating with the peripheral surfaces of said drum adjacent said groove for relative movement with respect thereto, the sides of said projecting portion of said shoe and the sides of said groove having clearance spaces therebetween, an abutment member fixed with respect to said shoe and closing one end of said passageway, and a die located at said closed end of said passageway, said method comprising the steps of:

- introducing, into said circumferential groove in said drum, metal to be extruded;
- rotating said drum and thereby moving it with respect to said shoe so that frictional drag of the surfaces of said groove draws said metal through said passageway and toward said die;

extruding metal through an orifice in said die to produce an extrusion;
allowing a small quantity of the metal in said groove to flow through said clearance spaces as metal is extruded through said die orifice; and
permitting a part of said metal flowed through said clearance spaces to be forced between said shoulder portions of said shoe and said peripheral surfaces of said drum mating therewith, so as to form therebetween a thin bearing layer of the metal;
said bearing layer of the metal to be extruded being in sliding contact with a bearing material different from the materials of said shoe and said drum.

4,054,049

THERMAL EXTENSOMETER

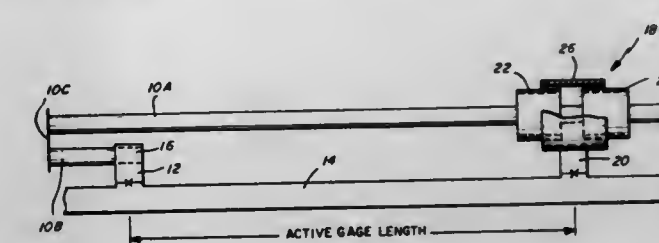
Richard Egger, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 14, 1976, Ser. No. 696,021

Int. Cl.² G01N 25/16

U.S. Cl. 73-16

14 Claims



1. A thermal extensometer for measuring thermally induced strain or expansion in a specimen subjected to thermal variations, said extensometer comprising:
an elongated link extending along the surface of said specimen and including two link sections including a short section and a long section with the two link sections having different thermal expansion coefficients to thereby provide a total expansion between sections that is negligible,
means securing one end of each link section in fixed relationship,
means for supporting the other end of the short link section from the specimen,
motion detecting means disposed in cooperative relationship with the long link section adjacent the other end thereof, and means for supporting at least part of the motion detecting means from the specimen at a location spaced from the location of the short link supporting means.

4,054,050

APPARATUS FOR MEASURING THE CRUSH STRENGTH OF SOLID PARTICLES

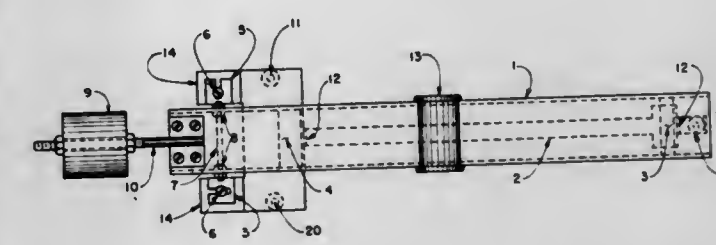
Luther J. Reid, 196 Bishops Drive, Aston, Pa. 19014

Filed June 1, 1976, Ser. No. 691,893

Int. Cl.² G01N 3/14

U.S. Cl. 73-94

3 Claims



1. In an apparatus for measuring the crush strength of a solid particle the combination of a counter-weighted beam hinged to a stationary base said beam being wider than it is deep, two anvils for clamping said particle between them, one of said anvils attached to said beam for applying force to said particle and other of said anvils for supporting said particle in place and

a rigid rollable metal mass movable along said beam to provide an increasing crushing force to said solid particle.

4,054,051

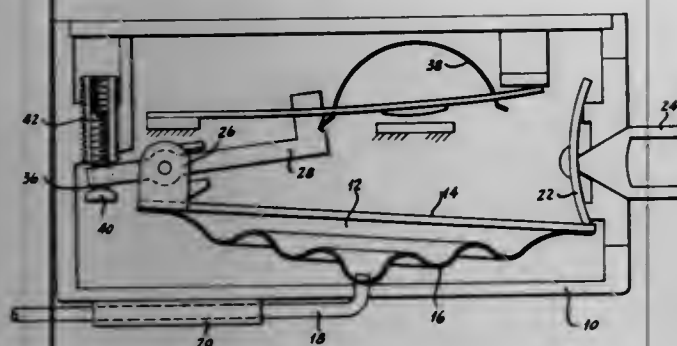
THERMOSTATIC CONTROL

Charles R. Smith, West Allis, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 16, 1976, Ser. No. 696,639
Int. Cl.² G01K 5/28

U.S. Cl. 73-368

4 Claims



1. A control for a thermostat having a thermal responsive power element consisting of a rigid cup-shaped portion having mounted thereon a single flexible diaphragm, such power element characterized in that there is a capillary tube which is rigidly secured to the diaphragm to fixedly mount the diaphragm and provide for movement of said cup-shaped portion in linear lines relative to changes in pressure of the gas in the chamber provided by such member and such diaphragm.

4,054,052

AIRCRAFT INSTRUMENT WITH ACCELERATION COMPENSATION DEVICE

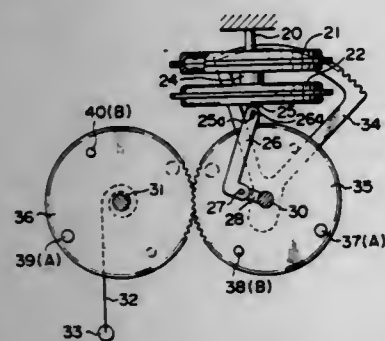
Kazuo Nakahama, Komae, Japan, assignor to Tokyo Aircraft Instrument, Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1976, Ser. No. 675,145

Claims priority, application Japan, Mar. 9, 1976, 51-25889
Int. Cl.² G01D 11/10

U.S. Cl. 73-430

8 Claims

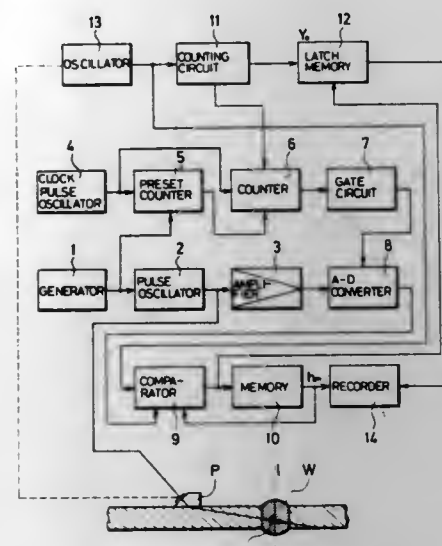


1. An aircraft instrument with an acceleration compensation device comprising: at least one capsule, a rocking axle, a link mechanism to transmit displacements of a free end of the capsule to the rocking axle, a first gear integrally provided with the rocking axle, a second gear meshed with the first gear and being rotatable, and weights provided on the first and the second gears so as to displace the centers of mass of the gears radially from the respective rotation axes, the relative masses and positions of said weights being such that the rotative force of the weights caused by an acceleration force works on the rocking axle so as to cancel the rotative force of the rocking axle by the displacements, due to the acceleration, of the free end of the capsule.

4,054,053
AUTOMATIC WELD FLAW DETECTOR
Eiji Yamamoto; Koji Ohta; Koji Sekiguchi, and Toshiaki Fujimori, all of Tokyo, Japan, assignors to Tokyo Kelki Co., Ltd., Tokyo, Japan
Filed Dec. 2, 1975, Ser. No. 636,974
Claims priority, application Japan, Dec. 5, 1974, 49-139738
Int. Cl.² G01N 29/04

U.S. Cl. 73-67.8 S

1 Claim



1. An automatic weld-flaw detecting apparatus, which comprises a probe movable along a welded member for applying and detecting ultrasonic waves, a memory for memorizing the amplitude of the echoes, a comparator coupled to the memory and the probe for repeatedly comparing an echo amplitude after each movement of the probe for a unit distance with the content of the memory and applying the larger of the compared amplitude to the memory, said memory memorizing only the larger of the compared amplitudes, a source of clock pulses, a counting circuit responsive to the distance of movement of said probe, a first counter set for counting clock pulses over a period of time corresponding to the time a beam of ultrasonic wave from the probe takes to reach a weld portion and its echo returns to said probe, a second counter coupled to the first counter and adapted to commence in response to said first counter having counted clock pulses up to the set value and stop counting in response to the content of said counting circuit, a gate circuit opened only between the stop and start of clock pulses from said second counter, an A-D converter responsive to said probe for applying the echo amplitude of the flaw into said comparator upon receiving control of said gate circuit, a latch memory circuit responsive to said comparator and said counting circuit for memorizing the contents of said counting circuit at the time of memory of the maximum flaw echo amplitude by said memory and a recorder for recording each of the contents of said latch memory circuit, and the memory circuit, and whereby it is made possible automatically to record a maximum value of flaw echo amplitude in a weld portion and the distance between the probe and the weld portion during each scan by said probe.

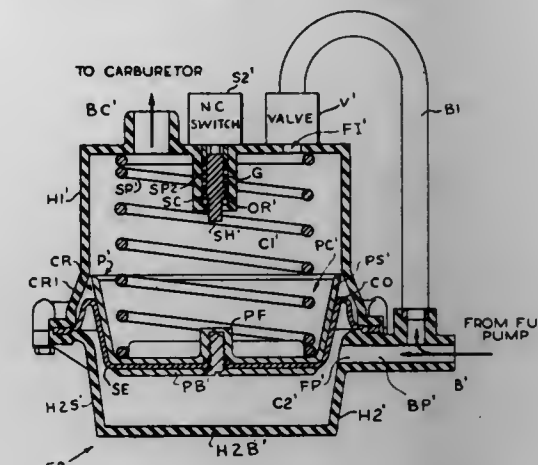
4,054,054
FLUID FLOW MEASUREMENT APPARATUS
Floyd M. Minks, Rte. No. 1, Box 66, Kissimmee, Fla. 32741
Filed Nov. 25, 1975, Ser. No. 635,221
Int. Cl.² G01M 15/00; G01F 11/04

U.S. Cl. 73-113

12 Claims

1. A device for indicating the interval for the flow of a predetermined volume of fuel in an internal combustion engine fuel system, said device comprising:
a housing having a cavity and a circumferential recess therein, said housing being interposed in series with a fuel line of said internal combustion engine fuel system;
a piston freely movable within said cavity of said housing for moving generally along a longitudinal axis thereof, said

piston including sides tapered upwardly and outwardly therefrom;
a flexible diaphragm coupled to said piston within said cavity for dividing said cavity into a first chamber and a second chamber, said flexible diaphragm preventing the flow of said fuel between said first and second chambers, said flexible diaphragm including a convolution therein for folding along said tapered sides of said piston, with said convolution folding within said circumferential recess within said housing;



means for connecting said first chamber to a fuel inlet from said internal combustion engine fuel system;
means for connecting said first chamber to a fuel outlet to said internal combustion engine system;
means for bypassing said fuel flow from said fuel inlet of said first chamber through a fuel port into said second chamber, whereby a fuel flow into said second chamber will displace said flexible diaphragm for expelling said predetermined volume of fuel from said first chamber through said fuel outlet and into said internal combustion engine fuel system.

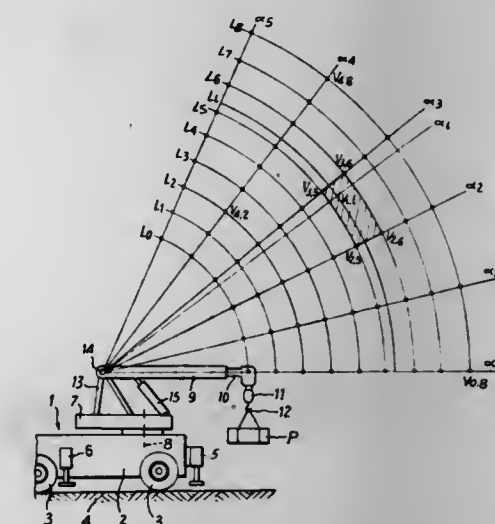
4,054,055
DEVICE FOR CONTROLLING THE LOAD OF A LIFTING APPLIANCE

Francois Simon, Gresy-sur-Aix, France, assignor to Precilec, Paris, France

Filed Aug. 6, 1976, Ser. No. 712,370
Int. Cl.² G01L 3/00; G08B 21/00

U.S. Cl. 73-133 R

3 Claims



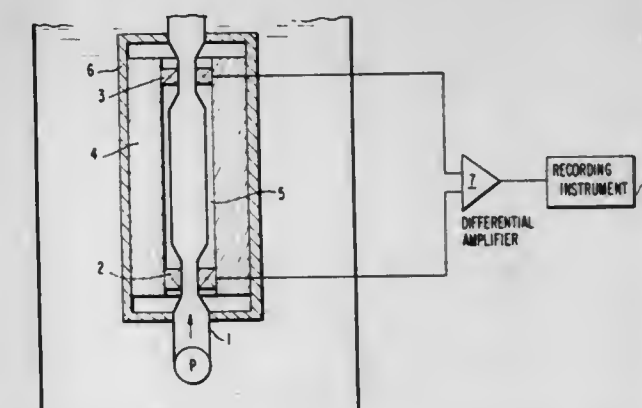
1. A device for enabling the load on a lifting appliance to be controlled, comprising a first potentiometer unit formed by a series of potentiometers, each having multipleappings and a movable contact arm, means for mechanically coupling together the arms of said potentiometers, first means for controlling the position of the arms of the said potentiometers as a function of the value of a first geometric parameter of the

appliance, a second potentiometer unit comprising a potentiometer having multipleappings and a movable contact arm, each tapping being electrically connected to the arm of a corresponding potentiometer of the first unit, a second means for controlling the position of the arm of the said second unit potentiometer as a function of the value of a second geometric parameter of the appliance, third means serving to assign reference voltages to theappings of the potentiometers of the first unit, fourth means serving to establish a voltage representing the instantaneous load actually applied to the appliance, fifth means serving to compare the voltage taken from the arm of the second unit potentiometer and the said voltage representing the load applied to the appliance, said third means including for each tapping, a system of polarisation comprising a series of polarisation circuits in parallel, associated with the position in which the appliance is brought into operation, each circuit having a member suitable for providing a regulated voltage and controlled by a switching device defining the instantaneous position of operation and simultaneously controlling all the circuits of all the systems of polarisation of theappings of the first unit potentiometers.

4,054,056
CALORIMETRY PROBE
Lars Wegstedt, Jarfalla, and Bengt Lindblad, Spanga, both of Sweden, assignors to LKB-Produkter AB, Bromma, Sweden
Filed Dec. 8, 1975, Ser. No. 638,543
Claims priority, application Sweden, Dec. 12, 1974, 7415590
Int. Cl.² G01K 17/00; G01N 33/00

U.S. Cl. 73-190 R

4 Claims



1. Calorimetric probe for measuring exothermic reactions in a liquid, comprising a protective cover defining a hollow vessel to be immersed in heat exchanging relationship in a body of said liquid, an elongated tube in communication with said body of liquid and defining a flow path for said liquid, at least a portion of the length of said tube being contained within said protective cover in heat isolating relationship thereto, a pair of thermoelements and means thermally coupling each of said thermoelements between said protective cover and said elongated tube at respective locations spaced along the length of said heat isolated portion, each of said thermoelements being capable of measuring the temperature difference between the protective cover and the elongated tube at said respective spaced locations, whereby the exothermic heat produced during a flow of said liquid between said spaced locations can be measured.

4,054,057
TEMPERATURE SENSING PROBE AND DISPOSABLE COVER THEREFOR

Douglas J. Kluge, Minneapolis, Minn., assignor to Diatek, Inc., San Diego, Calif.

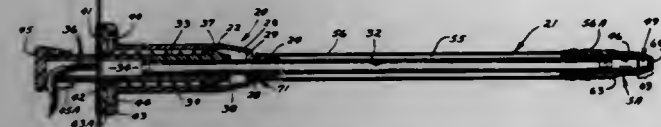
Filed Mar. 1, 1976, Ser. No. 662,587
Int. Cl.² G01K 1/08, 7/16

U.S. Cl. 73-343 R

40 Claims

1. A temperature sensing probe and cover therefor comprising: a temperature sensing probe including an elongated tubu-

lar member having a first end and a second end, a tip secured to the first end of the tubular member, said tip having a forwardly converging annular side wall, said side wall having an outward convex shape, a temperature responsive element secured to the tip, a body secured to the second end of the tubular member, a cylindrical collar having a chamber accommodating the body, a head secured to the collar surrounding the tubular member between the body and tip, and means surrounding the body and engageable with the collar to bias the collar away from the tip, said head having an annular groove and an annular shoulder facing the groove; a cover for enclosing part of the tubular member and the tip, said cover having a body, said body having a generally cylindrical elastic side wall forming a cover chamber accommodating part of the tubular member, an end member of rigid material attached to



the body for accommodating the tip, said side wall having an open end section surrounding the head, said open end section having an annular bead located in the groove and engageable with the shoulder to hold the cover in assembled relation with the tubular member and tip, said end member having a forwardly converging annular thermal window section, said thermal window section having a flexible annular wall being deformed into surface engagement with the outward convex shaped side wall of the tip whereby heat from the environment adjacent the thermal window section is transferred through said thermal window section to the tip and temperature responsive element secured thereto, said means surrounding the body and engageable with the collar to bias the collar away from the tip being operable to bias the flexible wall of the thermal window section into surface engagement with the convex shape of the side wall of the tip.

4,054,058

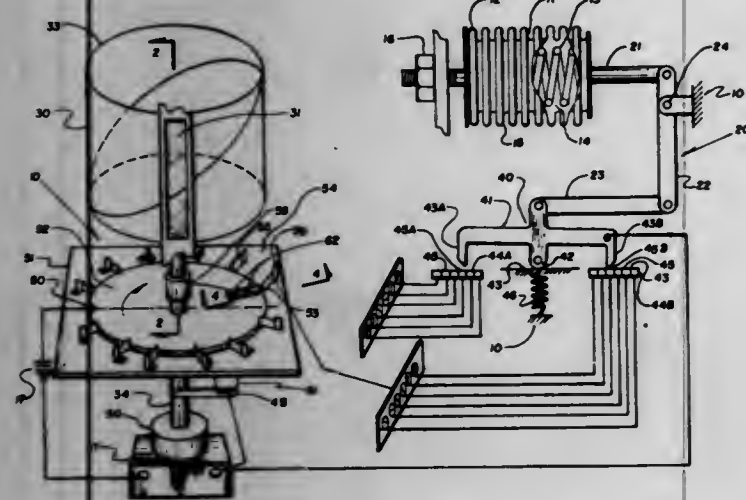
DEVICE FOR INDICATING DIRECTION OF BAROMETRIC PRESSURE TRENDS

John Protz, 376 S. Walnut St., Blairsville, Pa. 15717
Filed Jan. 3, 1977, Ser. No. 755,935

Int. Cl.² G01L 7/12

U.S. Cl. 73-386

9 Claims



1. A device for indicating barometric pressure trends, comprising:
 - a. a housing;
 - b. means for measuring barometric pressure mounted on the housing;
 - c. a linkage member connected to one end of means for measuring barometric pressure;
 - d. display means for indicating direction of barometric trend, mounted on the housing;
 - e. trend means for determining barometric pressure trend, mounted on the housing and controlled by the linkage

member, that creates a signal when trend direction changes; and

- f. motor means for energizing display means, connected to the trend means and display means in such a manner that the signal from trend means is translated by motor means to energize display means so that display means indicates direction of trend of barometric pressure.

4,054,059

PRESSURE GAUGE

Francis Xavier Kay, Yew Tree Cottage, 30 Sheep Street, Winslow, Bucks., England

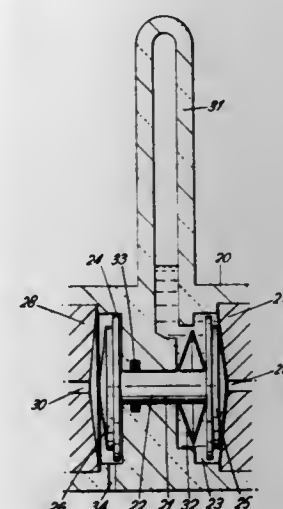
Filed Dec. 24, 1975, Ser. No. 644,323

Claims priority, application United Kingdom, Dec. 30, 1974, 56073/74

Int. Cl.² G01L 7/08

U.S. Cl. 73-407 R

3 Claims



1. A pressure gauge comprising:
 - a. a gauge vessel filled with indicating liquid, the gauge vessel having at least one deflectable wall portion;
 - b. a reader tube communicating with said gauge vessel and into which said indicating liquid extends as a column;
 - c. a first gauge port directly exposing said deflectable wall portion to a first fluid pressure to be applied whereby said first pressure tends to deflect said wall portion to reduce the gauge vessel volume;
 - d. a second gauge port at which a second fluid pressure is to be applied, the deflectable wall portion being indirectly exposed to the second fluid pressure applied at the second gauge port and said second fluid pressure producing a force on the deflectable wall portion opposing that arising from the first fluid pressure; and
 - e. biasing means acting on said deflectable wall portion to oppose its deflection in response to the first fluid pressure applied at the first gauge port.

4,054,060

DEVICE FOR SAMPLING FURNACE GASES

Masayuki Ueno, and Fumiaki Sano, both of Yokohama, Japan, assignors to Ishikawakima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1976, Ser. No. 718,607

Claims priority, application Japan, Oct. 30, 1975, 50-148070[U]

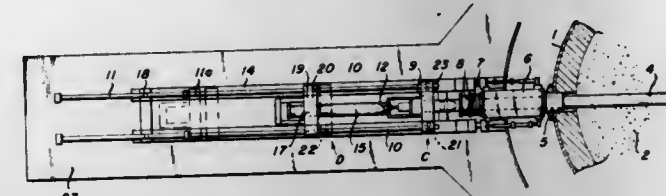
Int. Cl.² G01N 1/22

U.S. Cl. 73-421.5 A

4 Claims

1. A device for sampling gases from a furnace consisting of the provision of
 - a. a lance adapted to be moved axially forwardly or backwardly along guide frames by hydraulic driving cylinders, and
 - b. a gate valve provided with a swingable valve disk for

sealing the furnace when said lance is retracted out of the furnace and a dust discharge mechanism for discharging



dust and the like accumulated in a valve box out of the valve box.

4,054,061

GRADUATED PIPETTE EQUIPPED WITH A LATERAL SUCTIONS SQUIRT

Alfredo Valt, Via Giambellino 41A, 20146 Milan, Italy

Filed Feb. 17, 1976, Ser. No. 658,944

Claims priority, application Germany, Jan. 14, 1976, 7600897

Int. Cl.² G01N 1/14

U.S. Cl. 73-425.6

1 Claim



1. A graduated pipette including an elongated tubular member closed at one end and open at the other, a laterally and downwardly extending capillary tube integrally connected with the tubular member adjacent its closed end but spaced therefrom and in communication with the interior thereof, and a bulb mounted on said capillary tube with its interior in communication with the passageway of the capillary tube, wherein the interior volume of the bulb is greater than that of tubular member in the bulb.

4,054,062

HAND-HELD MICROPIPETTOR WITH IMPROVED ACCURACY OF LIQUID VOLUMES TRANSFERRED

Doud Roger Branham, Redwood City, Calif., assignor to Oxford Laboratories Inc., Foster City, Calif.

Filed May 3, 1976, Ser. No. 682,401

Int. Cl.² B01L 3/02

U.S. Cl. 73-425.6

12 Claims

1. In a hand-held liquid transfer pipetting device, comprising:
 - an elongated hollow body,
 - a piston chamber within said body,
 - a piston entering one end of said piston chamber and reciprocally held relative thereto, and
 - means extending from said piston out of one end of said body to a knob for providing such reciprocal motion to said piston,
 the improvement comprising means within said body operable as said piston and said reciprocal motion means recip-

rocate for drawing air from outside the pipettor into the body in a direction past portions of the piston without any



of said drawn air getting into the piston chamber, whereby the portion of the piston outside the piston chamber at any instant is cooled by the drawn air.

4,054,063

GUARD FOR A CHAIN AND CHAIN WHEEL TRANSMISSION IN PARTICULAR FOR THE TRANSMISSION OF A CYCLE OR THE LIKE

Marc Auguste Perrin, Genlis, France, assignor to Cycles Peugeot, Valentigney, France

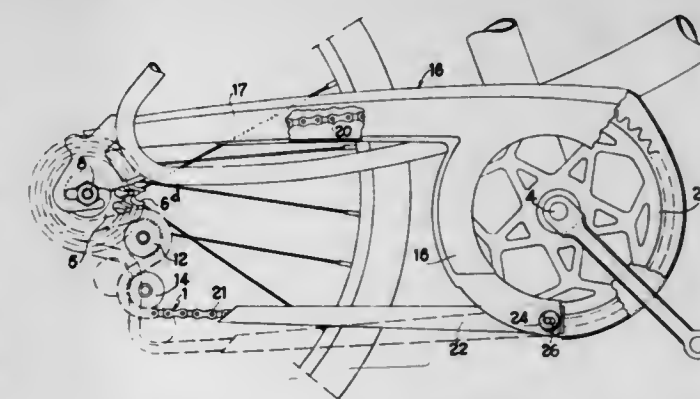
Filed Aug. 26, 1976, Ser. No. 717,822

Claims priority, application France, Sept. 8, 1975, 75.27441

Int. Cl.² F16P 1/00

U.S. Cl. 74-611

8 Claims



1. A guard for a transmission including a chain and chain wheels, and in particular for the transmission of a cycle, which comprises a fixed cover for surrounding a first reach of the chain and surrounding at least one chain wheel, and a tube for surrounding and protecting a second reach of the chain, the tube being pivoted to the cover at a point corresponding to a point of tangency of the second reach of the chain with said one chain wheel.

4,054,064

MULTISIDED GUARD

Brooks Walker, 807 Francisco St., San Francisco, Calif. 94109
Continuation of Ser. No. 484,678, July 1, 1974, abandoned. This application July 21, 1975, Ser. No. 597,879

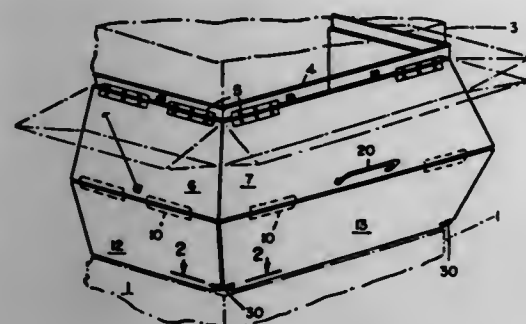
Int. Cl.² F16P 1/00

U.S. Cl. 74-612

3 Claims

1. A safety guard for protecting a pair of adjoining intersecting vertically extending sides of a space comprising:
 - a pair of vertically extending walls covering said sides,

each of said walls including an upper trapezoidal panel having upper and lower horizontally disposed edges, a fixed mount, means hingedly supporting the upper panels of said walls to said mount for swinging movement in vertical planes about horizontally extending axes in intersecting relation, each of said walls including a lower trapezoidal panel hingedly secured along its upper edge to the lower edge of its corresponding upper panel, and a pivot pivotally securing said lower panels together adja-



cent their lower edges with the adjacent side edges of said upper panels and the adjacent edges of said lower panels being unsecured except at said pivot to permit each pair of upper and lower panels to be swung upwardly to substantially face to face relationship, the lower edge of each upper panel being longer than its upper edge, and the upper edge of each lower panel being longer than its lower edge to prevent corresponding upper and lower panels from being swung to coplanar relationship thereby facilitating swinging each of said walls from a lower to an upper position.

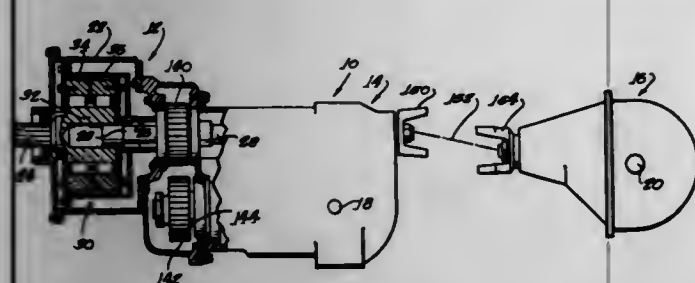
4,054,065

MULTIPLE AXLE DRIVE MECHANISM

Robert William Lemon, Farmington, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 7, 1975, Ser. No. 602,944

Int. Cl.² F16H 1/44, 37/06; B60K 17/34; F16D 43/00
U.S. Cl. 74-711 8 Claims



1. A clutch mechanism for transferring drive to a pair of concentric output shafts from an input shaft, each of said output shafts connected to drive a drive axle said clutch mechanism including two one-way devices each comprises of a plurality of wedging elements, said input shaft extending on one side of said clutch mechanism and said output shafts extending from the other side of said clutch mechanism, one of said output shafts having an output gear thereon and said other output shaft extending through said output gear said input shaft having an inner drive race thereon in operative engagement with the wedging means of each said one-way devices, a pair of outer driven races surrounding said drive race for said one-way devices each adapted to be engaged by said wedging elements of one of said devices and each being drivingly connected to one of said concentric output shafts, each of said one-way devices having a cage member containing said wedging means, friction means connected to said cage member and in frictional engagement with each of said outer driven races, interlock means interconnecting the cage members of said devices and permitting limited angular displacement therebetween whereby when each of said output shafts are rotating at

the same speed said drive race will engage said wedging elements with said driven races to provide positive drive to each of said output shafts and whereby said limited angular displacement of said cages will allow either of said output shafts to rotate faster than the other output shaft and release said wedging engagement whereby at all times driving torque is applied to the slower rotating output shaft.

4,054,066

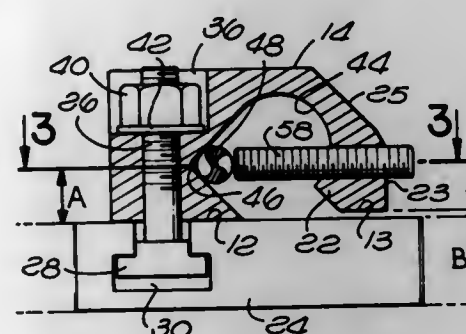
LATHE TOOL

Walter L. Carter, 17156 Los Alimos, Granada Hills, Calif. 91344

Filed Apr. 30, 1976, Ser. No. 681,970

Int. Cl.² B23B 29/00; B26D 1/00

U.S. Cl. 82-36 R 8 Claims



1. A tool holder adapted for releasable mounting on a lathe turret including mean for horizontally supporting an elongated tool over a part of its length, comprising:

a one piece housing formed with (a) a first plane bottom surface for flat connection to said lathe turret, (b) an interior wall surface defining a passage including, in cross section, a V-shaped portion at one end of said passage of serving as a seat for said tool and including an angle of 90° with a horizontally disposed bi-sector at a predetermined distance from said first bottom surface, (c) a distal bottom surface separated from said first surface by said passage and dimensioned to be fractionally spaced from the plane of said lathe turret to enable spring-loading of said tool supported in said housing, and (d) a vertical bore from said first plane bottom surface entirely through said housing for insertion of a stud therethrough for retention of the tool holder on said lathe turret; and means for securing said tool in said V-shaped portion whereby the centerline of said tool is disposed coincident with said horizontal bi-sector.

4,054,067

COMPACT SCREWDRIVER BIT

George Blank, Ajax, Canada, assignor to The Raymond Lee Organization, Inc., a part interest

Filed Sept. 15, 1975, Ser. No. 613,116

Int. Cl.² B25B 13/00

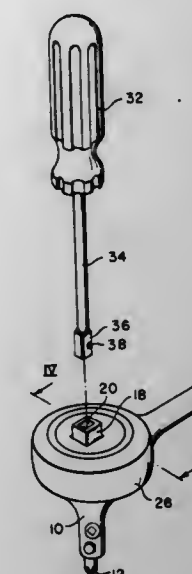
U.S. Cl. 81-58.1 1 Claim

1. A compact screwdriver bit which can be used interchangeably with a ratchet wrench type driver having a square shaped bit receiving opening and with a screwdriver type having a bit controlling member, of square cross section, said bit comprising:

an elongated shank having a screwdriver tip at one end and a flat circular flange at the other end, said flange having a flat surface perpendicular to the axis of the shaft, and centered on the shank, the other end of the shank flaring outward to said flange; and

an elongated rectangularly shaped solid body extending in the direction of the shank, one end of the body being secured to said flange and centered on said shaft, said body having a cross sectional shape of a square as viewed in a plane at right angles to the direction of elongation of said body, the other end of said body being rounded, the

diagonal of said one end slightly smaller than the diameter of the flange, said body having a longitudinally extending bore centered on said shaft and extending from said other tool, into slight rotational movement about said hinge pin and against the clamping action of said securing means.



4,054,069

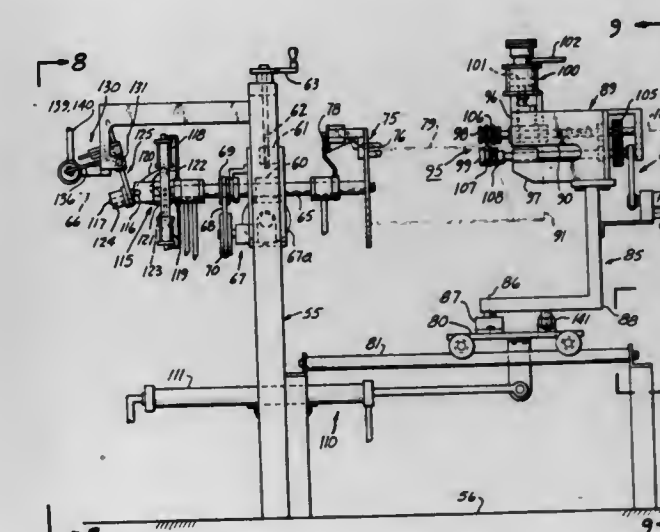
ELBOW-MAKING MACHINE

Vernon W. Coop, Pico Rivera, Calif., assignor to Basil H. Sugden, Bell Gardens, Calif.

Filed Nov. 19, 1976, Ser. No. 743,403

Int. Cl.² B23B 3/06, 5/14

U.S. Cl. 82-57 20 Claims



end of the body to a point intermediate both ends of the body, said bore in cross section having the shape of a square, said body fitting detachably into the opening of said driver, said member fitting detachably into said bore.

4,054,068

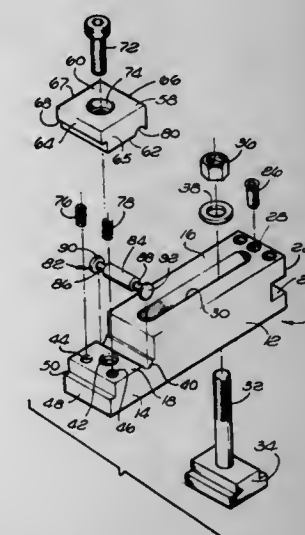
LATHE TOOL

Walter L. Carter, 17156 Los Alimos, Granada Hills, Calif. 91344

Filed Apr. 30, 1976, Ser. No. 681,971

Int. Cl.² B23B 29/00; B26D 1/12

U.S. Cl. 82-36 R 9 Claims



1. In a cut-off tool holder having a planar bottom surface portion and adapted for releasably mounting on a lathe turret, including a support member defining a support surface for said cut-off tool an overhead clamping member and means for releasably securing said clamping member to said support means to provide clamping action thereto whereby to project a cut-off tool horizontally outwardly therefrom, the improvement thereby said clamping member comprises a lid having a tool retaining surface juxtaposed with said support surface and spaced vertically from said support surface, said support surface being spaced a predetermined distance from said planar bottom surface portion, and pivoting means for rotating said lid with respect to said support surface, said pivoting means including a hinge pin horizontally disposed intermediate said support member and clamping lid, parallel to the orientation of said cut-off tool, said hinge pin comprising a center section intermediate a pair of adjoining end sections of reduced diameter, portions only of said end sections extending exteriorly of said cut-off tool whereby to permit conversion of translational displacement of said lid, caused by vibration of said cut-off

1. Mechanism for cutting ends on circularly cylindrical pipe, said pipe having a longitudinal axis and a peripheral wall, said mechanism comprising:

a frame;
collet means to grip and to rotate the pipe around its longitudinal axis;
a collet shaft to support and turn said collet means;
drive means to turn said collet shaft;
cutter means having a cutting edge to cut the wall of said pipe;
cutter mounting means supporting said cutter means, said cutter mounting means rotatably mounting the cutter means for rotation of its cutting edge around its point of contact with a pipe being cut;
supporting means mounting one of said collet shaft or cutter mounting means for axially shifting the same;
positioning means for moving the supporting means and cutter mounting means to make a cut in the pipe, with the cutter means substantially aligned with its cutting path, said positioning means comprising: wobble means mounted to said collet shaft having a wobble axis at a reference angle to the axis of rotation of the collet shaft, whereby a plane normal to the wobble axis, when turned around the axis of rotation, is tangent to a cone; a converter comprising an embrasure which grips the wobble means and enables it to slide therein, rocking embrasure mount mounting the embrasure for rotation with the wobble means, and slave means interconnecting the embrasure and the cutter mounting means, whereby the angular position of the cutter means corresponds with the angular position of the wobble means, one of said collet shaft or the embrasure mounting being restrained to the base against axial movement, the other being axially shiftable relative to the base, whereby the relative axial position of the cutter means and of the collet is a function of the angular position of the wobble means.

4,054,070

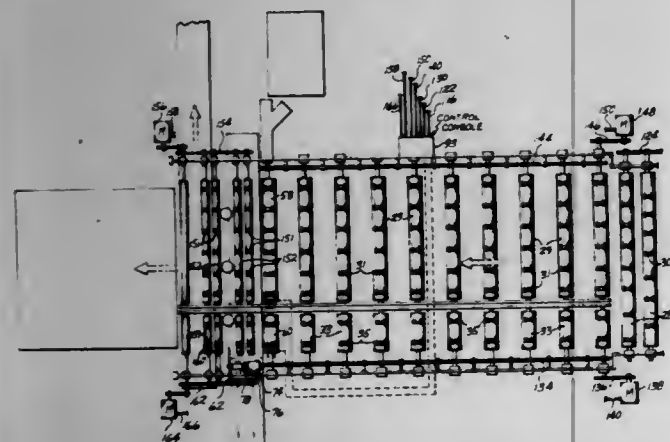
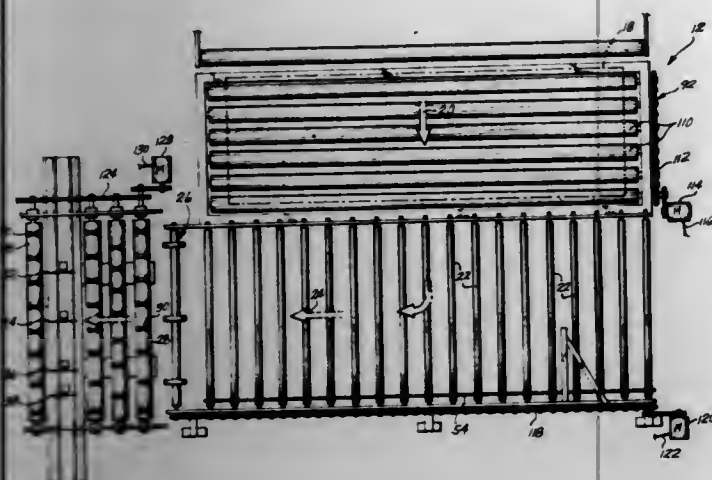
PANEL SAW MECHANISM

Virgil Stelling, Tacoma, Wash., assignor to Globe Machine Manufacturing Company, Tacoma, Wash.

Filed May 17, 1976, Ser. No. 686,701
Int. Cl.² B27B 5/06

U.S. Cl. 83—208

7 Claims



1. A panel saw mechanism comprising a plurality of panel strip, rotary driven, cutting saws; panel conveyor means urging a panel through said panel strip cutting saws and dividing a panel, into a plurality of strips including a main strip and a residual strip; a rotary driven, cutoff saw for sawing panel strips and cutting in a plane disposed at substantially right angles to the saw cuts of the panel strip cutting saws; a plurality of sets of panel strip conveyor means, each set disposed in the line of travel of a panel strip passing said panel strip cutting saws and each thereof urging a panel strip past said panel strip cutting saws; a plurality of measuring rolls, one thereof having a predetermined measured circumference engaging with and measuring a predetermined lineal travel of a main strip and another thereof having a predetermined measured circumference engaging with and measuring a predetermined lineal travel of a residual strip; cutoff saw stroking means stroking said cutoff saw in a path across said panel strips in one direction of its stroking and clear of said panel strips in the other direction of its stroking; a plurality of adjustable control means, one for each of the panel conveyor means and connected with and operated by a predetermined amount of turning movement of its measuring roll; and control means for said saw stroking means connected with and responsive to each of said adjustable control means.

4,054,071

FLYING SAW WITH MOVABLE WORK SHIFTER

Jerzy F. Patzjak, Wampum, Pa., assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

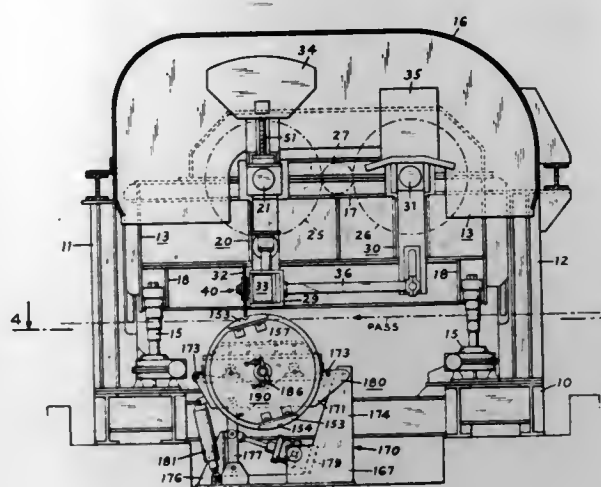
Division of Ser. No. 587,605, June 17, 1975. This application
Dec. 6, 1976, Ser. No. 747,942
Int. Cl.² B23D 45/22

U.S. Cl. 83—306

9 Claims

1. In an apparatus for severing successive longitudinal sections from continuously moving elongated work having a cutting tool movable in a circular path and means for guiding

the work in a normal path spaced a short distance from such circular path, the improvement which comprises an eccentric unit having a cam wheel mounted for rotation on a light-weight vertically movable frame and having a pair of parallel eccentric shafts extending through said frame at opposite sides of said cam wheel, a supporting frame having bearing means mounting said shafts for rotation about parallel axes, a pair of blocks having openings to receive said shafts, each shaft hav-



ing an eccentric portion mounted for rotation in its associated block to cause oscillation of the block in response to rotation of the shaft, means mounting said blocks for horizontal sliding movement on said movable frame, and means mounting said movable frame for vertical movement, whereby the sliding blocks cause the frame to reciprocate vertically in response to rotation of said eccentric shafts, and cause the cam wheel to deflect the work from its normal path into the path of the tool to permit severing of said sections.

4,054,072

MACHINE FOR THE COLD-SAWING OF STEEL PLATES WITH HORIZONTAL FEED MOVEMENT

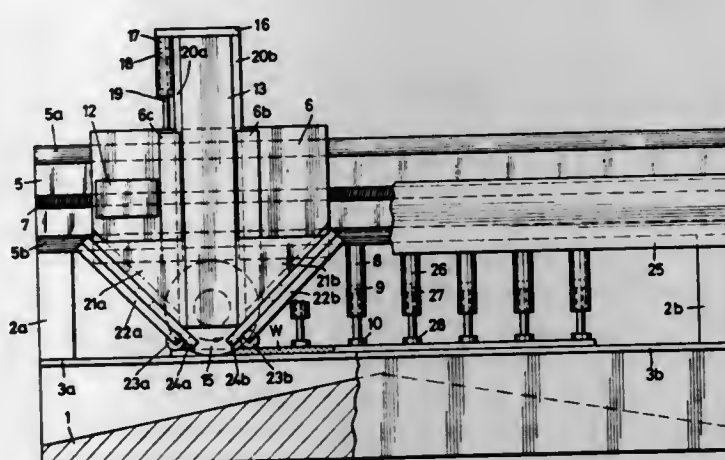
Leopold Jagers, Rudolf-Diesel-Str. 1, 5350 Euskirchen, Rhineland, Germany

Filed Oct. 1, 1975, Ser. No. 618,616

Claims priority, application Germany, Oct. 3, 1974, 2447147
Int. Cl.² B23D 45/02

U.S. Cl. 83—488

5 Claims



1. In a machine for cold-sawing metal workpieces such as a steel plate, an arrangement comprising: a horizontal plate for supporting the workpiece, horizontal guiding means at a distance above said horizontal plate, a carriage slidable on said horizontal guiding means, means for moving said carriage on said guiding means, vertical guiding means fixed on said carriage, a cold-metal saw unit slidable on said vertical guiding means, said saw unit comprising a housing having therein a shaft of a rotary circular saw blade and gearing means for driving said shaft, means contacting the surface of said workpiece in an immediate proximity to a cut formed in said work-

piece by said saw blade and supporting said saw unit housing in a vertical direction on said vertical guiding means, said contacting means being adjustable in a vertical direction relative to said saw unit, one said contacting means being arranged closely ahead of the location at which said saw blade enters said workpiece and another said contacting means being arranged closely behind said location.

4,054,073

JEWELER'S TOOL

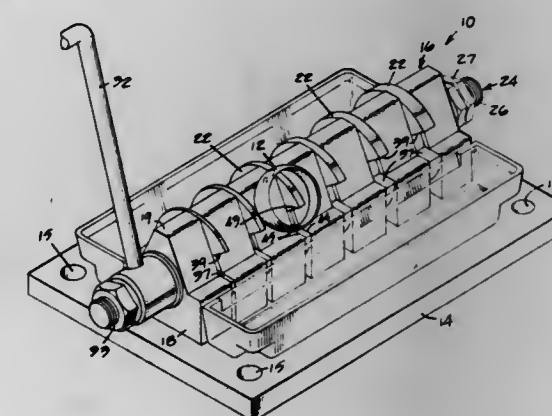
Howard H. Smith, No. 4 W. Lake Place, Antioch, Calif. 94509,
and Glenn E. Christensen, 175 A South Ave., Pittsburg, Calif. 94565

Filed Nov. 22, 1976, Ser. No. 743,564

Int. Cl.² B26D 1/30, 3/00

U.S. Cl. 83—599

10 Claims



1. A cutting tool comprising:
a base member;
two substantially identically formed cutting blocks each defining at least one block cutting edge, said cutting blocks affixed to said base with said cutting edges in a parallel facing arrangement;
a spindle;
a cutting blade of predetermined thickness, said cutting blade defining a pair of blade cutting edges;
said cutting blocks defining a bore therethrough to rotatably receive said spindle, and said cutting blade mounted on said spindle intermediate of said cutting blocks said cutting blade rotatable with said spindle to bring said pair of blade cutting edges into a simultaneous shearing relation with said cutting edges of said cutting blocks;
means for rotating said spindle.

4,054,074

ARRANGEMENT FOR THE SEPARATION OF PACKING CONTAINERS

Kjell H. Mårtensson, Malmö; Stig A. Löthman Sodra Sandby,
and Jan-Anders Holmgren, Arlov, all of Sweden, assignors to
AB Ziristor, Lund, Sweden

Filed May 25, 1976, Ser. No. 689,723

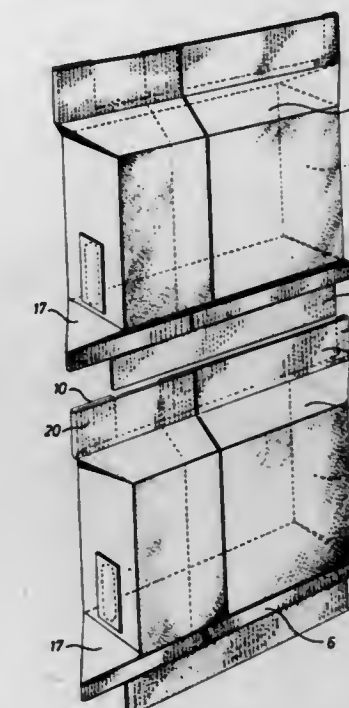
Claims priority, application Sweden, May 29, 1975, 7506125
Int. Cl.² B65D 61/06; B26D 3/16, 9/00, 11/00

U.S. Cl. 83—622

2 Claims

1. A cutting device for separating packing containers formed from a longitudinal tube-like member filled with a filling material and composed of a carton forming material, said tube-like member being provided with a plurality of spaced pairs of spaced transverse seals between opposed wall portions of the tube-like member to provide a series of interconnected packing containers, each pair of transverse seals having a transverse unsealed portion therebetween, said device comprising a first cutter member having a first knife blade extending parallel to the unsealed portion between a pair of transverse seals and terminating short of the ends of the unsealed portion, the depth of said first knife blade being substantially equal to the thickness of one layer of the carton forming material, said first knife blade having lateral extension blades extending at least to the lateral marginal edges of the unsealed portion with a depth not

less than the thickness of two layers of the carton forming material, a second cutting member cooperable with said first cutting member and having a second knife blade extending parallel to the unsealed portion between the pairs of transverse seals and substantially coextensively with said first knife blade but spaced therefrom at right angles to said first knife blade, said second knife blade having extension blades at the ends of and at right angles to said second knife blade and extending substantially to the ends of said first knife blade and trans-



versely of the unsealed portions, the depth of said second knife blade and right angular extension blades thereof being substantially equal to the thickness of one layer of the carton forming material, whereby when said first and second cutting members are pressed together with the unsealed portion therebetween to separate the packing containers, each separated portion of the unsealed portion will be provided with a central flap of a single layer of carton forming material, one separated section also being provided with lateral end portions of two thickness of the carton forming material.

4,054,075

SHEAR MECHANISM

Jim Dvorak, Cosmos, Minn. 56228
Filed Nov. 17, 1976, Ser. No. 742,418

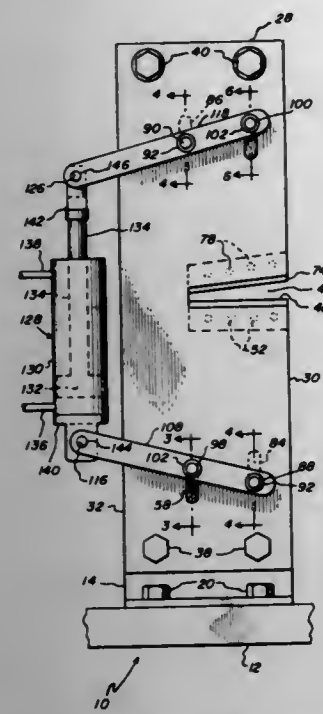
Int. Cl.² B26D 5/12

U.S. Cl. 83—633

10 Claims

1. A shear mechanism comprising first and second relatively movable plates having corresponding first and second ends and notches extending inwardly from one of their adjacent edges toward their opposite adjacent edges, said first plate having a first circular hole nearer its said first end and its said one edge and a second circular hole nearer its second end and its said opposite edge, said second plate having a third circular hole nearer its said first end and its said opposite edge and a fourth circular hole nearer its said second end and its said one edge, a first pin received in said first hole, a second pin received in said second hole, a third pin received in said third hole, a fourth pin received in said fourth hole, first arm means connected to said

first and second pins, second arm means connected to said second and fourth pins, and means for actuating said arms to



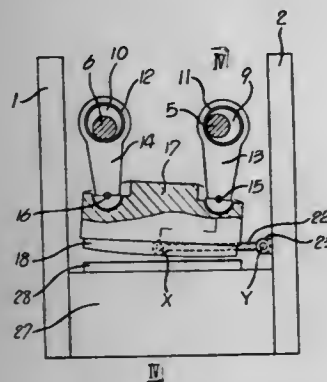
produce relative movement of said plates and to cause shearing of stock placed in said notches.

4,054,076 ROLLING CUT TYPE SHEAR

Satoru Kumabe, Yokohama, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 8, 1976, Ser. No. 748,563

Claims priority, application Japan, Feb. 10, 1976, 51-13527
Int. Cl.² B23D 15/08

U.S. Cl. 83-644



1. A rolling cut type shear wherein a lower blade is securely attached to a stand and a downwardly curved upper blade is attached to an upper blade holder which swings upon rotation of cranks, and

the point on the upper blade holder which corresponds substantially to the midpoint of the upper blade in the longitudinal direction thereof and a shear frame which is the starting side of the cutting work are interconnected with a connecting rod which extends substantially in parallel with the lower blade through spherical bearings.

4,054,077 GUIDE FOR HAND HELD POWER SAWS

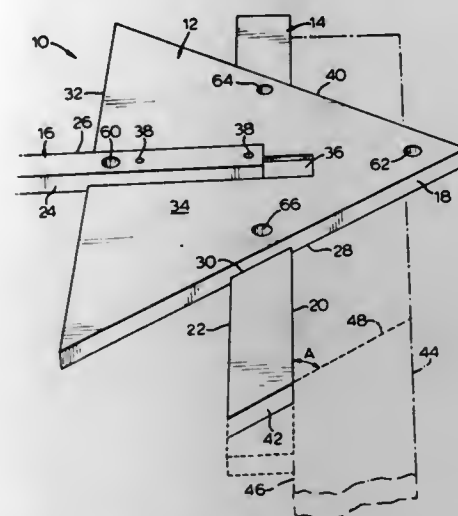
Reginald Henry Gram, 29 Scarboro Ave., West Hill, Ontario, Canada

Filed Mar. 24, 1975, Ser. No. 561,243
Int. Cl.² B27B 9/04

U.S. Cl. 83-745

1. A saw guide for use with a hand held power saw comprising in combination a base plate having a triangular shaped body portion each edge thereof being generally planar, and two first saw blade indexes which are connected to a side of said base plate and which project beyond and outwardly of

two generally planar edges of said triangular shaped body portion and a second saw blade index which is connected to the other side of said base plate and which projects beyond and outwardly of the remaining generally planar edge of said triangular shaped body portion; each said saw blade index having a generally planar first edge extending along the length thereof, the plane of each generally planar first edge intersecting the plane of the respective generally planar edge of said triangular shaped body portion, an angle of 90° being defined between the intersecting planes of the generally planar first edge of said second saw blade index and the respective gener-



ally planar edge of the triangular shaped body portion, an angle of less than 90° being defined between the intersecting planes of each generally planar first edge of each first saw blade index and the respective generally planar edge of the triangular shaped body portion; the arrangement being such that a workpiece to be cut is placed along the generally planar first edge of a selected one of said first or second saw blade indexes and against the corresponding side of said triangular shaped body portion, the angle defined between intersecting planes which correspond to the selected saw blade index determining the angle at which a workpiece is cut with a hand held power saw.

4,054,078 AUTOMATIC ARPEGGIO ELECTRONIC MUSICAL INSTRUMENT

Nobuaki Kondo, Saitama, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

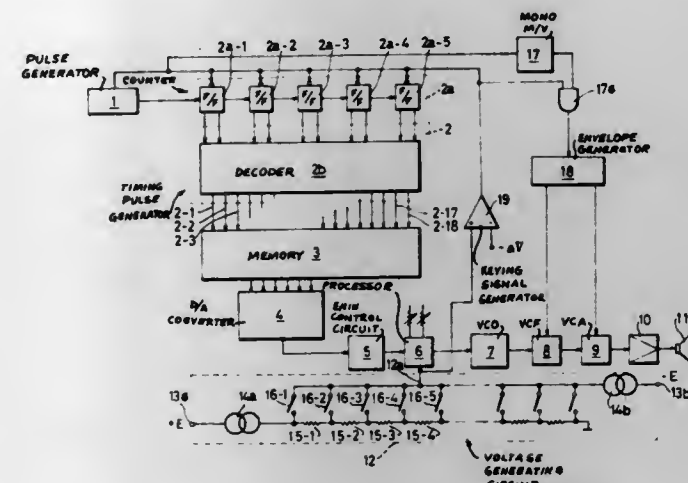
Filed Sept. 1, 1976, Ser. No. 719,450

Claims priority, application Japan, Sept. 3, 1975, 50-106045; Oct. 9, 1975, 50-121256

Int. Cl.² G10H 1/02

U.S. Cl. 84-1.24

6 Claims



1. An automatic arpeggio musical instrument comprising: pulse generator means having a plurality of keys for generat-

ing periodic pulses by depression of one of said keys, each of said keys generating a voltage;
a timing pulse generator connected to said pulse generator means;
memory means connected to said timing pulse generator for generating digital signals of a musical scale;
digital-to-analog converter means connected to said memory means for converting the digital signals into analog signals;
processor means connected to said converter means for selectively adding and subtracting the key-generated voltage to said analog signals and for generating an output voltage therefrom; and
a voltage-controlled connected to said processor means for controlling said output voltage.

4,054,079

KEYBOARD AND NOTATION SYSTEM

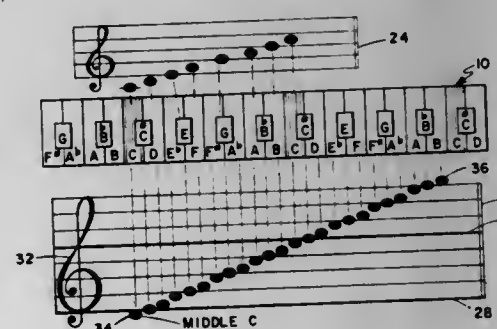
Melvin Howard Sohler, P.O. Box 32, Pinos Altos, N. Mex. 88053

Continuation-in-part of Ser. No. 557,592, March 12, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,104

Int. Cl.² G10C 3/12

U.S. Cl. 84-423

3 Claims



1. A keyboard for use with a musical notation system in which the notes of an octave group representing a twelve tone chromatic scale are in four distinct groups of three, each group having one note on a line of a musical staff and the other two notes immediately above and below the line, the keyboard comprising:

a plurality of evenly spaced, elongated flat keys in a common plane in the keyboard, the flat keys being arranged in pairs and having forward ends and rearwardly extending portions;
a raised key projecting upwardly symmetrically between each pair of flat keys;
each pair of flat keys and the associated raised key forming a group of three, the raised key representing the note on the line of a three note group, and the pair of flat keys in the group representing the notes above and below the line of the related note group.

4,054,080

TANK EQUIPPED WITH LARGE-CALIBRE FIREARM
Karl Ulf Rossel, Granbergadal, and Sven-Håkan Svensson, Karl-skoga, both of Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Sept. 26, 1975, Ser. No. 617,260

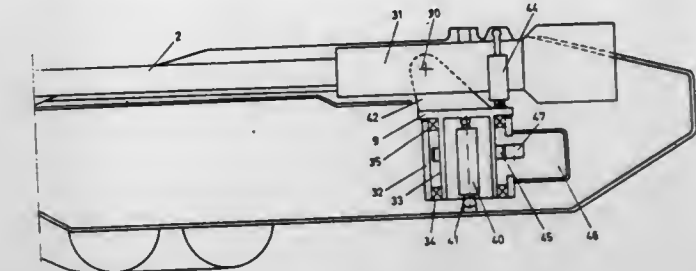
Claims priority, application Sweden, Oct. 18, 1974, 7413128
Int. Cl.² F41F 23/02, 23/10

U.S. Cl. 89-38

7 Claims

1. A tank equipped with a large-calibre gun, said tank having a chassis, comprising:
hydraulic cylinder means mounted in said chassis for vertical expansion relative thereto;
means for supporting said gun for elevation about a horizontal axis, said supporting means being attached to said hydraulic cylinder means for movement in response to expansion thereof;
first support cylinder means surrounding said hydraulic

cylinder means and depending from said supporting means;
second support cylinder means surrounding said first support cylinder means, said second cylinder means being adapted to permit said first support cylinder means to rotate therewithin;



means for rotating said first support cylinder means within said second support cylinder means; and
means for preventing rotation of said second support cylinder while permitting vertical movement thereof.

4,054,081

MACHINING METHOD

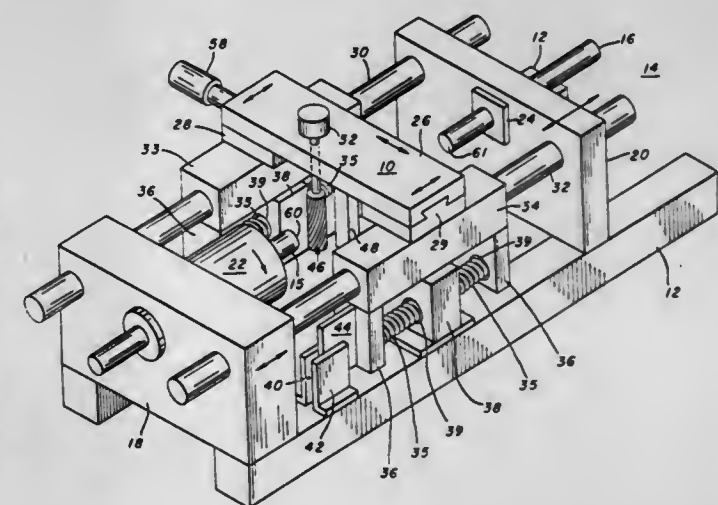
Trenton L. Brown, Bethel Park, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 633,682, Nov. 20, 1975, Pat. No. 4,002,102. This application July 26, 1976, Ser. No. 708,896

Int. Cl.² B23C 3/12; B23B 1/00

U.S. Cl. 90-11 C

2 Claims



1. A method of facing the surfaces of two workpieces comprising the steps of
mounting the workpieces in spaced apart, workpiece holding devices, with the surfaces of said workpieces facing each other,
locating a spacing block between the holding devices and the surfaces of said workpieces, the sides of said block being in planes closely adjacent opposed cutting surfaces of a cutting device,
moving at least one of the holding devices toward the other holding device such that the surfaces of said workpieces engage opposed sides of the spacing block,
moving the spacing block transversely of and out of contact with the surfaces of said workpieces, and simultaneously, with the transverse movement of the spacing block, moving the cutting device transversely between the surfaces of the workpieces to machine the same.

2. A method of relatively positioning the cutting edge of a machine tool and the surface of a workpiece to be machined by said tool, the method comprising the steps of
mounting the workpiece in a workholding device,
locating a workpiece positioning means having a surface for engaging the surface of the workpiece to be machined opposite the surface of the workpiece,
relatively moving the workpiece and the workpiece posi-

tioning means such that the surface of the workpiece and the surface of the positioning means are disposed in mutual engagement, and in a plane closely adjacent the cutting surface of a cutting device, simultaneously moving the positioning means and a cutting device transversely of the surface of the workpiece such that the positioning means is moved out of contact with the surface of the workpiece while the cutting device is moved transversely of and into contact with the surface of the workpiece to machine the same.

4,054,082

BROACHING MACHINES

Rene P. Poincenot, Paris, France, assignor to Ratier-Forest, Paris, France

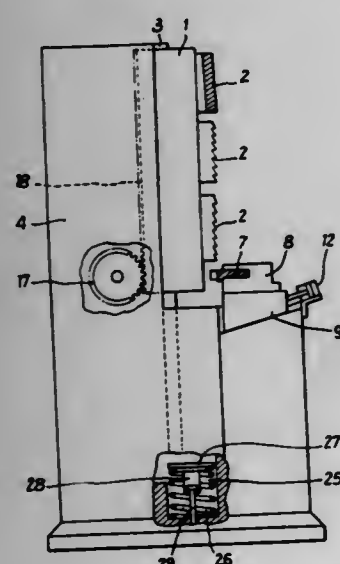
Filed Apr. 21, 1976, Ser. No. 679,072

Claims priority, application Romania, Apr. 30, 1975, 13499

Int. Cl.² B23D 41/08

U.S. Cl. 90-96

9 Claims



1. A broaching machine comprising:
a frame provided with guideways,
a workpiece-carrying support carried by said frame,
a slide-block reciprocable in said guideways to achieve a cutting stroke and a return stroke and adapted to carry a broaching tool to operate upon a workpiece supported on said workpiece-carrying support, during said cutting stroke,
an asynchronous electric motor having a stator and a rotor,
a transmission system operatively connecting said rotor and said reciprocable slide-block,
energy accumulating means for accumulating at least part of the kinetic energy stored in said slide-block, in said rotor and in said transmission system, during at least one of said cutting and return strokes,
and energy transfer means for transferring said energy from said slide-block to said energy accumulating means and from said energy accumulating means to said slide-block.

4,054,083

DUAL LEVER CONTROL MECHANISM

Robert Eugene Utter, LaCrosse, Wis., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 14, 1975, Ser. No. 595,820

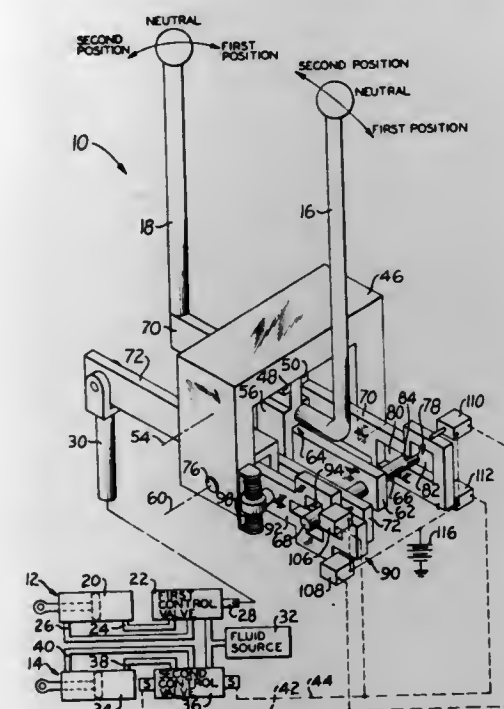
Int. Cl.² F15B 11/16

U.S. Cl. 91-413

7 Claims

1. A dual lever control mechanism, including a first control lever and a second control lever for actuating a pair of control devices individually having first and second modes of operation, comprising:
a stationary support having the control levers pivotally connected thereto;
first means including an intermediate actuating element pivotally connected to said first control lever and cooperatively engaged with said second control lever for selectively moving both of the control devices into either their first modes of operation of their second modes of operation and effecting simultaneous coordinated movement of the control devices in the same travel direction in response to movement of the first control lever; and
second means cooperatively couple with said first means of selectively moving both of the control devices respectively into either their first and second modes of operation or their second and first modes of operation and effecting simultaneously coordinated movement of the control devices in opposite travel directions in response to movement of the second control lever, said second means having defined therein profiled aperture means for selectively coupled engagement with said actuating element, said mechanism being of a construction such that selective movement of said first control lever and said actuating element is free from transmission to said second control lever and selective movement of said second control lever is transmitted to said actuating element free from transmission to said first control lever and movement of one of said control levers is independent of movement of the other one of said control levers.

tively moving both of the control devices into either their first modes of operation of their second modes of operation and effecting simultaneous coordinated movement of the control devices in the same travel direction in response to movement of the first control lever; and
second means cooperatively couple with said first means of selectively moving both of the control devices respectively into either their first and second modes of operation or their second and first modes of operation and effecting simultaneously coordinated movement of the control devices in opposite travel directions in response to movement of the second control lever, said second means having defined therein profiled aperture means for selectively coupled engagement with said actuating element, said mechanism being of a construction such that selective movement of said first control lever and said actuating element is free from transmission to said second control lever and selective movement of said second control lever is transmitted to said actuating element free from transmission to said first control lever and movement of one of said control levers is independent of movement of the other one of said control levers.



ment of the second control lever, said second means having defined therein profiled aperture means for selectively coupled engagement with said actuating element, said mechanism being of a construction such that selective movement of said first control lever and said actuating element is free from transmission to said second control lever and selective movement of said second control lever is transmitted to said actuating element free from transmission to said first control lever and movement of one of said control levers is independent of movement of the other one of said control levers.

4,054,084

FIRE AND SMOKE FREE SYSTEM FOR HIGH RISE BUILDING STAIRWAYS

William Francis Palmer, 14 E. Webster, Merrick, N.Y. 11566

Filed Nov. 18, 1975, Ser. No. 633,005

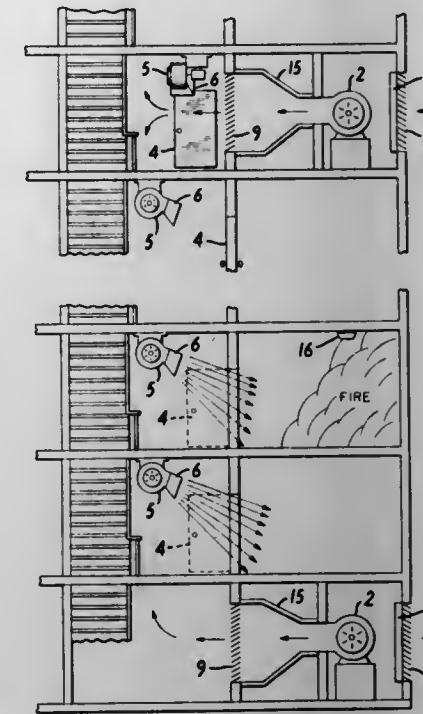
Int. Cl.² F24F 7/00

U.S. Cl. 98-39

1 Claim

1. A fire control device to maintain a smoke and fire free escape from a multi-floor building having a stair shaft, comprising an entrance door to the stair shaft from each floor, a

first fan supplying a variable quantity of external air, in proportion to the number of entrance doors open, to said stair shaft



when activated, a second fan directing a flow of air through the doorway of said entrance door when said door is opened.

4,054,085

ADAPTER FOR COFFEE BREWER

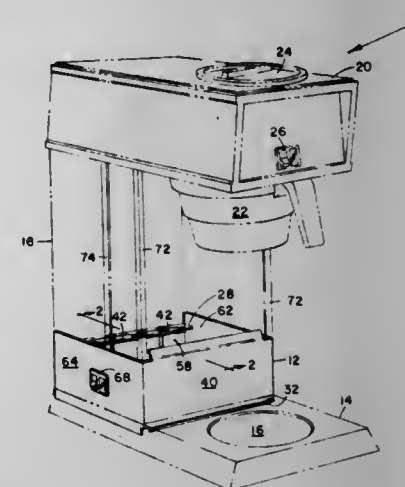
James Philip Tarr, 7027 Forest Moss, San Antonio, Tex. 78238

Filed May 21, 1976, Ser. No. 688,528

Int. Cl.² A47J 31/44

U.S. Cl. 99-284

2 Claims



1. A removable adapter for converting a home size coffee brewer to a commercial size coffee brewer, the brewer including a base with a heating element in a forward portion thereof and a stand connected to a rear portion thereof, said stand having means for connecting to said base, a head portion connected to a top of said stand and extending outwardly therefrom over said heating element, said adapter comprising:
front, rear and side walls conforming to cross sectional configuration of said stand;
a lower front flange connecting to said front wall adapted for extending below an upper surface of the base;
an upper front flange connecting to said front wall, said upper front flange abutting said stand;
upper and lower rear flanges connected to said rear wall, said upper and lower rear flanges being adapted to receive a bolt therethrough for connecting said stand to said base via said adapter; and
said means for connecting said stand to said base securing said adapter therebetween in its operative position.

4,054,086

HOME DONUT MAKER

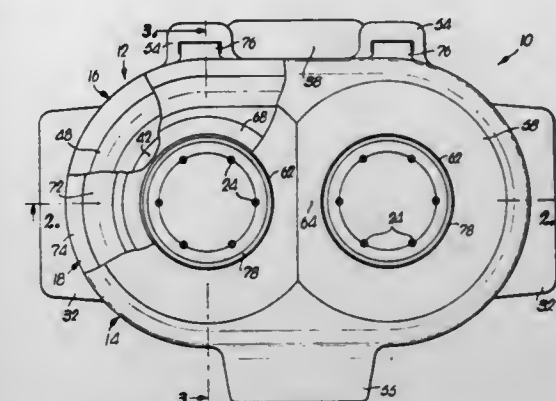
Samuel L. McNair, Kansas City, Mo., assignor to Dazey Products Company, Kansas City, Mo.

Division of Ser. No. 745,119, Nov. 26, 1976, abandoned. This application Feb. 25, 1977, Ser. No. 772,106

Int. Cl.² A47J 37/00

U.S. Cl. 99-374

8 Claims



1. A cooking device, comprising:
a base section including a metallic, nonporous, first concave wall adapted to hold a quantity of batter or the like to be cooked;
a lid section including a metallic, nonporous, second wall, said lid section being shiftable with respect to said base section for movement thereof between a closed cooking position where said lid section and said base section are adjacent and said first and second walls are proximally disposed for cooperatively presenting a substantially enclosed cooking chamber, to an open position where the base and lid sections are spread apart;
means for electrically heating at least one of said first and second walls;
means on said lid section defining a cavity for collecting cooking oil; and
structure defining at least one unobstructed aperture through said second wall for establishing continuous communication between said cavity and cooking chamber when said sections are adjacently disposed, and for allowing flow of cooking oil into said chamber from said cavity, flow of oil and steam from said chamber to said cavity as said batter expands, and subsequent return of said oil to said chamber, during final cooking of said batter or the like.

4,054,087

APPARATUS HAVING A VARIABLE STROKE RECIPROCATING MEMBER AND MEANS RESPONSIVE TO A PREDETERMINED STROKE TO CONTROL A CIRCUIT

Paul V. Choate, Milton, and Thomas Papoulias, Brockton, both of Mass., assignors to Norris Industries, Inc., Los Angeles, Calif.

Filed Apr. 28, 1976, Ser. No. 680,985

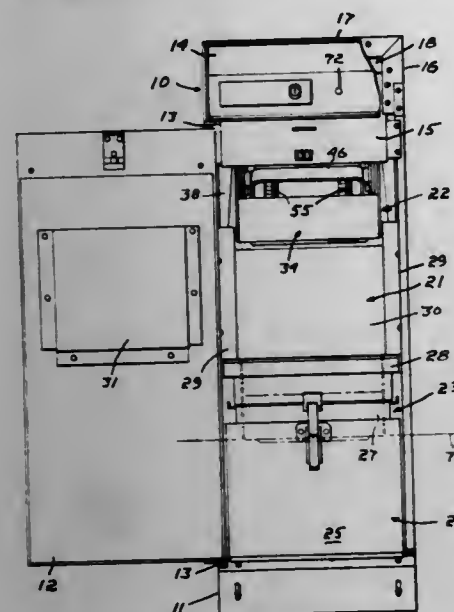
Int. Cl.² B30B 15/14

U.S. Cl. 100-53

18 Claims

1. Apparatus including operating means including a working element reciprocated thereby with the length of its stroke varying in a predetermined relation to the work accomplished, control means including a switch responsive to a predetermined stroke length that is a measure that the work accomplished by the reciprocating means has reached a predetermined state, a follower member, and a track member with which said follower member is in engagement and which includes first and second courses each including an end section representing the retracted position of the element, first and second course shifters between said courses, the first adjacent said end sections and the second at a location representing said predetermined stroke length, said first course shifter operable to transfer the follower member to the second course on approach.

private travel of the element from the first end section, said second course shifter operable to permit the follower member to pass therethrough and return via the first course if the stroke of the element permits the follower member to pass through the second course shifter, the follower member otherwise returning along the second course, said control switch asso-



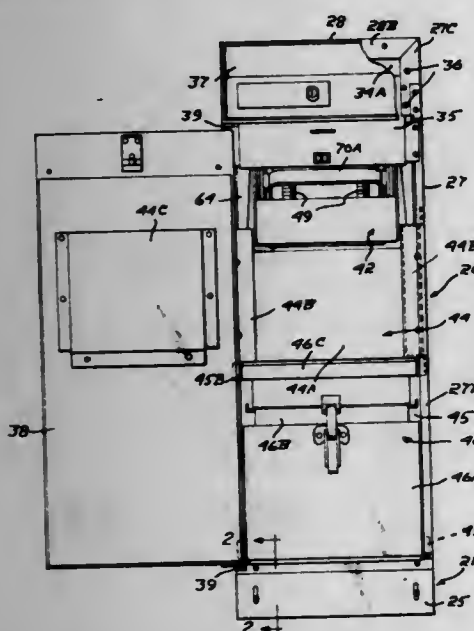
ciated with one end section to be operated by the follower member when therein and the other end section receiving the follower member until said predetermined stroke length is attained, one member being fixed and the other member including a connection with said operating means operable to cause relative reciprocating movement between the members in proportion to the strokes of the element.

4,054,088 TRASH COMPACTOR

Michael A. Nee, Melrose, Mass., assignor to Norris Industries, Inc., Los Angeles, Calif.

Filed Apr. 2, 1976, Ser. No. 672,862
Int. Cl.² B30B 1/18

U.S. Cl. 100-214



1. A trash compactor comprising a housing including interconnected top, side and end walls, a base, and a door at the front of the compactor, the lower part of said housing being a compacting chamber, a chasis, means detachably supporting said chasis on said end walls in the upper end of the housing for limited upward movement relative to said end and side walls, and trash compacting means including a compacting head and means connected to said chasis and operable to reciprocate said head between an upper inoperative position and operative positions in which trash in said chamber is subjected to compacting pressures, said chasis moving upwardly in response to reaction forces developing on application of said

compacting pressures to trash and at its upper limit of travel transferring said forces to said side walls transversely of a substantial part of each of them and substantially at their junction with said top wall.

4,054,089

LINE PRINTER

Katsuhiko Okabe, Tokorozawa, Japan, assignor to Copal Company Limited, Tokyo, Japan

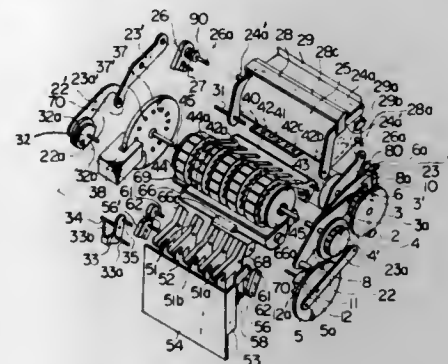
Filed Dec. 22, 1975, Ser. No. 643,381

Claims priority, application Japan, Dec. 27, 1974, 50-157265[U]; Dec. 27, 1974, 50-157268[U]

Int. Cl.² B41U 1/22

U.S. Cl. 101-99

3 Claims



1. In a line printer having a plurality of rotatable printing rings coaxially arranged adjacent to each other and each bearing on at least more than one-half of the peripheral surface thereof a plurality of characters spaced from each other in the circumferential direction of said rings, a driving shaft rotatably supporting said printing rings and resiliently holding them at predetermined positions relative thereto, said driving shaft having a starting position, one printing cycle being completed each time said driving shaft rotates two revolutions from said starting position, a movable roller pad adapted to abut against the respective printing rings at a predetermined printing position with respect to said printing rings thereby permitting one of the characters of each of said printing rings positioned at said printing position to be printed simultaneously on a sheet of paper held between said roller pad and said printing rings so as to form a line of printing on said sheet of paper, an ink roller for supplying ink to the respective characters on the periphery of each of said printing rings by abutment thereagainst after the printing has been completed, selectively arresting means for selectively arresting the respective printing rings independently from each other while said driving shaft rotates so as to temporarily hold a selected one of the characters of each of said printing rings stationarily at said printing position by shifting the positions of said printing rings relative to said driving shaft from said predetermined relative positions, said arresting means when released from said printing rings, permitting said printing rings to return to said predetermined positions relative to said driving shaft, the timing of operation of said selectively arresting means being controlled with respect to the operation of said roller pad so that a line of printing of selected characters is formed on said paper after the selection of characters has been completed and, thereafter, the respective printing rings are released from their selectively arrested positions so as to restore the rings to the initial positions with respect to said driving shaft and terminate one printing cycle, an improvement comprising stopper members arranged on said driving shaft so as to be rotated therewith and each cooperating with the respective printing ring, each of said stopper members including an engaging portion, ratchet teeth on each of said printing rings engageable by said arresting means for holding the printing rings in readiness for the printing operation, the positions of said ratchet teeth being selected to correspond respectively to the positions of the respective characters on each of said printing rings, arresting portions each formed

in the respective printing rings so as to engage with the respective stopper member, spring means for each printing ring having one end supported by the respective printing ring and the other end supported by the respective stopper member cooperating with the corresponding printing ring for resiliently abutting said arresting portion in each of said printing rings against said engaging portion of each of said stopper members so as to resiliently maintain each of said printing rings at a predetermined angular position with respect to said driving shaft, thereby for permitting each of said printing rings to be automatically returned to said predetermined angular position with respect to said driving shaft by the release of said printing rings from their temporarily arrested positions after the completion of the printing operation, engaging means for driving said ink roller synchronously with said printing rings thereby positively preventing relative angular displacement of said printing rings from said predetermined angular position with respect to said driving shaft when said ink roller abuts against said printing rings and cam means rotating in coupled relation to said driving shaft and engageable with said ink roller for permitting said ink roller to be disengaged from said printing rings during the printing operation in each printing cycle effected in the first revolution of said driving shaft while permitting said ink roller to contact said printing rings during the second revolution of said driving shaft.

4,054,090

ENDORSER ASSEMBLY AND DRUM THEREFOR

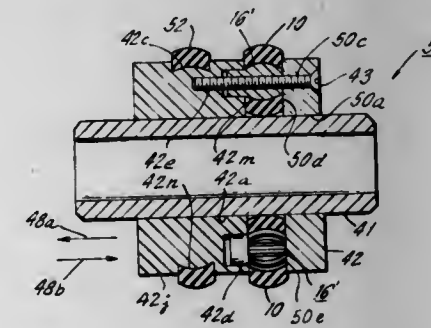
Peter J. Loftus, Levittown, Pa., and John A. DiBlasio, Pennsauken, N.J., assignors to Brandt-Pra, Inc., Cornwells Heights, Pa.

Filed Sept. 26, 1975, Ser. No. 617,035

Int. Cl.² B41J 1/22

U.S. Cl. 101-110

18 Claims



1. A rotatable endorser drum assembly for printing graphic information on paper documents passing between the drum assembly and a rotatably mounted platen means, said assembly comprising:

- a cylindrical shaped drum, said drum having a continuous groove surrounding said drum and perpendicular to the axis of rotation of the drum;
- the bottom of said groove having means for forming a curved convex contour;
- a resilient elongated print strip mounted in said groove, said strip having a raised portion along one surface defining a print surface;
- the opposite surface engaging said contour forming means whereby the convex contour urges the print surface to assume a curved convex contour substantially similar to the convex contour of the contour forming means;
- said platen means having a groove at least as wide as the width of the print surface of said strip; said print surface extending only partially into the groove of said platen means whereby documents passing between said platen means and said print strip are engaged by said print surface;
- and said print surface does not contact the platen means when no documents are passing therebetween to prevent the transfer of ink from said print surface to the platen thereby preventing the occurrence of back printing;
- the convex surface of said print surface enabling the use of a

print strip having a substantially large width measured in the axial direction of said drum.

4,054,091

SILK SCREEN PRINTING PROCESS AND APPARATUS

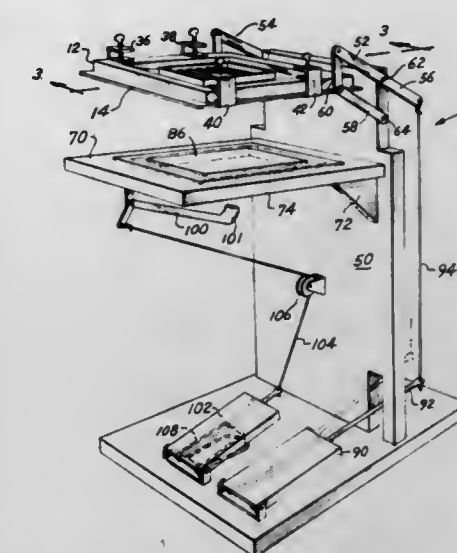
Robert F. Bradley, New Buffalo, Mich., assignor to Micro-Circuits Company, Inc., New Buffalo, Mich.

Filed Apr. 5, 1976, Ser. No. 673,956

Int. Cl.² B41F 15/04, 15/10

U.S. Cl. 101-129

16 Claims



1. A silk screen printing process for printing with a plurality of different inks in a single operation, said process comprising forming a screen with ink porous areas therein representing the figure to be printed and with partitions separating said areas into compartments for the different inks, positioning a sheet to be printed beneath the screen and applying an upwardly accelerating force to said sheet and screen to cause the inks to flow through the respective areas from the compartments onto the surface of the sheet.

8. An apparatus for printing with a silk screen using a plurality of different inks in a single operation, comprising a screen having ink porous areas therein representing the figure to be printed, means for holding the screen in a horizontal position, partitions in contact with the upper surface of the screen defining separate compartments for the different inks, a sheet receiving means beneath said screen, and means for propelling a sheet to be printed and screen upwardly to cause the inks to flow through the porous areas within the confines of the respective partitions.

4,054,092

DOCUMENT COUNTER

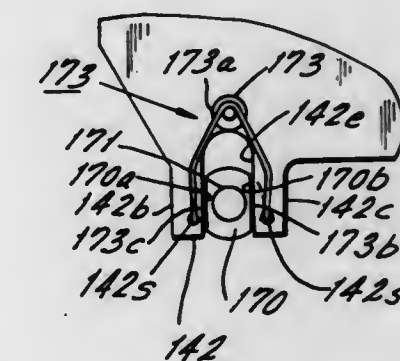
Peter J. Loftus, Levittown, Pa., and John A. DiBlasio, Pennsauken, N.J., assignors to Brandt-Pra, Inc., Cornwells Heights, Pa.

Filed Sept. 30, 1975, Ser. No. 618,280

Int. Cl.² B41F 33/00

U.S. Cl. 101-242

50 Claims



1. Apparatus for advancing sheets from a stack to an outfeed location whereby said sheets are delivered to said outfeed

location in sequential fashion and the trailing edge of the sheet last advanced to the outfeed location is separated from the leading edge of the next sheet to be delivered to said outfeed location to form a finite gap therebetween, said apparatus comprising:

- an infeed hopper for supporting a plurality of sheets generally arranged in a stack;
- said infeed hopper having an outfeed passageway at one end thereof through which at least one sheet may pass;
- continuously moving closed loop conveyor means for advancing at least the bottom sheet of said stack through said outfeed passageway and towards said outfeed location;
- said conveyor means including an elongated upper friction surface lying in a predetermined plane and positioned between said infeed hopper and said outfeed location, said elongated upper friction surface extending at least partially into said infeed hopper;
- continuously moving closed loop stripper means for permitting only a single sheet passing between said stripper means and said conveyor means to advance towards said outfeed location, said continuously moving closed loop stripper means including an elongated lower friction surface positioned adjacent to an intermediate portion of said upper friction surface and extending at least partially below the predetermined plane of said upper friction surface, said lower friction surface being moved in a direction opposite the direction of movement of said upper friction surface;
- said stripper means and said conveyor means cooperating to permit only that sheet which makes frictional contact with said upper friction surface to be fed towards the outfeed location and in the event of multiple sheets being fed therebetween, enabling only the bottommost sheet to move beyond the downstream end of said stripper means towards said outfeed location.

4,054,093

SELF-INKING HAND STAMP

Takaji Funahashi, No. 1, 2-chome, Kitatakascho, Nishi, Nagoya, Aichi, Japan

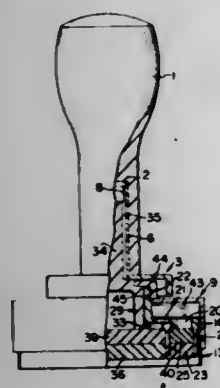
Filed Dec. 27, 1973, Ser. No. 428,759

Claims priority, application Japan, Jan. 29, 1973, 48-11751; Sept. 4, 1973, 48-103705[U]

Int. Cl.² B41F 31/00; B41K 1/38

U.S. Cl. 101-327

1 Claim



1. In a stamp comprising an annular subsidiary imprint body having on its surface a plurality of circumferentially arranged subsidiary imprint sections, and a disc-shaped main imprint body having on its surface a main imprint section and a marking to be directed to any one of said subsidiary imprint sections, said main imprint body being disposed in a central opening of said subsidiary imprint body, said main imprint body and said subsidiary imprint body being arranged to be rotatable relative to each other and both made of porous material having a plurality of continuous pores, the improvement which comprises at least one partition wall interposed between said main imprint body and said subsidiary imprint body and tightly fitted on said main imprint body, means provided inside of said partition wall for supplying ink into said main imprint body, and means provided outside of said partition wall for supplying

ink into said subsidiary imprint body, said main imprint body including on its surface a marking for pointing to one of the subsidiary imprint sections and being inserted into a sleeve portion of a retainer ring member, a peripheral portion of said main imprint body being supported by a flange of the retaining ring member, and said flange being formed with a notch in which the marking is fitted.

4,054,094

LASER PRODUCTION OF LITHOGRAPHIC PRINTING PLATES

Jack R. Caddell, Landenberg, Pa., and Harvey H. Hoehn, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

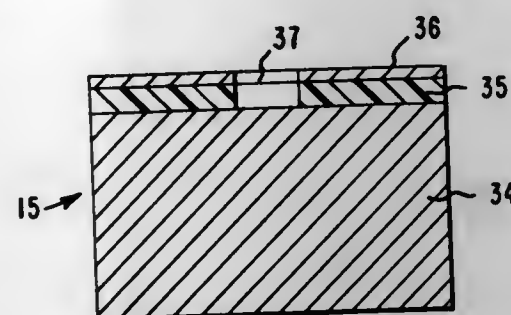
Continuation of Ser. No. 283,770, Aug. 25, 1972, abandoned.

This application Dec. 19, 1973, Ser. No. 426,038

Int. Cl.² B41C 1/10; B41M 5/24; B41N 1/14

U.S. Cl. 101-467

1 Claim



1. A process for making a lithographic printing plate, the imaging portion of which comprises a metallic surface which comprises the steps of:

- a. providing a plate comprising an aluminum base, a thin coating of an organic polymeric composition comprising materials selected from the group consisting of polyester, polymethyl methacrylate and polyoxymethylene, disposed on one surface of said aluminum base, and a thin coating of poly silicic acid, disposed on the exposed surface of said organic polymeric composition;
- b. removing a portion of the polysilicic acid and the organic polymeric composition to expose the aluminum base by subjecting the plate to a focused laser beam having an intensity sufficient to burn through the polysilicic acid and organic polymeric composition without substantially melting said aluminum base; and
- c. varying in a controlled manner, the point at which the laser beam impinges on said plate so that a predetermined pattern can be engraved on said plate.

4,054,095

PROCESS FOR ELECTROLESS METAL COATING OF NITROCELLULOSE BASE PROPELLANTS, AND ARTICLE

Scott I. Morrow, Denville, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 24, 1976, Ser. No. 689,289

Int. Cl.² C23C 3/02

U.S. Cl. 102-39

12 Claims

1. In a method for producing a metal coating on a nitrocellulose base propellant substrate, wherein the metal is deposited on the nitrocellulose substrate from an electroless metal plating bath, the improvement which comprises incorporating in the nitrocellulose substrate to be coated an effective amount of an acrylonitrile-butadiene copolymer to increase the adhesion of the metal coating produced.

4,054,096

MOBILE ELEVATIONALLY ADJUSTABLE STAGE

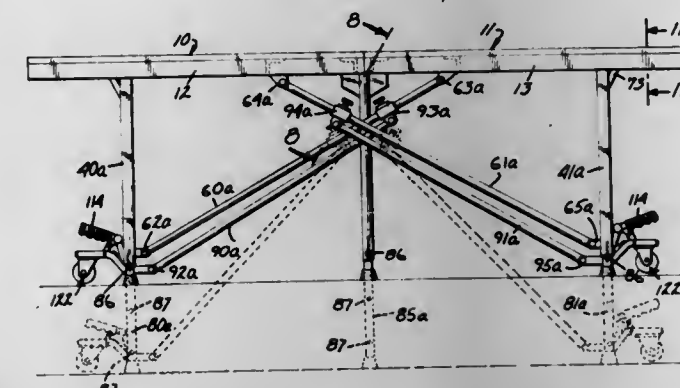
Kermit H. Wilson, Edina; Ronald R. Carlson, Mound, and Richard C. Bae, Chaska, all of Minn., assignors to Sico Incorporated, Minneapolis, Minn.

Filed Apr. 6, 1976, Ser. No. 674,168

Int. Cl.² A47B 3/00

U.S. Cl. 108-113

12 Claims



1. A mobile, elevationally adjustable foldable stage comprising:

- a. a pair of generally planar stage surface members;
- b. means hingeably connecting said stage surface members for movement between an operative position in which the stage surface members conjointly define a common stage surface, and a folded position;
- c. main support legs associated with each of said stage surface member;
- d. means pivotally mounting said main support legs to said stage surface members for allowing movement of said stage surface members to their folded position;
- e. cross connect link means pivotally connected to said main support legs and to the underside of the opposite stage surface member for holding said legs approximately vertical in both the operation and folded positions;
- f. elevationally adjustable lower support legs telescopically positioned within said main support legs;
- g. wheel means associated with said lower support legs;
- h. means for connecting said wheel means to said lower support legs for alternate extension to a floor engaging position wherein said wheel means extend further than said lower support legs, and retraction to a position short of the length of said lower support legs, thereby transferring the weight of said stage to said support legs, said means for retracting and extending said wheel means being independent of the folding of the stage;
- i. a plurality of stabilizing braces having means pivotally connecting first ends thereof to said lower support legs and having means for slideably connecting the other ends thereof to said cross connect link means; and
- j. means for locking said slideably connected ends of said stabilizing braces to said cross connect link means according to the elevational adjustment of the stage.

pressure fluid and said first aperture means and formed to permit said high pressure fluid to pass to and through said first aperture means;

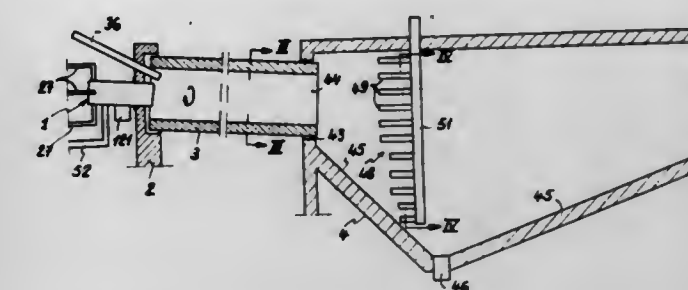
resonant cavity means having a channel formed therein and disposed to protrude into said pulverizing chamber so that said channel lies opposite said first aperture means to directly receive said high pressure fluid passing there-through whereby a high frequency vibratory flow of said fluid is set up within said pulverizing chamber;

a source of waste material;

second conduit means connected between said source of waste material and said second aperture means whereby when waste material enters said pulverizing chamber from said second aperture means it is drawn into said high frequency vibratory flow and pulverized thereby into very small particles of waste;

a source of combustion air;

third conduit means connected to said source of combustion air and formed to conduct said combustion air to be in close proximity to the edge of said pulverizing chamber to



be drawn into said high frequency vibratory flow and mix with said particles of waste to form a mixture of small particles of waste material and combustion air which mixture will commence to incinerate in response to ignition from said ignition means.

7. A process for incinerating waste material employing a resonant cavity means comprising the steps of:

- a. passing a high pressure fluid into said resonance cavity means to create a high frequency vibratory flow of said fluid;
- b. passing waste material in close proximity to said resonant cavity means to be drawn into said high frequency vibratory flow of fluid to be pulverized thereby;
- c. substantially simultaneously with step 2 passing combustion air in close proximity to said resonant cavity to be drawn into said high frequency vibratory flow to effect a mixture of said pulverized waste material and combustion air; and
- d. igniting said mixture of said pulverized waste material and combustion air to initiate incineration thereof.

4,054,098

EMBROIDERING MACHINE

Franz Hoever; Wolfgang Teetz, both of Kerken, and Jürgen Bretschneider, Krefeld, all of Germany, assignors to Maschinenfabrik Carl Zangs Aktiengesellschaft, Krefeld, Germany

Filed Sept. 16, 1976, Ser. No. 724,105

Claims priority, application Germany, Sept. 17, 1975, 2541359

Int. Cl.² D05C 5/00; D05B 55/16

U.S. Cl. 112-86

14 Claims

1. In an embroidering machine of the type in which the fabric, while advancing through the machine, is also shifted laterally in accordance with an embroidery control pattern, and in which several identical embroidery designs are produced simultaneously in a number of embroidering stations which are spaced across the machine, as one out of a group of needles arranged in each embroidering station is being driven to execute a stitching motion while the other needles in the group remain retracted, holding threads of varying color or

4,054,097

METHOD AND APPARATUS FOR INCINERATING LIQUID, GASEOUS AND PASTY WASTE

Per W. Barkhuus, 1699 Chesalles-sur-Oron, Switzerland

Filed Mar. 17, 1976, Ser. No. 667,648

Int. Cl.² F23G 5/06

U.S. Cl. 110-7 B

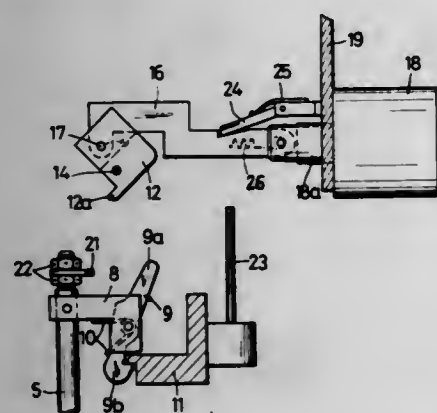
7 Claims

1. An apparatus for pulverizing waste and to be used with an ignition means to effect the incineration of said pulverized waste comprising in combination:

- pulverizing chamber means formed to have a substantially concave shape and further formed to have first aperture means at approximately the base of said concave shape and to have second aperture means located toward the edge of said concave shape;
- a source of high pressure fluid;
- first conduit means connected between said source of high

texture, for the selective embroidering with different threads, through switchover of the needle driving means of the machine from one needle to another in each needle group; in such a machine, a needle drive control mechanism comprising in combination:

- in each embroidering station, a group of needle rods arranged in a row, each needle rod carrying a needle which protrudes from its forward end;
- a needle bar which holds and guides the row of needle rods for longitudinal displacement between an advanced position in which stitch formation takes place and a retracted position, including means for shifting the needle bar in a direction transverse to the needle rod axes, so as to align any selected needle rod of the group with a fixed working plane of the embroidering station;
- a stationary retaining bar arranged rearwardly of and parallel to the needle bar and having a gap in alignment with said working plane, the retaining bar cooperating with all the needle rods of the group, with the exception of the one which is aligned with said working plane and retaining bar gap, and which thus serves as a working needle rod, the needle bar retaining, by said cooperation, the other, non-working needle rods in their retracted position, while allowing for a transverse displacement of the retained needle rods along the retaining bar, when the needle bar executes its transverse shifting movement;
- needle rod retaining means defined between the stationary retaining bar and the needle rods, for retaining said non-

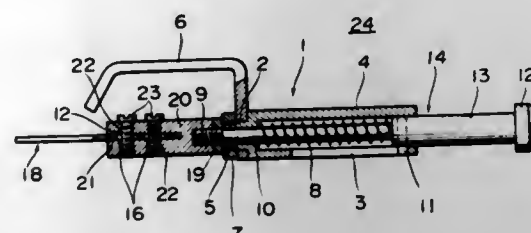


working needle rods in the manner aforementioned, said retaining means including a retaining protrusion on each needle rod.

selectively releasable means for holding the working needle rod in its retracted position, in substantial alignment with the non-working needle rods, so as to allow for a shift of the working needle rod into the range of the retaining bar, thereby rendering it non-working, and to also allow for a simultaneous shift of a previously non-working needle rod into the working plane, when the needle bar executes said transverse shifting movement;

a needle rod drive member arranged in cooperational proximity of at least the working needle rod in the working plane of each group, said drive member executing a reciprocating motion which, if transmitted to a working needle rod, moves the latter between its advanced and retracted positions in a stitching action; and means for releasably connecting the working needle rod with said drive member, each needle rod including, as part of said connecting means, a movable connecting member which is engageable by the drive member; and wherein: said working needle rod holding means and said working needle rod connecting means are operatively interconnected in such a way that the holding means, when holding the needle rod in its retracted position, deflects the connecting member of the working needle rod into a position in which it cannot be engaged by the reciprocating drive member.

4,054,099
THREAD CUTTING MECHANISM FOR A SEWING MACHINE
Osamu Yanagi, Tokyo, Japan, assignor to Nara Sewing Machine Industrial Co., Ltd., Tokyo, Japan
Filed July 26, 1976, Ser. No. 708,453
Claims priority, application Japan, Oct. 20, 1975, 50-142664
Int. Cl.² D05B 65/00
U.S. Cl. 112-299 2 Claims



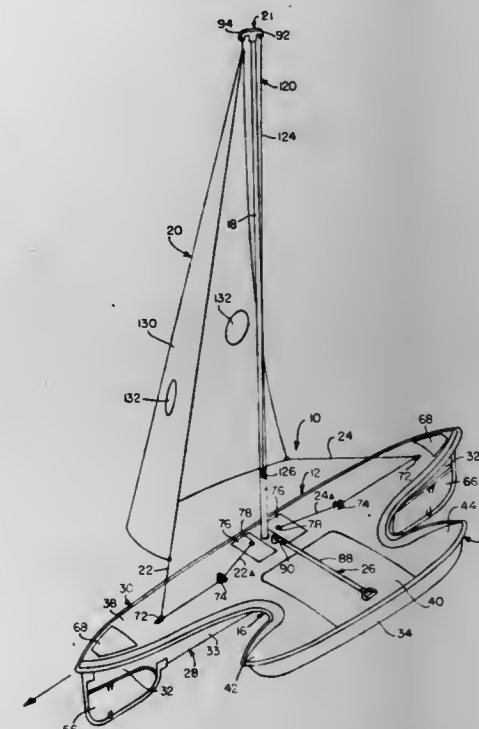
1. A thread cutting mechanism, for attachment to the body of a sewing machine, comprising, in combination:
 - i. a cylindrical tube open at both ends
 - ii. a bracket having a first end and a second end, said bracket being secured at said first end to the cylindrical tube, said second end being intended for securing to the body of the sewing machine
 - iii. an operating rod disposed within said tube and having a first screwthreaded end projecting from one end of said tube and a second end projecting from the other end of said tube, said rod being freely slidable in said tube,
 - iv. guiding and limiting means comprising a longitudinal guide recess and a lug engaged in said guide recess, the guide recess and the lug being provided one on one item of the assembly of tube and rod and the other on the other item of the assembly of tube and rod,
 - v. spring means positioned within said tube and acting between said tube and said rod to urge said rod into a first limiting position of longitudinal sliding determined by said guiding and limiting means,
 - vi. a cutter support member having a first end and a second end, said member having at said first end a threaded hole by which the member is engaged on the threaded end of the rod, said member having an elongated slot extending longitudinally from said second end, said member having two longitudinally spaced securing means extending transversely to said elongated slot, and
 - vii. a cutter having a cutting edge, said cutter including a blade portion having two elongated holes positioned to correspond to the securing means of the support member, thereby to permit adjustment of the cutter longitudinally in the support member, and securing of the cutter in a predetermined position of adjustment.

4,054,100
SPORT SAILBOAT
Richard Lynn Rineman, Brighton, Mich., assignor to R. Lynn Rineman, Brighton; Harold J. Rineman, Southfield; S. Albert Young, Birmingham and Benjamin W. Colman, Huntington Woods, all of, Mich.
Continuation-in-part of Ser. No. 584,124, June 5, 1975, Pat. No. 3,985,090, and a continuation-in-part of Ser. No. 629,689, Nov. 6, 1975, Pat. No. D. 242,614. This application Oct. 8, 1976, Ser. No. 730,734

The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.
Int. Cl.² B63H 9/04

- U.S. Cl. 114-39 25 Claims
1. In a sailing craft having a unitary main hull, outboard pontoon and intermediate web and platform chambered structure, a mast mounted on said main hull substantially medially of its length, a sail depending from said mast and manually operable sail control means, the improvement residing in said sail control means and comprising in combination

- a line to control said sail connected to each lower corner of said sail,
- a block or equivalent guide means for each said line secured to and upon said main hull,
- a locking cleat or equivalent line holding means for releasably gripping each said line secured to and upon said main hull,



and a line take-up reel for each said line secured to said structure, each said line extending from said sail corner and being threaded through said block or equivalent line guide means and said locking cleat or equivalent line holding means to connection with said line take-up reel.

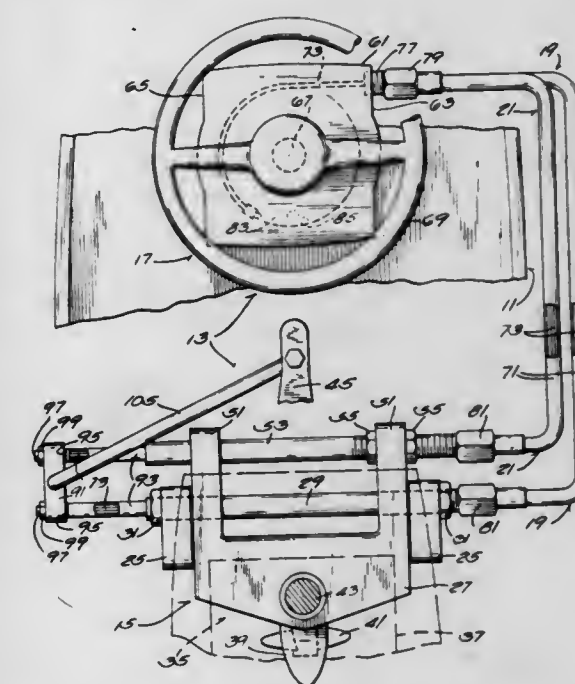
4,054,101
STEERING VANE
James M. Meade, 76 N. Kessing St., Porterville, Calif. 93257
Filed Feb. 23, 1976, Ser. No. 660,442
Int. Cl.² B63H 25/52
U.S. Cl. 114-144 C 1 Claim



1. A steering vane for a watercraft or the like comprising: an auxiliary rudder suspended from a rudder post, said auxiliary rudder comprising: a rudder; and

an extended trim tab, said trim tab being rotatably mounted behind said rudder;
a wind vane, said wind vane having a neutral position wherein said wind vane is substantially vertical;
a vane bearing for supporting said vane for pivoting about an axis which is substantially 30° to the horizontal;
a support extension said support extending between and supporting said vane and said rudder post, said vane bearing an said rudder post being supported respectively one above the other; and comprising:
a hollow tube;
a clamp at one end of said tube, said clamp for setting said wind vane in said neutral position when said watercraft is proceeding on a heading; and
an auxiliary rudder post support, said rudder post being rotatably coupled to said rudder post support;
a counterweight coupled to said wind vane; and
a vane lock rotatably coupled to said clamp and engaging with a pair of locking notches in said weight.

4,054,102
DUAL CABLE STEERING SYSTEM
Gaylord M. Borst, and Martin E. Larson, both of Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed May 21, 1976, Ser. No. 688,672
Int. Cl.² B63H 25/10
U.S. Cl. 114-144 R 26 Claims

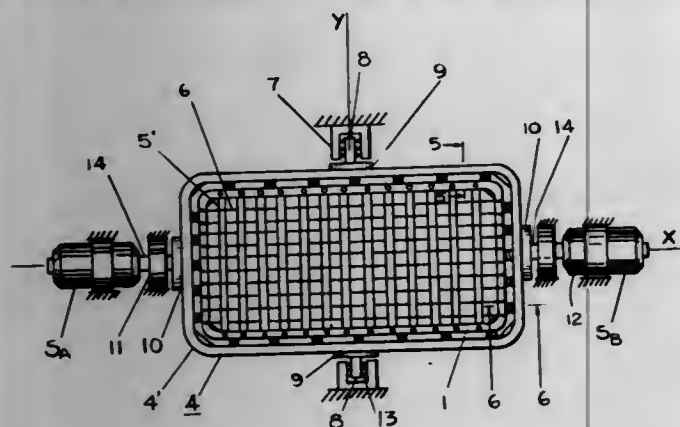


19. A marine propulsion device including a first part adapted to be fixed relative to a boat hull, a second part including spaced parallel apertures, means mounting said second part to said first part for tilting movement of said second part relative to said first part about a tilt axis extending parallel to said apertures, a third part, and means mounting said third part to said second part for common tilting movement with said second part and for steering movement of said third part relative to said second part about a steering axis extending in a plane perpendicular to the tilt axis.

4,054,103
TECHNIQUES FOR SAFELY UNLOADING EXTERNALLY-SLUNG HELICOPTER LOADS
Edwin Zenith Gabriel, 318-B South St., Eatontown, N.J. 07724
Filed Jan. 21, 1976, Ser. No. 651,212
Int. Cl.² B63B 35/52

- U.S. Cl. 114-258 11 Claims
1. A load supporting system for safely unloading a containerized load from hoisting cables onto a ship platform comprising: a rectangular-shaped net to support heavy loads while

maintaining a level position along one of its two axes when supported by a platform moving angularly, said net attached to a rectangular - shaped inner frame, said inner frame supported by a rectangular outer frame by means of coiled tension springs, a stationary servo motor mounted on said ship and a tilt sensor attached to said outer frame responsive to the angular roll position of said ship in order to provide a horizontal reference, a mat having essentially



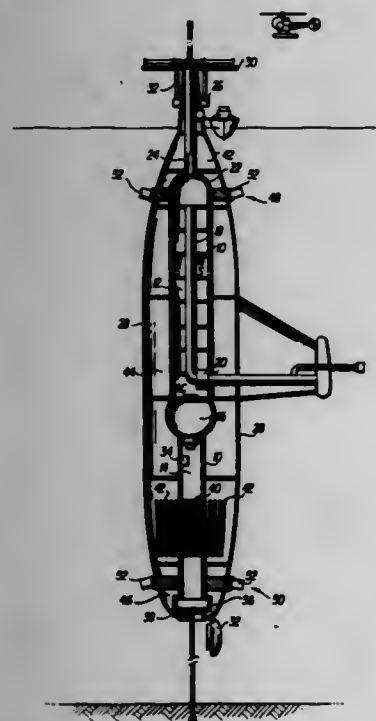
a flat surface provided beneath said net for cushioning said cargo in case any part of said net should fail, said tilt sensor sensitive to any departure of said outer frame from a horizontal position along one of its two orthogonal axes, producing an output signal proportional to the magnitude of the angle of tilt from the horizontal to cause said servo-motor to rotate and keep said net level along one of said axes.

4,054,104
SUBMARINE WELL DRILLING AND GEOLOGICAL EXPLORATION STATION
Frederick R. Haselton, 1205 Fallsmead Way, Rockville, Md. 20854

Filed Aug. 6, 1975, Ser. No. 602,506
Int. Cl.² B63B 35/44

U.S. Cl. 114-264

13 Claims



1. A self-propelled submarine geological exploration and drilling station, comprising:
a pressure hull having at least one selectively openable and closeable access hatch through a wall thereof;
first means operatively associated with said pressure hull, for selectively moving said hull between an essentially vertical orientation suited for geological exploration and drilling of a submerged surface downwardly through said access hatch in its open position and an essentially hori-

zontal orientation suited for submerged transit of said station with said access hatch in its closed position;
second propulsion and station keeping means attached to said pressure hull for maintaining said station submerged and suspended in said vertical orientation for geological exploration and drilling from a predetermined location in the water above said submerged surface, and also for propelling said station submerged for transit through the water in said horizontal orientation; and

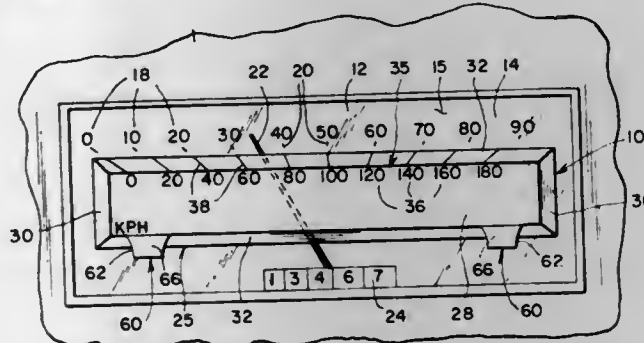
at least one compression and decompression chamber dividing said pressure hull into an atmospheric pressure portion located above said chamber in said vertical orientation and a superatmospheric pressure portion located below said chamber in said vertical orientation, said at least one access hatch communicating with said superatmospheric pressure portion, whereby persons working in said superatmospheric pressure portion may conduct said geological exploration or drilling through said at least one access hatch while said station is suspended in said vertical orientation above said submerged surface and said at least one access hatch is open to the surrounding sea.

4,054,105
MOTOR VEHICLE METRIC CONVERSION KIT
Francis Fegan, 630 St. Andrews St., W., Fergus, Ontario, Canada

Filed Oct. 13, 1976, Ser. No. 732,173
Int. Cl.² G01P 1/08

U.S. Cl. 116-129 T

6 Claims



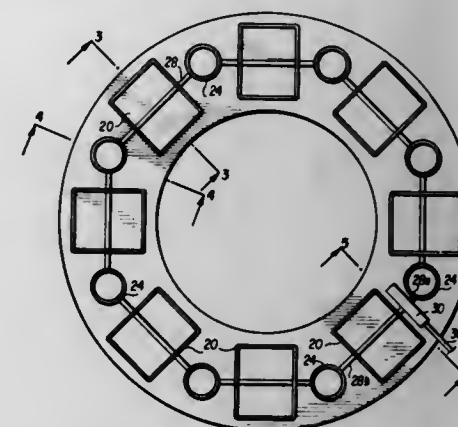
1. A kit for permitting the direct reading from a standard speedometer having a front transparent panel and markings associated therewith in miles per hour to kilometer per hour, comprising:

- an elongated base having a front surface and rear surface,
- indicia means on one of said surfaces and including a plurality of spaced apart numerals and guide lines angularly disposed to substantially coincide with markings on the standard speedometer,
- securing means for removably coupling said elongated base to the transparent panel, said securing means including an adhesive on said front surface with a cover thereon which when removed permits said elongated base to be positioned and secured in place to the front panel so as to align the zero numeral of said indicia means with the similar marking on the standard speedometer, and
- alignment means having at least one angularly disposed scale arm to align the numerals of said indicia means with the speedometer markings, said alignment means being removably connected to said elongated base to aid in the proper positioning thereof relative to the transparent panel prior to utilization of said securing means to obtain the proper alignment of said indicia means with respect to the speedometer markings.

4,054,106
MONOLITHIC FEED AND WATERING DEVICE FOR NEWBORN POULTRY
Charles B. Dean, Star Rte. Box 75, Dunlap, Tenn. 37327
Filed Jan. 27, 1976, Ser. No. 652,753
Int. Cl.² A01K 7/02, 39/04

U.S. Cl. 119-51.5

5 Claims



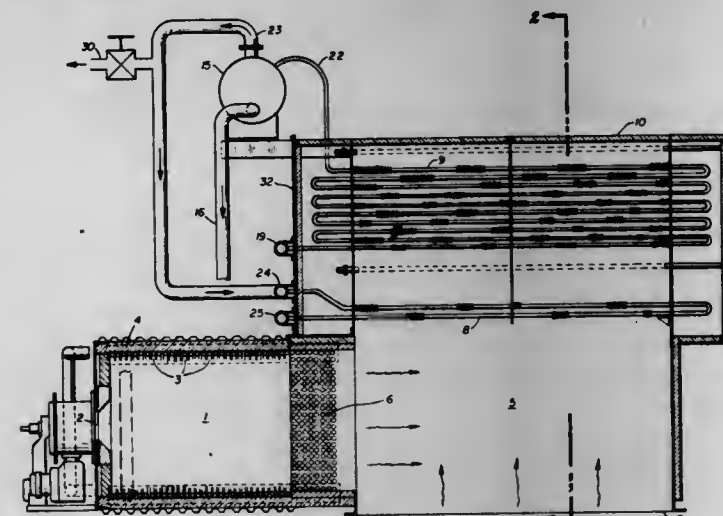
1. A monolithic feed and watering device for newborn poultry comprising:

- a circular shaped base,
- a plurality of feed pans integrally formed with said base equidistant from the center of said base and adjacent each other, each of said feed pans being of a size and having a side wall of a height low enough to enable a plurality of said newborn poultry to step into said pan and feed therein,
- a plurality of watering troughs also integrally formed with said base, one of said watering troughs being located between two of said adjacent feed pans, each of said watering troughs having a side wall of a height low enough to enable said newborn poultry to drink therefrom while standing on said base, and
- means for supplying fresh water to each of said watering troughs.

4,054,107
MARINE WASTE HEAT STEAM GENERATOR
Carl Frederick Horlitz, Jr., Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Apr. 26, 1976, Ser. No. 680,614
Int. Cl.² F22B 1/02, 37/36

U.S. Cl. 122-7 B

5 Claims



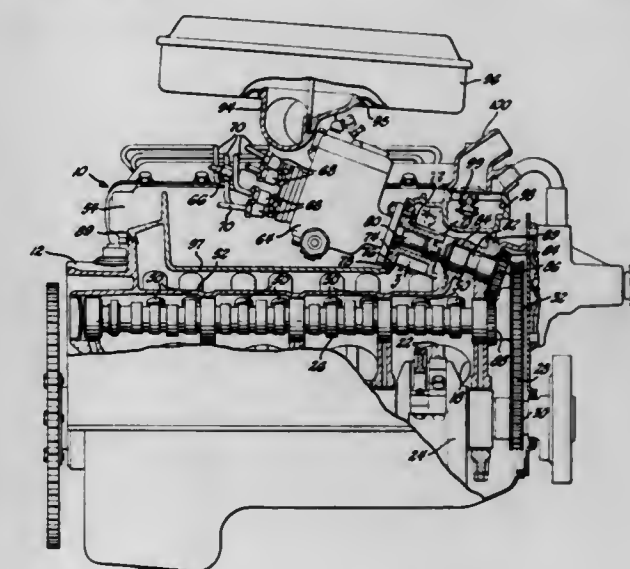
1. A steam generator for marine installation, including, a radiant furnace section extended horizontally and having walls covered with tubes for water to be heated, a first set of tube reaches extended across the discharge of the radiant furnace section, a plenum chamber positioned horizontally from the radiant furnace section and beyond the set of the tube reaches which extend across the discharge of the radiant furnace

section to receive the products of combustion discharged after their passage through the set of tube reaches, an inlet to the plenum chamber and from below the plenum chamber through which waste gases enter the plenum chamber from marine propulsion units to mix with the products of combustion from the radiant furnace section, a second set of tube reaches arranged in parallel and extended horizontally above the plenum chamber so the mixture of heating media discharges upward from the plenum chamber and passes over the reaches in a direction transverse the length of the reaches, a steam-water separating drum mounted above the second set of tube reaches and connected to the tubes, a pump connected to the lower portion of the drum and the tubes to positively fill the drum through the tubes to a predetermined water level, and a source of fuel connected to a burner which is directed to generate products of combustion in the radiant furnace section, whereby the combination of heat sources directed into the plenum chamber supplies heat to the tubes of the generator to develop saturated steam in the drum which is then superheated in the second set of tube reaches as an output of the generator.

4,054,108
INTERNAL COMBUSTION ENGINE
Lloyd T. Gill, Okemos, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 2, 1976, Ser. No. 710,923
Int. Cl.² F02B 75/22

U.S. Cl. 123-55 R

5 Claims



1. A V-type automotive engine comprising a cylinder block having a pair of angularly disposed cylinder banks defining longitudinally aligned cylinders, pistons in the cylinders, a crankshaft supported in the cylinder block at the junction of the cylinder banks and connected with the pistons to convert their reciprocating motion to rotational motion of the crankshaft, a camshaft carried in the block between the cylinder banks for rotation on an axis parallel with and spaced from the axis of the crankshaft, the camshaft being driven by the crankshaft in timed relation with the movement of the pistons, cylinder heads disposed on the ends of said cylinder banks and closing the ends of the cylinders, said cylinder heads including ports communicating with each cylinder and poppet valves movable to control the opening and closing of said ports, valve actuating means between the camshaft and the valves for actuating the valves in timed relation with the motion of the pistons,

a cover member extending between the cylinder banks and covering the camshaft, and fuel injection means including an injection nozzle for each cylinder, said nozzles being mounted on the cylinder heads at their respective cylinder locations, a fuel injection pump mounted between the engine cylinder heads and above the cover member and fuel lines interconnecting the injection pump with the injection nozzles, said injection pump having a drive shaft angled downwardly for rotation on an axis coplanar with the axes of the camshaft and crankshaft and forming an acute angle with the camshaft axis, and pump drive means including a first bevel gear on one end of said camshaft and a second bevel gear engaging said first gear and supported in the block for rotation on an axis closely approaching the camshaft axis at said one end and coaxial with the pump drive shaft axis, said second gear being drivably connected with said pump drive shaft, whereby a compact internal drive and mounting arrangement is provided for said fuel injection pump.

4,054,109

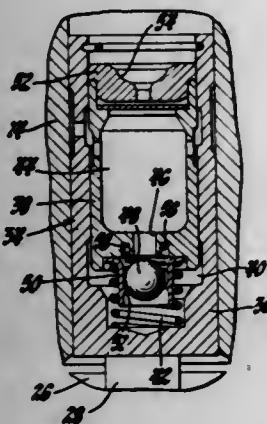
ENGINE WITH VARIABLE VALVE OVERLAP

Ronald J. Herra, Clawson, and Donald J. Pozniak, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1976, Ser. No. 672,474
Int. Cl.² F01L 1/34, 1/14

U.S. Cl. 123—90.16

7 Claims



4. A hydraulic tappet comprising a cylinder member closed at one end, a piston member slidably received in said cylinder member and defining at the closed end thereof a chamber adapted to be filled with hydraulic fluid which when trapped therein prevents movement of said piston in a direction to shorten the effective length of said tappet, valve means in one of said cylinder and piston members and including a port connecting with said chamber for the passage of fluid there-through, a valve closure element movable to open or close said port and positioned such that fluid flow from said chamber creates a fluid pressure differential across the closure element that urges said closure element in a port closing direction, said closure element being biased in an opening direction and movable in a closing direction solely by said pressure differential, whereby said tappet is compressively yieldable up to a predetermined rate of compression at which the force of fluid flow from said chamber is sufficient to close said valve closure element against the force of said bias, thus preventing further yielding until a reduction of the tappet load allows said bias to open the closure element against the force of fluid pressure in said chamber.

4,054,110

ENGINE SPARK TIMING DEVICE

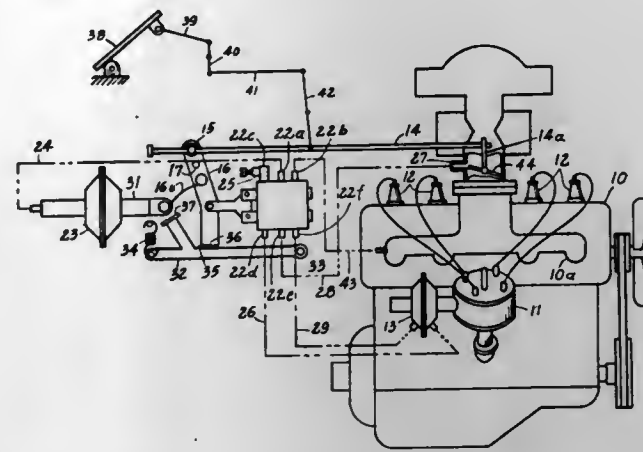
Brooks Walker, and Fred V. Hall, both of San Francisco, Calif., assignors to Brooks Walker, San Francisco, Calif.

Continuation-in-part of Ser. No. 615,469, Feb. 13, 1967, abandoned, and a continuation-in-part of Ser. No. 90,457, Nov. 17, 1970, abandoned. This application June 7, 1972, Ser. No. 260,484

Int. Cl.² F02P 5/04

U.S. Cl. 123—117 A

11 Claims



1. A spark timing control for an internal combustion engine having a timed spark producing means, a throttle and a control mechanism connected thereto for accelerating the engine, the timing control comprising a suction motor cooperating with said timed spark producing means and means for supplying suction to operate said motor to advance and retard the timing of the spark; the means for retarding the spark comprising mechanical means connected to and responsive to any initial movement of the throttle control mechanism from any position thereof to initiate the supply of suction to said motor to retard production of the spark during such initial phase of movement of the said mechanism to accelerate the engine and to thereafter maintain such supply, and timing means simultaneously rendered operative in response to said initial phase of movement of the mechanism for removing the supply of suction to terminate retardation of the spark after a preselected time interval of more than one second following said initiation of the supply.

4,054,111

INTERNAL COMBUSTION ENGINE ELECTRONIC IGNITION SPARK TIMING SYSTEM MODULATED BY CYLINDER COMBUSTION PRESSURE

Roger D. Sand, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 19, 1976, Ser. No. 706,789

Int. Cl.² F02P 5/04

U.S. Cl. 123—117 D

5 Claims

1. An electronic ignition spark timing system modulated by cylinder combustion pressure for initiating the production of an ignition spark for each cylinder of an associated internal combustion engine comprising:

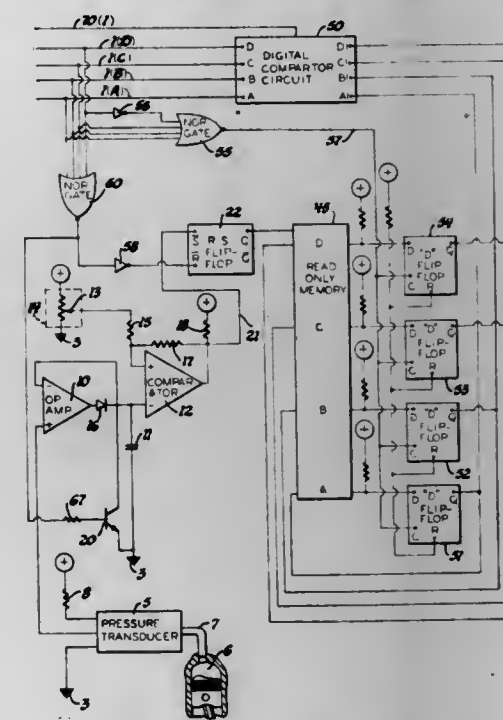
means for producing, in response to the combustion pressure of a selected monitored cylinder of said engine, an excessive cylinder combustion pressure indicating signal when the combustion pressure of said monitored cylinder is greater than a predetermined value;

encoder means for producing for each cylinder of said engine a plurality of crankshaft position digital code signal groups, each of said digital code signal groups being a representation of a respective different engine crankshaft position in degrees relative to piston top dead center, and for producing once every two engine crankshaft revolutions a reset signal digital code signal group;

a function generator means responsive to said excessive cylinder combustion pressure indicating signal for periodically producing the digital code signal group representa-

tion of the engine crankshaft position in retard from that as represented by the last output digital code signal group thereof by a preselected number of engine crankshaft position degrees retard and for producing, in the absence of said excessive cylinder combustion pressure indicating signal, the digital code signal group representation of the engine crankshaft position in advance of that as represented by the last output digital code signal group thereof by a preselected number of crankshaft position degrees advance;

means responsive to said crankshaft position digital code



signal groups and said last output digital code signal group of said function generator for producing an output ignition spark initiating signal when one of said crankshaft position digital code signal groups is the same as said last output digital code signal group of said function generator;

means for converting said reset signal digital code signal group to a reset signal; and

means for applying said reset signal to said means for producing said excessive cylinder combustion pressure indicating signal for erasing said excessive combustion pressure signal, if present.

4,054,112

FUEL INJECTION GOVERNOR

Fuminori Kurokawa, Matsuyama, and Yasuhide Suzuki, Okabe, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

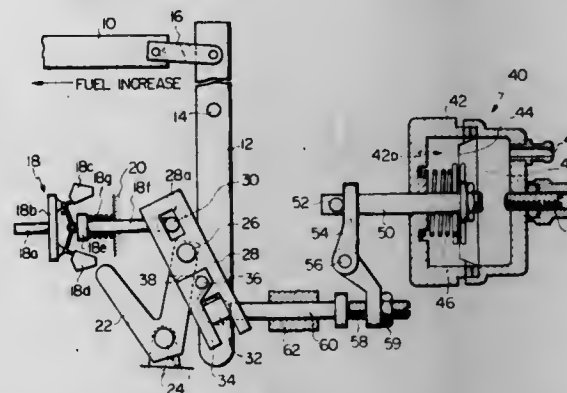
Filed July 30, 1975, Ser. No. 600,239

Claims priority, application Japan, Aug. 1, 1974, 49-91101[U]

Int. Cl.² F02D 1/04

U.S. Cl. 123—140 MP

10 Claims



1. In a fuel injection governor having flyweights, a pressure

sensitive means and a fuel control rod, the combination thereof with of:

a first lever being rotatable about a fixed point and pivotally

connected to the control rod, the pressure sensitive means being abuttingly engageable with the first lever;

a pin carried by the first lever;

a second lever being rotatable about an intermediate point and pivotally connected at one end to the flyweights, the other end of the second lever abuttingly engaging with one side of the pin;

an arm pivotally connected to the second lever and engaging with a side of the pin opposite to the other end of the second lever; and

biasing means yieldably urging the arm into engagement with the pin.

4,054,113

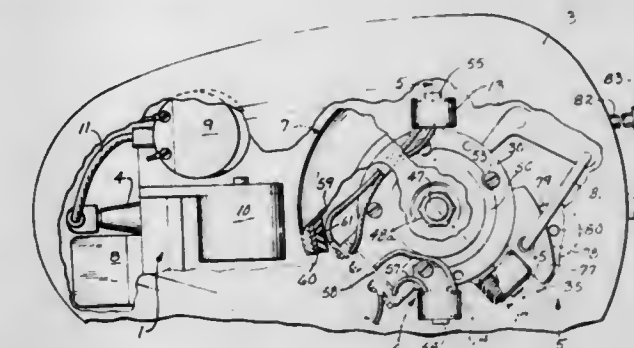
IGNITION BREAKERLESS AND DISTRIBUTORLESS MULTIPLE CYLINDER IGNITION SYSTEM

Richard L. Sleder, Fond du Lac, and Robert J. Beck, Oshkosh, both of Wis., assignors to Brunswick Corporation, Skokie, Ill. Division of Ser. No. 380,384, July 18, 1973, Pat. No. 3,937,200. This application Oct. 29, 1974, Ser. No. 518,764

Int. Cl.² F02P 3/04, 1/00

U.S. Cl. 123—148 CC

10 Claims



1. An alternator for charging of an ignition capacitor and actuating of a switch means to discharge said capacitor for firing of an internal combustion engine having a drive shaft and having firing means connected to said capacitor, said alternator comprising an annular rotor having a plurality of circumferentially extended magnet members defining circumferentially spaced essentially neutral pole positions, a shaft mounting means connected to said rotor with a center axis of rotation and adapted to be connected to be driven from said shaft, a stator assembly, a support means for mounting said stator assembly in fixed position concentrically of said rotor and having a magnetic core having pole positions spaced slightly from the periphery of the magnet members on the rotor and having charging winding means mounted on each pole piece of said core, a trigger winding located in the common plane with said charging means, a movable mounting means connected to said trigger winding and providing for angularly positioning the trigger winding about said center axis with respect to said shaft mounting means and said charging winding means, and a remote throttle and timing control means connected to said mounting means for adjusting the angular position of said trigger winding thereby adjusting the timing with the throttle setting for the engine.

4,054,114

DEVICE FOR ADJUSTING IGNITION TIME FOR DUAL IGNITION INTERNAL COMBUSTION ENGINE

Toshikazu Saita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

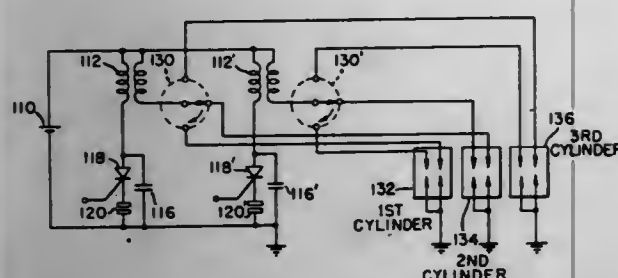
Division of Ser. No. 408,077, Oct. 19, 1974, Pat. No. 3,946,708, which is a continuation of Ser. No. 173,986, Aug. 23, 1971, abandoned. This application Nov. 14, 1974, Ser. No. 523,894

Claims priority, application Japan, Sept. 1, 1970, 45-86979

Int. Cl.² F02P 1/00

U.S. Cl. 123-148 DS

3 Claims



1. In a dual timing mode ignition system: a supply of electrical energy; a first set of breaker contacts, and a first ignition coil having a primary winding connected in series with said first set of breaker contacts and said supply of electrical energy to define a first series circuit; a second set of breaker contacts having a different opening time than said first set of breaker contacts, and a second ignition coil having a primary winding connected in series with said second set of breaker contacts and said supply of electrical energy to define a second series circuit; means for preventing preignition during changeover between timing modes, comprising first switching means comprising a first thyristor, connected in series with said first set of breaker contacts and said supply of electrical energy and said first ignition coil, and operable for cyclically open-circuiting and closing the first series circuit to energize and de-energize said primary winding; second switching means comprising a second thyristor, connected in series with said second set of breaker contacts and said supply of electrical energy and said second ignition coil, and operable for cyclically open-circuiting and closing the second series circuit to energize and de-energize said primary winding; and means for selectively operating said first and second switching means to conduct to selectively (a) continuously close both of the series circuits thereby enabling the opening and closing of the first and second sets of breaker contacts to control timing of energization of said coils in a first ignition mode and (b) continuously close one of the series circuits thereby enabling the opening and closing of the corresponding set of breaker contacts to control the timing of the ignition system in a second ignition mode.

4,054,115

MINIATURE INTERNAL COMBUSTION ENGINE

Leopold v. Habsburg-Lothringen, Gabelsbergerstr. 15, Munich 2, Germany (800)

Filed June 9, 1975, Ser. No. 584,766

Claims priority, application Germany, Oct. 31, 1974, 2451948

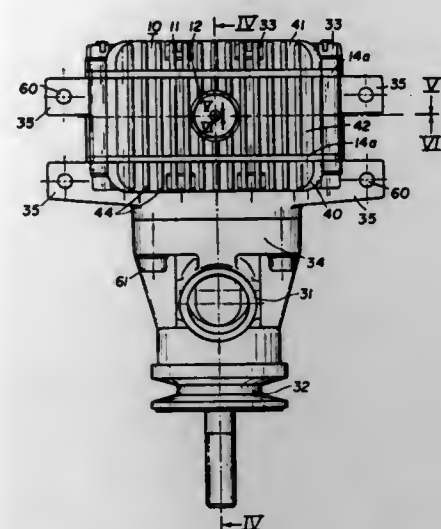
Int. Cl.² F02F 1/00; F01C 9/00

U.S. Cl. 123-193 CP

18 Claims

1. An internal combustion engine comprising a cylinder having a rectangular cross section, a piston having a rectangular cross section defined by a pair of short opposite sides and a pair of long opposite sides, said sides defining four corners, said piston being mounted in said cylinder for movement along the longitudinal axis of said cylinder, a crankshaft having an axis perpendicular to the longitudinal axis of said cylinder, said piston having a guideway in the surface thereof toward said crankshaft, said guideway extending transversely of the axis of said cylinder completely across said surface and only partially through said piston axially of said crankshaft, pin means, means mounting said pin means on said crankshaft in a position offset with respect to the axis of said crankshaft, said pin means extending into said guideway, whereby said pin means couples

the crankshaft directly to the piston so that linear movement of said piston in said cylinder is directly translated to rotational movement of said crankshaft by way of said pin means, said piston further comprising a substantially straight groove in each of said short sides and a curved groove in each of said long sides, said grooves merging in said corners, a pair of straight sealing strips inserted in the respective groove of said short piston sides, a pair of curved sealing strips inserted in the



respective groove of said long piston sides, separate spring means inserted in each of said grooves for uniformly urging the corresponding sealing strip outwardly, said straight sealing strips having a shoulder at each end with a surface extending perpendicularly to said longitudinal axis, said curved sealing strips having end legs resting on the corresponding shoulder surface of the straight sealing strips at said corners whereby the sealing strips reinforce each other at the corners.

4,054,116

EMERGENCY FUEL LINE CLOSURE

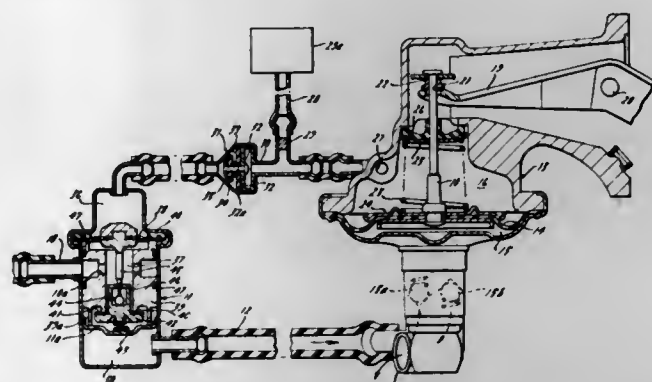
Thomas Tucker Coddington, Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Apr. 9, 1976, Ser. No. 675,438

Int. Cl.² F02B 77/08

U.S. Cl. 123-198 DB

22 Claims



1. In combination with an engine, a fuel system comprising, a fuel pump having a fuel pumping chamber and an air pumping chamber and driven by said engine to effect alternate fuel pumping and fuel vacuum cycles in said fuel pumping chamber and concurrent air vacuum and air pumping cycles respectively in said air pumping chamber, said fuel pumping chamber having fuel inlet means in communication with a fuel supply for said engine to receive fuel therefrom only during the fuel vacuum cycles and having fuel outlet means for discharging said fuel for use by said engine during the fuel pumping cycles, control valve means normally closing the communication between said fuel supply and inlet means, and control valve operating means independent of the fuel pressure in said fuel pumping chamber during said fuel pumping cycles and responsive to the pressure in at least one of said chambers during the

alternate cycles for opening said control valve means to maintain the last named communication during operation of said pump.

4,054,117

OIL PRESSURE FAILURE PROTECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

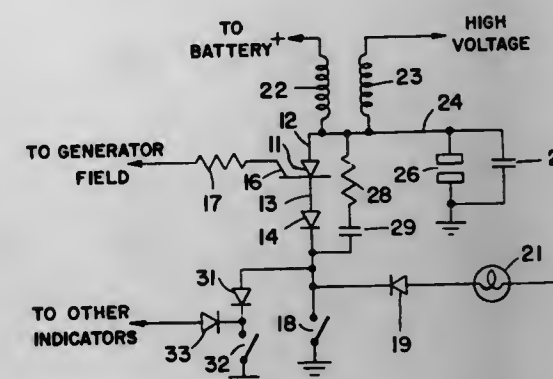
Howard J. Palmer, 68 Gaywood Place, Moraga, Calif. 94556, and James R. Bechard, 314 Perkins St., Oakland, Calif. 94610

Filed Jan. 28, 1976, Ser. No. 653,209

Int. Cl.² F02B 77/00

U.S. Cl. 123-198 D

3 Claims



1. In combination with an internal combustion engine having a generator powered electrical system and an ignition system including breaker points, an engine malfunction protection device including engine malfunction sensing means, engine speed limiting means actuated by said engine malfunction sensing means to limit the speed of said engine to a predetermined maximum during the occurrence of a malfunction, and engine speed sensing means, connected to said engine speed limiting means, to trigger said speed limiting means when said engine exceeds a predetermined speed; said speed limiting means including a solid state switching device having one electrode connected to said breaker points, said engine malfunction sensing means including a normally open switch having one pole connected to ground and the other pole connected to the other electrode of said solid state switching device, said speed sensing means including a resistor connected between the field winding of said generator and the gate of said solid state switching device.

4,054,118

COMPOUND BOW WITH TORQUE ELIMINATORS AND TENSION CABLE DEFLECTORS

Arnold D. McKee, 130 E. Elm, Hartford, Ill. 62048, and Richard C. Segelken, Rte. 1 Box 160, Caseyville, Ill. 62232

Filed Jan. 26, 1976, Ser. No. 652,133

Int. Cl.² F41B 5/00

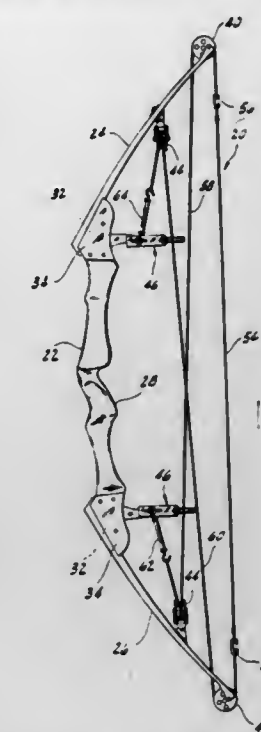
U.S. Cl. 124-23 R

7 Claims

1. In a compound bow including a frame, a pair of limbs carried by said frame, a pair of eccentric pulleys carried by said limbs and positioned adjacent the free ends thereof, a first tension cable mounted to a first one of said eccentric pulleys, a second tension cable mounted to a second one of said eccentric pulleys, and a bowstring mounted at opposite ends thereof to said eccentric pulleys, the improvement wherein said eccentric pulleys mount the bowstring and the first and second tension cables, wherein said eccentric pulleys are substantially circular in cross-section and have circumferentially disposed substantially circular symmetrically spaced grooves for receipt of mounting means whereby said bowstring and said tension cables are mounted thereto, each of said pulleys having three grooves which are substantially uniform in diameter and having four holes substantially symmetrically spaced about the margin thereof, one of which serves as a pivot to said limbs, and wherein a first passageway interconnects a first outer one of said grooves to an inner one of said grooves and wherein a second passageway interconnects a second one of said grooves to one of said holes, said passageways converging by passing

substantially along the diameter of said eccentric pulleys whereby torque in said improved compound bow is reduced.

4. In a compound bow including a frame, a pair of limbs carried by said frame, a pair of eccentric pulleys carried by said limbs and positioned adjacent the free ends thereof, a first tension cable mounted to a first one of said eccentric pulleys, a second tension cable mounted to a second one of said eccentric



pulleys, and a bowstring mounted at opposite ends thereof to said eccentric pulleys, the improvement wherein a pair of removable cable adjustment deflectors are carried by said frame and wherein said cable adjustment deflectors are rollers located between and offset from said eccentric pulleys and positioned to deflect said tension cables away from a sight window in said frame.

4,054,119

ARCHERY BOW WITH ADJUSTABLE ARROW REST

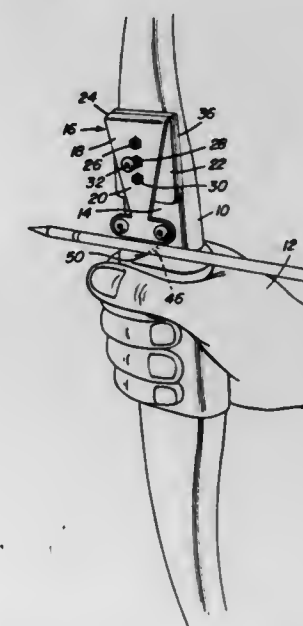
Jep F. Hansen, and Albert L. Hansen, both of P.O. Box 1249, Grants Pass, Oreg. 97526

Filed Jan. 26, 1976, Ser. No. 652,708

Int. Cl.² F41B 5/00

U.S. Cl. 124-24 R

10 Claims



1. In combination with a bow having a hand grip defining mid-portion, an arrow rest structure including an inverted generally U-shaped member including first and second side-by-side legs including upper and lower base and free end portions, respectively, and interconnected at their base ends by means of an integral bight portion extending therebetween, said U-

shaped member being constructed of stiff, but resilient material whereby the free end portions of said legs may be spread, at least slightly, apart and thereafter allowed to return to their original spaced relationship, attaching means attaching said first leg to the mid-portion of said bow with said first leg extending along said mid-portion and with said second leg spaced outwardly of one side of said mid-portion, the free end portion of said second leg including a laterally outwardly projecting arrow rest element extending in a direction away from said first leg, and adjustable spacing means carried by one of said legs intermediate the base and free ends thereof and engaged with the other leg for adjustably increasing the spacing between said free end portions in excess of the original spaced relationship thereof.

4,054,120

BLOW GUN WITH MOUTHPIECE INDENTATIONS AND PROJECTILE THEREFOR PREVENTED BY INDENTATIONS FROM MOVEMENT THEREPAST
Charles F. Foley, 3908 Merriam Road, Minnetonka, Minn. 55343

Filed May 12, 1976, Ser. No. 685,728
Int. Cl.² F41B 1/00, 1/02

U.S. Cl. 124—62

3 Claims



1. In combination, a projectile, blow gun and target combination comprising a projectile formed as a generally cylindrical soft foam pellet having a length generally twice its diameter, and having a head including a flat disc-shaped member of substantially the same diameter as the pellet, a layer of hook and loop type material fixed to the outer end surface of said disc-shaped member, and a blow gun for impelling said projectile, said blow gun comprises a molded plastic cylindrical barrel having a mouthpiece end formed to fit the users mouth, at least three indentation means molded into and generally symmetrically spaced around said barrel adjacent said mouthpiece end, said indentation means forming a smaller size opening through said barrel than the diameter of said disc-shaped member to prevent said disc-shaped member from being forced rearwardly through said mouthpiece end, said indentation means also forming a sufficiently large opening through said barrel that said pellet may be forced therepast toward the end of the barrel opposite from said mouthpiece, said barrel being the size so that said soft foam pellet forms an air seal against the inner surface of said barrel, and a target member having a surface for causing adherence of said hook and loop type material to the target member.

4,054,121

ADJUSTABLE MOUNTING MEANS FOR ARCHERY BOW STABILIZERS
Earl H. Hoyt, Jr., 11510 Natural Bridge Road, Bridgeton, Mo. 63044

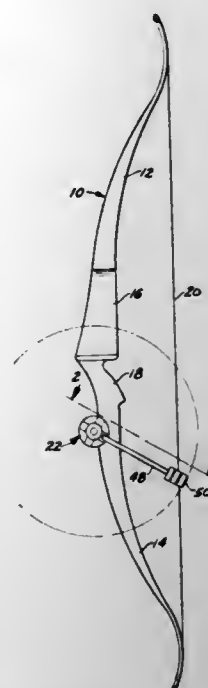
Filed Aug. 23, 1976, Ser. No. 716,883
Int. Cl.² F41B 5/00

U.S. Cl. 124—89

10 Claims

1. A device for mounting a pair of stabilizers on an archery bow so that they may be conveniently extended at various angles from opposite sides of a bow comprising; an elongated mounting bar adapted to be mounted transversely on a forward or rear face of a bow with the ends thereof extending from opposite sides of a bow, said bar including means intermediate of its length for rigidly attaching it to a bow, a rotatably adjustable member pivotally mounted on each end of said elongated mounting bar for rotation on an axis parallel to said bar and

perpendicular to the bow, pivot means for so mounting said members on the ends of said bar including screw threaded means for securing said members in a rotatably adjusted posi-



tion, a stabilizer comprising a rod having a weighting element at one end connected at its other end to each of said members, and screw threaded means for connecting the said other ends of said stabilizers to said members.

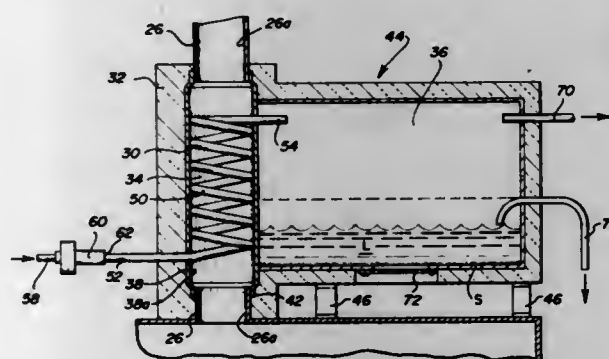
4,054,122

GAS HUMIDIFIER
Hugh T. Reed, 3067 Valwood Parkway, Farmers Branch, Tex. 75234

Filed Sept. 22, 1975, Ser. No. 615,359
Int. Cl.² F24F 3/14

U.S. Cl. 126—113

5 Claims



1. A humidifier for connection to a hot gas furnace having a hot waste gas vent pipe of predetermined cross-sectional size for venting heated waste gas, comprising:

a humidifier housing, said housing being substituted for a section of the hot waste gas vent pipe,

a water coil disposed in said humidifier housing for directing water through the hot waste gas vent pipe wherein the water is vaporized into steam, said coil being formed from a material having a coefficient of thermal expansion between ambient temperature and a predetermined operating temperature so that said coil substantially expands as the temperature of said coil is raised from ambient temperature to a predetermined operating temperature by the flow of waste gas through said vent pipe and substantially contracts as the temperature of said coil is subsequently reduced, the expansions and contractions of said coil causing separation of sediment from the interior thereof which sediment is carried through said coil by fluid flowing therethrough,

a sediment separation zone having an upper and lower portion, means for discharging the fluid flowing through said coil into the upper portion of said sediment separation zone so that sediment and unvaporized water flowing from said coil are separated from steam by the action of gravity and collected in the lower portion of said sediment separation zone, means for discharging steam from the upper portion of said sediment separation zone, said humidifier housing is tubular and said water coil is coaxially disposed therein with an inside coil dimension larger than the cross-sectional dimension of the vent pipe so that the flow of hot gases through said housing is not inhibited by said water coil, and drain means mounted in the lower portion of said sediment separation zone and comprising siphon means responsive to the accumulation of a predetermined quantity of liquid in the lower portion of said sediment separation zone for automatically

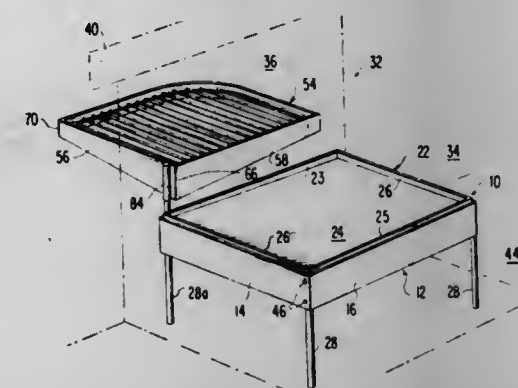
4,054,123

PORTABLE FIREPLACE GRILL ASSEMBLY FOR USE WITH AN OPEN FIREPLACE
Dale E. Corter, R.D. No. 1, Allenwood, Pa. 17810

Filed Mar. 19, 1976, Ser. No. 668,377
Int. Cl.² F24B 1/26

U.S. Cl. 126—137

4 Claims



1. A portable fireplace grill assembly for use with an open fireplace including a horizontal hearth external of a vertical fireplace opening and a fire box internally thereof, said fireplace grill assembly comprising: an open rectangular box frame, legs fixed to the box frame at respective corners for supporting the open rectangular box frame above the fireplace hearth and outside of the fire box, said legs comprising vertical rods fixed to the corners of said box frame, one of said rods proximal to said fire box extending above the upper edge of the box frame, a vertically open, generally horizontal grill frame mounted to said box frame on an upper edge at one rear corner thereof for pivoting about a vertical axis for moving from a first position overlying the drip pan to a second position within said fireplace fire box, said grill frame including a vertical tube fixed to an outside wall of said grill frame at one corner of said grill frame which telescopically receives the upper end of said one rod to effect pivoting of said grill frame about the axis of said one rod on the upper edge of said box frame, said grill frame having a width parallel to the fireplace opening when overlying the box frame which is less than the width of said box frame and having a length generally equal thereto and having a corner diametrically opposite the corner carrying said tube which is rounded to insure that during pivoting of the grill frame with respect to the box frame that no portion of the grill is directly exposed to the underlying hearth in front of the fireplace opening, a drip pan of a configuration and size corresponding gener-

ally to that of the rectangular box frame and removably mounted within said box frame, and a removable grill of a size and configuration corresponding generally to said grill frame and spanning said grill frame opening and removably mounted within said grill frame opening for supporting food to be cooked within said firebox.

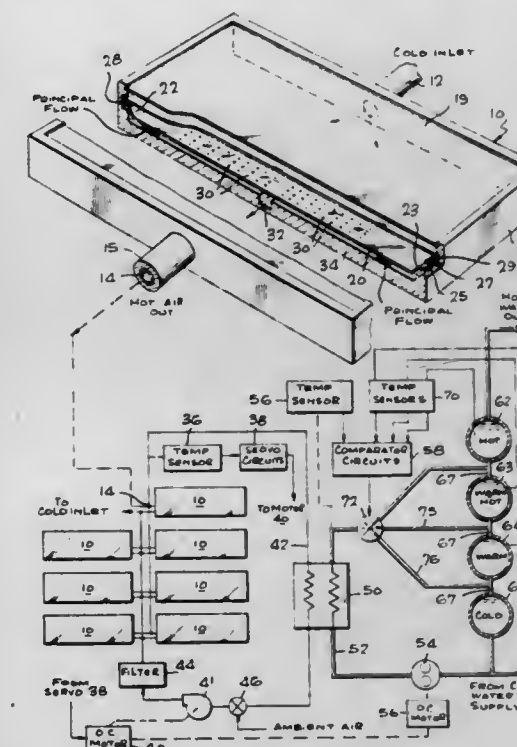
4,054,124

SOLAR RADIATION COLLECTION SYSTEM
Stellan Knoos, 1746 Manzanita Park Ave., Malibu, Calif. 90265

Filed Apr. 6, 1976, Ser. No. 674,309
Int. Cl.² F24J 3/02

U.S. Cl. 126—270

49 Claims



1. In a solar energy collection system of the fluid heating type having at least one transparent upper panel for limiting heat losses from an adjacent, lower, collector panel, the improvement characterized by means providing at least two major fluid flow paths relative to the collector panel, at least a first of the fluid flows being adjacent and in thermal interchange relation with the under side of the collector panel, and at least one other of the fluid flows having flow components at least partially angled toward the plane of the collector panel and intersecting with the first fluid flow.

4,054,125

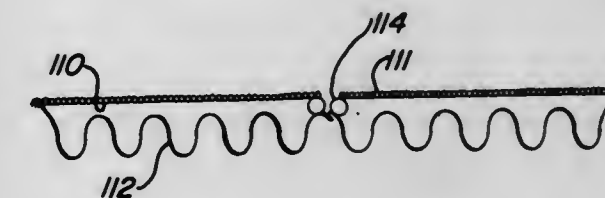
SOLAR HEATING WINDOW COVER
Robert E. Eckels, 2101 Youngfield St., Golden, Colo. 80401

Filed Jan. 2, 1976, Ser. No. 646,269

Int. Cl.² F24J 3/02

U.S. Cl. 126—270

8 Claims



1. A room window covering for utilizing solar radiation, comprising
a. solar radiation collector means arranged to be positioned adjacent a window and cover at least a portion of the window for absorption of solar radiation passing the window, said collector means including a flexible thin, dark colored fabric-like substrate and a monolayer of solar

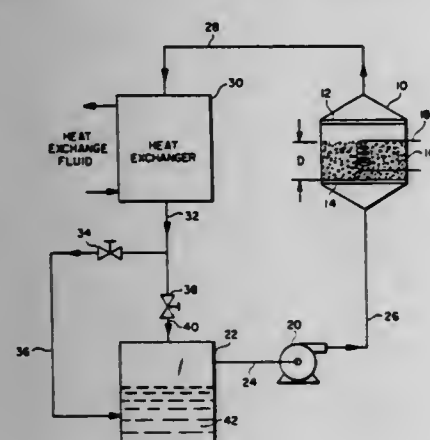
radiation transparent spheres secured to the window facing surface thereof;
 b. an overlaying pleated drapery material window covering means adjacent said collector means on the side opposite said spheres, and positioned to provide a plurality of tubular type vertical passages therebetween for passage of air, and
 c. said overlaying covering means being provided with an upper and a lower room opening for each tubular type passage permitting the passage of air to and from different elevations in the room.

4,054,126

SYSTEM FOR STORING AND RELEASING THERMAL ENERGY

Gay Ervin, Jr., Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
 Division of Ser. No. 589,733, June 23, 1975, Pat. No. 3,973,552.
 This application Apr. 6, 1976, Ser. No. 674,184
 The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.
 Int. Cl.² F24J 3/02

U.S. Cl. 126—271



1. A system for the storage and recovery of thermal energy comprising:

- a. container having at least one water-permeable wall for the passage of water vapor therethrough;
- b. particulate bed of a selected heat storage material disposed in said container adjacent at least said one water-permeable wall, said heat storage material being selected from the group consisting of the hydroxides or magnesium, calcium, and barium, said bed of selected material having an apparent density of from 25% to 75% and a depth of less than about 40 cm;
- c. means for heating said bed of selected hydroxide to a temperature within the range of from about 300° C to 900° C and above the decomposition temperature of the selected hydroxide to decompose at least a part of the selected hydroxide to form the corresponding oxide and water vapor;
- d. means for withdrawing the formed water vapor, said means including means for passing a carrier gas into contact with said water-permeable wall of the container to absorb the water vapor permeating therethrough; and
- e. means for recovering thermal energy, said means including means for passing a water vapor-laden carrier gas into contact with the water-permeable wall whereby the water vapor permeates through the wall into contact with the oxide to reform the selected hydroxide and generate heat.

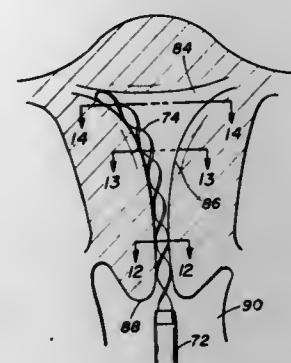
4,054,127
 ENDOMETRIAL SAMPLING INSTRUMENT
 Albert R. Milan, 1335 Heather Road, Baltimore, Md. 21239, and
 Raymond L. Markley, 707 Thornwood Court, Baltimore, Md. 21204

Continuation-in-part of Ser. No. 505,709, Sept. 13, 1974, Pat. No. 3,945,372, which is a continuation of Ser. No. 365,850, June 1, 1973, abandoned. This application Oct. 1, 1975, Ser. No. 618,365

The portion of the term of this patent subsequent to Mar. 23, 1993, has been disclaimed.
 Int. Cl.² A61B 10/00

U.S. Cl. 128—2 B

10 Claims



1. A medical system for obtaining tissue samples for the endometrial cavity, comprising:
 tissue gathering means including a helically-shaped end section, said end section being formed of a flat elongated and essentially rectangular member twisted about its longitudinal axis such that the edges thereof which extend in a direction parallel to the longitudinal axis of said member are disposed in a helically wound fashion about said longitudinal axis, the surface of the end section being of a matte finish to enhance the adhesion of tissue thereto, the end section being arcuately formed with a memorized curve therein and being formed of a flexible pliant material, the end section being curvilinear along the longitudinal axis of the aforesaid member, portions of the end section being adapted to engage the surfaces of the cavity to gather a cross-section of tissue from essentially all areas thereof;
 handle means for manipulating said end section and being joined to the inner end portion of said end section, the handle means extending externally of the cavity on insertion of the end section therinto for controlling the rotational movement of said end section within said cavity, the curvilinear longitudinal axis of the end section being skewed relative to the longitudinal axis of the handle means, the end section deflecting toward the walls of the cavity on insertion of said end section into said cavity whereby surfaces of the end section contact full surfaces of said walls; and a flat paddle-shaped member having a slot-like opening formed therein, at least a portion of the helically shaped end section of the tissue gathering means being disposed within the slot-like opening and being movable relative thereto to transfer tissue adhering to the end section from said end section to a surface of the flat paddle-shaped member.

4,054,128

DEVICE FOR CARRYING OBSERVATION AND/OR MANIPULATION INSTRUMENTS

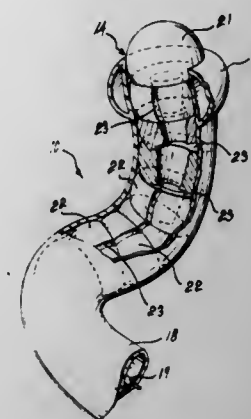
Wolf D. Seufert, and France M. Bessette, both of Sherbrooke, Canada, assignors to Universite de Sherbrooke, Calif.
 Filed Sept. 28, 1976, Ser. No. 727,539
 Int. Cl.² A61B 1/00

U.S. Cl. 128—004

12 Claims

1. A device for carrying observation and/or manipulation instruments comprising: an elongated snake-like member having a distal end and a proximal end; said member incorporating a series of electrically connected and individually articulatable

segments including a controllable leading segment at said distal end; said segments being sequentially activatable whereby all segments are articulated to successively assume an angle relative to an axis extending centrally through said segments, said



angle corresponding to a guide angle introduced at said leading segment; and guidance control means at said proximal end for introducing said guide angle to said leading segment whereby said guide angle is repeated to following segments.

4,054,129

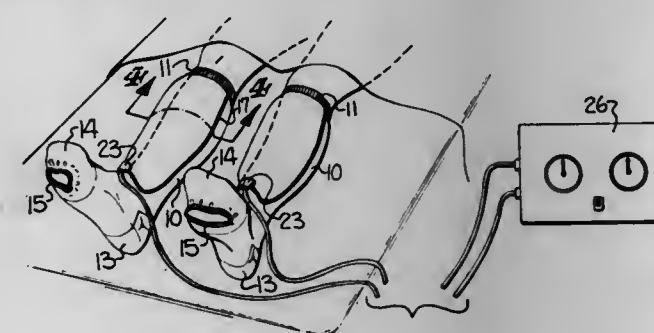
SYSTEM FOR APPLYING PULSATING PRESSURE TO THE BODY

Edward F. Byars; Thomas J. Tarnay, both of Morgantown, W. Va., and Gordon R. Hopkins, Memphis, Tenn., assignors to Alba-Waldensian, Inc., Valdese, N.C.

Filed Mar. 29, 1976, Ser. No. 671,029
 Int. Cl.² A61N 1/00

U.S. Cl. 128—24 R

18 Claims



1. A system for applying pulsating pressure to a portion of the human body, said system comprising
 - a. an appliance comprising a seamless knitted sleeve generally conforming to the configuration of the portion of the human body on which said sleeve is to be placed, said seamless knitted sleeve being sufficiently stretchable to permit easy placement and removal,
 - b. a pocket attached longitudinally along and partially around said sleeve, the width of said pocket being greater than one-fourth the circumference of said sleeve,
 - c. expandable bladder means positioned in said pocket and extending longitudinally of said seamless knitted sleeve, and
 - d. means for periodically expanding said bladder to exert direct pressure against the portion of the body covered thereby and to circumferentially contract said sleeve and apply pressure to the corresponding portion of the body encompassed by said sleeve.

4,054,130

EMERGENCY SPLINT ASSEMBLY

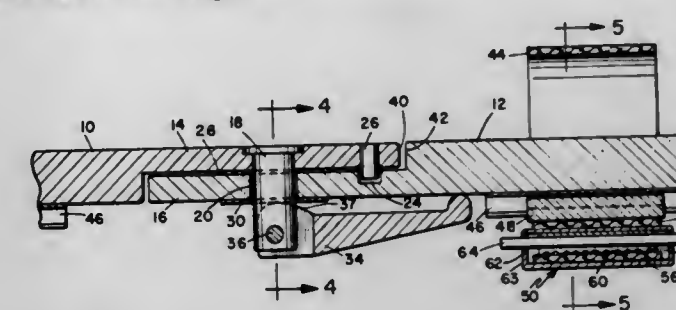
Paul William Franke, 619 Camellia St., Escondido, Calif. 92027.
 Filed Dec. 29, 1975, Ser. No. 644,640
 Int. Cl.² A61F 5/04

U.S. Cl. 128—87 R

9 Claims

1. An emergency splint assembly for use in restraining a fractured limb comprising:
 at least two cooperating limb supports, pivotally connected

and lockable in a multiplicity of relative angular positions for supporting a fractured limb,
 an adjustable restrainer associated with at least one of said limb supports for strapping the fractured limb against said limb supports, said restrainer being radially adjustable to accommodate limbs of varying girth, said restrainer being movable longitudinally along its associated limb support and securable at a multiplicity of stations therealong to accommodate any limb fracture position,
 means slidable longitudinally along at least one of said limb supports and connected to one end of said restrainer for locating said restrainer along said limb support,
 and adjustable means operable to releasably secure the other end of said restrainer for strapping the limb against the associated limb support,



said adjustable means comprises a clamp for releasably locking the other end of said restrainer in a multiplicity of positions for accommodating limbs of varying girth, resilient means releasably mounted in said clamp, a part of said resilient means for contacting said restrainer to secure the other end thereof within said clamp,
 said resilient means comprises a leaf spring, said leaf spring is biased toward a restrainer securing position in which a part of said leaf spring engages said one end of said restrainer,
 and a movable member received in said slot and active on said leaf spring and adapted to drive the same out of engagement with said restrainer.

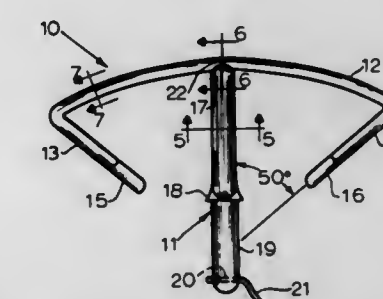
4,054,131

INTRAUTERINE CONTRACEPTIVE DEVICE

Elton Kessel, Chapel Hill, N.C., assignor to International Pregnancy Advisory Services, Chapel Hill, N.C.
 Filed Aug. 10, 1976, Ser. No. 713,233
 Int. Cl.² A61F 5/46

U.S. Cl. 128—130

14 Claims



1. An intrauterine contraceptive device comprising:
 - a. an elongated stem having an upper portion and a lower portion;
 - b. a resilient downwardly bowed crossbar integrally secured at its midpoint to the tip of said stem upper portion; and
 - c. a pair of resilient arms formed as integral continuations of the opposed ends of said crossbar, said arms being angled downwardly and inwardly toward said stem and terminating short of touching said stem, and the line of each of said arms defining an included angle with the central axis of said stem of between 40° and 70°.

4,054,132

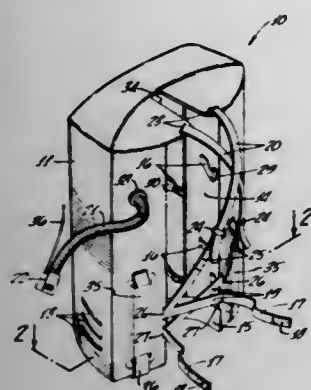
INTEGRATED DIVING SYSTEM

Douglas Allen Deeds, 1706 W. Arbor Drive, San Diego, Calif. 92103

Filed Apr. 14, 1975, Ser. No. 568,011
Int. Cl.² A62B 7/00

U.S. Cl. 128—142 R

6 Claims



1. Integrated breathing apparatus for an underwater diver for use with a compressed air tank and an air pressure regulator attached thereto, comprising:

a molded stressed skin monocoque shell having a plurality of hollow interior portions formed with a concave exterior cradle for accepting said tank, restraining means for selectively positioning said tank in said cradle;

harness means for attaching the shell to the back of a diver, water entry means in said shell permitting bi-directional passage of water to and from said interior portions of said shell;

buoyancy compensation weights positioned in weight compartments selectively molded into said shell, means for manually ejecting said weights from said compartments; a buoyancy bladder for buoyancy compensation fitted in said hollow interior portions;

a buoyancy compensator valve connected by first hose means to said buoyancy bladder and by second hose means to said air pressure regulator attached to said tank and having control means for selectively transferring pressure regulated air from said air pressure regulator to said bladder;

said control means including means for selectively transferring air from said bladder to atmosphere, said compensator valve including mouth piece means for orally inflating said bladder, said control means including means for automatic release of over pressure from said buoyancy bladder;

said buoyancy compensator valve comprising first, second and third interior chambers in a suitable housing, said first chamber connected to said second hose to thereby receive air from said air pressure regulator therethrough, first control means for controlling the passage of air through a first air passage connected between said first chamber and said second chamber, said second chamber connected to said first hose to provide air to said buoyancy bladder therethrough, second control means for controlling the passage of air through a second air passage connecting said second chamber and said third chamber, said third chamber connected to said mouthpiece means for the passage therethrough of air into or out of said valve, said first and second control means providing independent control over air flow through the respective passages;

said first control means includes a lever arm in contact with a first valve stem having a first valve seat spring-loaded with a first spring whereby the positioning of said lever arm in a first position applies force to said first valve stem to force said first valve seat against said first spring to thereby open said first air passage, said first valve seat and said first spring being located in said first chamber; and said second control means includes said lever arm in contact with a second valve stem having a second valve seat

spring-loaded by a second spring whereby the positioning of said lever arm in a second position applies force to said second valve stem to force said second valve seat against said second spring to thereby open said second air passage, said second valve seat and said second spring being positioned in said third chamber.

4,054,133

CONTROL FOR A DEMAND CANNULA

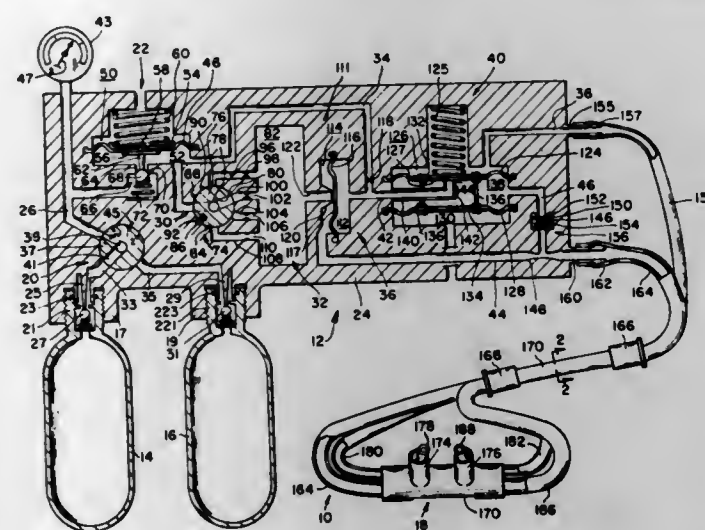
William P. Myers, Davenport, Iowa, assignor to The Bendix Corporation, South Bend, Ind.

Filed Mar. 29, 1976, Ser. No. 671,195

Int. Cl.² A61M 16/00

U.S. Cl. 128—142.2

13 Claims



1. A control means for regulating the communication of pressurized breathable fluid from a storage container to a recipient, comprising:

a housing having a plenum chamber, a distribution chamber, a control chamber, a sensing chamber, a relief chamber, a first outlet port and a second outlet port, said plenum chamber being connected to a storage container of pressurized breathable fluid through a first passageway, said control chamber being connected directly to said first passageway through a control passage, said sensing chamber being connected to said first outlet port by a second passageway, said distribution chamber being connected to said plenum chamber through a distribution passage and to said second outlet port through a third passageway, said control chamber being connected to said relief chamber through a relief passage, said relief chamber including means for relieving pressure accumulated therein, said housing having a plurality of orifices varied flow rate located in said first passageway downstream of the connection between said control passage and said first passageway for connecting the storage container with said plenum chamber;

means adapted for connection to the nasal passages of a recipient;

a first conduit connected to said first outlet port at one end and to said means adapted for connection to the nasal passages of the recipient;

a second conduit connected to said second outlet port at one end and to said means adapted for connection to the nasal passages of the recipient at the other end;

actuator means connected to the first passageway for permitting said pressurized breathable fluid to flow from the storage container into said first passageway;

selector means for choosing a flow rate orifice from said plurality of orifices which allows continual communication of a fixed quantity of breathable fluid from said first passageway into the plenum means corresponding to the metabolic needs of a recipient;

first wall means located in said housing for separating said control chamber from said distribution chamber and for

controlling flow of fluid from said distribution chamber through said distributor passage; and second wall means located in said housing for separating said sensing chamber from said relief passage for controlling flow from said relief passage, said second wall means responding to an exhalation pressure communicated from the nasal passages through said first conduit to said sensing chamber to seal said relief passage causing the pressurized breathable fluid in the control passage to flow into said control chamber and urge said first wall means toward said distribution passage to interrupt the flow of breathable fluid therethrough and allow a fixed quantity of pressurized breathable fluid to flow into said plenum chamber, said second wall means responding to an inhalation pressure communicated from the nasal passages through said first conduit to said sensing chamber to allow the pressurized breathable fluid in said control chamber to flow through said relief passage into said relief chamber and permit said fixed quantity of pressurized breathable fluid to communicate to the nasal passages of the recipient through said second conduit to meet an inhalation demand.

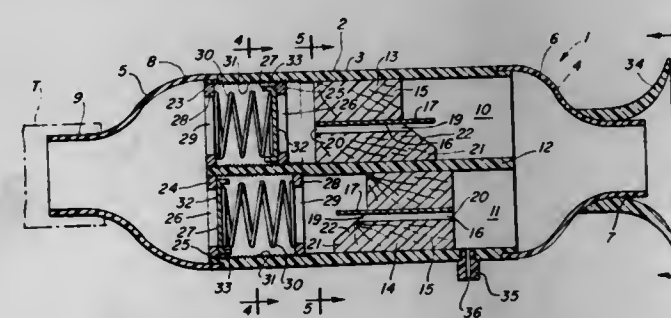
4,054,134

RESPIRATORS

Richard W. Kritzer, 5800 N. Pulaski Road, Chicago, Ill. 60646
Filed Sept. 15, 1975, Ser. No. 613,176Int. Cl.² A61M 15/06; A62B 7/00

U.S. Cl. 128—208

3 Claims



1. A respirator comprising

a. an elongated tubular housing having a mouthpiece at one end thereof for insertion into a person's mouth to thereby enable the person to

1. inhale in one direction longitudinally through said housing, and

2. exhale longitudinally through said housing in the direction opposite to said one direction, and

b. means in said housing for vibrating material inhaled and exhaled therethrough,

c. said housing having two passageways extending longitudinally through at least a portion thereof in side-by-side relation to each other,

d. said means for vibrating material inhaled through said housing comprising means mounted in one of said passageways,

e. said means for vibrating material exhaled through said housing comprising means mounted in the other of said passageways,

f. each of said passageways having

1. an annular valve seat mounted therein for the passage of such material therethrough,

2. a valve member mounted therein in position to be moved into and out of closing engagement with said valve seat,

3. spring means mounted therein and yieldingly engaged with said valve member for yieldingly holding said valve member in said closing engagement with said valve seat, and

4. a retainer member mounted therein and engaged with said spring means on the side thereon remote from said

valve member in position to hold said spring means in engagement with said valve member,
g. said valve seats being threaded into respective ones of said passageways and being adjustable longitudinally thereof,
h. said retainer members being threaded into respective ones of said passageways and being adjustable longitudinally thereof,
i. said valve member in said one passageway being disposed in said closing engagement during such exhalation through said housing, and
j. said valve member in said other passageway being disposed in said closing engagement during such inhalation through said housing.

4,054,135

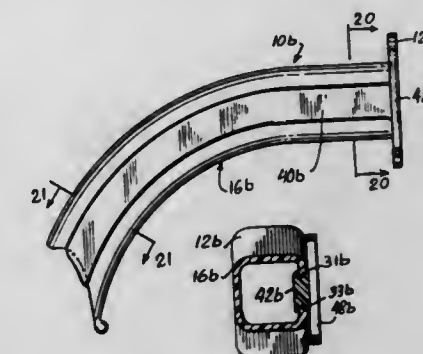
INTUBATING PHARYNGEAL AIRWAY

Robert A. Berman, 501 Cedar Hill Road, Far Rockaway, N.Y. 11691

Division of Ser. No. 708,274, July 23, 1976. This application
Dec. 15, 1976, Ser. No. 750,739Int. Cl.² A61M 16/00

U.S. Cl. 128—208

1 Claim



1. An intubating airway, comprising:

a. A tubular longitudinally extending body member, said body member having a longitudinally extending side opening, defined therein,

b. said member having a distal end for insertion into the mouth and throat of a patient and a proximal end for location at the mouth of the patient, and

c. a closure member extending the length of said side opening, said closure member being removably inserted into said side opening for closure thereof.

4,054,136

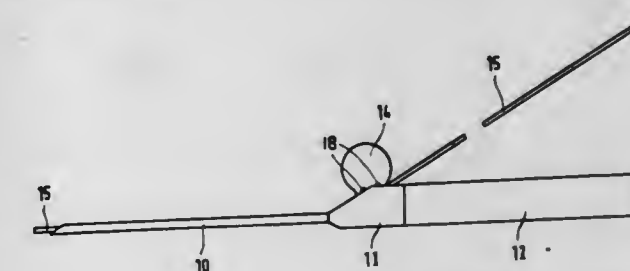
CANNULA FOR THE INTRODUCTION OF A CATHETER
Dieter von Zeppelin, Goethestrasse 30, 7230 Schramberg 1, Germany

Filed Mar. 2, 1976, Ser. No. 663,204

Claims priority, application Germany, Mar. 3, 1975, 2509139
Int. Cl.² A61M 5/00

U.S. Cl. 128—214.4

6 Claims



1. A cannula for the introduction of a catheter, comprising: an elongated body having a pointed forward end and slot means extending substantially the full length of said body, and an enlarged grip disposed at the rearward end of said body; said grip including a recess therein extending laterally from said slot means and communicating with said slot

means and adapted to guide the catheter into said slot means;

- a plastic strip removably disposed in said body;
- said strip including a first portion in said slot means and extending throughout said slot means for closing said slot means, and a handle portion secured within said recess to laterally close said recess, so that said handle and grip sealingly surround a catheter inserted within the cannula;
- said handle portion including means to be gripped for removing said strip from said body;
- said grip further including a bore which fluidly communicates with, and forms an extension of said slot means; and
- a container removably connected to said grip in communication with said bore for receiving fluid from said slot means.

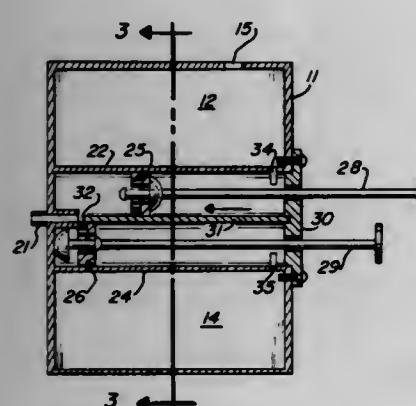
4,054,137

IRRIGATOR FOR BODY CAVITIES

Seung Joon Lee, 4703 Hickory Ave., and Leon Schreiner, 1603 E. 19th St., both of Cheyenne, Wyo. 82001
Filed July 2, 1976, Ser. No. 702,215
Int. Cl.² A61M 1/00

U.S. Cl. 128—234

7 Claims



1. An irrigator for use in irrigating internal body cavities, comprising a unitary housing defining a first chamber for holding a supply of an irrigating solution liquid for irrigating a body cavity and a second chamber for receiving and retaining waste liquid from the body cavity; a first single action pump having an intake stroke for receiving a measured quantity of liquid from the first chamber and an output stroke for pumping the liquid into the body cavity; and a second single action pump having an intake stroke for withdrawing waste liquid from the body cavity and an output stroke for discharging said waste liquid into said second chamber; said first and second pumps each having a port in communication with a single conduit connectable with the body cavity.

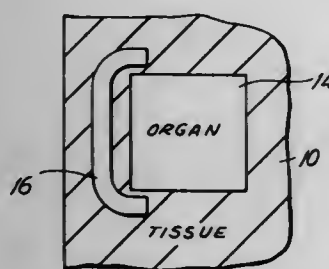
4,054,138

IMPLANTS FOR ACTING ON LIVING BEINGS

Louis Bacalo, 155 Roberts St., Holbrook, N.Y. 11741
Division of Ser. No. 537,572, Dec. 30, 1974, Pat. No. 3,982,537.
This application May 12, 1976, Ser. No. 685,636
Int. Cl.² G61M 31/00

U.S. Cl. 128—260

5 Claims



1. An implantable composition for treating a living being

over a prolonged period of time with an agent which affects the health of such living being by causing said agent to be slowly released during said period of time within internal tissues of the living being, comprising an absorbable carrier substance which solidifies in the internal tissue of the living being and which is safely absorbable by the living being, said substance being solid at the temperature of the body of said living being and being molten and liquid at a higher temperature at which it can be implanted, the implanting temperature being such as to adversely affect the living being during the implanting, said substance having distributed therethrough said agent which affects the health of said living being so that as said substance is absorbed by the living being the agent is released within the internal tissue of the living being to act on its health.

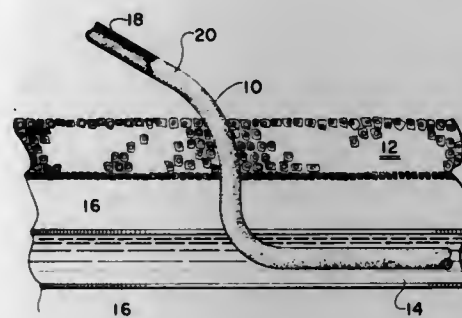
4,054,139

OLIGODYNAMIC CATHETER

Kent B. Crossley, 1245 Delaware Ave., St. Paul, Minn. 55118
Filed Nov. 20, 1975, Ser. No. 633,641
Int. Cl.² A61M 31/00, 25/00

U.S. Cl. 128—260

6 Claims



1. In a catheter of the type comprising an elongated tubular member adapted for physiological use, the improvement wherein the exterior and interior surfaces of said elongated tube have fixed and exposed thereon an effective quantity of silver-bearing, immobile, oligodynamic material, wherein said material forms prophylactic means with respect to infection during said use and is adapted for contact with surrounding tissue.

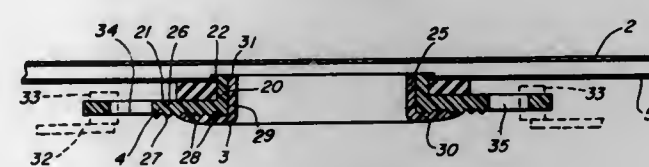
4,054,140

OSTOMY APPLIANCE

Donald E. Etes, Crystal Lake, Ill., assignor to Donald E. Etes, Crystal Lake, Ill.
Filed July 31, 1975, Ser. No. 600,845
Int. Cl.² A61F 5/44

U.S. Cl. 128—283

1 Claim



1. An ostomy appliance for mounting on the body of a patient in position for receiving drainage from the stoma of the patient, said appliance comprising
 - a. a receptacle for receiving such drainage,
 - b. said receptacle having
 1. top and bottom edges, and
 2. an opening through one wall thereof in downwardly spaced relation to said top edge, for receiving the stoma of such a patient therein,
 - c. resilient, annular reinforcing means
 1. permanently secured to the outer face of said wall in axially aligned surrounding relation to said opening and
 2. projecting laterally outwardly away from said outer face,

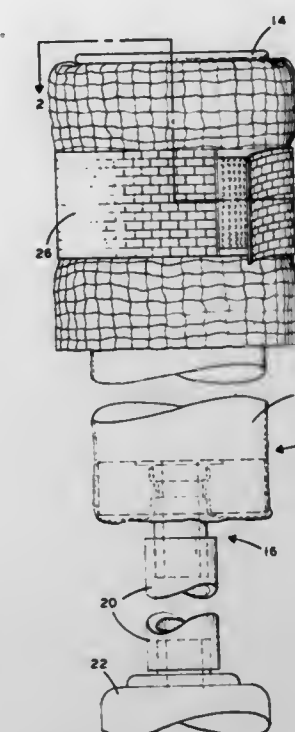
4,054,142

METHOD FOR ATTACHING A PORTABLE URINARY SYSTEM

Dorothy M. Teeter, P.O. Box 362, Bryant, Ark.
Filed Dec. 22, 1975, Ser. No. 643,192
Int. Cl.² A61F 5/44

U.S. Cl. 128—295

1 Claim



- d. a supporting plate having
 1. a tubular body portion, and
 2. two flanges projecting radially outwardly from respective opposite ends of said body portion,
- e. said supporting plate being removably mounted on said receptacle with
 1. said body portion disposed in axial alignment with said opening, and
 2. said reinforcing means clampingly disposed between said two flanges, and
- f. said reinforcing means comprising a substantially flat, uniplanar pad adhesively secured to said receptacle in position wherein the substantially flat sides of said pad coact with respective ones of said flanges so as to be clamped therebetween,
- g. a resilient pad having
 1. a central tubular portion, and
 2. an annular flange projecting radially outwardly from one end of said central tubular portion,
- h. said resilient pad being removably mounted on said supporting plate with
 1. said central tubular portion extending into said tubular body portion, and
 2. said annular flange disposed in outwardly overlying juxtaposition to the outer face of the one of said two flanges remote from said receptacle,
- i. said last mentioned flange including means for connection to opposite ends of a supporting band.

4,054,141

ABSORPTIVE MATERIAL FOR HYGIENIC PURPOSES

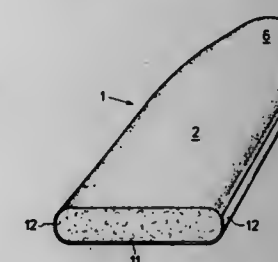
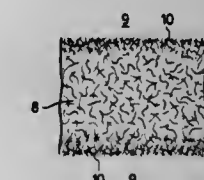
Julius Schwaiger, Hirschbergerstr. 33, 8500 Nurnberg; Wolfgang Bracke, Triebweg 123, D-7000 Stuttgart-Feuerbach; Roland Bergel, Grafstr. 119, D-8000 Munich, and Gerhard Wagner, Mogeldorfer Hauptstr. 60, D-8500 Nurnberg, all of Germany

Filed Feb. 28, 1977, Ser. No. 772,451

Claims priority, application Germany, Apr. 6, 1976, 2625177
Int. Cl.² A61F 13/16

U.S. Cl. 128—287

5 Claims



1. An absorbive body pad for contact with the human skin for hygienic purposes, said body pad having at least one skin contacting surface layer portion and a porous central portion, said central portion comprising randomly dispersed hydrophilic fibers and surface layer portion being porous and comprising fibers at least some of which are hydrophobic, said layer fibers having dispersed therethrough a gradually diminishing quantity of solid thermoplastic particles from the top of the layer to its bottom, which particles when subjected to heat form a dense porous skin-like surface, at least some of said layer fibers adjacent the bottom extending into and engaging with the fibers of said central portion, thereby defining a unitary absorbive body contacting pad.

4,054,143

SINGLE-POLE COAGULATION FORCEPS

Siegfried Bauer, Heldelsheim, Germany, assignor to Richard Wolf GmbH, Knittlingen, Germany

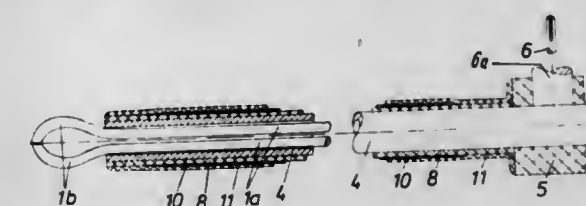
Filed Apr. 19, 1976, Ser. No. 678,065

Claims priority, application Germany, Apr. 26, 1975, 7513534[U]

Int. Cl.² A61B 17/40; A61N 3/06

U.S. Cl. 128—303.17

8 Claims



1. A single-pole coagulation forceps for endoscopy, comprising:
 - a. a conductive guide barrel having proximal and distal ends,

- b. a high frequency connection connected to the barrel in the region of its proximal end,
- c. a conductive rod extending through the guide barrel in electrical conductive contact therewith and comprising forceps arms terminating externally of the distal end of the barrel in forceps jaws and being biased in a direction away from each other,
- d. insulating covering means insulating the end portion of said rod opposite the jaws,
- e. an insulating coating surrounding substantially the length of the barrel,
- f. a substantially rigid sheath extending around substantially the length of said insulating coating,
- g. an impact and heat-resistant insulating sleeve enclosing substantially the length of said sheath and
- h. an insulated operating handle connected to the proximal end of the barrel and the end portion of the rod opposite the jaws for effecting relative displacement of the rod and barrel between positions in which the forceps jaws are closed by engagement with the distal end of the barrel and the forceps jaws are opened by being disengaged from the distal end of the barrel respectively.

4,054,144

SHORT-CRIMP SURGICAL NEEDLE

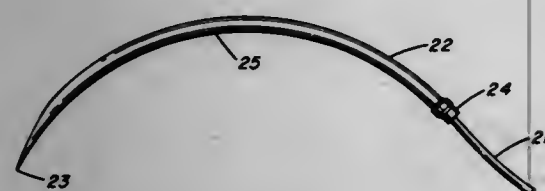
John Ronald Hoffman, New Milford, and Peter John Marsland, Monroe, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 28, 1976, Ser. No. 691,102

Int. Cl.² A61B 17/06

U.S. Cl. 128—339

2 Claims



1. A needed-suture comprising: a surgical needle having a pointed end and a blunt end, having a coaxial cylindrical blind hole in the blunt end; a suture fitted into said blind hole; and a crimp in said blunt end, retaining the suture in said hole, said crimp being spaced from the blunt end of the needle sufficiently far that the suture emerges from an essentially undistorted portion of the blind hole, said crimp leaving the front end of the blind hole essentially undistorted, so that the length of crimp is about 0.012 inch, and at least about 0.010 inches of the front end of the suture is essentially undistorted; said crimp being elliptical, the outside minor diameter of the ellipse formed in the blind hole being after crimping at least about 91% of 0.044 inch or larger surgical wire outside diameter and at least about 87% of less than 0.044 inch surgical wire outside diameter, and bringing said minor diameter into contact with the suture in compressing frictional relationship so that the pull-out value has a maximum of (1) about 3 pounds for size 1 and 0, about 2.5 pounds for sizes 2/0 and 3/0 and about 1.5 pounds for size 4/0 and smaller or (2) half the tensile strength of the suture, whichever is smaller; and the pull-out has a minimum of at least 0.4 pounds for size 3/0 and larger, 0.25 pounds for size 4/0, and 0.1 times the tensile strength of the suture for sizes 5/0 and smaller.

4,054,145
METHOD AND APPARATUS FOR CONDITIONING
TOBACCO

Wolfgang Berndt; Heinz Wittkugel; Waldemar Wochnowski, all of Hamburg, and Gustav Hancke, Hamburg-Meisdorf, all of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

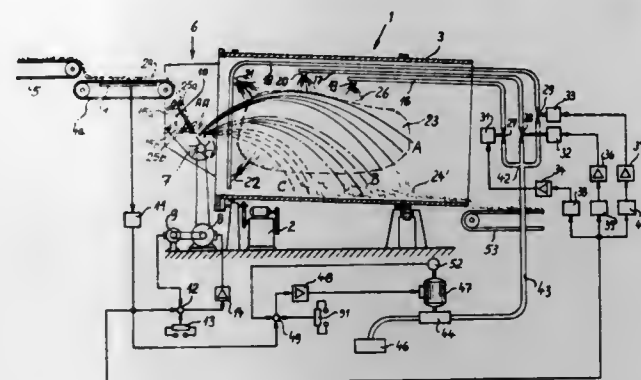
Filed July 13, 1972, Ser. No. 271,532

Claims priority, application Germany, July 16, 1971, 2135637

Int. Cl.² A24B 3/00

U.S. Cl. 131—138

8 Claims



1. A method of contacting tobacco with at least one additive to thereby change the condition of tobacco, comprising the steps of continuously supplying into a predetermined contact zone at least one spray of finely dispersed additive; feeding a continuous stream of tobacco particles toward a location without said contact zone; propelling across said contact zone a continuous body of at least substantially separated tobacco particles whereby such particles are contacted by and conditioned by the dispersed additive, including propelling the particles of tobacco from said location so that the particles have flight spans extending across said contact zone; measuring the rate of tobacco feed; and changing the flight spans of particles as a function of deviations of said rate from a predetermined rate.

4,054,146

CIGARETTE PERFORATOR BOX

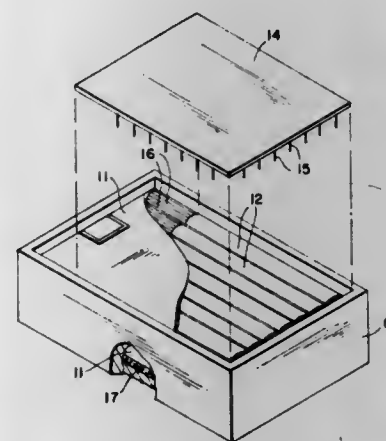
Jaime Ortiz, Jr., Bronx, N.Y., assignor to Lawrence Peska Assoc., New York, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,234

Int. Cl.² A24F 13/00

U.S. Cl. 131—170 R

1 Claim



1. A device for perforating cigarettes comprising a rectangular parallelepiped shaped box with one open broad face, the box being dimensioned to accommodate a pack of cigarettes, a rectangular cover, fitting the open broad face and a plurality of needle shaped members affixed to the inward facing surface of cover, the members being parallel to one another and distributed approximately uniformly over a portion of the cover corresponding to a major portion of the combustible end of the cigarettes which the box is to hold, said box including a

thin resilient pad covering the inner face of box face opposite to the open broad face.

4,054,147

4,4-DISUBSTITUTED DIPHENYLAMINES IN DYE COMPOSITIONS FOR KERATINIC FIBERS

Grégoire Kalopissis, Neuilly-sur-Seine; Andrée Bugaut, Boulogne-sur-Seine, and Françoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Filed Feb. 21, 1975, Ser. No. 551,662

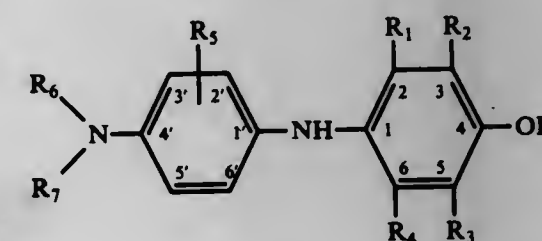
Claims priority, application Luxembourg, Feb. 22, 1974, 69456

Int. Cl.² A61K 7/13

U.S. Cl. 132—7

19 Claims

1. A composition for coloring keratinic fibers comprising an aqueous or hydroalcoholic solution of a diphenylamine of the formula



wherein

R₁ and R₄ each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, amino, lower alkylamino, acetylamino, lower carbamylalkylamino, lower hydroxyalkyl amino, lower carbalkoxy amino and ureido;

R₂ and R₃ each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, acetylamino and ureido;

R₅ represents a member selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy;

R₆ represents a member selected from the group consisting of lower hydroxyalkyl, lower alkylamino alkyl, lower mesylamino alkyl, lower carbamylalkyl, lower sulfoalkyl and lower piperidinoalkyl; and

R₇ represents a member selected from the group consisting of lower alkyl, lower hydroxyalkyl, lower acylamino alkyl, lower mesylamino alkyl, lower carbamyl alkyl, lower sulfoalkyl and lower piperidinoalkyl, each of said alkyl and alkoxy moieties containing 1-6 carbon atoms and each of said acyl moieties representing R-CO— wherein R is selected from the group consisting of an aliphatic and aromatic group, said composition having a pH between 5-12 and said diphenylamine being present in an amount of about 0.002 to 5 percent by weight of said composition.

4,054,148

COOLING DEVICE FOR LIQUID COOLING OF THERMOPLASTIC EXTRUSIONS AND A CALIBRATING DEVICE FOR THERMOPLASTICS EXTRUSIONS INCORPORATING SUCH A COOLING DEVICE

Rolf Gurr, Brunnenstrasse 105, D-4972 Lohne 2, Germany

Filed Oct. 6, 1976, Ser. No. 730,279

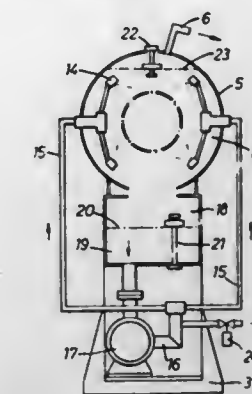
Claims priority, application Germany, Oct. 6, 1975, 2544611

Int. Cl.² B08B 3/02

U.S. Cl. 134—57 R

5 Claims

1. A cooling device for liquid cooling of thermoplastics extrusions in an enclosed calibrating chamber comprising a plurality of liquid jets for the calibrating chamber, a liquid receptacle for positioning beneath the calibrating chamber for receiving liquid sprayed into the calibrating chamber by said liquid jets, a pump for removing liquid from said liquid recep-



liquid level selectively within said liquid receptacle or above the level of said liquid jets in said calibrating chamber.

4,054,149

APPARATUS FOR CLEANING AND STORING A RECREATIONAL VEHICLE SEWER HOSE ASSEMBLY

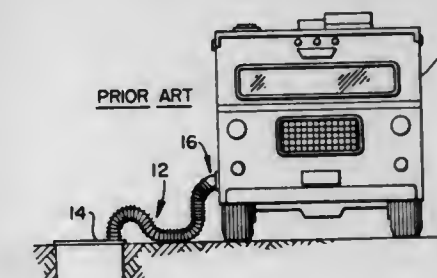
Wray H. Nelson, 307 N. 15th St., Colorado Springs, Colo. 80904

Filed Apr. 16, 1976, Ser. No. 677,536

Int. Cl.² B08B 3/02, 9/02

U.S. Cl. 134—167 C

10 Claims



1. Apparatus for storing a recreational vehicle sewer hose assembly of a collapsible type comprising: an elongated mandrel having opposed marginal end portions, a lower enlarged cone assembly concentrically arranged in fixed relationship about a lower marginal end portion of said mandrel; an upper enlarged cone assembly slidably and concentrically arranged about an upper marginal end portion of said mandrel; said lower and upper cone assemblies having an external conical surface which reduces in diameter towards one another when both cone assemblies are positioned on said mandrel; lock means connected to said upper cone assembly by which said upper cone assembly can be selectively locked into fixed relationship relative to said mandrel and thereby selectively positioned along said upper marginal length of said mandrel; said upper and lower cone assemblies each having a major and a minor diameter of a value to receive the sewer hose of a recreational vehicle therebetween with a marginal length of each cone assembly being received within opposed marginal lengths of the sewer hose assembly such that the sewer hose assembly is held in captured relationship between the cone assemblies.

4,054,150

APPARATUS FOR CLEANING A COOLING SYSTEM

Dalton A. Thomas, Alpine Rte. 1, Box 97, Winterboro, Ala. 35014

Filed July 29, 1976, Ser. No. 709,934

Int. Cl.² B08B 9/00

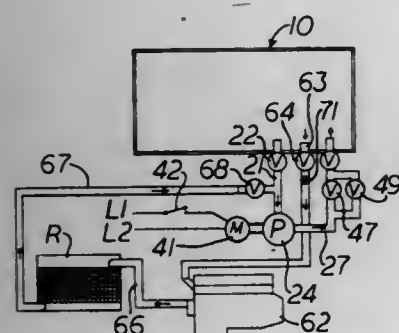
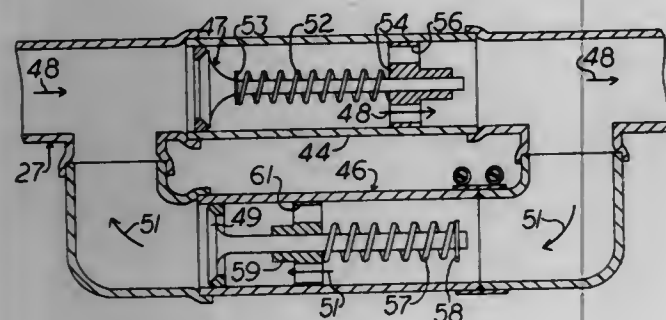
U.S. Cl. 134—169 A

6 Claims

1. Apparatus for cleaning a cooling system having a port for

receiving a cooling solution and a port for discharging said cooling solution,

- a. means supplying a cleaning solution,
- b. means communicating one said port of said cooling system with said means supplying a cleaning solution,
- c. a first discharge conduit communicating with the other said port of said cooling system,
- d. pump means communicating with said first discharge conduit and a second discharge conduit and creating alternately a positive pressure and a negative pressure in said discharge conduits,
- e. flow control means permitting flow of cleaning solution toward discharge through said second discharge conduit in response to the creation of positive pressure in said second discharge conduit and permitting flow of cleaning solution through said second discharge conduit in a direc-



tion reverse to discharge flow in response to the creation of negative pressure in said second discharge conduit, means restraining said flow in said second discharge conduit toward discharge until there is a predetermined increase in positive pressure in said second discharge conduit, and

- g. means restraining said flow in said second discharge conduit in a direction reverse to discharge flow until there is a predetermined increase in negative pressure in said second discharge conduit with the means restraining said flow in a direction reverse to discharge flow requiring a greater pressure to permit flow than the pressure required to permit flow toward discharge so that there is a major flow of cleaning solution toward discharge and a minor flow of cleaning solution in a direction reverse to discharge flow.

4,054,151

CONCENTRATING VORTEX SHAKER

Bernard Parker, Westport, Conn.; Otto Gross, Bergenfield, and Joseph Buchler, Fort Lee, both of N.J., assignors to Buchler Instruments, Division of Searle Diagnostics Inc., Fort Lee, N.J.

Division of Ser. No. 471,751, May 20, 1974, Pat. No. 3,944,188. This application Mar. 9, 1976, Ser. No. 665,280

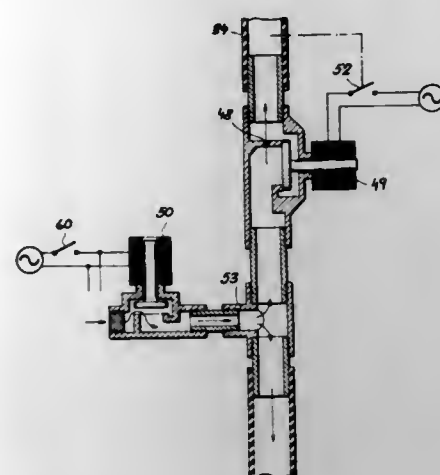
Int. Cl.² G05D 11/00

U.S. Cl. 137-110

2 Claims

1. A vacuum control system comprising:
 - a duct communicating between a chamber to be evacuated and a vacuum source;
 - a first solenoid valve normally closed for controlling the flow of air in said duct between said chamber and said vacuum source;
 - a second solenoid valve normally open for feeding atmo-

spheric air to said duct between said first solenoid valve and said vacuum source;
 a nozzle in said duct for feeding a limited flow of air there-through and connected to bypass said first solenoid valve;
 means for energizing said vacuum source and simultaneously closing said second solenoid valve;



means responsive to a predetermined level of air pressure in said duct between said chamber and said first solenoid valve for energizing said first solenoid valve into an open position; and
 a vacuum gauge communicating with said duct between said first solenoid valve and said chamber.

4,054,152

CHECK VALVE

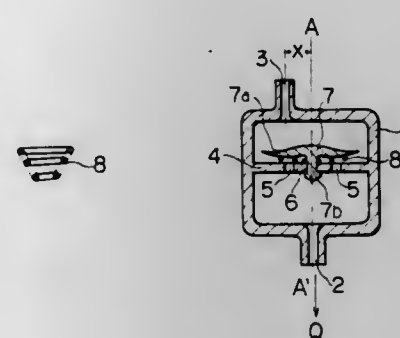
Mikiji Ito, Nagoya, and Zyuziro Yosimura, Okazaki, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
 Filed Jan. 6, 1976, Ser. No. 646,743

Claims priority, application Japan, Mar. 11, 1975, 50-33080[U]; Mar. 13, 1975, 50-33704[U]; Mar. 24, 1975, 50-39613[U]; Apr. 11, 1975, 50-49730[U]; Apr. 23, 1975, 50-56315[U]; Apr. 23, 1975, 50-56318[U]; June 6, 1975, 50-81769[U]; June 6, 1975, 50-81770[U]; June 20, 1975, 50-85654[U]

Int. Cl.² F16K 15/14

U.S. Cl. 137-512

12 Claims



1. A fluid flow control apparatus comprising:
 - a housing having a first and a second ports;
 - first and second separating means disposed in said housing for forming therein a first, second and a third compartments, said first compartment being communicated with said first port, said third compartment being communicated with said second port and said second compartment being disposed between said first and third compartments;
 - a first opening formed in said first separating means for communicating said first compartment with said second compartment;
 - a second opening formed in said second separating means for communicating said second compartment with said third compartment;
 - first valve means, cooperating with said first opening, for

permitting fluid flow in one direction only from said first port to said second port through said first opening when a pressure difference in one direction and between said first and second ports exceeds a first predetermined value, whereby the fluid flow in the direction is established from said first port to said second port through said first and second openings;
 second valve means, cooperating with said second opening, for interrupting said fluid flow through said second opening when said pressure difference exceeds a second predetermined value higher than said first predetermined value.

4,054,153

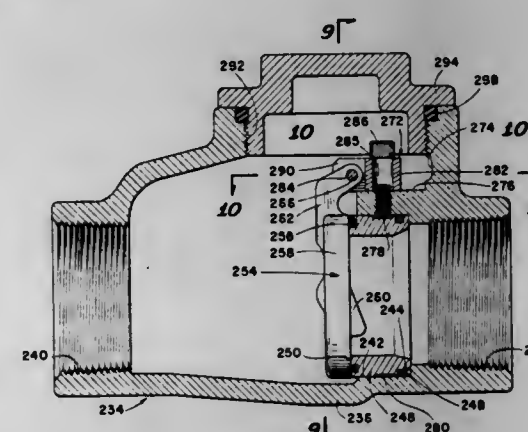
CHECK VALVE

Glen B. Guyton, 3401 E. Newton, Tulsa, Okla. 74115
 Division of Ser. No. 415,742, Nov. 14, 1973, Pat. No. 3,934,608.
 This application May 21, 1975, Ser. No. 579,452

Int. Cl.² F16K 15/03

U.S. Cl. 137-527

2 Claims



1. A check valve comprising a housing having oppositely disposed aligned inlet and outlet ports provided a fluid passageway through the housing, a sleeve member removably disposed in said housing in alignment with the inlet port and having one end extending into the interior of the housing to provide a valve seat, a hanger means removably secured to the housing in the proximity of the valve seat, a bore through said hanger means, independent securing means, accessible through said bore for removably securing the valve seat to said housing, clapper means removably secured to the hanger means and pivotal in directions toward and away from said valve seat to provide alternate open and closed positions for the valve, access port means provided in the housing in the proximity of the clapper means, and cover means removably secured in said access port to selectively provide access to the interior of the housing for facilitating removal and installation of the sleeve member and hanger means and clapper means, the independent securing means being positioned for direct access through the access port.

4,054,154

SELF MONITORING REDUNDANT HYDRAERIC CONTROL SYSTEM

Richard K. Mason, Granada Hills, Calif., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 880,166, Nov. 26, 1969, abandoned. This application June 16, 1971, Ser. No. 153,858

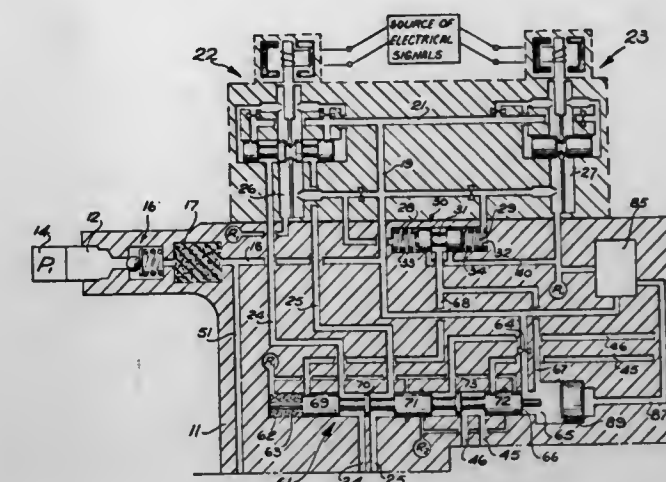
Int. Cl.² F15B 13/043, 13/06; F16K 11/07

U.S. Cl. 137-625.62

1 Claim

1. A redundant control system having a plurality of control channels, each of said channels comprising:
 - a separate source of hydraeric fluid;
 - a separate control valve connected to said source;
 - a separate monitor valve connected to said source;
 - said monitor valve being a dynamically exact model of said control valve connected to the same source of fluid;
 - a separate position indicating pressure signal generating

transducer means connected individually to each of said control and monitor valves;
 separate comparator means connected individually to receive only the position indicating pressure signal from said control valve and said monitor valve connected to the same source of fluid said comparator means being the only detector to which said position indicating pressure signals



are connected thereby to detect disparity therebetween and provide a failure indicating signal responsive thereto; switching means coupled to receive said failure indicating signal and disable a failed control channel responsive thereto; and
 each of said control channels being hydraerically isolated from the other of said control channels.

4,054,155

HYDRAULIC ACTUATED CONTROL VALVE

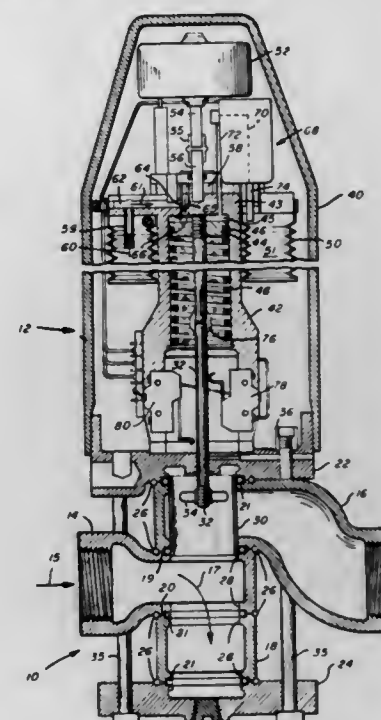
Ralph W. Hill, 2163 S. Sandusky, Tulsa, Okla. 74114
 Continuation of Ser. No. 500,702, Aug. 26, 1974, abandoned.

This application Mar. 8, 1976, Ser. No. 664,500

Int. Cl.² F16K 31/122

U.S. Cl. 137-625.48

5 Claims



1. An electrically actuated flow control valve comprising:
 - a valve body having a fluid inlet and at least one fluid outlet and a cylindrical bore therethrough;
 - a gate member slidably received in said bore and adapted to selectively close or open said valve;
 - an actuator housing having a bottom plate attached to said valve body, the bottom plate having an opening therein coaxial with said valve body cylindrical bore;
 - a cylinder mounted in said housing, the cylinder providing a cylinder cavity closed at one end;

a piston reciprocally positioned in said cylinder cavity;
 a piston rod affixed at one end thereof to said piston, the piston rod extending through said opening in said housing bottom plate, the other end of the piston rod being attached to said valve gate member;
 an electrically powered pump positioned within said housing, the pump having a fluid inlet and a fluid outlet, the fluid outlet being connected to said cylinder housing cavity between said closed end and said piston;
 a check valve in said fluid inlet permitting fluid to flow from said pump into said cylinder cavity but prohibiting fluid flow in the reverse direction;
 a closed, variable volume fluid sump container positioned within said housing adjacent said cylinder and said pump;
 a conduit communicating said sump container with said pump inlet;
 an electrically operated bypass valve having a fluid inlet and a fluid outlet;
 a conduit connecting said bypass valve fluid inlet to said cylinder cavity between said closed end and said piston;
 a conduit connecting said bypass valve fluid outlet to said sump container, said sump container, said conduits, said pump, said cylinder cavity between said piston and said closed end, and said valves forming a closed fluid containing system isolated from the interior of said housing; and
 switch means for selectively energizing said pump and said bypass valve to selectively position said piston, and said piston rod to thereby control the position of said valve gate member, said pump, cylinder and switch means being exterior of said sump container.

4,054,156

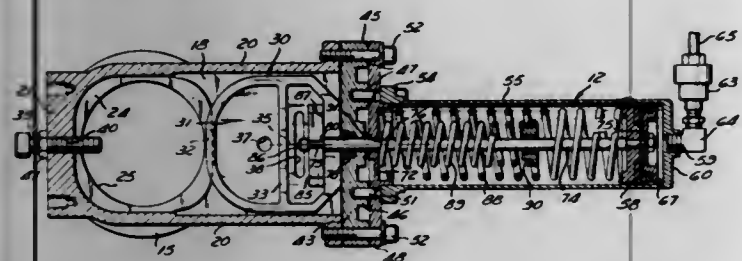
EXHAUST BRAKE VALVE

John Benson, Tigard, Oreg., assignor to The Weatherhead Company, Cleveland, Ohio

Filed Feb. 24, 1975, Ser. No. 552,658
 Int. Cl.² F16K 3/02

U.S. Cl. 137—630.12

19 Claims

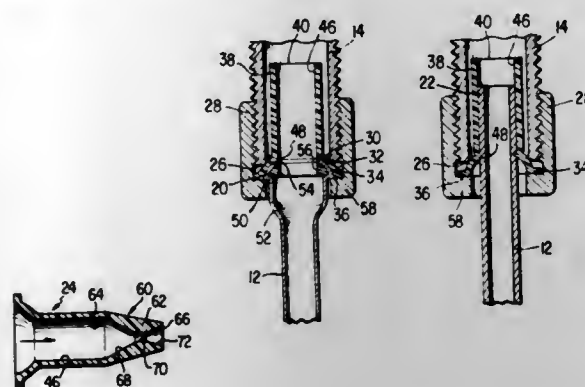


5. An exhaust brake valve comprising a housing having an inlet and outlet, a passage within said housing providing a gas flow path between said inlet and outlet, a valve seat within said housing defining a peripheral boundary around said passage, a valve member in said housing adapted to close said valve seat to restrict said passage, a control member adapted to be connected to a power actuator external of said housing for selectively opening and closing said valve member on said valve seat, lost motion connection means between said valve member and said control member, and means for adjustably limiting the closed position of said valve member to less than complete sealing engagement with said seat, said lost motion connection means including a secondary valving member, said first-mentioned valve member including a relief port, said secondary valving member being adapted to seal said relief port when said first-mentioned valve is in its closed position, and being adapted to open said relief port when said control member initiates opening movement of said first-mentioned valve member.

4,054,157
 COUPLING DEVICE FOR PIPES HAVING A CONVEX SHAPED OR STRAIGHT TUBULAR END
 Charles D. Moseley, Jr., P.O. Box 449, Lynchburg, Va. 24503
 Filed June 20, 1975, Ser. No. 588,773
 Int. Cl.² F15D 1/06

U.S. Cl. 138—42

5 Claims



1. The combination of a pipe coupling having a sleeve with a threaded end and a device insertable into said threaded end for permitting the connection of piping to said sleeve by a correspondingly threaded nut, said piping having either a convex-shaped end or a straight tubular end, said device comprising:

- a housing having a frusto-conical outer surface section which has its largest diameter adjacent one end of said housing and its smallest diameter extending in the form of a cylindrical-shaped section to the other end of said housing, said housing further having a circumferential flange adjacent said largest diameter at said one end, and
- a through bore in said housing, a first portion of said through bore being in the shape of a substantially concave socket extending inwardly from said one end of said housing for receiving said convex shaped end of said connecting piping and a right cylindrical portion extending from said concave socket to said other end of said housing for receiving said straight tubular end of said connecting piping, the junction of said concave socket and said cylindrical portion of said bore being closer to one end of said housing than is the junction of said frusto-conical outer surface section and said cylindrical shaped section and said frusto-conical outer surface section being so tapered with respect to the longitudinal axis of rotation of said housing that said threaded end of said sleeve will engage the approximate mid-point of said tapered surface at a bearing point so that any axially applied compressive force exerted by said threaded nut between said circumferential flange and said bearing point will cause said concave socket to be inwardly, radially distorted into fluid tight engagement with said convex-shaped end of said connecting piping or said compressive force will cause said frusto-conical section to flex at said bearing point thereby inwardly, radially distorting said junction into fluid tight engagement with said straight tubular end of said connecting piping.

4,054,158

INSULATED PIPE STRUCTURE

Terry E. Hoeman, and Douglas D. Fockler, both of Lancaster, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

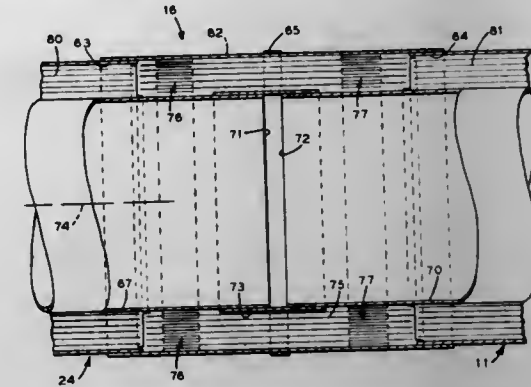
Filed June 14, 1974, Ser. No. 479,330
 Int. Cl.² F16L 9/22

U.S. Cl. 138—155

1 Claim

1. A stack comprising a plurality of stack segments, each of said stack segments having a centrally disposed generally cylindrical conduit, a plurality of foils, each of said foils being individual to a respective one of said conduits, at least one foil wound at least twice about the outer surface of at least one of said conduits in a generally spiral path to produce a plurality of

layers, each of said layers in said spiral winding being spaced from the next adjacent layer, said conduits each having at least one transverse end thereof tapered to mate with and engage the transverse end of the next adjacent conduit, at least one expansion joint in communication with said stack segments, said expansion joint having two axially aligned conduits that are axially spaced from each other, a collar bridging across said



conduits and said spacing therebetween, said collar being secured to only one of said conduits, another foil wrapped around the outside of said conduits and said collar in a spiral path into a roll of said another foil, each layer of said another foil being spaced a predetermined distance from adjacent layers thereof, and a casing extending beyond the extremities of said foil roll.

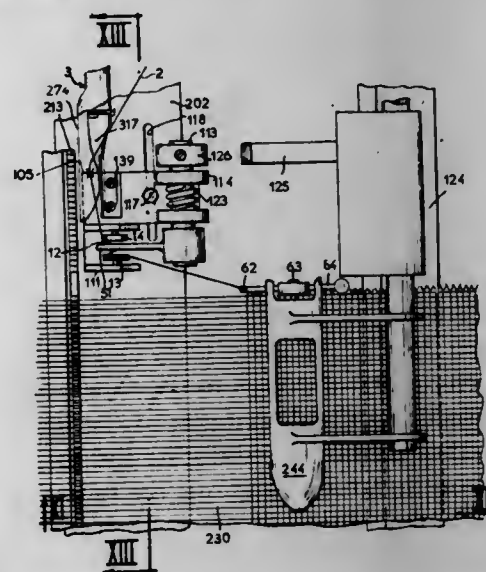
4,054,159

PICKING METHOD FOR A SHUTTLELESS WEAVING MACHINE

Yves Juillard, Mulhouse, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, France
 Continuation-in-part of Ser. No. 509,965, Sept. 27, 1974, abandoned. This application Dec. 3, 1975, Ser. No. 637,180
 Claims priority, application France, Oct. 4, 1973, 73.35451
 Int. Cl.² D03D 47/34

U.S. Cl. 139—450

1 Claim



1. A shuttleless weaving machine having a rocking sley, a shed-forming mechanism, an outside weft thread supply package and cooperating inserting and withdrawing weft thread carriers reciprocable on a predetermined rectilinear path on said sley, means for reciprocating said weft thread carriers, said carriers each having a nipper with the nipper of the inserting carrier being capable to pull mid-width into the shed a weft thread portion from a position between the outside weft thread supply package and the associated first selvage of the fabric which is near one side of the machine, said nipper of said withdrawing carrier being capable to grip the weft thread from said inserting carrier and to pull same as far as a second selvage of the fabric on the other side of the machine, means for forming a weft thread reserve between the first selvage and said path of said inserting carrier, means for cutting the weft thread between said first selvage and said weft thread reserve,

means for actuating said weft thread cutting means in synchronism with the reciprocating movement of said rocking sley, said nipper of said inserting carrier being capable to clamp and pull said weft thread in the form of a loop as far as the middle of the shed, said loop having one arm formed by the free thread end of said weft thread reserve and the other arm formed by the thread part connected to said outside weft thread supply package, means for opening the nipper of said withdrawing carrier upon said withdrawing carrier reaching a position distant from said second selvage by an amount substantially equal to the length of said weft thread reserve, with simultaneous closure of the shed to provide for said weft thread loop to be removed by straightening the weft thread being pulled toward said second selvage and allowed to slide in the open nipper of said withdrawing carrier so as to completely unwind as far as the second selvage during the completion of the travel of said withdrawing carrier, said weft thread reserve forming means comprising two rollers and a hook; said rollers being idly mounted for rotation and spaced apart on two coaxial pivots carried by said sley immediately under the start portion of said rectilinear path of travel of said inserting carrier, said hook being reciprocable vertically in a plane extending between said two rollers from a position higher than said rollers to a position lower than said rollers, said machine further comprising means for actuating said hook in synchronism with the reciprocating movement of said rocking sley.

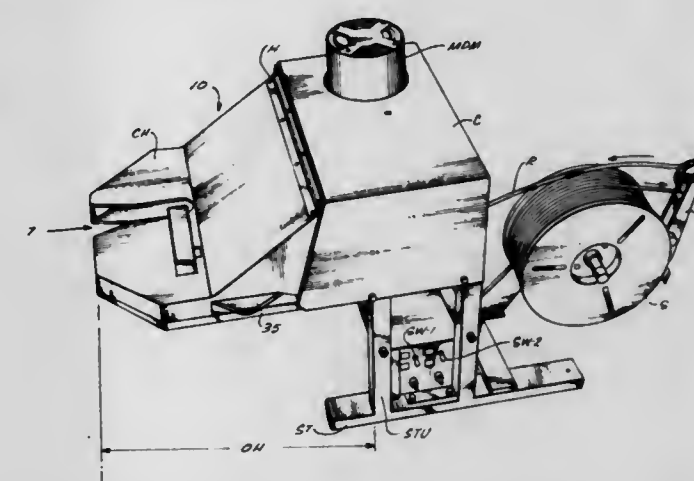
4,054,160

TYING MACHINE

David S. Knudsen, St. Louis, Mo., assignor to International Packaging Corporation, Santa Ana, Calif.
 Continuation of Ser. No. 597,596, July 21, 1975, abandoned.
 This application Dec. 9, 1976, Ser. No. 748,819
 Int. Cl.² B21F 15/04

U.S. Cl. 140—93 A

26 Claims



2. Apparatus for tying articles with tie material capable of being twisted to form a tie comprising:
 means for storing a continuous length of tie material;
 means for metering out a preselected length of tie material from the storage means;
 means for severing the preselected length of tie material from the continuous length of tie material;
 means for receiving the preselected length of tie material and forming it around an article to be tied after it is severed;
 means for receiving and twisting tie material presented to it by receiving and twisting the ends of the tie material on itself, said twisting means being arranged in a spaced relationship relative to said forming means;
 said receiving and forming means being movable towards the twisting means and including means for positively guiding and forming the tie material around an article to be tied and presenting the tie material ends to said twisting means; and
 drive means coupled to each of the aforementioned means

for actuating the severing means, the forming means and the twisting means to twist-tie an article positioned in the machine.

4,054,161

APPARATUS FOR FILLING A CONTAINER AND METHOD OF DE-AERATING MATERIAL

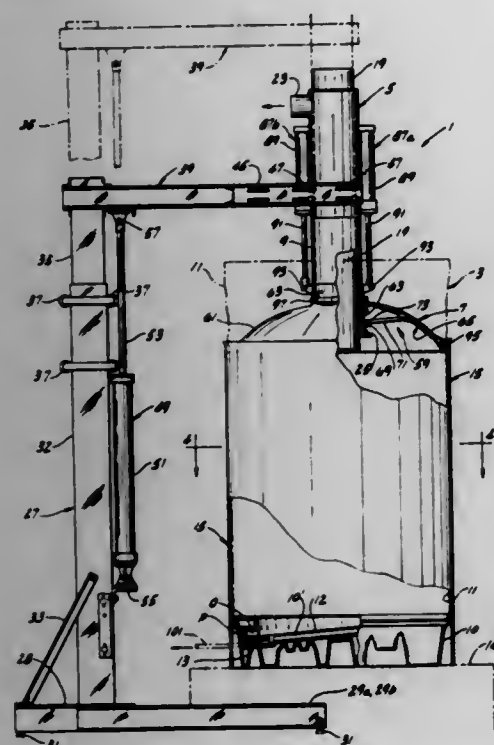
Charles S. Alack, St. Louis, Mo., assignor to Semi-Bulk Systems, Inc., St. Louis, Mo.

Filed Apr. 22, 1976, Ser. No. 679,216

Int. Cl.² B65B 1/04

U.S. Cl. 141-12

23 Claims



22. A method of de-aerating a powdered or particulate material filling a container, the latter having side walls, a base including a generally horizontal floor for supporting a load of said material in said container, a porous diaphragm overlying said floor separating the material from the floor, and a passage in the container in communication with the exterior of the container and the space between the bottom face of said diaphragm and said floor, said method comprising filling the container with powdered or particulate material and connecting a vacuum source to said passage for reducing the pressure in said space below atmospheric pressure thereby to draw air out of said material through said diaphragm to de-aerate said material and to at least partially reduce its volume.

4,054,162

COLOR STABILIZED ACRYLONITRILE POLYMERS

Manfred Krieg, Darmstadt, and Armin Meyer, Darmstadt-Eberstadt, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed May 13, 1976, Ser. No. 686,034

Claims priority, application Germany, June 25, 1975, 2528201

Int. Cl.² C08K 5/16, 5/10

U.S. Cl. 260-45.9 KB

25 Claims

1. A method of making a polymer composition stabilized against thermal discoloration, said composition comprising a homopolymer of acrylonitrile or a copolymer comprising at least 20 percent by weight of acrylonitrile, the balance being one or more monomers copolymerizable with acrylonitrile, which method comprises dissolving an effective amount of at least one stabilizer selected from the group consisting of nitroalkanes having 1 to 8 carbon atoms, nitrocycloalkanes having 5 or 6 carbon atoms in the cycloalkane ring, alkyl isocyanates having up to 8 carbon atoms, cycloalkyl isocyanates having 5 or 6 carbon atoms in the cycloalkyl ring, aryl isocyanates having 6 to 22 carbon atoms in the aryl group, and pyrocarbonic acid dialkyl esters wherein each alkyl group has from 1 to 8 carbon atoms, in monomeric acrylonitrile or in a mono-

mer mixture comprising at least 20 percent by weight of acrylonitrile, which monomer or monomer mixture may be partially polymerized, and then polymerizing the resultant mixture in bulk to form said stabilized composition.

4,054,163

TIRE INFLATOR

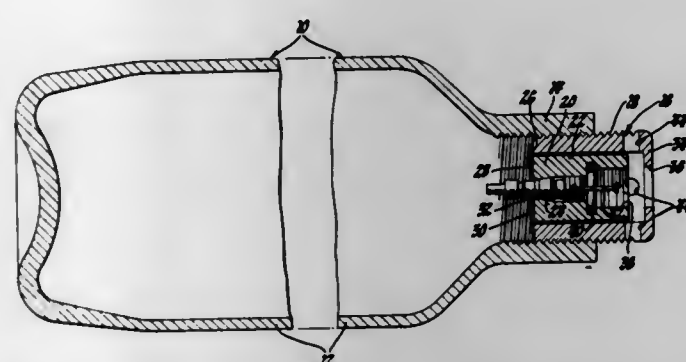
Robert K. Brown, Jr., Sandusky, and Richard L. Merrell, Huron, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1976, Ser. No. 678,155

Int. Cl.² B65B 3/04

U.S. Cl. 141-291

2 Claims



1. A tire inflator comprising a pressure vessel containing pressure fluid and having an opening, a housing secured within the opening and including an axial bore opening through the inner end of the housing to the pressure vessel and opening through the outer end of the housing to atmosphere, the housing including a plurality of radial ports adjacent the outer end thereof opening to the axial bore and to atmosphere, a valve body slidably received within the axial bore of the housing in radially spaced relationship to the bore wall, the valve body including an axial bore opening through the inner end of the valve body to the pressure vessel and opening through the outer end of the valve body to atmosphere through the outer end of the housing, normally closed valve means mounted within the bore of the valve body to control fluid flow from the pressure vessel through the valve body to a tire, a fluid pressure rupturable diaphragm bridging the radial space between the inner ends of the valve body and of the housing and having an opening therethrough to the axial bore of the valve body, means securing the diaphragm to the inner ends of the valve body and of the housing to locate the valve body within the axial bore of the housing and seal the radial space between the inner ends of the valve body and of the housing to thereby normally limit fluid flow between the pressure vessel and the tire through the normally closed valve means, the valve means being opened by insertion of a tire valve within the housing to permit the flow of pressure fluid from the pressure vessel to a tire for inflation thereof, the occurrence of pressure within the pressure vessel exceeding a predetermined limit acting against the inner end of the valve body and forcing the valve body outwardly within the axial bore of the housing to rupture the diaphragm between the inner ends of the valve body and of the housing and permit the flow of pressure fluid from the pressure vessel through the radial space between the valve body and valve housing and to atmosphere through the radial ports, and means locating the valve body outwardly within the axial bore of the housing in a position closing the outer end of the axial bore of the housing to prevent fluid flow therethrough to atmosphere and thereby prevent reverse thrust of the pressure vessel.

4,054,164

PENCIL SHARPENER

Ryoji Kose, Shimodate; Syoichi Saito, Funabashi, and Masahito Ogiwara, Kamagaya, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

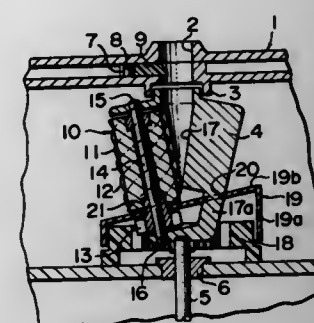
Filed Oct. 14, 1976, Ser. No. 732,199

Claims priority, application Japan, Oct. 17, 1975, 50-141590

Int. Cl.² B43L 23/00

U.S. Cl. 144-28.7

4 Claims



1. A pencil sharpener comprising:
a frame;

rotary blade including a cylindrical portion having spiral cutting edges and a pinion co-axially provided at one end of said cylindrical portion;
a blade holder which rotatably supports said rotary blade and defines a conical cavity for receiving an end of a pencil therein;
said blade holder being supported by said frame to be rotatable around the axis of said conical cavity;
an annular internal gear fixedly supported by said frame and meshing with said pinion;
a drive shaft which drives said blade holder around said axis; and
a cover means supported by said blade holder to be rotatable therewith;
said cover means traversing said blade holder and said rotary blade thereby isolating the meshing region of said pinion and said annular internal gear from said conical cavity.

4,054,165

GROOVED SHEET MATERIAL

Takuji Karakawa, Fuchu, Japan, assignor to Karakawa Fancy Plywood Works Ltd., Japan

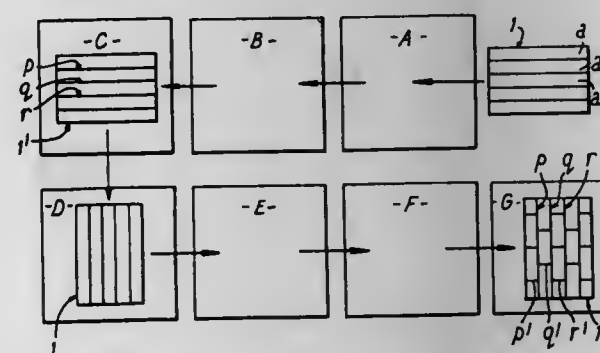
Filed Feb. 28, 1975, Ser. No. 553,946

Claims priority, application Japan, Mar. 14, 1974, 49-29752

Int. Cl.² B27C 5/00

U.S. Cl. 144-136 R

4 Claims



1. Apparatus for preparing a grooved veneer plywood and hardboard sheet material, comprising:

- a plurality of groove-forming devices disposed in a row
- means for causing relative feeding movement, normally to said row of devices, of a sheet of said material having provided in a major face thereof a plurality of first parallel grooves disposed in a first direction parallel to said row
- a plurality of shifting means coupled one to each of said groove-forming devices and adapted to shift the respective groove-forming device into and out of operative

engagement with said major face of said sheet material, and

iv. control means connected to each of said plurality of shifting means and arranged to cause shifting of selected ones of said groove-forming devices into operative engagement with said sheet material and simultaneously to cause shifting of other selected ones of said groove-forming devices out of operative engagement with said sheet material, according to the relative position of the sheet material in the feeding direction, thereby to permit the forming in said major face of the material of a plurality of second parallel grooves disposed in a second direction normal to said first direction, at least one of said second grooves being intermittent and formed in a first series of alternately spaced lands of said major face, at least another of said second grooves being intermittent and formed in a second series of alternately spaced lands situated intermediate the lands of said first series of lands.

4,054,166

CHRISTMAS TREE COVER

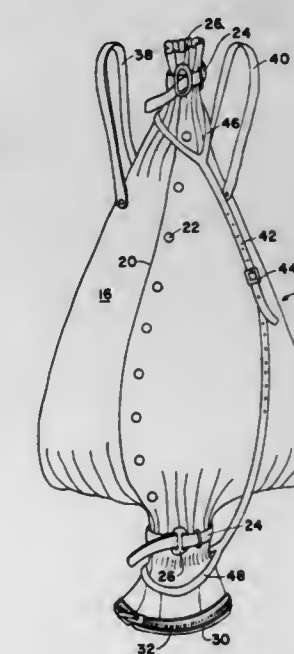
John J. Burke, 5547 S. Sacramento, Chicago, Ill. 60629

Filed Feb. 10, 1977, Ser. No. 767,365

Int. Cl.² B65D 81/00

U.S. Cl. 150-52 R

8 Claims



1. A Christmas tree carrying cover comprising:

a flexible sheet of material adapted to be wrapped about a Christmas tree, with opposite edges overlapping;
complemental means on each of said edges for retaining said edges secured together;
a drop cloth removably secured to the bottom edge of said sheet; and
tie means adjacent the top and bottom edges of said sheet for drawing said sheet taut about said tree;
said drop cloth including a radial slit enabling said drop cloth to be draped about the trunk of a tree when removed from said sheet.

4,054,167

CASE FOR PHOTOGRAPHIC CAMERAS

Günter Rausch, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed July 1, 1976, Ser. No. 701,992

Claims priority, application Germany, July 11, 1975, 7522008[U]

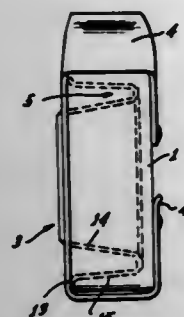
Int. Cl.² G03B 29/00

U.S. Cl. 150-52 J

6 Claims

1. Case for photographic cameras, with projecting objective lens, having a body and a flap with a conical extension having internal access for receiving the objective lens, comprising:

two parallel running score lines defining a folding zone and extending around the extension of the flap, dividing the extension into a frontal and a rear portion; and a closed loop bending zone between the rear portion of the extension and the flap for inward bending of the rear portion so that the extension can be folded into the case, by shifting the frontal portion into the rear portion and inverting the rear portion.



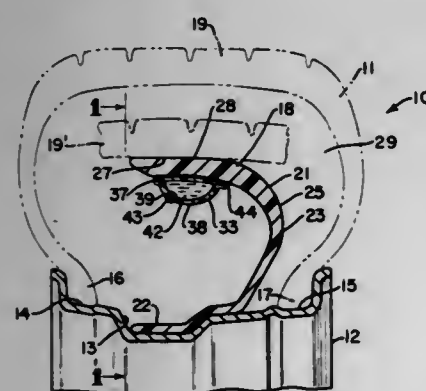
4,054,168 FLUID DISPENSING APPARATUS FOR TIRE WHEEL ASSEMBLY

Roger N. Beers, Uniontown, and Marvin T. Conger, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 15, 1976, Ser. No. 677,218
Int. Cl.² B60C 17/04

U.S. Cl. 152—330 L

5 Claims



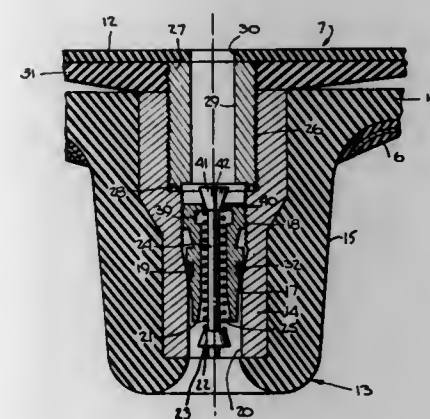
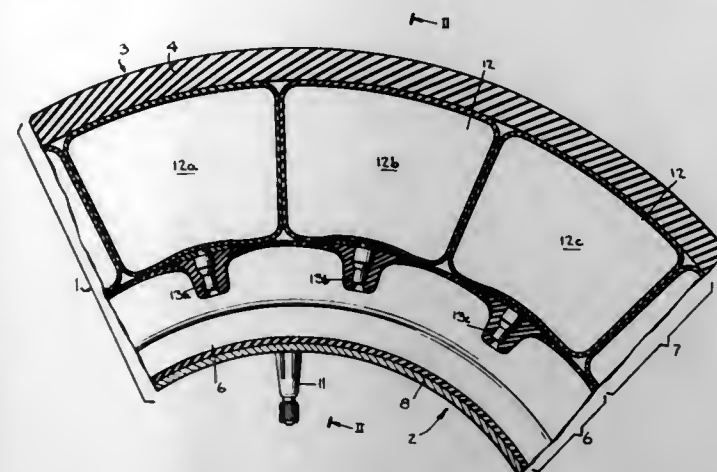
1. A fluid container for mounting on the radially inner surface of a stabilizer ring positioned within a tire cavity radially outward of a wheel rim and radially inward of a tread portion of a tire with said ring having a radially inner surface and a radially outer surface engageable with a tread portion of said tire in the deflated condition of said tire comprising a fluid-containing bag having walls of flexible sheet material, at least two of said walls are connected at a seam in overlapping relation, an adhesive interposed between said radially inner surface of said ring and said first one of said walls of said bag for mounting said bag on said ring and fluid releasing means responsive to rotation of said tread portion in engagement with said radially outer surface of said ring to provide communication between the space within said bag and the space within said tire cavity for release of said fluid, said fluid releasing means includes an adhesive interposed between and holding said walls together in sealing relationship at said seam, said adhesive having a predetermined softening temperature higher than the normal operating temperature of said tire during operation in the inflated condition whereby said fluid will be released from said bag at said seam when the operation of said tire in the deflated condition generates sufficient heat to raise the temperature above said predetermined softening temperature.

4,054,169 INNER TUBE ASSEMBLY FOR RUN-FLAT TIRES

Andre M. Devienne, Compiègne, and Gilbert L. Igea, Clairoix, both of France, assignors to Uniroyal S.A., Clairoix, France
Filed July 8, 1976, Ser. No. 703,339
Claims priority, application France, July 18, 1975, 75.22609
Int. Cl.² B60C 5/06

U.S. Cl. 152—337

9 Claims



1. An inner tube assembly for a pneumatic tire, said assembly comprising an annular primary tube means, primary valve means connected to and communicating with the interior of said primary tube means, secondary tube means surrounding said primary tube means, and secondary valve means interconnecting and communicating with the interiors of said primary and secondary tube means, said secondary valve means remaining open and intercommunicating the interiors of said primary and secondary tube means for as long as there remains an equilibrium of pressure therebetween, said secondary valve means including closure means for pneumatically isolating the interiors of said primary and secondary tube means from one another when there occurs a pressure drop in said secondary tube means relative to said primary tube means, said secondary valve means including a housing having a pair of coaxially open ends, an elongate rod supported for endwise movement in said housing and defining with the interior of said housing an annular space, said rod including a pair of enlarged heads coaxially spaced from one another over a distance that is greater than the spacing between said opposite open ends of said housing, spring means surrounding said rod between said heads, one of the ends of said spring means being engageable with one of said heads of said rod, the other end of said spring means being engageable with the interior of said housing adjacent to one of said open ends of said housing, said spring means urging said rod into a position at which one of said heads of said rod engages one of said open ends of said housing, the latter said head being diametrically larger than the latter said open end and including groove means for intercommunicating the exterior of said housing with the interior thereof when the latter said head is engaged with the latter said open end, the opposite one of said heads also being diametrically larger than its corresponding one of said open ends of said housing and held remote from the latter by said spring means when the

other head engages its corresponding one of said open ends of said housing, said head which is held remote from its corresponding open end of said housing by said spring means confronting the interior of said primary tube means and being movable in response to pneumatic pressure thereagainst into engagement with its corresponding open end of said housing to close the latter said open end and pneumatically isolate the interiors of said primary and secondary tube means from one another.

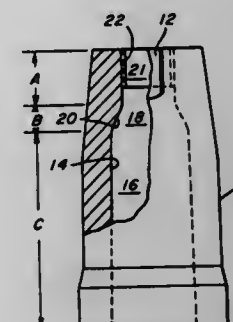
4,054,170 INGOT MOLD AND METHOD FOR POURING INGOTS

Dwight A. Kraai, and Clifford R. Whiddon, both of Lower Burrell, Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed June 15, 1976, Ser. No. 696,239
Int. Cl.² B22D 7/10

U.S. Cl. 164—53

6 Claims



1. Apparatus for casting ingots comprising an ingot mold having an interior wall defining a mold cavity provided with a main bottom section, a top section of reduced cross sectional area and an intermediate tapered section connecting the top and bottom sections, and a hot top lining only a portion of the top section, said hot top terminating a substantial distance above the intermediate section and the height of the top section being such that a solid bridge of substantial height is obtained between the upper primary pipe cavity and the secondary lower cavity of the ingot.

5. A method of casting a steel ingot comprising the steps of providing an ingot mold having an interior wall defining a mold cavity provided with a main bottom section, a top section of reduced cross sectional area and an intermediate tapered section connecting the top and bottom sections, lining said top section with a hot top having its lower end a substantial distance above the top of the intermediate section, and pouring molten steel into said mold until the level of the molten steel reaches substantially the top of said hot top.

4,054,171 METHOD AND APPARATUS FOR STARTING THE CONTINUOUS CASTING OF A METAL

Kenneth Ray Stone, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Jan. 13, 1977, Ser. No. 759,088
Int. Cl.² B22D 11/06

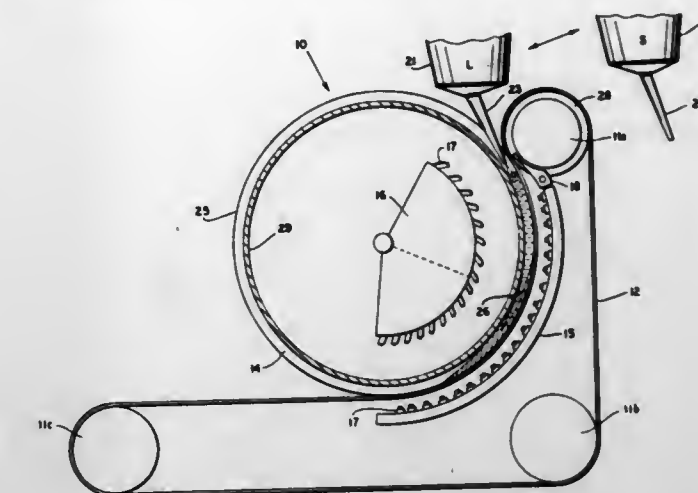
U.S. Cl. 164—87

27 Claims

9. A method of starting the continuous casting of a first metal in a mold formed by engaging the peripheral groove of a rotatable casting wheel with a continuous flexible band, said first metal having a melting point higher than the melting point of said mold, comprising the steps of:

- introducing into said mold a molten second metal having a melting point lower than the melting point of said mold at a temperature substantially lower than the molten temperature of said first metal;
- immediately cooling said mold at a rate sufficient to prevent said mold from melting on contact with said first metal;
- terminating the introduction of second metal when said

mold has filled to the point of introduction of said molten metal;



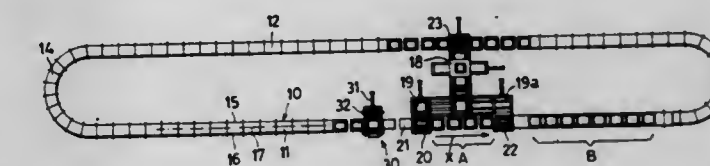
D. immediately introducing molten first metal into said mold while continuing to cool said mold.

4,054,172 DEVICE FOR THE PRODUCTION OF CASTINGS

Julius Hansberg, Via Bellinzona 31/2, Modena, Italy
Filed Apr. 30, 1976, Ser. No. 682,353
Claims priority, application Italy, Apr. 30, 1975, 22920/75
Int. Cl.² B22D 47/02

U.S. Cl. 164—168

6 Claims



1. An apparatus for producing castings, comprising a conveyor arranged in a closed loop having at least two laterally adjacent straight sections spaced along the closed loop, at least one moulding machine located adjacent said conveyor between said straight sections adapted to form sand moulds within flasks, at least one flask loading device located adjacent a first one of said straight sections of said conveyor including means to receive mould filled flasks from the moulding machine and to load them on said conveyor, at least one flask stripping device located adjacent a second one of said straight sections of said conveyor including means to strip the flasks from the respective moulds and to transfer them to said moulding machine, a metal pouring device located adjacent said conveyor immediately downstream from said loading device in a first conveyor path from said loading device to said stripping device and a mould discharging device located adjacent said conveyor immediately upstream of said loading device in a second conveyor path from said stripping device to said loading device.

4,054,173 APPARATUS FOR PRODUCING COMPLETELY RECRYSTALLIZED METAL SHEET

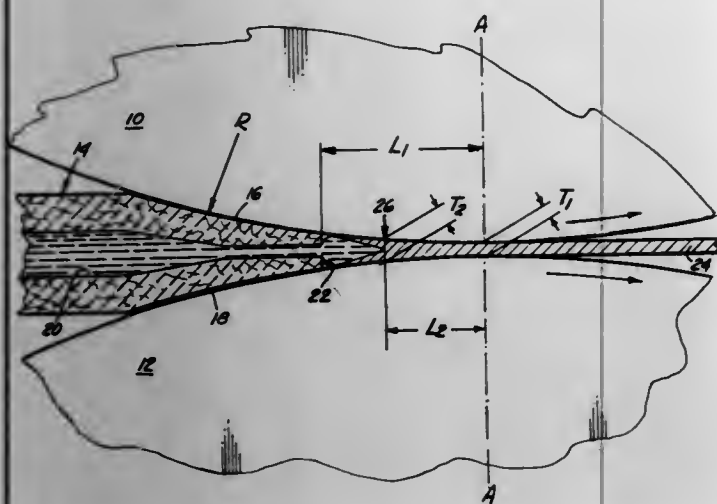
Jim Hickam, South Orange, Calif., assignor to Hunter Engineering Co., Inc., Riverside, Calif.
Division of Ser. No. 535,421, Dec. 23, 1974, abandoned. This application June 28, 1976, Ser. No. 700,177
Int. Cl.² B22D 11/06

U.S. Cl. 164—428

1 Claim

1. In apparatus for continuously casting metal in the form of a sheet or strip having exceedingly fine grain, said apparatus consisting of a pair of parallel casting rolls spaced apart slightly to receive molten metal between them, a pouring tip of heat-insulating material fitted snugly into the converging space

between said casting rolls on one side thereof, and means for driving said rolls synchronously in the direction to carry the molten metal from said pouring tip through the space between said rolls, while heat is extracted from the molten metal, causing the same to solidify, the improvement comprising: said casting rolls having a radius of not less than 18 inches and spaced apart approximately 0.250 inches at their closest point;



the pouring spout being positioned with its outer tip set back from the roll centerline a distance not less than 2.5 inches; means adapted to drive said rolls at a speed of approximately 0.6 rpm; and means adapted to cool said rolls such that the molten metal freezes solidly across the space from one casting roll to the other at a point where the metal is approximately 0.375 inches thick, so that the solidified metal is hot-rolled down to 0.250 inch thickness.

4,054,174 METHOD OF INHIBITING DEPOSITION OF INTERNAL CORROSION PRODUCTS IN TUBES

Kurt H. Haller, Akron, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.
Continuation-in-part of Ser. No. 452,248, March 18, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,415
Int. Cl.² F28F 19/06

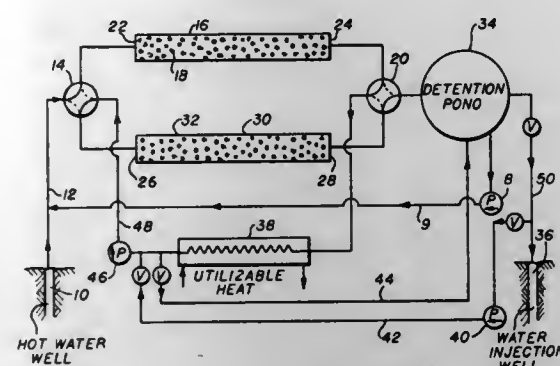
U.S. Cl. 165—1

3 Claims



1. The method of inhibiting the deposition in solid form on the inside surfaces of heat absorbing vaporizable liquid conducting tubes of suspended solids, consisting principally of magnetite, Fe_3O_4 , transported by the liquid in the tubes which have their outside surfaces exposed to hot gases and are embodied in a closed cycle vapor generating system wherein almost all of the vapor generated is recovered as condensate and returned to the tubes, which comprises using ferrous metal tubes having a film of a non-ferrous metal on the inside surfaces of the tubes which has been applied in a known manner.

4,054,175
GEOTHERMAL POWER SYSTEM
Judson S. Swearingen, 500 Bel-Air Road, Los Angeles, Calif. 90024
Division of Ser. No. 513,777, Oct. 10, 1974, Pat. No. 3,951,794, which is a continuation-in-part of Ser. No. 424,470, Dec. 13, 1973, Pat. No. 3,935,102. This application Dec. 12, 1975, Ser. No. 640,006
Int. Cl.² F03G 7/02; C02B 5/06
U.S. Cl. 165—45 8 Claims



1. A system for extracting heat from hot unrefined water containing scale-forming impurities comprising:
a source of said hot unrefined water;
a heat exchange means having an entrance end and an exit end;
means for conveying said hot unrefined water from said source to the entrance end of said heat exchange means;
a detention receptacle for receiving cooled unrefined water from the exit end of said heat exchange means; and means for separating and extracting a dispersion of precipitated particles of said impurities from said cooled unrefined water in said detention receptacle, and recycling said dispersion to said hot unrefined water at a point prior to its entry into said heat exchange means.

4,054,176 MULTIPLE-COMPLETION GEOTHERMAL ENERGY PRODUCTION SYSTEMS

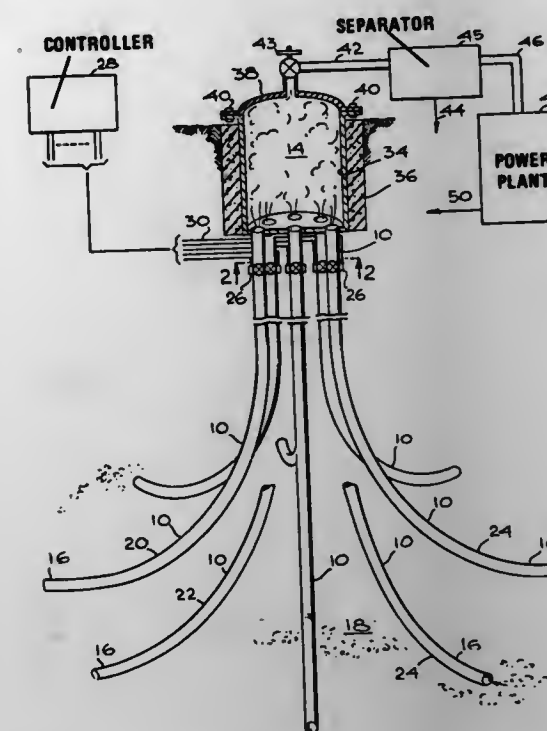
Allen T. Van Huisen, 29456 Indian Valley Road, Rolling Hills Estates, Calif. 90274
Division of Ser. No. 375,751, July 2, 1973. This application May 13, 1974, Ser. No. 469,391
Int. Cl.² F01K 7/04

U.S. Cl. 165—45

20 Claims

1. A system for the recovery of geothermal energy comprising:
a closed, steam vapor collection reservoir vessel having side walls, a top wall and a bottom wall, said side walls and bottom wall being recessed below the surface of the earth and said bottom wall containing a plurality of apertures;
a plurality of cased geothermal wells, the casings of each having a first end converging toward and sealingly connected to one of the apertures in the bottom wall of said reservoir and each well casing diverging from said reservoir and having a second end disposed within a common, wet geothermal zone having a temperature of at least 300° F;
said second ends being closed and a portion of each well within the zone and containing the closed end forming a heat exchanger;

supply means for delivering water from the surface to said heat exchanger to form steam vapor therein; and

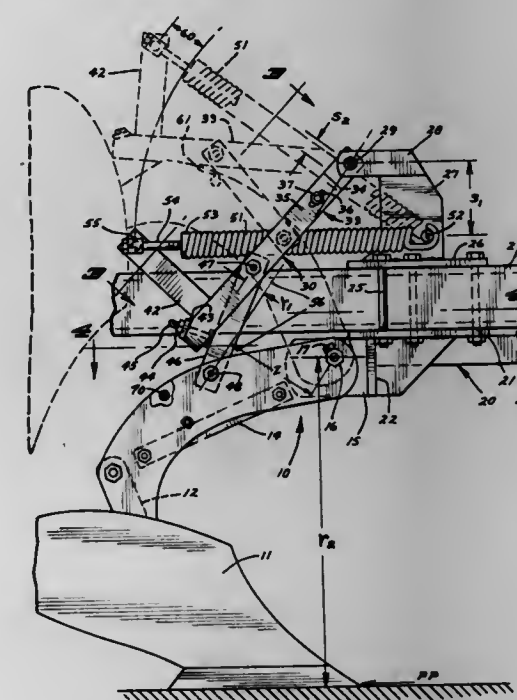


vapor fluid delivery means within each of said wells to conduct heated steam vapor fluid from each second end to said reservoir.

4,054,177
TRIP BEAM LINKAGE
Sherman H. Quanbeck, Aneta, N. Dak. 58212
Filed Aug. 21, 1975, Ser. No. 606,726
Int. Cl.² A01B 61/00

U.S. Cl. 172—267

15 Claims

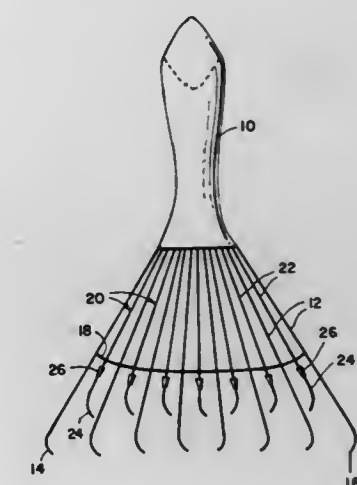


1. A tripping beam for an earth working tool including a generally horizontal beam frame member extending fore and aft and diagonally with respect to the direction of travel of said tool, said frame member having a substantial vertical depth, and means to mount a pivoting trip beam to said frame member including a first support fixed to the lower side of said frame member and including means forming a first pivot immediately below and to the rear of said frame member, an earth working tool including a standard pivotally mounted about said first pivot and extending rearwardly and downwardly therefrom, a second support mounted to and positioned above said frame member, said second support including a mast extending upwardly from said frame member, a folding linkage including first and second links, a pivot connection pivotally mounting

said first and second links together at first portions thereof, said first link having a second portion pivotally mounted to said second support and said second link having a second portion pivotally mounted to said earth working tool rearwardly of the frame member and said first pivot, said folding linkage extending rearwardly and downwardly from the pivotal mounting of said second portion of said first link to said second support to said earth working tool, and tension spring means having a first end mounted to said second support for pivotal movement about an axis above said frame member and below the pivotal mounting of the first link to the second support, and means to mount a second end of said tension spring means to said first link at a level above the lower edge of said frame member, said means to mount said second end of said tension spring means positioning the second end of said spring means rearwardly of the pivot between said first and second links and urging the pivot between said first and second links remaining spaced rearwardly and above a plane defined by the axes of the pivotal mountings of said second portions of said first and second links, respectively, when the earth working tool is in a working position, the points of mounting of the tension spring means separating to elongate said tension spring means as the earth working tool moves from working position.

4,054,178
GARDEN TOOL WITH ADJUSTABLE LENGTH TINES
Ferron Boothe, P. O. Box G/415 Beach 43rd St., Far Rockaway, N.Y. 11691

Filed Sept. 8, 1976, Ser. No. 721,186
Int. Cl.² A01B 1/14; A01D 7/06
U.S. Cl. 172—374 7 Claims



1. A gardening tool, comprising a handle portion, a plurality of first tines having a predetermined length depending therefrom, a plurality of second tines depending from said handle, said second tines being variously disposed between said first tines, at least some of said second tines including two portions, a first portion being hollow and having a predetermined internal diameter ω , said first portion being provided with external threads disposed thereabout, said second portion having an external diameter lesser than said internal diameter, said second portion being telescopically disposed for movement in said first portion for varying the length thereof, means disposed on said second tines for arresting the telescopic movement, said means including a rotatable clamp defining a central bore through which said second tine passes, said central bore being provided with a variably tapered internally threaded section for threadably engaging said external threads disposed about said first portion the degree of narrowing of the taper of said internally threaded section varying substantially from one end thereof to the other, so as to facilitate clamping of the second portion in place with respect to the first portion.

4,054,179

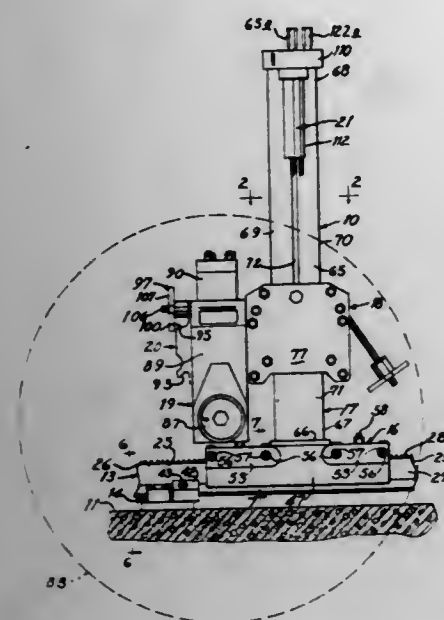
STONE AND CONCRETE CUTTING MACHINE

Allen L. Destree, 15728 Sunset Road, Bothell, Wash. 98011
Filed May 26, 1976, Ser. No. 690,071

Int. Cl.² E21C 9/00

U.S. Cl. 173—32

11 Claims



1. A stone and concrete cutting machine, comprising:
an elongated base;
a bracket means for mounting the base in a stationary position relative to a surface to be cut;
a truck means mounted to the base for longitudinal movement along the base length;
an elongated standard protruding from the truck means in lateral relation to the base length;
a cutting head receiving carriage mounted to the standard movement along the standard length;
a cutting head;
an adapter means having coupling elements on the cutting head and receiving carriage for releasably mounting the cutting head to the receiving carriage on either of oppositely facing sides of the standard;
a carriage drive means interconnecting the standard and carriage for moving the carriage along the standard length; and
a truck drive means interconnecting the truck means and base for moving the truck along the length of the base.

4,054,180

IMPACT DRILLING TOOL HAVING A SHUTTLE VALVE

Grey Bassinger, San Antonio, Tex., assignor to Reed Tool Company, Houston, Tex.
Filed Feb. 9, 1976, Ser. No. 656,283

Int. Cl.² B25D 9/00

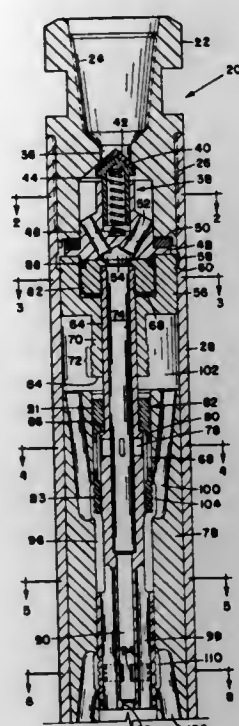
U.S. Cl. 173—136

17 Claims

1. In an impact drilling tool for operation by high pressure fluid comprising a casing, an upper sub connected to said casing for connection to a string of drilling pipe, anvil means slidably positioned in a lower end of said casing, bit means located below said anvil means, hammer means slidably positioned in said casing for periodically impacting said anvil means, feeder means in said casing extending downward into an opening of said hammer means adapted to receive high pressure fluid from said drilling pipe, upper cross passages in said feeder means periodically communicating said high pressure fluid from a center flow passage through said hammer means to an upper pressure chamber, lower cross passages in said feeder means periodically communicating said high pressure fluid from said center flow passage through said hammer means to a lower pressure chamber, the improvement comprising:

shuttle valve means surrounding said upper cross passage of said feeder means, said shuttle valve means having shuttle passages therethrough maintaining communication with

said upper cross passages, said shuttle valve means being movable along said feeder means between a first and second position to provide periodic communication between the shuttle passages and the upper pressure chamber, and said shuttle valve means being movable preceding



like movement of said hammer means, with communication through said upper cross passage with said upper pressure chamber being maintained through said shuttle passages for a substantially extended portion of a down-stroke of said hammer means.

4,054,181

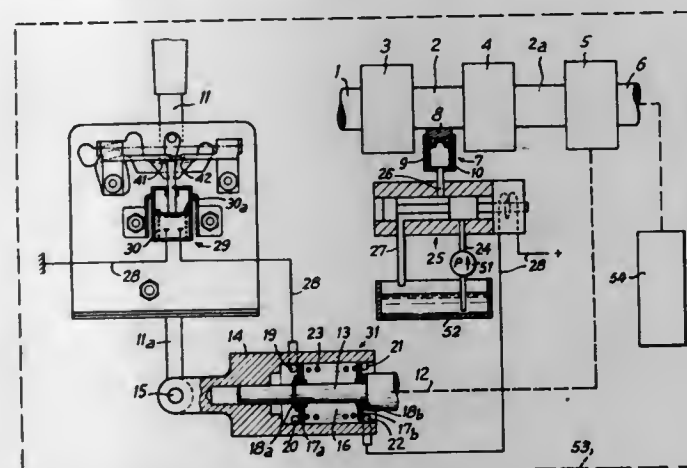
TRANSMISSION MECHANISM FOR AUTOMOBILE VEHICLE

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles CITROEN, Paris, France
Filed Jan. 8, 1976, Ser. No. 647,603

Claims priority, application France, Jan. 15, 1975, 75.01152
Int. Cl.² B60K 17/06

U.S. Cl. 180—77 R

10 Claims



1. A transmission mechanism for automobile vehicle, comprising a drive shaft, a driven shaft equipped with a gear change device, an output shaft coupled to the wheels, a coupling device connecting the drive shaft and the driven shaft, a device for reversing the direction of motion connecting the driven shaft to the output shaft, means for actuating a brake of the driven shaft and means for manually selecting the positions of engagement "Forward motion" or "Reverse motion" and positions "Neutral" and "Parking brake" of the reversing device constituted by a linkage comprising a lever for manually controlling the said positions, wherein the said actuating means are constituted by a circuit feeding the brake with press-

urised fluid in which is disposed an electrovalve normally interrupting said circuit when it is not excited and of which the electrical excitation circuit comprises a first switch that may be actuated by said lever when it is manoeuvred in the sense of establishing a connection at the reversing device between the said driven and output shafts and wherein said linkage comprises an elastic device that may be compressed when the manoeuvring effort applied to the said lever reaches a predetermined value.

4,054,182

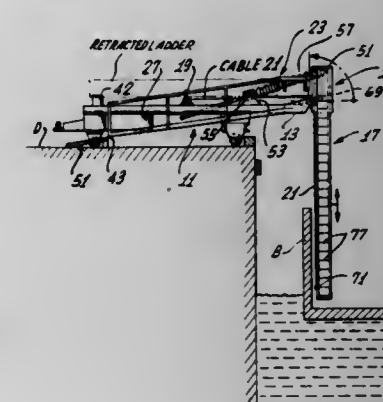
LADDER CARRIAGE

Allan R. Ide, 10066 Bloomfield, Cypress, Calif. 90630
Filed July 12, 1976, Ser. No. 704,534

Int. Cl.² E06C 5/04

U.S. Cl. 182—68

6 Claims



1. A barge access ladder carriage apparatus to facilitate access by workmen to a barge moored alongside and beneath the level of a dock and comprising:
a truck means including an overhang projecting from one end thereof;
a ladder slide pivotally carried from said truck overhang for rotation between a vertical operative position and a horizontally disposed stowing position;
a ladder slidably carried from said slide for longitudinal sliding relative thereto;
extension control cable means connected between said truck means and said ladder and operative to slidably extend and retract said ladder with respect to said slider and to provide for free retraction of said ladder;
retraction means connected between said truck means and said slider for pivoting said slider between its operative and inoperative position; and
an access walkway leading longitudinally from said truck along said projection to said slide and opening adjacent thereto for access to said ladder by workmen when it is vertically disposed in its operative position whereby said truck may convey said ladder to the edge of said dock, said retraction means operated to pivot said slide to its operative position overhanging said barge and said extension control means operated to slide said ladder downwardly into said barge so workmen can walk along said walkway to said ladder to descend down said ladder.

4,054,183

CONTROLLED-SPEED DESCENT DEVICE

George I. Boniface, 6935 Espey Lane, McLean, Va. 22101
Filed Nov. 28, 1975, Ser. No. 636,086

Int. Cl.² A62B 1/14

U.S. Cl. 182—142

20 Claims

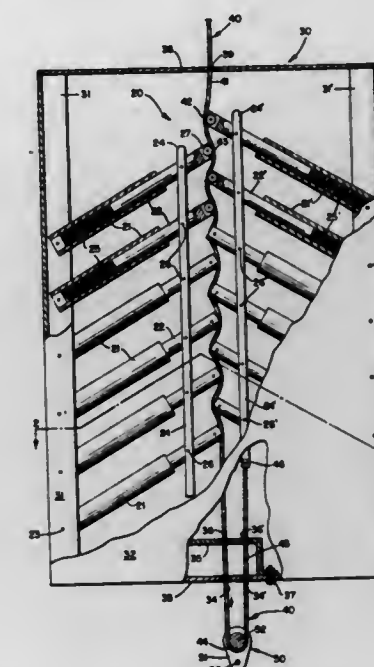
3. A controlled-speed descent device for safely lowering a load on a cable, comprising:

A. a rigid anchor frame, comprising a first side member and a second side member and rigidly attached interconnecting members therebetween and having a vertically disposed center into which an incoming portion of said cable feeds;

B. a first bank of generally parallel friction-inducing arms which:

1. are inclined toward said incoming portion,
2. are pivotally attached to and extend from first side member toward said center,
3. have cable-retarding tips which comprise a friction-inducing composition and are generally disposed in parallel with said center, and
4. comprise a resiliency means for absorbing shocks and minimizing binding forces upon said cable;

C. a second bank of generally parallel friction-inducing arms which:



1. are inclined toward said incoming portion,
 2. are pivotally attached to and extend from said second side member toward said center,
 3. have cable-retarding tips which comprise a friction-inducing composition and alternatively oppose said tips of first bank, and
 4. comprise a resiliency means for absorbing shocks and minimizing binding forces upon said cable; and
- D. a groove means in said tips for defining a zigzag path for said cable passing therebetween approximately along said center and in parallel to said side members.

4,054,184

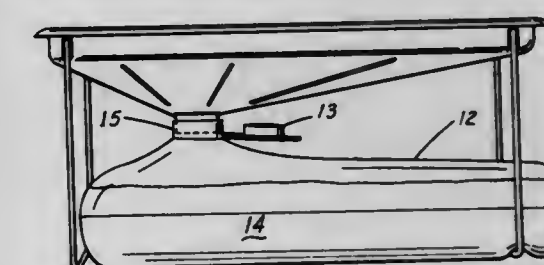
DISPOSABLE OIL DRAIN SYSTEM AND METHOD OF USING THE SAME

Michael L. Marcinko, 1108 E. Chestnut, Santa Ana, Calif. 92705
Filed Sept. 19, 1975, Ser. No. 615,069

Int. Cl.² F16N 33/00

U.S. Cl. 184—1.5

3 Claims



1. A device for receiving and disposing of oil drained from a motor vehicle, comprising:
a pan having a bottom;
a drain opening formed in said bottom;
said entire bottom sloping to said drain opening;
legs on said pan supporting said pan bottom above a support surface on which the motor vehicle rests;
a disposable flexible bag of impervious material able to contain high temperature oil;
said bag having an opening therein for receiving oil;

means on said pan drain and said bag opening cooperating to sealingly connect together for conducting oil from said pan into the bag, said connecting means being readily unconnectable without use of any tools to remove the bag from the pan; and
said bag being of a height relative to that of the legs such that the bag, when connected to the pan, is supported on the surface which supports the pan.

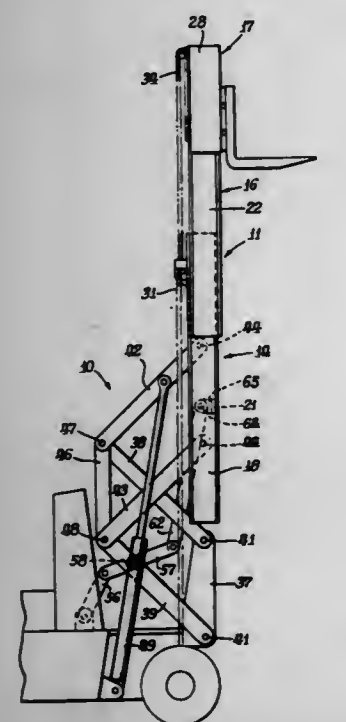
4,054,185

MAST CONTROL MECHANISM

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 16, 1976, Ser. No. 705,847
Int. Cl.² B66F 9/20

U.S. Cl. 187-9 E



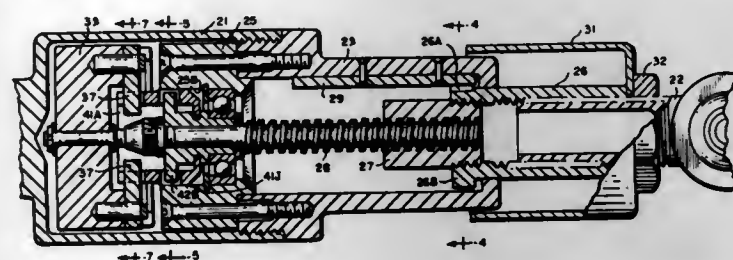
1. A mast control mechanism in combination with a lift truck of the type having a longitudinally extending main frame comprising:
a vertical mast disposed adjacent the forward end of the main frame;
mounting means extending upwardly from the forward end of the main frame;
means for pivotally connecting the mast to the mounting means for pivotally moving the mast between a lowered position and a raised position, said means including
a first pair of longitudinally extending vertically spaced parallel arms having their forward ends pivotally connected to the mounting means,
a second pair of longitudinally extending vertically spaced parallel arms having their rearward ends individually connected to the rearward ends of the first pair of arms and their forward ends pivotally connected to the mast, and
a vertically extending link having its opposite ends pivotally connected to the rearward ends of at least one arm of each pair of the arms;
means for moving the mast between the lowered and raised positions; and
control linkage means pivotally anchored to the main frame and pivotally connected to one arm of the first pair of arms and to the mast so that the control linkage means causes the mast to move in a substantially straight vertical path as it is raised.

4,054,186
SNUBBER APPARATUS
Edwin L. Banks, Jr., Lakeview Terrace, and Terrence P. Dowell, Van Nuys, both of Calif., assignors to Barry Wright Corporation, Watertown, Mass.

Filed Apr. 10, 1975, Ser. No. 566,790
Int. Cl.² F16F 7/10

U.S. Cl. 188-1 B

13 Claims



1. A snubber comprising first and second members mounted for relative telescoping movement with respect to each other through a ball screw and ball nut, said ball nut threaded on said screw, said first member supporting said screw for rotation, said second member supporting said ball nut for telescoping motion with respect to said ball screw in order to cause rotation of said ball screw, a braking surface on said first member, an inertia mass frictionally driven by said ball screw and supported thereby for free rotation, a brake positioned adjacent said braking surface and having portions for engaging said braking surface, means coupled to said first member for supporting said brake, brake actuating lever means pivotally coupled to said inertia mass for moving apart said brake portions to bring said portions into engagement with said braking surface above a predetermined degree of acceleration of said members with respect to one another.

4,054,187

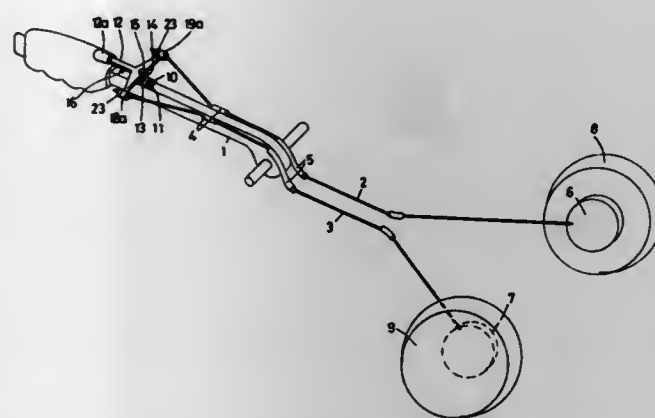
WHEEL-BRAKING DEVICE FOR MOTOR VEHICLES
Francesco Sbarro, Route de Lausanne, Les Tuilleries-de-Grandson, Switzerland

Filed June 17, 1975, Ser. No. 587,658
Claims priority, application Switzerland, June 17, 1974, 8285/74

Int. Cl.² B60T 1/00

U.S. Cl. 188-16

4 Claims



1. A wheel-braking device for a motor vehicle equipped with a hand-brake lever having two brake cables which connect said hand-brake lever directly to respective braking mechanisms for each of two wheels of said motor vehicle, said wheel-braking device comprising:
a selector lever containing a two-armed rocker means rotatably mounted about a neutral pivot point positioned on said hand-brake lever;
the arms of said rocker means extending laterally from the hand-brake lever;
the free end portion of said rocker arms being attached to said brake cables, and also provided with laterally disposed notches;
said selector lever being selectively shiftable, laterally from

said neutral pivot point to engage either of said lateral notches so that said rocker means is selectively pivotable in one of said notches about said hand-brake lever for braking one wheel of the motor vehicle and transferring the entire driving force to the other wheel thereof when the hand-brake lever is pivoted to a normal brake operating position, and
said selector lever being selectively shiftable, laterally to a neutral notch for braking both wheels of the motor vehicle when the hand-brake is pivoted to a normal brake operating position.

4,054,188

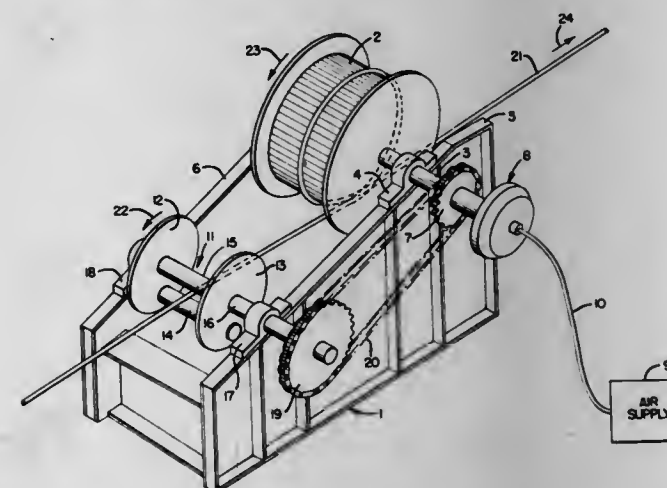
ROPE STOP AND HOLDING DEVICE

Otis R. Pannell, 9023 Mcnair Drive, Alexandria, Va. 22309
Filed Apr. 12, 1976, Ser. No. 676,272

Int. Cl.² B65H 59/14

U.S. Cl. 188-65.3

3 Claims



1. A device for stopping and holding a ropelike member adapted for line payout with respect with a first terminal comprising:
a base structure adapted for fixed mounting with respect said first terminal, said base structure including first and second rotatable means adapted for rotation about first and second axes, respectively, said first and second axes being disposed in spaced substantially parallel relation;
said first rotatable means being a drum means adapted for at least one complete wrap around of said ropelike member, said drum means being normally free wheeling in a selected direction of rotation when said ropelike member is being payed out from said first terminal;
said second rotatable means having an open center section adapted for unimpeded direct passage of said ropelike member therethrough when said second rotatable means has a selected angular disposition with respect said second axis;
means for interconnecting said first and second rotatable means, said means for interconnecting adapted such that when said first rotatable means is free wheeling in said selected direction of rotation, said second rotatable means is stationary with respect to said second axis and such that said first and second rotatable means will rotate in a like manner in the reverse direction of rotation;
power drive means coupled to said means for interconnecting and adapted to rotate said second rotatable means in said reverse direction of rotation, said power drive means including connect-disconnect coupling means normally in the disconnect operational state when said ropelike member is being payed out from said first terminal;
and means for energizing said connect-disconnect coupling means to change the operational state thereof whereby a compound friction engagement of said first and second rotatable means with said ropelike member results.

4,054,189

FULLY LINED HYDRAULICALLY ACTUATED DISC BRAKES

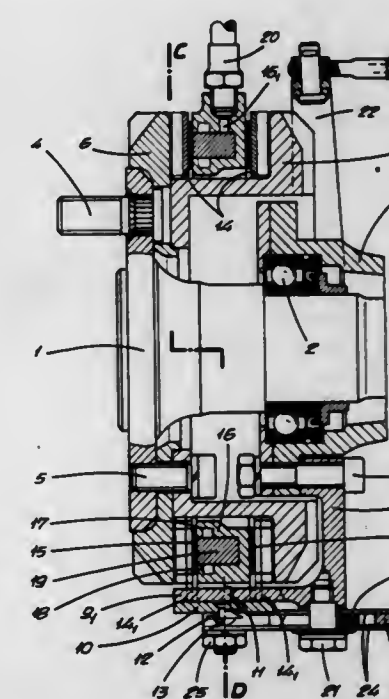
Hermann Klaue, Tour d'Ivoire 24 e, 1820 Montreux, Switzerland
Continuation of Ser. No. 415,681, Nov. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 288,287, Sept. 12, 1972, Pat. No. 3,885,650, which is a continuation-in-part of Ser. No. 73,566, Sept. 18, 1970, abandoned. This application Nov. 24, 1975, Ser. No. 634,896

Claims priority, application Germany, Dec. 2, 1969, 1960286; Dec. 27, 1969, 1965171; Dec. 27, 1969, 1965170; Sweden, Nov. 17, 1972, 16741/72

Int. Cl.² F16D 55/04

U.S. Cl. 188-71.4

13 Claims



1. In a brake assembly for a vehicle wheel comprising a brake housing rotatable with the wheel and having separate wheel side and second annular members axially spaced from each other to form a channel-like gap which is open at its radially exterior side, said annular members having facing internal sides which provide braking surfaces, braking discs having friction linings disposed in the gap and facing the braking surfaces, and means for hydraulically actuating the braking discs disposed in the gap between the braking discs, the improvement which comprises
a. support means for the braking discs and actuating means fixed against rotation with the wheel having at least one pair of diametrically opposite arms which extend over the open side of the gap and support the braking discs and actuating means in the gap, said arms supporting the braking discs against circumferential movement but permitting free axial movement thereof and supporting the brake actuating means freely in the gap without transmission of torque thereby;
b. said means for hydraulically actuating the braking discs being mounted on the said arms between the braking discs and comprising annular members which are axially movable relative to each other under fluid pressure to press the braking discs against the braking surfaces, said annular members being disposed where they contact the braking discs at the radial centers thereof;
c. means for securing the said second annular member for rotation with the wheel; and
d. means for securing the wheel side annular member to the second annular member whereby upon removal of the wheel and said wheel side member, the braking discs may be removed without dismantling the actuation unit.

4,054,190

MECHANICAL BRAKING APPARATUS

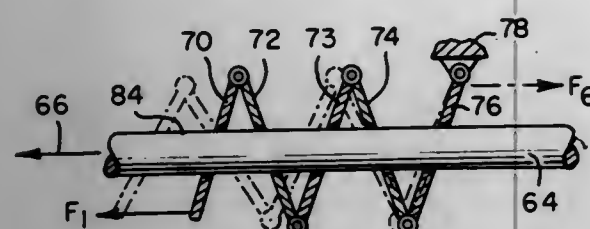
Donald F. Wilkes, Albuquerque, N. Mex., assignor to Decoto Aircraft, Inc.

Filed Oct. 24, 1975, Ser. No. 625,709

Int. Cl.² B65H 59/10

U.S. Cl. 188—67

36 Claims



1. Relative motion inhibiting apparatus comprising:
an elongated member having a surface;

a plurality of mutually inclined element means in force transmitting relation to one another including terminal element means and at least one element means between said terminal element means, each element means being proportioned such that friction locking of that element means is avoided and having a friction surface which engages the surface of the elongated member, the plurality of element means cooperating such that each element means exerts a friction force on the elongated member and such that the friction force exerted by each successive element means between the two terminal element means has an essentially constant ratio to the friction force generated by adjacent element means, the plurality of element means and the elongated member being relatively movable;

restraining means for inhibiting movement of one terminal element means of the plurality of element means; and control means for inducing a control force on the other terminal element means during relative movement between the plurality of element means and the elongated member, the control force causing a proportional friction force substantially greater than the control force to be exerted on the elongated member by the plurality of element means.

4,054,191

CARRYING CASE FOR TOYS, DOLLS, OR THE LIKE
Palmer J. Schoenfeld, Evanston, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 24, 1975, Ser. No. 634,370

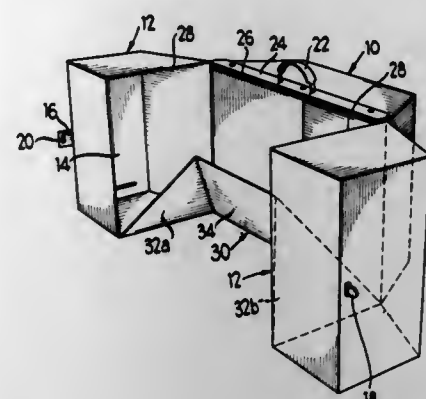
Int. Cl.² A45C 3/00

U.S. Cl. 190—41 R

14 Claims

1. A carrying case fabricated of sheet material, comprising:
a box-like rear compartment having an open front defined

partially by a pair of generally parallel vertical side edges; a pair of box-like front compartments each having an open side defined partially by a generally vertical edge hinged to one of the vertical edges of said rear compartment, each of said front compartments being approximately one-half the size of said rear compartment and pivotable about said



hinged edge between a closed position closing the open front of said rear compartment and an open position whereat the interior of all three compartments are exposed; and handle means on the top of the carrying case for carrying the same.

4,054,192

OVERRUNNING CLUTCH CAGE

Lawrence P. Johnson, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.

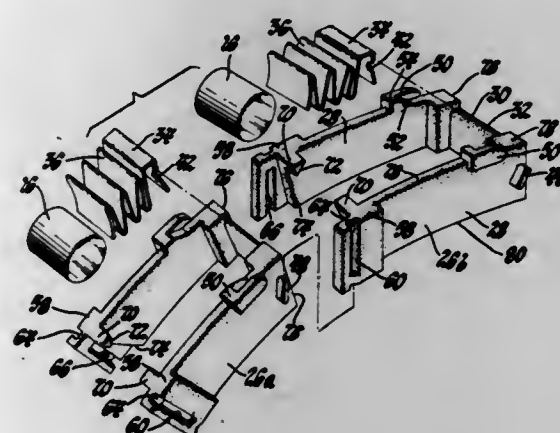
Continuation of Ser. No. 622,242, Oct. 14, 1975, abandoned.

This application Feb. 7, 1977, Ser. No. 766,485

Int. Cl.² F16D 41/06

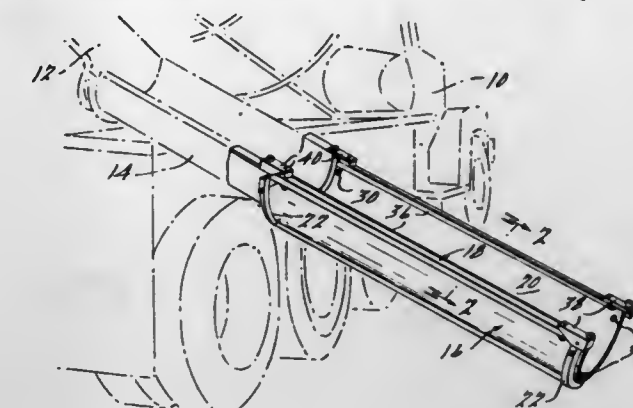
U.S. Cl. 192—45

6 Claims



1. An overrunning clutch cage for accurately centering concentric clutch races with respect to each other comprising:
a plurality of moldable plastic, arcuate segments joined end-to-end in an annulus, each of said segments having an inner bearing surface and an outer bearing surface and laterally spaced circumferentially aligned rails connected by a cross bar at one end and a radially projecting ear having a reaction surface facing said one end,
each of said segments further including a pair of lateral posts and a pair of sockets at opposite ends in interference relationship with a pair of sockets and a pair of posts of adjacent segments respectively, said segments having ones of

said pairs disposed on laterally flexible portions of said rails for said ones to clear interferring portions of complementary other ones of said pairs of adjacent segments and snap in locked engagement therewith, and said pairs of sockets being slightly oversized with respect to said posts to permit adjustments of said cage in roundness and circumferential dimension.



4,054,193

FLUID COUPLING DEVICE AND BIMETAL COIL ADJUSTMENT FOR USE THEREIN

Kenneth R. Streeter, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

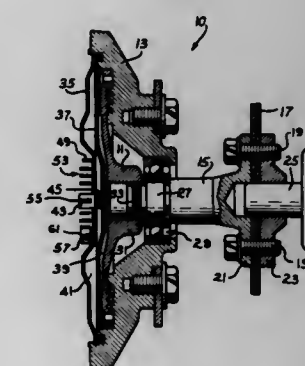
Filed May 17, 1976, Ser. No. 687,264

Int. Cl.² F16D 31/08

U.S. Cl. 192—58 A

19 Claims

ing said sheet to said frame and holding said sheet in a transversely curved configuration.



4,054,195

ROLLER CONVEYOR

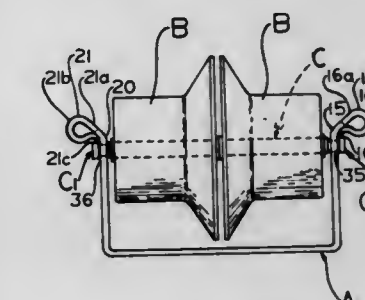
John F. Wahl, Sterling, Ill., assignor to Mallard Manufacturing Corporation, Sterling, Ill.

Filed May 19, 1975, Ser. No. 578,368

Int. Cl.² B65G 13/00

U.S. Cl. 193—35 R

9 Claims



1. A fluid coupling device including a first rotatable member, cover means associated with said first member to define a fluid chamber therebetween, a valve plate disposed to separate said fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable member disposed in said fluid operating chamber and rotatable relative to said first member, valve means operable to control fluid communication between said operating chamber and said reservoir chamber, temperature-responsive means controlling said valve means, said temperature-responsive means including a bimetal element having a first end portion operatively connected to said valve means and a second end portion, bracket means fixed relative to said device and including a generally flat terminal portion extending away from said cover means, a clip member including means receiving said second end portion of said bimetal element and substantially preventing rotational movement of said second end portion relative to said first end portion, said clip member being disposed in movable engagement with said terminal portion of said bracket means to provide rotational adjustment of said second end portion of said bimetal element.

1. In a roller conveyor which includes a shaft, a roller rotatably mounted on said shaft and a frame which carries said shaft, the improvement comprising a side member which forms a part of said frame, the upper portion of said member being turned to form a loop, a vertically elongated opening in said member, said opening being of a size sufficient to receive the end of said shaft through the upper part of the opening and to permit downward movement of said shaft into the lower part of said opening, the edge of said upper portion being inward of the extreme end of the shaft, the upper part of said opening being above said edge and the lower part of said opening being below said edge, said upper portion of said member being resilient whereby when said end of the shaft is received into the upper part of said opening and moved downwardly said upper portion of said member will yield to permit said end of the shaft to pass by said edge and move into said lower part of said opening and then said edge will move back to a position overlying said shaft end to lock said shaft end against movement upwardly beyond said edge.

4,054,194

DISCHARGE CHUTE FOR CONCRETE MIX

Thomas E. Davis, 8919 Birkhill, Sterling Heights, Mich. 48098

Filed Dec. 29, 1975, Ser. No. 644,717

Int. Cl.² B65G 11/10

U.S. Cl. 193—10

8 Claims

1. A concrete delivery means comprising a mixing vehicle having a chute removably connected thereto for conveying freshly mixed concrete from said mixing vehicle, said chute including a plurality of sections removably assembled end to end, at least one of said sections having a rigid frame including at least two arcuate cross members adjacent opposite longitudinal ends thereof, a pair of longitudinal members extending between and connecting end portions of said cross members, a third longitudinal member extending between and connecting center portions of said cross member, a bendable sheet of

4,054,196

APPARATUS FOR RECEIVING AND STORING EMPTY BOTTLES

Eugen Schäufler, Henstedt-Ulzburg, and Hans Herman Trautwein, Stuttgart, both of Germany, assignors to The Firm of Eugen Schäufler, Ostfildern, Germany

Filed Feb. 2, 1976, Ser. No. 654,606

Claims priority, application Germany, Feb. 3, 1975, 2504352

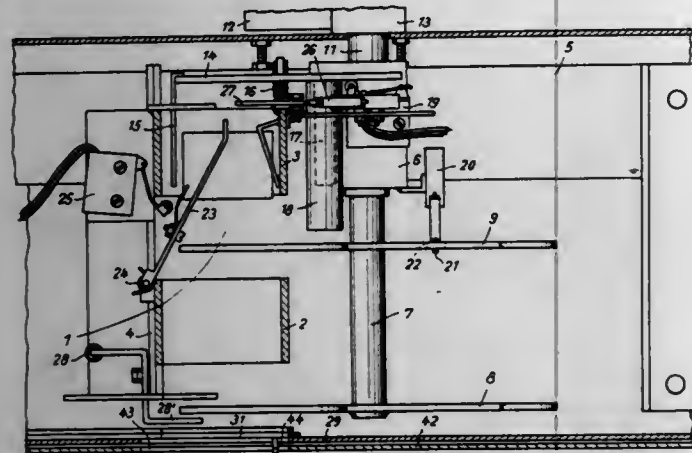
Int. Cl.² G07F 7/06

U.S. Cl. 194—4 C

14 Claims

1. An apparatus for storing cylindrical objects, especially empty bottles, comprising:
a cabinet having a bottle chamber;

bottle storage container disposed in said cabinet and further comprising a base including an aperture; a bracket means aligned with said aperture in said cabinet, switch means in proximity to said bracket means arranged to be actuated upon insertion of an empty bottle into said cabinet;

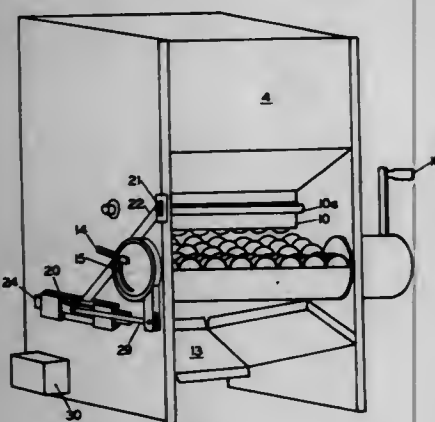


bottle conveyor means disposed adjacent to and below said bottle storage container further including at least one rotatably disposed conveyor disc which extends into said bottle chamber for transporting individual bottles after insertion through said aperture upwardly into said bottle storage container.

4,054,197 GOLF BALL VENDOR

Oscar Bock, Bock Corp., P. O. Box 551, Madison, Wis. 53701
Filed Sept. 24, 1976, Ser. No. 726,066
Int. Cl.² G07F 11/00

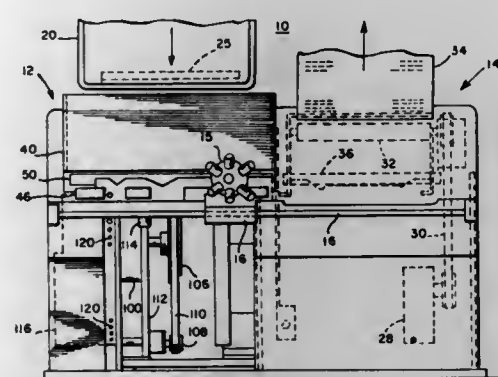
U.S. Cl. 194-57



1. A golf ball vendor comprising:
 - a. a ball hopper having an bottom pan;
 - b. a declining ramp extending below said hopper bottom pan in spaced relation thereto, said pan and ramp defining a ball dispensing opening there between;
 - c. a gate pivotably mounted below said hopper pan and above said discharge ramp at said opening rotatable between (1) a downwardly extending closed position wherein the lower edge of said gate is spaced more than the diameter of one ball and less than the diameter of two balls from said ramp to cause said balls in said hopper to bridge across said opening and (2) a release position into which said gate is swung toward the mass of balls in said hopper to break up the bridging of balls therein for releasing balls down said ramp;
 - d. ball receiver-dumper extending across the lower end of said declining ramp, said ball receiver being rotatable between a receiving position and a dumping position for receiving a predetermined number of balls from said ramp and dumping them; and
 - e. manually movable double stroke actuating means operatively linked to said ball receiver-dumper and said gate for (1) rotating said ball receiver-dumper from its receiving

position to its dumping position for dumping balls therefrom and for rotating said gate from said closed position to said release position back to said closed position, by a single operating stroke of said actuating means, and (2) rotating said ball receiver-dumper from its dumping position back to its receiving position and said gate from its closed position to said release position and back to its closed position by a single return stroke of said actuating means.

4,054,198
MAGNETIC HEAD CONTROL ASSEMBLY FOR A MAGNETIC PASSBOOK PRINTING SYSTEM
Okun Kwan, Trumbull, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Continuation of Ser. No. 493,398, July 31, 1974, Pat. No. 3,978,964. This application Feb. 2, 1976, Ser. No. 654,131
Int. Cl.² B41J 13/12, 19/92
U.S. Cl. 197-127 R 7 Claims



7 Claims

1. A printing apparatus having a printer for printing on a document containing a stripe on which indicia with respect to the printing operations to be performed may be written and/or read therefrom by a scanner assembly, which indicia is used in the printing operation, comprising:

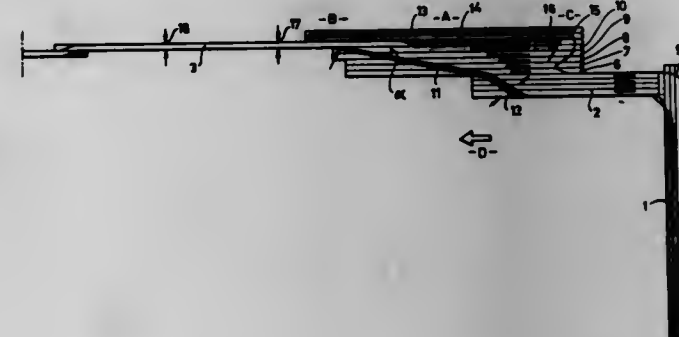
- a. a document printing station having a movable, non-rotatable document holder that moves in a single plane, for receiving and positioning a document which is to be printed upon, said document having a stripe thereon on which indicia may be recorded and/or read pertaining to the print operation which is to be performed on said document, said document printing station having a printer for printing on said document,
- b. a scanner assembly on said document printing station carrying a transducer head for scanning said stripe of said document by said transducer head,
- c. drive means coupled to said document holder for providing controlled movement of said document holder containing said document with respect to said scanner assembly and said printer at said document printing station,
- d. said document holder having a home position for positioning said document for the scanning of said stripe thereon by said scanner assembly, and a plurality of other positions for the printing of one or more lines on said document in said document holder by said print means.

4,054,199
DEVICE FOR TRANSFORMING A PLURALITY OF DISORDERLY ADVANCED CONTAINERS INTO A SINGLE ROW
Pieter Aart Polderman, Haarlem, Netherlands, assignor to Stork Amsterdam B.V., Amsterdam, Netherlands
Filed Sept. 24, 1975, Ser. No. 616,440
Claims priority, application Netherlands, Sept. 27, 1974, 7412855
Int. Cl.² B65G 47/26
U.S. Cl. 198-452 2 Claims

1. A device for transforming a plurality of disordered ad-

vancing upright containers into a single row, which containers have an arbitrary circumference and are advanced on a buffer path, said device having a plurality of conveyors driven in a common direction and comprising:

- a. a metering path being sufficiently wide to advance n containers and capable of being driven at a speed V_1 ;
- a first lateral guide situated above and extending obliquely across the metering path;
- a transformation area comprising a plurality of adjacent transformation conveyors, the transformation conveyors being mutually parallel and parallel to the metering path conveyor, a first transformation conveyor being immediately adjacent the metering path conveyor at the portion of the metering path conveyor immediately upstream of the first lateral guide and being capable of being driven at a speed which is a multiple of the metering path speed V_1 , and each additional transformation conveyor more distant from the metering path, having a velocity at least 10% greater than the immediately preceding transformation conveyor;
- a discharge path conveyor being sufficiently wide to discharge a single row of containers, the discharge path conveyor being parallel and immediately adjacent to the transformation conveyor most distant from the metering

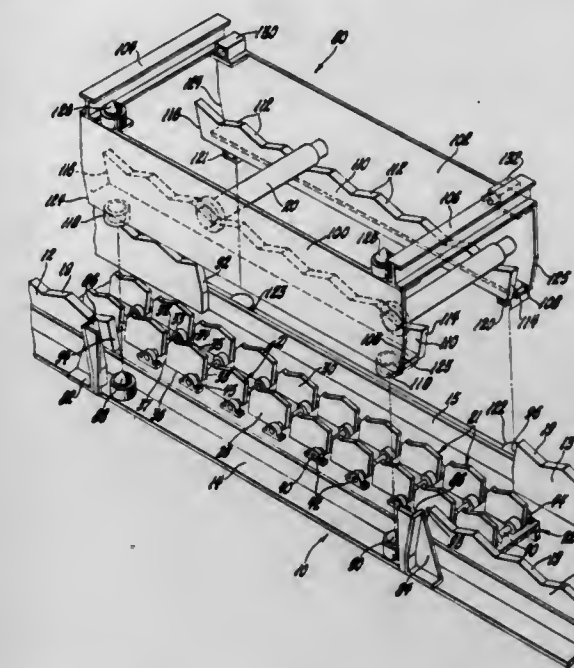


- path conveyor and being capable of being driven at a speed V_2 , at least equal to $n \times V_1$;
- a second lateral guide situated above and extending obliquely across the transformation conveyors at an angle of less than 30° with the direction of movement of the transformation conveyors;
- whereby containers moving along the metering path conveyors are directed by the first lateral guide onto the first transformation conveyor and then directed by the second lateral guide successively across the transformation conveyors towards and onto the discharge conveyor;
- a return conveyor being situated adjacent to and extending substantially parallel to the discharge conveyor and being designed and adapted to move in a direction relatively upstream of the discharge conveyor, an intermediate wall situated so as to separate the return conveyor and the discharge conveyor between two points intermediate the end of the second lateral guide and the ends of the return conveyor and the discharge conveyor, and a guide bend disposed across the return conveyor and the discharge conveyor and situated intermediate the end of the intermediate wall and the ends of the return and discharge conveyors, whereby upright containers returning on the return conveyors are directed to the transformation area.

4,054,200
ACCUMULATING CONVEYOR HAVING A REMOVABLE PARTS CARRIER
Kenneth R. Bartos, Flushing, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 22, 1976, Ser. No. 753,363
Int. Cl.² B65G 25/04
U.S. Cl. 198-774 3 Claims

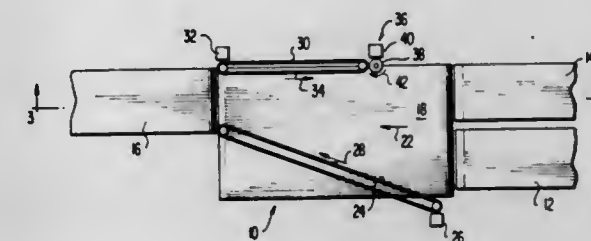
1. A parts carrier for use with an elongated accumulating conveyor having an entrance end for receiving parts and an exit end from which said parts are removed, said conveyor including a pair of laterally spaced support plates each of

which has the upper portion thereof formed with a series of equally spaced and uniform notches for supporting and spacing individual parts, a plurality of identically formed position members located between said support plates for guiding and controlling successive movement of the parts from one notch to the next notch from the entrance end to the exit end of the conveyor, said support plates having a section thereof of a predetermined length removed between the entrance and exit ends of the conveyor so as to provide an opening, said parts carrier adapted to fit into said opening and support a plurality of parts, said parts carrier including a pair of laterally spaced



support beams which longitudinally and horizontally align with said support plates when said parts carrier is positioned in said opening, each of said support beams having the upper portion thereof formed with notches which correspond in spacing and configuration with the notches in said support plates and cooperating locating means formed with said container and said conveyor for assuring alignment of said support beams with said support plates when said parts carrier is placed in said opening so as to permit said positioning members to guide and control movement of the parts on said support beams towards the exit end of the conveyor.

4,054,201
LUGGAGE SORTATION DEVICE
Gary J. Rollinger, Belgium, Wis., assignor to Rexnord, Inc., Milwaukee, Wis.
Filed Sept. 9, 1975, Ser. No. 611,756
Int. Cl.² B65G 47/26
U.S. Cl. 198-455 2 Claims



1. In a luggage merging device for handling randomly sized, shaped, and weighted luggage comprising:
 - a. a first conveyor belt adapted to carry luggage;
 - b. first means for driving the working surface of said first conveyor belt in a first direction;
 - c. a luggage guiding means mounted adjacent to said first conveyor belt such that the working surface thereof is generally perpendicular to the working surface of said

first conveyor belt and is disposed at an angle to the first direction;
 d. a second conveyor belt having a high coefficient of friction mounted adjacent to said first conveyor belt such that the working surface thereof is generally perpendicular to the working surface of said first conveyor belt and is disposed parallel to the first direction; and
 e. second means for driving the working surface of said second conveyor belt in the direction opposite to the first direction

the improvement comprising a buck roller mounted adjacent to said first conveyor belt and the upstream end of said second conveyor belt, said buck roller being mounted for rotation about an axis at least generally perpendicular to the working surface of said first conveyor belt, being disposed so that the peripheral surface thereof extends beyond the working surface of said second conveyor belt into the converging path for luggage carried by said first conveyor belt, and being driven about its axis of rotation in the direction such that the peripheral surface which extends in to the converging path moves in the direction of said working surface of said first conveyor belt, whereby said luggage which approaches the luggage merging device is laterally shifted away from said second conveyor by said buck roller and is prevented from scuffing against said second conveyor.

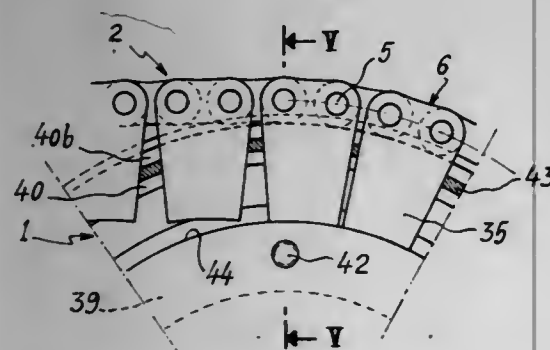
4,054,202

STEPWISE DRIVE MECHANISM

Jean-Claude Henri Hautemont, Gif-sur-Yvette, France, assignor to Societe Anonyme dite: Etude et Realisation de Chaines Automatiques ERCA, Orsay, France
 Filed Aug. 6, 1975, Ser. No. 602,361
 Int. Cl.² B65G 23/18

U.S. Cl. 198-805

13 Claims



1. In a stepwise drive mechanism of the type comprising a pair of endless conveying members formed of a magnetic material with gripping means thereon, wherein the said conveying members are parallel to one another and wherein said gripping means are fixed temporarily to a thermoplastic film in which receptacles are formed and traverse a machine for processing food and/or pharmaceutical products having different working stations positioned at intervals whose length is a multiple of the feed steps of said drive mechanism, and wherein the improvement comprises means for driving said conveying members synchronously, said drive means including driving wheels respectively located in contact with a corresponding conveying member along a predetermined contact arc, return wheels and means for intermittently rotating said driving wheels through an elementary angular displacement corresponding to a feed step of the conveying member, said conveying member being applied along the predetermined contact arc of their associated driving wheels over at least a contact surface area located in the peripheral portion of their associated driving wheels, and means for producing a system of magnetic forces whose directions are substantially perpendicular to the said contact surface area and whose resulting intensity is sufficient to prevent relative movement of the wheel and conveying member, said contact surface area being annular and rotating about the axis of rotation of the driving wheels, said means for producing a magnetic force including at least one magnet positioned in each of said driving wheels whereby the convey-

ing member is attracted to and held against said contact surface along said predetermined contact arc under the action of the magnetic pull exerted by said magnet, and wherein said conveying members comprise chains formed of a plurality of links respectively including spaced pairs of fish plates formed of magnetic material at least one of said links closing at least partly the magnetic circuits formed by the magnets carried by the driving wheels, each of said fish plates having a stop surface formed thereon which is applied by magnetic pull to a contact surface of the driving wheel and has a curvature identical to that of the said contact surface.

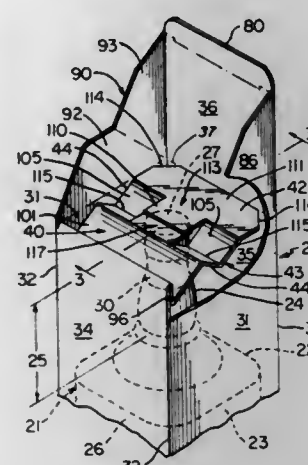
4,054,203

CARTON AND BLANK FOR MAKING SAME

Melville T. Farquhar, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.
 Filed Dec. 22, 1976, Ser. No. 752,898
 Int. Cl.² B65D 5/50

U.S. Cl. 206-45.14

25 Claims



1. A carton for a bottle having a body and an elongated upwardly extending neck provided with a closure, said carton comprising: a pair of opposed sides having front and rear edges; a front wall connected between said front edges; a rear wall connected between said rear edges; a top panel connected to one of said side walls; and a reinforcing flap connected to the other of said walls and being disposed beneath said top panel, said flap being foldably connected to said other wall along a first score line and comprising a second score line arranged in parallel spaced relation to said first score line defining a first strip therebetween, a third score line disposed in parallel spaced relation to said second score line defining a second strip therebetween, score means disposed parallel to the third score line defining strip means therebetween, and an H-shaped cut between said third score line and score means, said H-shaped cut and score means defining a roughly T-shaped terminal outer portion of said flap, said outer portion being defined by a leg disposed perpendicular to said other wall and a cross arm adjoining and disposed parallel to said leg, said leg being sandwiched between said closure and top panel and thereby holding said flap adjacent the top of said carton, said second strip and said strip means defining a portion of said flap which adjoins said terminal portion and has opposed supporting side edges disposed in spaced relation beneath said top panel enabling said flap to serve as a horizontal reinforcement against collapse of said sides upon squeezing said sides toward each other in grasping said carton.

4,054,204

COMPRESSED FOAM ARTICLE

Heldi Keeton, 3389 Knollwood Court, Las Vegas, Nev. 89121
 Division of Ser. No. 535,798, Dec. 23, 1974, Pat. No. 3,968,620.
 This application Apr. 30, 1976, Ser. No. 682,181
 Int. Cl.² B65D 71/00, 77/00

U.S. Cl. 206-83.5

3 Claims

1. A novelty gift comprising an article of fabric-covered

flexible foam, the fabric being air permeable, said article being compressed to a volume no greater than 25% of its freely expanded volume, the article being contained in a flexible sack,



fastening means for maintaining the sack in closed condition such that the article cannot expand until the fastening means is removed, and a rigid container for retaining the article compressed in the sack.

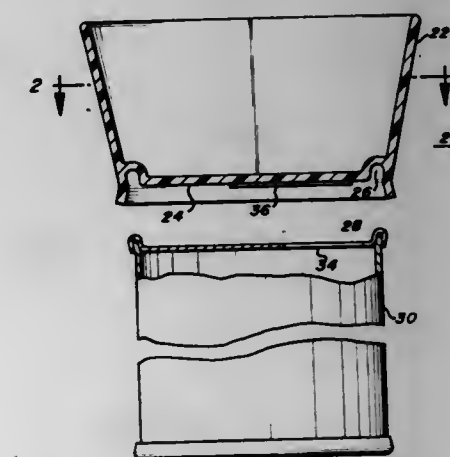
4,054,205

COMBINATION PRODUCT CONTAINER AND ATTACHMENT FOR BEVERAGE CANS

James H. Blow, Jr., 23 Palisade Ave., Piscataway, N.J. 08854, and Louis C. Blow, 115 Lincoln St., Tallahassee, Fla. 32301
 Filed June 22, 1976, Ser. No. 698,369
 Int. Cl.² B65D 77/24, 25/00, 35/38

U.S. Cl. 206-217

7 Claims



1. A combination product container and drinking attachment for a beverage can comprising: an annular cup-shaped vessel having sidewalls and a generally planar bottom portion; a lid portion wedgingly received within the interior of said sidewalls remote from said bottom portion to provide a closure for a product contained within said vessel; said bottom portion having an annular recess disposed about the periphery thereof for receiving the rim portion of a beverage can, said recess being arranged to fit tightly about such rim portion of a beverage can while permitting said vessel to rotate thereabout, said bottom portion having a slotted opening extending radially outwardly from the center of said bottom portion along a first axis to provide access to a corresponding aperture aligned therewith in such beverage can as said vessel is attached to such beverage can; a first rib portion extending about the periphery of said slotted opening adjacent the underside of said bottom portion and adapted to sealingly contact the lid of such beverage can about such beverage can aperture; a removable sealing element covering said slotted opening in said bottom portion to prevent the leakage of the contents of said vessel therefrom, which sealing element is removable to expose said slotted opening to provide access to such corresponding beverage can aperture aligned therewith as said vessel is attached to such beverage can; and a second rib portion located adjacent the underside of said bottom portion and angularly displaced from said first rib portion, said second rib portion having a peripheral contour similar to said first rib portion and arranged

to provide a complete seal thereabout as said vessel is rotated through a predetermined arc atop such beverage can.

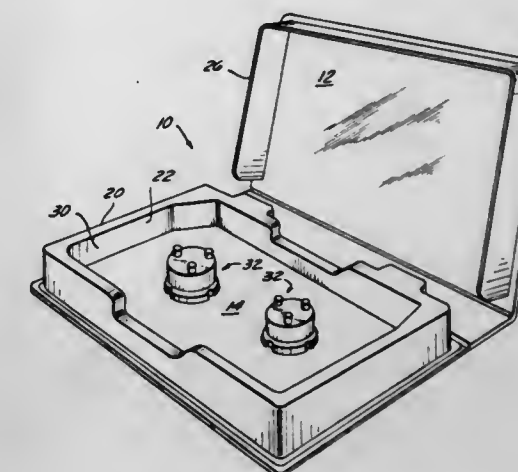
4,054,206

CASSETTE CASE

Tadashi Kobayashi, Miyagi, and Kiichiro Toyoshima, Sendai, both of Japan, assignors to Sony Corporation, Tokyo, Japan
 Filed Feb. 7, 1977, Ser. No. 766,202
 Claims priority, application Japan, Feb. 13, 1976, 51-15540[U]
 Int. Cl.² B65D 85/67

U.S. Cl. 206-387

18 Claims



1. A storage case for storing a tape cassette which includes a tape reel hub having a cylindrical side wall defining a cylindrical recess in the hub and a bottom wall extending across the recess and having a plurality of reel hub drive holes formed therein, said storage case comprising, enclosure means for receiving and enclosing a tape cassette therein, a hub engaging member movably mounted in said case for reciprocal movement between first and second positions and being located to be received in the reel hub recess when the tape cassette is inserted in the case, said hub engaging member including at least one button for engagement in one of said drive holes, and means for biasing said member towards its second position to urge the member into the reel hub recess to engage said button in one of said drive holes when there is alignment therebetween.

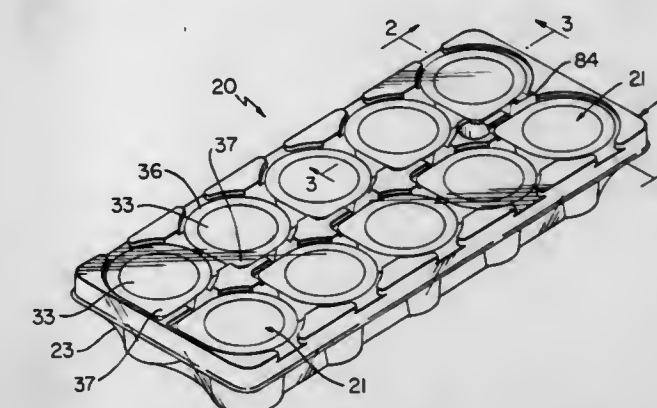
4,054,207

PACKAGE CONSTRUCTION

Frank S. Lazure, and William C. Whitaker, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.
 Filed May 10, 1976, Ser. No. 684,482
 Int. Cl.² B65D 85/62, 21/04, 1/24

U.S. Cl. 206-486

16 Claims



1. A package construction comprising a tray having coplanar top surface portions and a plurality of containers carried within said tray; each of said containers comprising a side wall, an annular flange extending outwardly from said side wall, and a closure sealed against said annular flange and having at least

a portion thereof extending outwardly of said flange; said tray having at least one elongate open-top chamber defined by a bottom wall adjoined by an upwardly extending tubular wall, a set of flange supports adjoining said tubular wall and supporting said flanges and containers thereon, and a set of closure supports, adjoining associated ones of said flange supports, said closure supports being disposed beneath said coplanar top surface portions, said closure supports receiving said outwardly extending portions of said closures therewithin beneath said coplanar top surface portions.

4,054,208 DOUBLE WALLED INSULATED MEDICINAL TABLET CONTAINER

Fred H. Lowe, 4535 Manning Lane, Dallas, Tex. 75226
Continuation of Ser. No. 622,926, Oct. 16, 1975, abandoned.
This application Dec. 28, 1976, Ser. No. 755,108
Int. Cl.² B65D 13/02, 85/56
U.S. Cl. 206—537

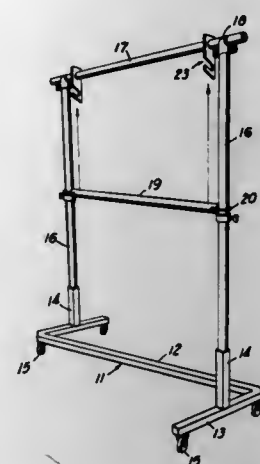


1. A pocket size container for carrying nitroglycerin tablets on the person comprising: a narrow hollow elongated cylindrical outer tube, said outer tube being composed of transparent material, a narrow hollow cylindrical shaped inner tube within the outer tube of smaller diameter than the outer tube forming an annular space therebetween, said inner tube having a closed inner end spaced from the end of the outer tube to form an air space between the ends of the inner and outer tubes and said inner tube being adapted to carry a plurality of medicinal tablets in stacked relationship, said inner tube being composed of amber translucent material to shield the contents from ultraviolet light; an annular resilient sealing ring secured about the inner tube within the annular space adjacent the closed end of said inner tube to space and seal the inner tube from the inside of the outer tube to form an annular cavity of air therebetween, said cavity extending along the length of said inner tube to the upper end of the outer tube; the open end of said inner tube being flared outwardly over the end of said outer tube to form a seal therebetween to close and seal the annular cavity of air; and a cap secured over the open end of said outer tube.

4,054,209
GARMENT RACK
Archie Solomon, Roswell, Ga., assignor to Harold Solomon Trust; Lisa Solomon Trust; Susan Solomon Trust; Wendy Solomon Trust; Mark Solomon Trust and Jonathan Solomon Trust, all of Atlanta, Ga.
Filed Apr. 7, 1976, Ser. No. 674,486
Int. Cl.² A47B 57/00

U.S. Cl. 211—208

3 Claims



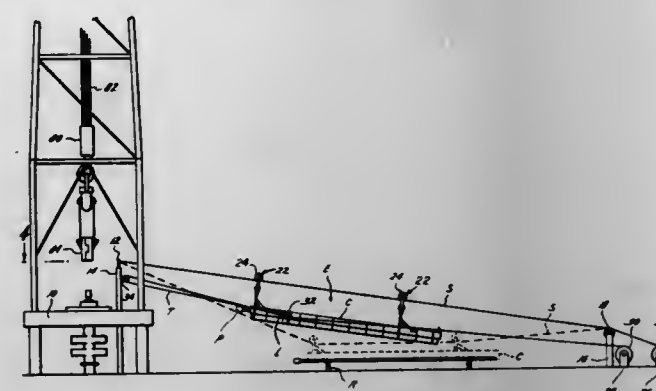
1. In a portable garment rack having a base, a pair of upright stanchions mounted to the base, and an upper hanger rod mounted to an upper portion of said pair of stanchions, the improvement comprising a height adjustable hanger rod slidably mounted to said pair of stanchions for movement therealong, first means on said upper hanger rod for releasably holding said height-adjustable hanger rod in an upper position close beneath said upper hanger rod, and second means for releasably holding said height-adjustable hanger rod in a lower position far beneath said upper hanger rod, whereby the height-adjustable hanger rod may be placed in its upper position for the rack to support a single row of long garments and placed in its lower position for the rack to support a double row of garments which are shorter in length than said long garments and wherein said first releasable holding means includes an element having a top end about which said element is pivotally mounted on said rack, opposed sides, an upwardly sloping camming surface on its lower end, said surface being in the path of travel of said height-adjustable hanger rod as it is moved to its upper position when said element is in its rest position and a slot formed in one of said sides which is adjacent the termination of the upward slope of said surface, said slot being of sufficient dimensions to receive a portion of said height-adjustable rod therein, said element being pivoted away from said rod position when said height-adjustable hanger rod engages said surface as said height-adjustable hanger rod is raised to said upper position and pivoting to its rest position as said rod clears said camming surface so that said height-adjustable hanger rod is automatically received within said slot, thereby holding said height-adjustable rod in its upper position, the upper edge of said slot having a camming surface so that when said height-adjustable hanger rod is within said slot and is raised upwardly, said upper edge camming surface is engaged to cause said element to pivot away from its rest position to disengage said height-adjustable hanger rod, thereby allowing said height-adjustable hanger rod to be lowered to said lower position, said height-adjustable hanger rod including an extension connected about each of its ends around said stanchions to guide said height-adjustable hanger rod in its movement along said stanchions, said upper hanger rod extending beyond said pair of stanchions, a pin extending radially through said upper hanger rod adjacent each of its ends, said upper hanger rod having a slot formed through each of its ends and extending beneath said pins, and said element being mounted at its top pivotally about each of said pins and extending through said slots, whereby the axis of rotation of each of said elements is normal to the longitudinal axis of said upper hanger rod.

4,054,210 APPARATUS FOR TRANSPORTING AND HANDLING PIPE

Roger A. Crocker, Box 37, Wickett, Tex. 79788
Filed Sept. 29, 1975, Ser. No. 617,499
Int. Cl.² E21B 19/00

U.S. Cl. 214—2.5

10 Claims

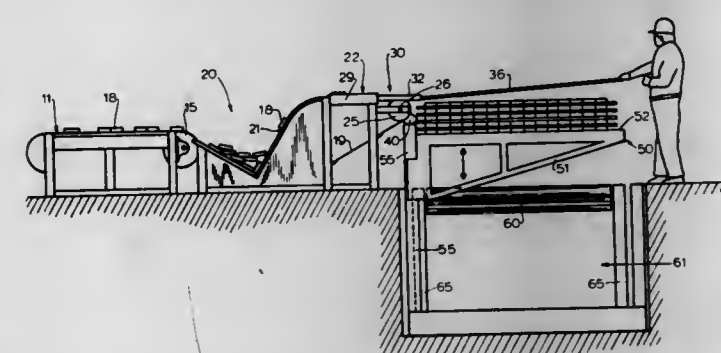


1. An apparatus for transporting pipe from a pipe rack to a derrick platform, and for transporting pipe from the derrick platform to a pipe rack, comprising:
a. a first upright member;
b. a second upright member spaced longitudinally apart from said first upright member;
c. a first cable extending between said first and second upright member and normally disposed in a longitudinal substantially straight line between said upright members;
d. support means mounted on said first cable for movement longitudinally along said first cable;
e. a pipe carrier supported by said support means for transporting pipe therein;
f. a second cable coaxing with said carrier for moving said pipe carrier longitudinally relative to said first cable; and
g. lateral displacement means coaxing with said second cable for laterally displacing said pipe carrier relative to said longitudinally substantially straight line between said upright members as said pipe carrier approaches the area in proximity to said first upright member.

4,054,211
LUMBER STACKING APPARATUS AND METHOD
Kemper N. Moseley, 1400 Camden St., Durham, N.C. 27704
Filed Nov. 23, 1976, Ser. No. 744,436
Int. Cl.² B65G 57/10, 57/18

U.S. Cl. 214—6 M

6 Claims



1. In a lumber stacking apparatus of the type having a vertically movable stacker base for receiving individual boards to form layers of several boards each, said layers being stacked to form a package with successive layers being separated by a series of stacking sticks running laterally across each layer of boards, a push-on apparatus for propelling individual boards onto the package to form the successive layers and for holding the uppermost stacking sticks during stacking, said apparatus comprising:
a. a substantially horizontal deck having means for conveying evenly spaced apart individual boards in a direction transverse to their longitudinal axes and said deck having

a terminal edge portion for discharging such boards to a selected lumber handling operation;

b. rotatable cam means proximate said deck terminal edge for engaging the trailing edge of the respective individual boards and propelling said boards forward onto said stacking base, said cam means comprising at least two spaced apart and vertically oriented disc members mounted for rotation on a horizontal drive shaft oriented perpendicular to the direction of lumber movement and located below said deck at a position proximate said deck terminal edge, each said disc member having major and minor axes such that during a fractional part of each revolution thereof a selected portion of said disc member on said major axis protrudes above said deck, said selected disc portion having a forwardly facing curved camming surface for engaging the trailing edge of each said evenly spaced apart individual board as it approaches said terminal edge, said curved camming surface having a shape designed to impart a resultant force on the board trailing edges at an angle downward from horizontal; and

c. a plurality of releasable stick holders corresponding to the desired number of stacking sticks separating each layer in the package, each such holder being adapted to hold the marginal end portion of one of the uppermost stacking sticks during the forming of the layers of lumber, whereby said stacking sticks may be held securely in place to serve as runners for supporting and guiding the individual boards as the boards are pushed forward to form the successive layers and may be released following the formation of the layer to serve as spacers between the layers of boards.

6. In a lumber stacking operation of the type in which layers of several boards each are stacked on a vertically movable stacker base to form a package with successive layers being separated by a series of stacking sticks running laterally across each layer of boards, a push-on method of propelling individual boards to form the successive layers, comprising the steps of:

a. providing a vertically movable stacker base for receiving the successive layers of boards thereon;
b. conveying evenly spaced apart individual boards in a direction transverse to their longitudinal axes across the upper surface of a substantially horizontal deck which terminates at a point adjacent to and above said stacker base;
c. mounting at least two spaced apart and vertically oriented cam discs for being rotatably driven about a horizontal axis oriented perpendicular to the direction of board conveying and said horizontal axis being located at a level below said deck upper surface, each said cam disc having a forwardly disposed curved camming surface along a major axis thereof, said camming surface protruding above said deck upper surface during a portion of each revolution of the cam disc;
d. rotating said cam discs about said horizontal axis and synchronizing such rotation with the conveying of said evenly spaced apart boards so as to engage the trailing edge of each successive board with said curved camming surfaces thereby imparting a resultant force to each such board at an angle downward from horizontal and propelling such board onto its respective layer;
e. propelling a predetermined number of boards forward onto said stacker base to form a first layer of boards;
f. indexing said stacker base downwardly;
g. placing a series of stacking sticks above the formed first layer of boards preparatory to propelling additional boards thereon to form the next successive layer and securely holding such stacking sticks at their respective ends proximate the cam discs for the period of time during which such next successive layer is being formed, whereby said stacking sticks may be securely held at their ends to serve as runners for supporting and guiding the boards as the successive layer is formed and may be re-

leased following the formation of the layer to serve as spacers between the formed layers of boards; and
 h. conveying additional boards over said deck and propelling such boards onto stacking sticks held above the immediately preceding layer to form additional layers of boards spaced by said stacking sticks and repeating such stacking operation until a package of lumber having a desired number of layers is formed.

4,054,212

CUP DISPENSING APPARATUS AND METHOD

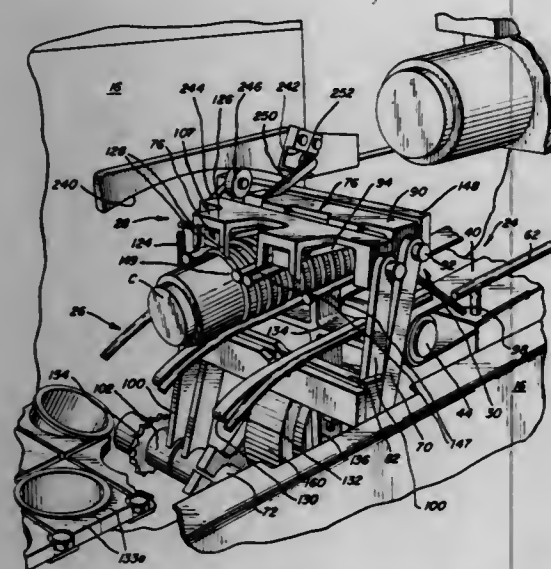
Martin Mueller, Wonder Lake, Ill., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 28, 1976, Ser. No. 653,222

Int. Cl.² B65G 59/10

U.S. Cl. 214-8.5 A

31 Claims



18. A method for continuously feeding containers to a station comprising (1) providing a continuous supply of nested, rimmed containers (2) continuously urging said nested rimmed containers along a generally horizontal path, (3) interrupting the movement of all but the leading container with gripper means, (4) gripping the leading container adjacent the rim with opposed relatively movable pusher jaws, (5) moving the pusher jaws along an arcuate path toward said station, (6) releasing said leading container so that the container falls by gravity to said station, (7) raising the leading end of the nested cups against a fixed guide to hold said nested cups while the gripper means are moved to the next succeeding cup, (8) returning the gripping jaws to the supply of nested, rimmed containers, and (9) repeating steps 3-8.

4,054,213

APPARATUS FOR REMOVING BULK MATERIAL FROM A STORAGE BED

Rene Chever, Paris, France, assignor to Fives-Cail Babcock, Paris, France

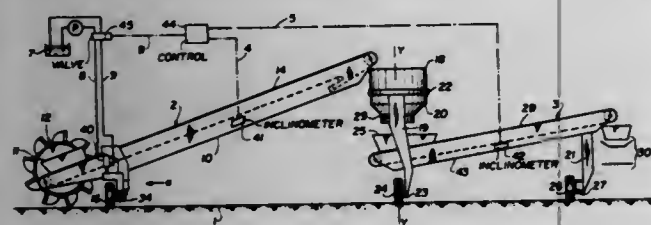
Filed Nov. 3, 1976, Ser. No. 738,539

Claims priority, application France, Nov. 4, 1975, 75.33622

Int. Cl.² B65G 65/28

U.S. Cl. 214-10

6 Claims



1. An apparatus for removing bulk material from a storage bed of the material, comprising
 a. a first elongated element for collecting the bulk material from the storage bed, the first elongated element having a longitudinal axis and two ends, the first element including
 1. a bulk material engaging device at one of the ends

arranged to take up bulk material from the storage bed, and

2. conveying means arranged to convey the bulk material from the device to the other end,

b. a second elongated element arranged adjacent the other end of the first element for receiving the conveyed bulk material from the first element and conveying the received bulk material away from the storage bed, the second elongated element having a longitudinal axis and two ends,

c. two driving and guiding wheels supporting the one end of the first elongated element on the storage bed adjacent the bulk material engaging device, the two driving and guiding wheels being arranged at respective sides of a vertical plane passing through the longitudinal axis of the first element,

d. a coupling supporting the other end of the first elongated element on one of the ends of the second elongated element, the coupling being arranged to permit pivoting of the first element in relation to the second element about a vertical axis passing through the coupling and to absorb vertical and horizontal forces, and

e. two wheels respectively supporting the ends of the second elongated element, the wheels having stationary axles extending parallel to the longitudinal axis of the second element, one of the wheels being disposed in the vertical pivoting axis and the other wheel being a driving wheel supporting the other end of the second element.

4,054,214

PLURAL VEHICLE PARKING DEVICE

Ulrich Lendi, Stafa, Switzerland, assignor to Firma Mageba S.A., Bulach, Switzerland

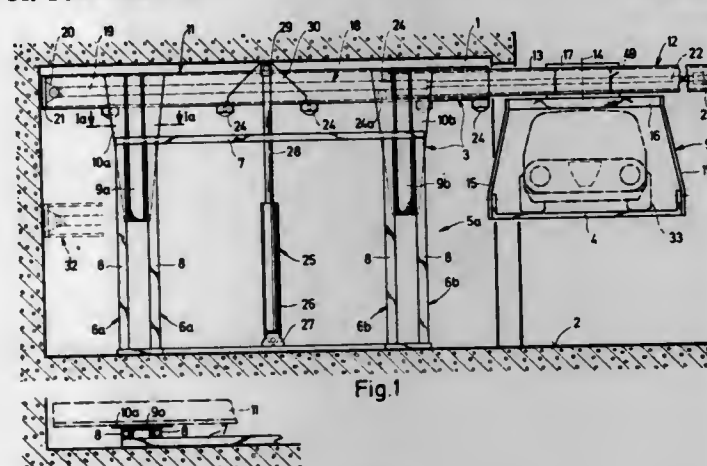
Continuation of Ser. No. 508,140, Sept. 20, 1974, abandoned.

This application May 10, 1976, Ser. No. 684,682

Int. Cl.² E04H 6/06

U.S. Cl. 214-16.1 C

2 Claims



1. In a garage for parking vehicles, stall means with an entrance end for parking two vehicles one above the other, said stall means defined by two pairs of fixed uprights spaced apart to define the corners of a rectangular space into which a vehicle to be parked a vehicle holding device onto which a vehicle can be driven,

horizontal guide rail means within the stall means parallel to the length of the rectangular space, wherein said guide rail means comprises spaced horizontal girders, said vehicle holding device including guide members movable between said girders, means to move said guide members to form extensions of said girders,

means for supporting said guide rails means on said uprights for relative vertical movement thereon,

said vehicle holding device being mounted on said guide members below said rail means and adjacent said entrance end when said vehicle is driven thereupon or unloaded therefrom, drive means for rotating said holding device about a vertical axis,

means for supporting said device on said guide rail means for

horizontal movement on said guide rail means into and out of said stall means,

means for raising and lowering said guide rail means and said vehicle holding device thereon between a lowermost position wherein a first vehicle can be driven onto said vehicle holding device, to an uppermost position wherein a second vehicle can be driven into said stall means to a position below said first vehicle and said vehicle holding device,

and means for moving said vehicle holding device relative to said guide rail means.

4,054,216

APPARATUS FOR CONTROLLING BUCKET IN TRACTOR MOUNTED LOADER

Takayasu Inui, Osaka, and Masao Kato, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

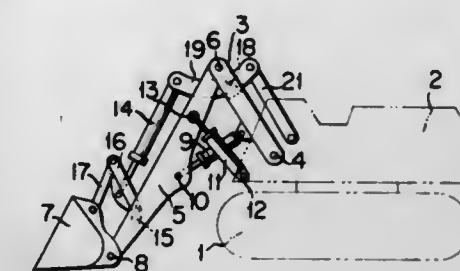
Filed Nov. 18, 1975, Ser. No. 633,119

Claims priority, application Japan, Nov. 18, 1974, 49-132007; Nov. 18, 1974, 49-132008; Feb. 19, 1975, 50-21833[U]

Int. Cl.² E02F 3/32

U.S. Cl. 214-138 R

2 Claims



1. An apparatus for controlling bucket in tractor mounted loader, comprising:

a. a body of the tractor;

b. a reach lever pivotally connected at its one end to said body;

c. a lift arm pivotally connected at its one end to the other end of said reach lever;

d. a bucket pivotally connected at its lever end to the other end of said lift arm;

e. a first cylinder means for reach operation of said bucket pivotally connected between said reach lever and a position approximately at the midpoint of said lift arm;

f. a second cylinder means for lift and down operation of said bucket pivotally connected between said body and a point between said one end and said approximate midpoint of said lift arm in such a manner that said second cylinder means form a deformable quadrilateral type linkage in combination of said body, said reach lever and said lift arm; and

g. a third cylinder means for tilt operation of said bucket pivotally connected at its one end to an upper end of said bucket through a tilt rod and tilt lever which are pivotally connected to each other at their respective one end and are pivotally connected at the other end of said tilt rod to the upper end of said bucket and at the other end of said tilt lever to said lift arm respectively, said third cylinder means being pivotally connected at one end thereof to said tilt lever and at the other end thereof to said body of the tractor by the interposition of a rock link and a rod which are pivotally connected at their respective one end to each other and are pivotally connected at the other end of said rod link to said body and at the other end of said rod to said the other end of said third cylinder means, respectively, whereby an approximately horizontal reach operation is brought to said bucket by actuating only said first cylinder means to excavate in horizontal a relatively soft ground.

4,054,217

LOAD-LIFTING ASSEMBLY

Gibson E. Brock, R.D. No. 5, Persimmon Road, Sewickley, Pa. 15143

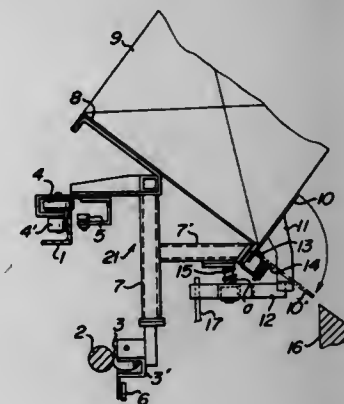
Continuation-in-part of Ser. No. 717,647, Aug. 25, 1976, abandoned. This application Mar. 31, 1977, Ser. No. 783,332

Int. Cl.² B60P 3/00

U.S. Cl. 214-392

20 Claims

1. A load-lifting assembly adapted for installation on a vehicle bed for picking up loads blocked therebelow and carrying them, comprising a mounting platform adapted to be attached to the vehicle bed, a pair of lifting means affixed at opposite sides of the mounting platform, a cross member disposed below



1. Apparatus comprising:

a conveyor line;

at least one unloading station positioned adjacent to said conveyor line;

a stop means positioned along said conveyor line adjacent said unloading station;

at least one vehicle supported by said conveyor line for movement along said conveyor line;

said vehicle including an inclined article supporting platform and a means for preventing an article from sliding off of said platform;

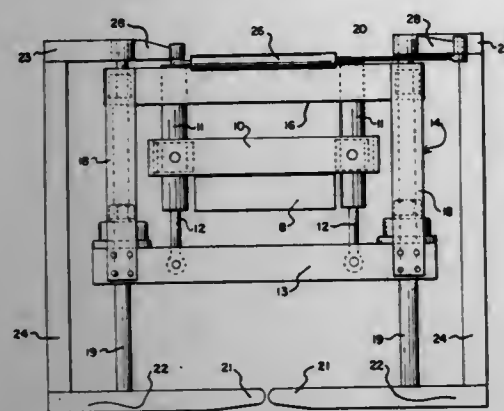
an actuator means mounted on said vehicle;

said preventing means including a gate means hinged to said vehicle adjacent the lower end of said inclined article supporting platform and an arm extending generally outwardly from said gate means and having an end with a generally horizontal surface supported by said actuator means;

said actuator means cooperating with said stop means when said vehicle is adjacent said unloading station for deactuating said preventing means whereby an article is allowed to slide off of said platform; and

said actuator means includes a generally horizontally disposed lever means rotating about a generally vertical axis having a first end adapted to support said arm and another portion being adapted to cooperate with said stop means.

the mounting platform and connected to the lifting means so as to be moved toward and away from the mounting platform thereby, an inverted U-shaped frame disposed above the mounting platform crosswise thereof with each leg connected at its lower end to an end of the cross member, a vertical shaft



mounted for rotation in each leg of the frame and extending below the cross member, a swing load-supporting member affixed to the lower end of each shaft normal thereto, and means mounted on the U-shaped frame adapted to rotate the vertical shafts through an arc of at least 90°.

4,054,218

TILTABLE TRAILER

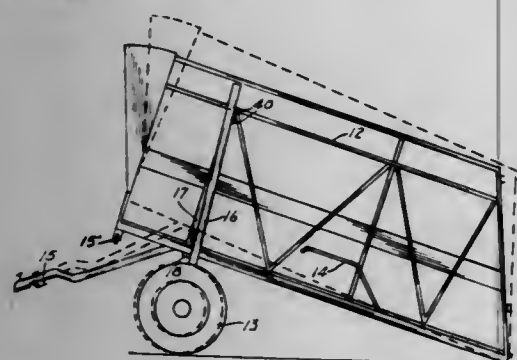
James F. Mackey, Highway House, Rte. 1, Steamboat Springs, Colo. 80477

Filed Oct. 5, 1976, Ser. No. 729,667

Int. Cl.² B60P 3/00

U.S. Cl. 214—506

7 Claims



1. A trailer for carrying livestock and other loads comprising:
a rigid flat frame for supporting a floor,
means providing rigid supports connected to and extending above said frame on each side thereof,
a pair of wheels for said trailer mounted on an axle member extending therebetween and positioned below said frame,
a pair of spaced parallel mounting arms rigidly secured to said axle member and extending laterally normal thereto, one on each side of said frame,
means for pivoting said arms on said rigid supports a substantial distance above said frame,
the length of said arms from said axle member to the pivots on said support being substantially greater than the height of said pivots above the bottom of said frame, and said arms extending at an angle rearwardly of said supports with said frame resting on said axle member,
said arms being swingable to a forward position over center with respect to said axle member and against stop means rigidly secured to said frame below said supports,
a drawbar pivotally mounted on the bottom of said frame for swinging movement in a vertical plane whereby when said wheels are blocked and the drawbar is forced rearwardly said arms rotate about said pivot and lift and tilt said trailer until said arms engage said stop means thereby locking said trailer in a predetermined tilted position for loading or unloading.

4,054,219

DRAINABLE CONTAINER BASE

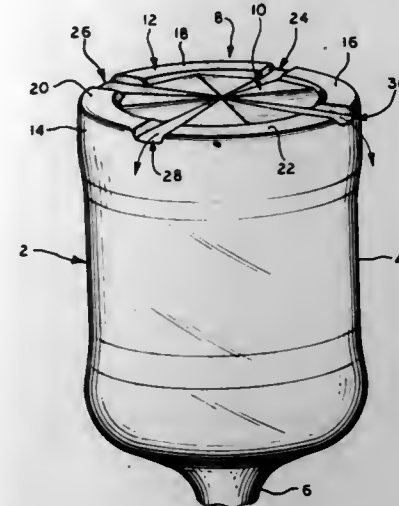
William C. Young, Southfield, Mich., and John S. Frazer, Pequannock, N.J., assignors to Beatrice Foods, Chicago, Ill.

Filed May 26, 1976, Ser. No. 690,016

Int. Cl.² B65D 1/02

U.S. Cl. 215—1 C

8 Claims



1. A bottle having a drainable base, comprising:
a body having a round side wall;
a neck having an opening therein; and
a base, integral with the lower edge of the side wall, the base having a central section, a rim section surrounding the central section, and a series of shoulders along the inner edge of the rim section to connect the rim section to the center section;
the central section having two or more radially extending raised ribs and an equal number of radially extending sloped troughs, each rib and trough being separated by a generally triangular shaped, planar, inclined surface which directs any liquid deposited on the base when the bottle is inverted toward a trough;
the rim section having generally flat raised portions extending higher than the ribs, and a number of depressions, each of which is formed by an outwardly and downwardly slanted center and by generally planar side walls disposed between the center and the rim's raised portions and is adjacent to and in flow communication with the outer end of one of the sloped troughs, to permit liquid collected in the troughs when the bottle is inverted to flow past the rim section and drain from the base;
the shoulders being disposed between the rim's raised portions and the center's planar inclined surfaces.

4,054,220

COMBINED POCKET FLASK AND DENTURE CASE WITH REMOVABLE CUP PORTION

Abraham J. Rosenstein, R.R. No. 1, Canaan, Conn. 06018

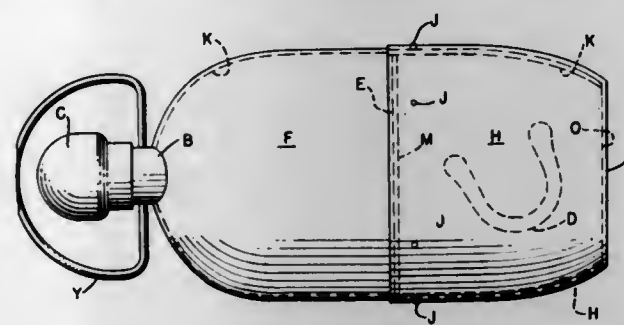
Continuation-in-part of Ser. No. 609,968, Sept. 3, 1975,

abandoned. This application Feb. 19, 1976, Ser. No. 659,477

Int. Cl.² B08B 3/04; B65D 1/04, 81/08

U.S. Cl. 215—6

4 Claims



1. A compact, portable pocket flask denture storage and

cleaning apparatus comprising an elongated, pocket size flask of a size and shape for ready insertion into and removal from a standard size pocket or handbag, said flask an integral having transverse dividing wall internally separating the space within said flask into aligned upper and lower compartments each of which is sealed from the other, said flask having a neck portion connected to said upper compartment, said neck portion being provided with a water-tight cap for sealing liquid therein, the lower compartment of said flask being completely open at the bottom, which bottom is spaced apart from said transverse dividing wall to provide a lower space within said flask, which lower space is sealed from said upper space, and means in the form of a cup which is shaped to fit snugly over the outside surfaces of said lower compartment in a manner to form a seal therewith, said cup having an open top and having a closed and sealed bottom, said cup having an inner bottom wall lined with soft and resilient material and said cup being of a size sufficient to contain a denture, and the inside walls of said lower compartment also lined with soft and resilient material, thus forming a protective and cushioning enclosure for the denture.

4,054,221

BOTTLE CLOSURE

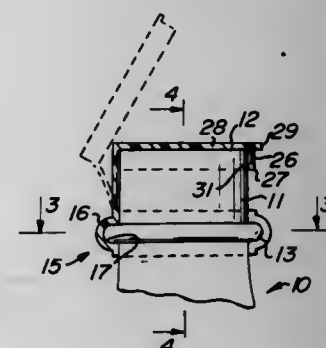
Ellis C. Glover, 225 Kirkwood Road, Gibbstown, N.J. 08026

Filed June 22, 1976, Ser. No. 698,525

Int. Cl.² B65D 55/16

U.S. Cl. 215—235

8 Claims



1. A bottle closure integrally fabricated of resiliently flexible plastic and a bottle having a neck, a mouth at one end of the neck and a bead on the neck spaced from the mouth, said closure comprising: a generally C-shaped resilient clip removably embraceable about the neck in conforming engagement with the bead for retention by the latter spaced from the mouth, a strap upstanding from a medial region of said clip closely adjacent the neck toward said mouth, and a cap extending from the upper end of said strap engageable in closing relation over and sealingly engageable about the mouth, said strap being flexible to mount said closure for swinging movement between said closing relation and an open relation spaced from said mouth with said strap extending away from said neck, so that strap displacement toward said neck moves said cap toward said closing relation.

4,054,222

COVER FOR ELECTRICAL FLOOR BOXES

Eugene J. Suk, Pittsburgh, Pa., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 2, 1976, Ser. No. 646,278

Int. Cl.² H02G 3/08

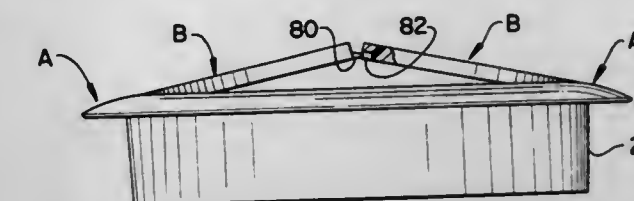
U.S. Cl. 220—3.8

10 Claims

1. A support member having an opening therein, said opening having an outer opening peripheral edge, a shoulder spaced inwardly from said opening peripheral edge, an opening peripheral wall extending between said shoulder and said opening peripheral edge, a two-piece cover received in said opening and having outer and under surfaces, the outer peripheral portion of said under surface being supported on said shoulder,

said cover having a cover peripheral wall facing said opening peripheral wall, said cover being in two pieces having mating straight walls extending across said opening to define a joining line, one of said peripheral walls having tabs extending outwardly therefrom on opposite sides of said joining line toward the other of said peripheral walls, said other peripheral wall having recesses receiving said tabs for releasably holding said cover from being lifted out of said openings, and said recesses having entrance openings facing laterally toward said tabs and being peripherally continuous around said entrance openings.

10. A half part cooperable with a like half part to form a cover for electrical outlet boxes or the like comprising; a substantially flat member having a mating straight wall for mating with a like wall on a like flat member, said straight wall having



straight wall ends, at least one weakened area extending inwardly from said straight wall and spaced inwardly from said straight wall ends to define a knockout, said flat member having a peripheral wall extending therearound between said straight wall ends, and releasable locking tab means extending outwardly from said peripheral wall for releasably locking said half member in an opening, said tab means having a locking flange extending downwardly therefrom and terminating at a flange end spaced below the under surface of said flat member, said peripheral wall of said flat member lying on the periphery of a circle having a predetermined diameter, and said flange having an inner flange surface intersected by the periphery of a circle having a diameter substantially the same as said predetermined diameter.

4,054,223

PACKINGS FOR TRANSPORT AND STORAGE ESPECIALLY OF LIQUID AND PASTY PRODUCTS

Gilles Marques, Villeneuve D'Ornon, France, assignor to Liquitainer S.A., Lausanne, Switzerland

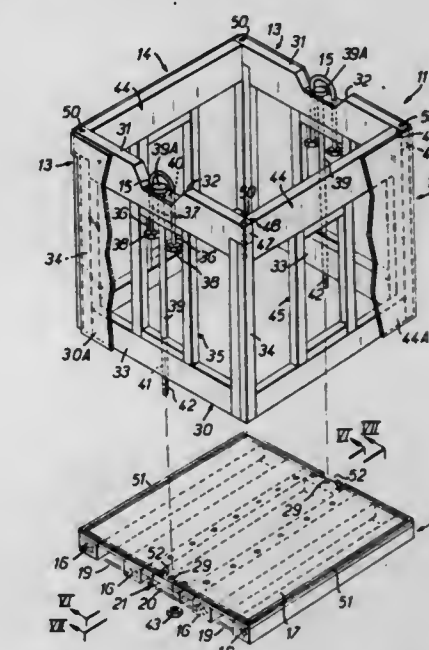
Filed Aug. 9, 1976, Ser. No. 712,917

Claims priority, application Switzerland, June 16, 1976, 7681/76

Int. Cl.² B65D 7/00, 9/12, 25/14

U.S. Cl. 220—4 F

11 Claims



1. A composite container comprising a plastic bag of generally parallelepiped shape collapsible into flattened condition and a rigid knock-down type enclosure adapted to accommo-

date the plastic bag, said enclosure including a pallet-type base member and four side members having lower edges adapted to face the base member and upper edges, an opposed pair of said side members having notches in their upper edges, handle means secured to each of said pair of opposed side members and having a position in which the handle means is located substantially entirely within the effective confines of the corresponding side members, said effective confines being defined in part by the continuation of the upper edge over the notch, releasable assembly means for releasably fastening said pair of opposed side members to said base member, said releasable assembly means having a retracted position in which they are located within said effective confines of their corresponding side members, and releasable securing means for securing said adjacent side members to one another, whereby upon release of said securing means said enclosure can be stacked in compact form with said releasable assembly means and said handle means in their retracted positions within the effective confines of their respective side members.

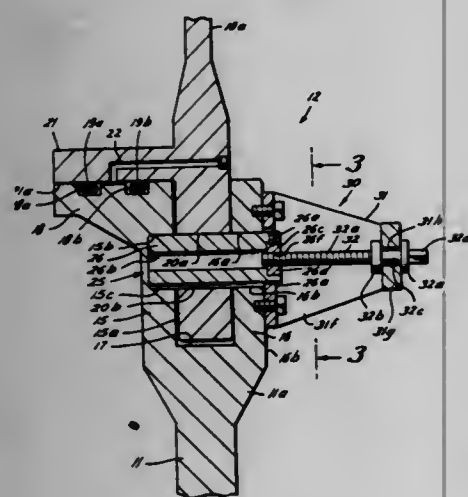
4,054,224
VESSEL ASSEMBLY

Raymond E. Pechacek, Houston, Tex., assignor to Hahn & Clay, Tex.

Continuation of Ser. No. 486,304, July 8, 1974, abandoned. This application Aug. 25, 1975, Ser. No. 607,210
Int. Cl.² B65D 45/16, 7/02, 7/42

U.S. Cl. 220—5 A

1 Claim



1. A new and improved vessel structure, comprising:
 - a first vessel section having an annular end portion formed of concentric connector rings separated by an annular recess;
 - a second vessel section having an annular end portion including a connector ring for insertion within said annular recess of said first vessel section with some clearance being formed between said connector ring of said second vessel section and said concentric connector rings of first vessel section annular end portion with said connector ring of said second annular end portion inserted into said annular recess of said first annular end portion;
 - seal means mounted on said annular end portions of said vessel sections for sealing said first and second vessel sections;
 - said connector rings of said first and second vessel sections including a plurality of circumferentially spaced sets of holes and a connector pin positioned in each of said sets of holes, one of said holes in said sets of holes including a retention ridge, and said pin having a groove for receiving said retention ridge for holding said pin against rotation; and
 - a pin retainer means mounted with each of said pins for placing said pin in an inserted position in said holes and for retaining said pin in said inserted position in spite of relative, radial movement of said connector rings which is caused from temperature or pressure differential or the like, said pin retainer means including means mounted in

engagement with said pin for temporarily yielding in response to outward radial displacement of said pin from an inserted position and for returning said pins to said inserted position, including:

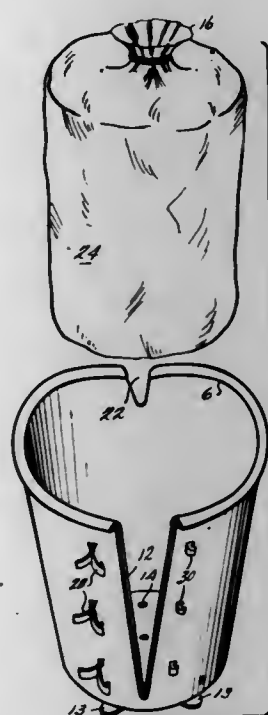
- a lock shaft being threaded and engaging a bore in said pin;
- a bracket mounting said lock shaft for rotation, said bracket including an outer bracket member and means mounting said outer bracket member in a position spaced from said first vessel section, said lock shaft being mounted for rotation in said outer bracket member and said outer bracket member being temporarily bendable outwardly in response to outward radial displacement of said pin from said inserted position, said outer bracket member returning said pin to said inserted position as said outer bracket member returns to an initial, unbent position.

4,054,225
REFUSE CONTAINER ASSEMBLY

Thomas D. Frech, 706 E. Park, Arlington Heights, Ill. 60005
Filed Feb. 8, 1977, Ser. No. 766,788
Int. Cl.² B65D 25/14

U.S. Cl. 220—63 R

6 Claims



1. A refuse container comprising:
 - a flexible container having an open top, a bottom and a continuous side wall integrally attached to said bottom, said side wall having a slit extending longitudinally from said top to a location near said bottom, and
 - releaseable means for securing opposite edges of said slits in close relationship when said container is in a fill position, said serving means being manually releasable so that the said edges move away from each other and the distance between said opposite edges increase along the direction from container bottom to container top to define an un-load position.

4,054,226
LINING OF CONTAINERS FOR BULK CARGO

Ronald W. Bjelland, Valley Stream; Charles A. Narwicz, Greenlawn, both of N.Y., and Casimir Hetmanski, Westfield, N.J., assignors to United States Lines, Inc., New York, N.Y.

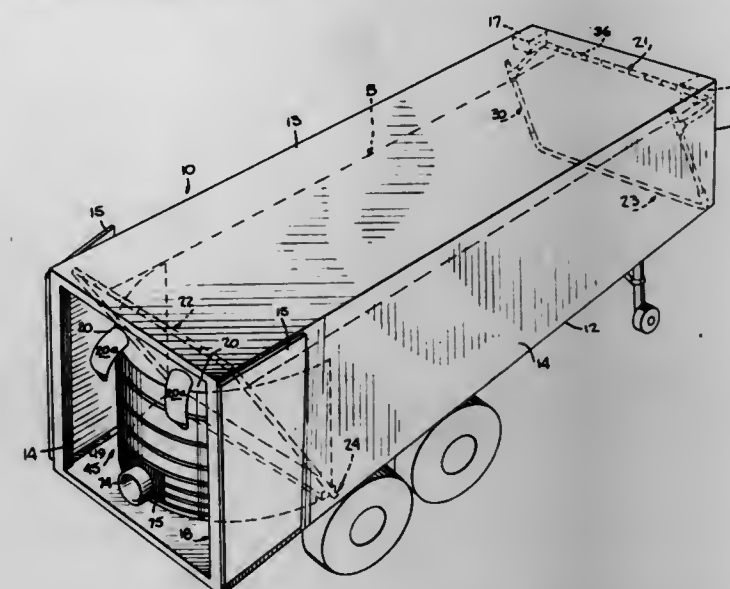
Filed Nov. 16, 1973, Ser. No. 416,580
Int. Cl.² B65D 25/14; B65G 65/34; B60P 1/00

U.S. Cl. 220—63 R

36 Claims

1. In a cargo container of the type having a floor, side walls, a roof, and a front wall, and wherein the roof structure includes downwardly projecting structural members, a liner bag adapting the container for receiving bulk cargo, and means for

supporting said liner bag within the container comprising front frame means including a bottom cross member substantially on and extending transversely across the container floor, a pair of substantially parallel side members extending upwardly and rearwardly from the respective ends of said bottom cross member, said side members having upper end portions engaging forwardly facing surface portions of one of said down-



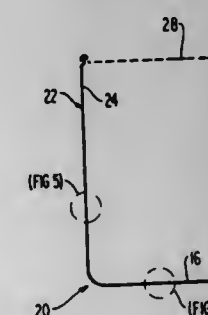
wardly projecting structural members, and means bracing said side members apart adjacent to their said upper end portions and including a top cross member extending between said side members and generally parallel to said bottom cross member, said liner bag having a transversely extending bottom front end area connected substantially to said front frame bottom cross member and a transversely extending upper front end area connected to said front frame top cross member.

4,054,227
SELECTIVE COATING CHARACTERISTIC TINPLATED STEEL CANS

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.
Division of Ser. No. 387,043, Aug. 9, 1973, Pat. No. 3,934,527.
This application Sept. 22, 1975, Ser. No. 615,684
Int. Cl.² B65D 23/02

U.S. Cl. 220—64

9 Claims



1. A one-piece sheet metal can body for special container packs requiring exposure of container contents to a tin surface while protecting remaining interior surfaces of the can body from contact with container contents, such special container pack can body having
 - a bottom wall and unitary sidewall extending longitudinally in one direction from the bottom wall,
 - the bottom wall and sidewall comprising flat rolled steel coated on interior surface of the bottom wall and sidewall with tin,
 - the bottom wall sheet metal having a substantially uniform thickness gage between about 0.010 inch and 0.015 inch, the interior surface of the bottom wall having a substantially uniform tin coating between at least ten microinches in thickness and about 90 micro-inches in thickness,
 - the sidewall being ironed and comprising over a major por-

tion of its area a substantially thinner interior surface tin coating than the bottom wall, and further including a protective organic coating on substantially the entire interior surface of the sidewall to substantially eliminate contact of container contents with the sidewall, while the interior surface of the bottom wall provides an exposed tin coating for contact of such tin coated surface with container contents.

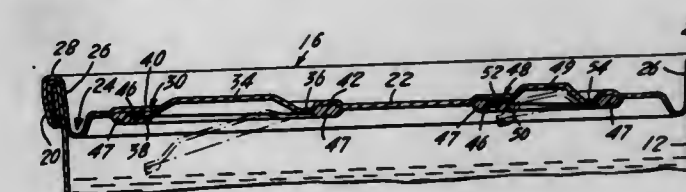
4,054,228
CAN END CLOSURE HAVING FIRST AND SECOND SEALING MEANS

Alfred E. Balocca, Wheaton, and Paul W. Hardy, Barrington, both of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 1, 1977, Ser. No. 783,718
Int. Cl.² B65D 41/32

U.S. Cl. 220—268

6 Claims



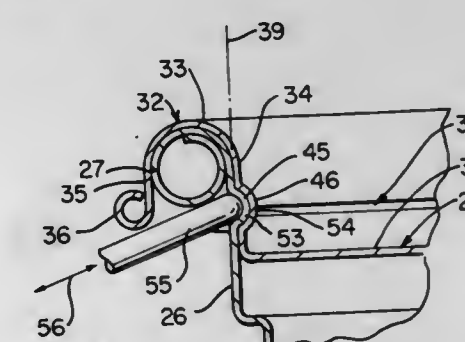
1. An end cover for a container comprising, a central panel having a pour opening and a first closure dimensioned and configured to close said pour opening, first hinge means for manually displaceably mounting said first closure on said panel with said first closure sealingly engaged across said pour opening by first sealing means positioned exclusive of said hinge means and including second sealing means sealingly engaged across said pour opening, said first sealing means having a higher tensile strength than said second sealing means and positioned beneath said second sealing means in a localized area spaced apart from said hinge means.

4,054,229
CONTAINER

Horst F. W. Arfert, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Feb. 11, 1976, Ser. No. 657,386
Int. Cl.² B65D 41/10

U.S. Cl. 220—288

12 Claims



1. A container comprising, a deformable metallic container body adapted to contain a product therein and having a bottom wall and a side wall which has a tubular upper portion terminating in an open end, a deformable metallic closure for said container body, said closure having a main body adjoined at its outer edge by an annular flange, said flange having a roughly U-shaped cross-sectional configuration defined by a bight with an inner leg portion and an outer leg extending from opposite ends of said bight, said inner leg portion adjoined said main body and said outer leg being disposed radially outwardly of said open end and terminating therebeneath, said tubular upper portion and said inner leg portion each being provided with an annular indentation to effect a seam between said tubular upper portion and said inner leg portion, one of said tubular upper

portion and said inner leg portion being made of metal the other which is stronger than the metal of the other, and at least one punch-like protrusion in said one portion which is convex into said other portion with said other portion having a corresponding cap disposed around said protrusion, said closure being adapted to be removed by applying a rotational and lifting force against said outer leg causing said punch-like protrusion to deform said other portion by defining a thread-like groove therein due to the rotational and lifting action enabling easy removal of said closure.

4,054,230

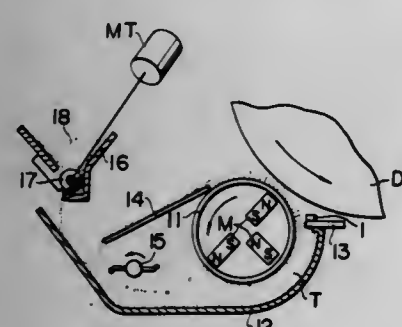
METHOD OF DETECTING A TONER CONCENTRATION
Koichi Suzuki, Yokohama, and Tomooki Suzuki, Funabashi, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Apr. 6, 1976, Ser. No. 674,087

Claims priority, application Japan, Apr. 7, 1975, 50-42512

Int. Cl.² B67D 5/08; G03B 27/00

U.S. Cl. 222-1



1. A method of detecting a toner concentration in a developer comprising a mixture of a carrier particles of a magnetic material and toner of a non-magnetic material, said method comprising the steps of;

- producing a magnetic field of a predetermined magnitude,
- shaping said mixture into a predetermined configuration,
- placing the shaped mixture in and at a predetermined position relative to said magnetic field,
- locating a Hall element adjacent to and at a predetermined position relative to said so placed shaped mixture,
- detecting the Hall voltage to provide an electric signal indicative of the magnitude thereof while passing through said Hall element a control current of a predetermined magnitude,
- detecting the temperature at said position where said Hall element is located to provide an electric signal indicative of the magnitude thereof, and
- supplying both said electric signals into respective inputs of an analog calculator which is designed to provide information of the toner concentration being detected in accordance with a preset calculation therein on the basis of the input electric signals.

4,054,231

PHOTOGRAPHIC APPARATUS

Valto K. Eloranta, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 27, 1976, Ser. No. 680,748

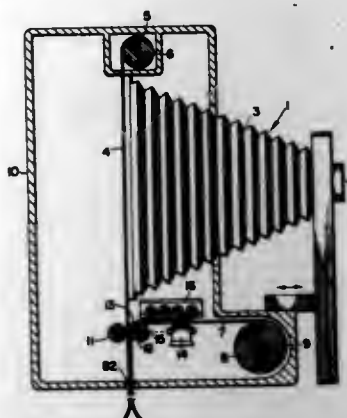
Int. Cl.² B65D 35/28; F04B 43/12

U.S. Cl. 222-102

4 Claims

1. A photographic fluid applicator adapted to cooperate with an extrusion press for dispensing a predetermined quantity of processing fluid across a sheet of photographic material, said applicator comprising an elongated flexible tube, a quantity of processing fluid greater than said predetermined quantity in said tube, a plug in a first end of said tube, said plug closing said tube and forming a stop preventing collapse of said tube when said tube is engaged by an extrusion press in a first region adjacent said first end, means forming a flow limiting orifice in a second end of said tube opposite said first end, means detachably mounted in said orifice for preventing the flow of processing fluid until detached, and stop means

mounted in said tube intermediate said ends and spaced therefrom for preventing collapse of said tube by an extrusion press in a second region adjacent said second end to stop the flow of



4 Claims fluid from said tube when engaged by the press as said tube is drawn through the press from said first end toward said second end.

4,054,232

FLUID CONTAINERS

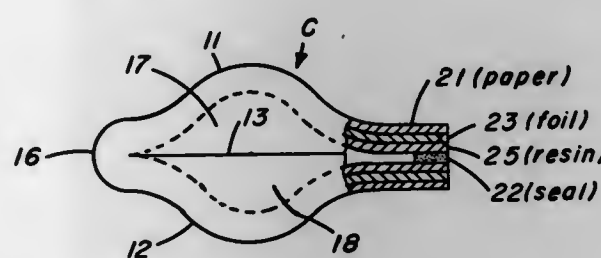
John Duval Cawley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 5, 1976, Ser. No. 683,363

Int. Cl.² B65D 35/08

U.S. Cl. 222-107

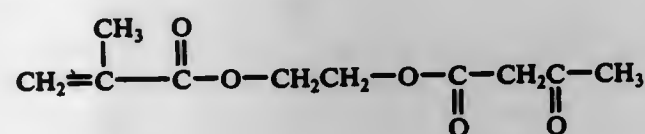
16 Claims



1. In a container for a fluid photographic processing material including aromatic alcohol comprising

a pair of opposed walls marginally sealed together over a substantial area to provide an internal cavity adapted to retain such material, at least one of said walls being flexible and deformable, the internal surfaces of said walls bounding said cavity comprising a polymer which resists deterioration by the action of such processing material, said opposed walls being marginally sealed together over a first part of said area polymer-to-polymer, and a polymeric sealing composition interposed between said opposed walls over a second part of said area forming a seal of less strength than the seal over said first part of said area, whereby said container preferentially opens along said second part of said area upon the application of pressure to said container, the improvement wherein:

said polymeric sealing composition consists essentially of crosslinked homopolymer or copolymer of an acrylic acid ester having the formula:



said homopolymer or copolymer prior to being crosslinked having an inherent viscosity in benzene or chloroform measured at a concentration of 0.25 g/deciliter of solution at 25° C ranging from about 0.2 to 1, said seal formed by said polymeric sealing composition between said opposed walls being substantially resistant to changes in burst strength of said seal during storage of said container.

4,054,233

FLUID CONTAINER FOR PHOTOGRAPHIC PROCESSING MATERIAL

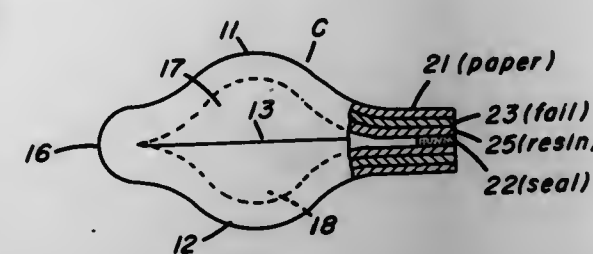
John Duval Cawley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 5, 1976, Ser. No. 683,365

Int. Cl.² B65D 35/08

U.S. Cl. 222-107

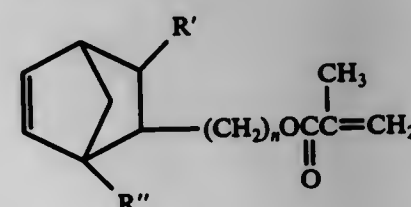
14 Claims



1. In a container for a fluid photographic processing material including aromatic alcohol comprising

a pair of opposed walls marginally sealed together over a substantial area to provide an internal cavity adapted to retain such material, at least one of said walls being flexible and deformable, the internal surfaces of said walls bounding said cavity comprising a polymer which resists deterioration by the action of such processing material, said opposed walls being marginally sealed together over a first part of said area polymer-to-polymer, and a polymeric sealing composition interposed between said opposed walls over a second part of said area forming a seal of less strength than the seal over said first part of said area whereby said container preferentially opens along said second part of said area upon the application of pressure to said container, the improvement wherein:

said polymeric sealing composition consists essentially of crosslinked homopolymer of a norbornene compound having the structure:



wherein R' is selected from the group consisting of a hydrogen atom, a monovalent aliphatic group of from 1 to 4 carbons, and a phenyl group, R'' is selected from the group consisting of a hydrogen atom and a monovalent aliphatic group of from 1 to 2 carbons, and n is 0 to 3, said homopolymer prior to being crosslinked having an inherent viscosity in benzene measured at a concentration of 0.25 g/deciliter of solution at 25° C ranging from 0.1 to 1, and said seal formed by said polymeric sealing composition between said opposed walls being substantially resistant to changes in burst strength of said seal during storage of said container.

4,054,234

COMBINATION GARMENT HANGER

John Thomas, 2105 Tomlinson Ave., Bronx, N.Y. 10461

Filed Mar. 9, 1972, Ser. No. 233,258

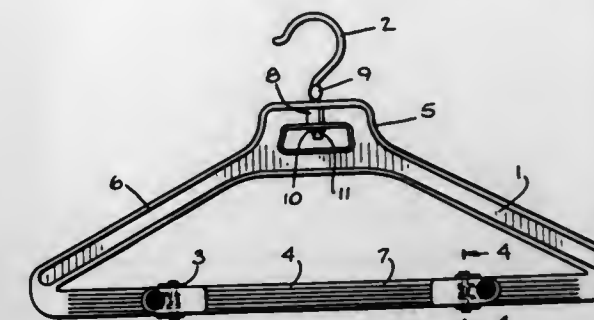
Int. Cl.² A47J 51/14

U.S. Cl. 223-91

5 Claims

1. A garment hanger comprising a triangular frame having two opposed sloping shoulders portions, neck portions, a horizontal bar, a hook swiveled to said neck portion and a pair of spaced fingers means secured to said horizontal bar, said finger means each including a bracket slidably secured to said bar, an elongated finger attached to said bracket and means releasably engaging said fingers with said bar, said elongated fingers having their long axis in alignment with each other and parallel

to said bar and forming clamps with said bar, said fingers being opposed to each other and movable toward and away from



each other to clamp and hold a garment stretched therebetween.

4,054,235

CONTINUOUS FORMS SHEET SEPARATOR

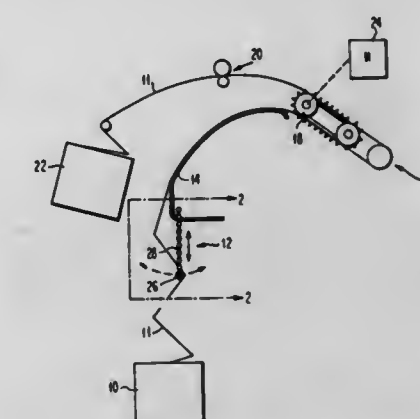
Leonard Dean Witcher, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,015

Int. Cl.² B65H 27/00

U.S. Cl. 226-200

1 Claim



1. In a paper driving system of the type wherein paper is fed along a path from an input stack of fan-folded paper initially in an upward direction to a printing station, the combination comprising:

a guiding and supporting member spaced upwardly from said input stack along said path, an elongated separator member, a pair of flexible elongated support members each comprising bead chains fixed at one end to opposed lateral sides of said guiding and support member and fixed at the other end to opposed ends of said elongated separator member to support said separator member adjacent said fan-folded paper above said input stack, said separator member having a mass sufficiently small that the separator member may be moved by the web and sufficiently large that the separator member may follow its natural tendency to swing so that the resultant reaction causes multiple sheet feeds of said web from said input stack to be separated from the web being fed upwardly toward said printing station.

4,054,236

MACHINE FOR NAILING SLATS ON STRINGERS

Gerald C. Paxton, Sanger, Calif., assignor to SWF Machinery, Inc., Calif.

Filed Aug. 30, 1976, Ser. No. 718,893

Int. Cl.² B27F 7/02

U.S. Cl. 227-45

23 Claims

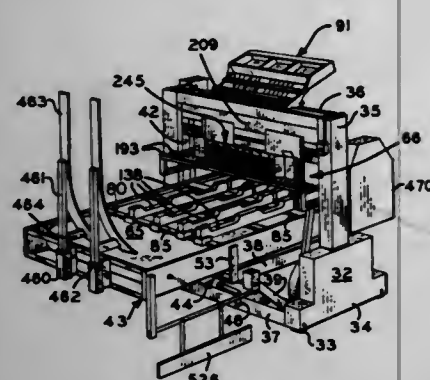
1. A machine for nailing slats on stringers comprising:
A. means for advancing a plurality of elongated stringers in substantially parallel spaced relation longitudinally in

corresponding increments of stepped progression into a nailing station whereby predetermined slat receiving positions on the stringers are successively located in the nailing station;

B. a hopper adapted to hold slats in horizontal stacked relation adjacent to the nailing station and above the stringers with the lowermost slat disposed in a substantially horizontal plane;

C. a pusher mounted for reciprocal movement in said plane successively to slide the lowermost slats from said stack edgewardly horizontally to a ready position over the slat receiving positions of the stringers in the nailing station;

D. a shelf at each end of said ready position adapted to receive opposite end portions of the slats thereon, said shelves being pivotally mounted for movement between substantially horizontal positions and positions downwardly thereof;



E. resilient means urging the shelves into their substantially horizontal positions but permitting the shelves to pivot downwardly to deposit the slats on the stringers when the resilient means is overcome;

F. means for operating the pusher synchronously with the increments of stepped progression of the advancing means to deliver such slats to the receiving positions on the stringers as said positions reach the nailing station; and

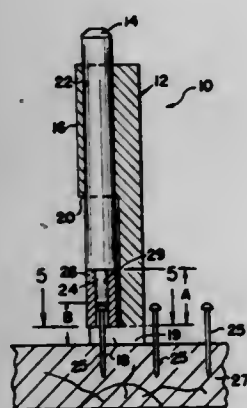
G. means operable synchronously with advancement of the stringers to force the slats individually successively downwardly in opposition to the resilient means whereby as the shelves tip downwardly they position the slats in their receiving positions transversely on the stringers and to nail the slats to the slat receiving positions on the stringers in interconnecting relation to the stringers while the slats are positioned thereon in the nailing station.

4,054,237 NAIL SETTING TOOL

Frank P. Rietveld, 1314 Vickie Lane, Matthews, N.C. 28105
Filed May 19, 1976, Ser. No. 687,676
Int. Cl.² B25C 7/00

U.S. Cl. 227-147

6 Claims



1. A precision nail driver for driving a nail into the surface of a workpiece to a predetermined uniform depth comprising:

a base having a lower surface slidably movable over the workpiece surface;

a holder mounted on said base;

a lower lateral cut out formed in said holder for providing an opening vertically extending from the base;

said holder further having a central bore extending there through into registration with said cut out portion;

a nail driver slidably movable downwardly and upwardly in said bore;

a spacer means of predetermined length removably mounted on the lower end of said nail driver and engagable with the upper surface of said base to provide a lower limit to the stroke of said nail driver whereby each nail is partially driven into the workpiece.

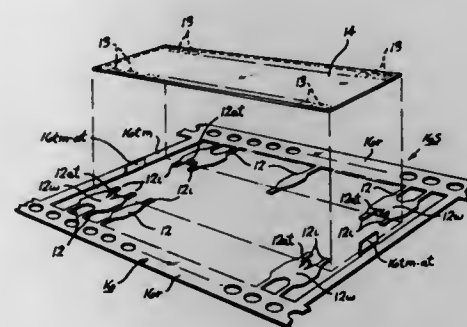
4,054,238 METHOD, APPARATUS AND LEAD FRAME FOR ASSEMBLING LEADS WITH TERMINALS ON A SUBSTRATE

Harold E. Lloyd, Merrimac, and Joseph F. Pollitt, Bradford, both of Mass., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,575
Int. Cl.² H01L 21/60

U.S. Cl. 228-173 R

18 Claims



1. A method of assembling leads of an essentially planar lead frame with respective terminals on a substrate, which comprises the steps of:

forming first aligning tab portions on the lead frame in preselected spaced relationship such that the first tab portions will locate the substrate in a first direction extending parallel to the plane of the lead frame to align the terminals of the substrate with their respective leads of the lead frame when the substrate is engaged with the first tab portions;

forming second aligning tab portions on the lead frame in preselected spaced relationship such that the second tab portions will locate the substrate in a second direction extending parallel to the plane of the lead frame and perpendicular to the first direction to align the terminals of the substrate with their respective leads when the substrate is engaged with the second tab portions; and

positioning the substrate in engagement with the first and second aligning tab portions on the lead frame to align the terminals of the substrate with their respective leads of the lead frame.

4,054,239 PROCESS FOR FABRICATING A HEAT EXCHANGER

James J. Watson, Jr., McMinnville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,200
Int. Cl.² B21D 53/02

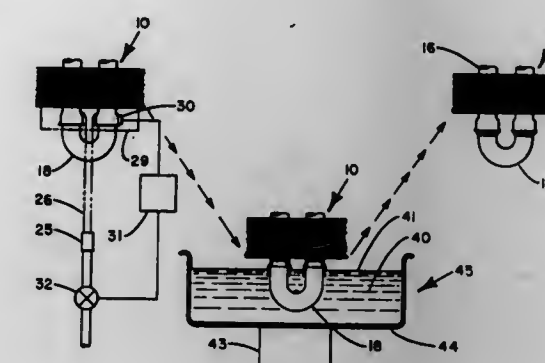
U.S. Cl. 228-183

9 Claims

1. In the fabrication of a heat exchanger wherein a number of tubular components are joined together to form flow circuits within a fan coil, the process of joining the components comprising providing telescoped socket joints between the tubular com-

ponents positioned adjacent to at least one tube sheet of the fan coil,

directing a high speed jet of flammable gas at the tube sheet whereby the jet is redirected by the tube sheet to form a blanket of gas about the outside of the tubular joints, maintaining the speed of the jet traveling between its source and the tube sheet at a velocity sufficient to prevent the gas from mixing with ambient air and thus being ignited,



igniting the blanket formed at the tube sheet to heat the joints within the blanket region to a predetermined temperature,

immersing the preheated joints in a bath of liquid solder, and exposing the bath to ultrasonic energy while the joints are immersed therein.

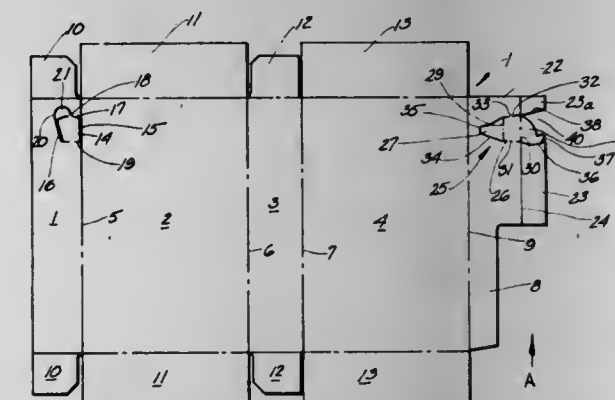
4,054,240 CARTON WITH INTEGRAL POURING SPOUT

James F. LaPierre, Franklin, Ohio, assignor to Interstate Folding Box Company, Middletown, Ohio

Filed Oct. 4, 1976, Ser. No. 729,184
Int. Cl.² B65D 5/74

U.S. Cl. 229-17 R

6 Claims



1. In a one-piece paperboard carton having a first end wall, a first side wall, a second end wall, and a second side wall in side-by-side articulation in the order named, and a glue flap hingedly connected to the remaining side edge of said second side wall, said glue flap being secured to the inner surface of said first end wall to form a tubular carton body, a generally rectangular pouring spout tab formed in said first body wall adjacent the upper end thereof, said tab being hingedly connected to said first end wall along its bottom edge and having one of its side edges lying along the line of articulation between said first end wall and said first side wall, said glue flap having an enlarged portion extending the full width of said first end wall in the area underlying said pouring spout tab, a flap extension hingedly connected to the outer side edge of the enlarged portion of said glue flap, said flap extension lying along the inner surface of said first side wall, a pouring spout formed in part in the enlarged portion of said glue flap and in part in said flap extension, said pouring spout having a generally rectangular center part underlying and secured to said pouring spout tab, a first wing part hingedly connected to one side edge of said center part, said first wing part being formed in the enlarged portion of said glue flap, and a second wing part

hingedly connected to the opposite side edge of said center part, said second wing part being formed in said flap extension, said first extension being substantially no greater in width than the width of said second wing part.

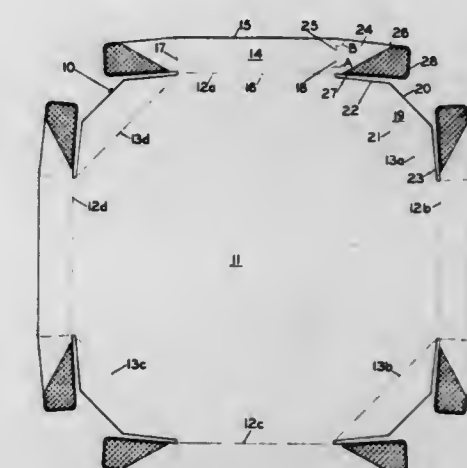
4,054,241 TAPERED OCTAGONAL TRAY

George Leroy Meyers, Menasha; David Charles Mueller, and Edward Thayer Elliott, both of Neenah, all of Wis., assignors to American Can Company, Greenwich, Conn.

Filed June 1, 1976, Ser. No. 691,879
Int. Cl.² B65D 5/28

U.S. Cl. 229-32

5 Claims



1. An octagonal tray of less than one inch in height made from a one piece paperboard blank, said blank comprising:

a. an octagonal bottom panel having four sides defined by a first set of four score lines and four sides defined by a second set of four lines,

b. four trapezoidal side walls each having parallel top and bottom sides and a pair of nonparallel sides, said top sides being longer than said bottom sides, each of said trapezoidal side walls being attached at its bottom side to said bottom panel along one of said first set of score lines,

c. four trapezoidal side flaps each having parallel upper and base edges said base edges being longer than said upper edges, each of said trapezoidal side flaps being attached along its base edge to said bottom panel along one of said second set of score lines,

d. said trapezoidal side walls and side flaps being alternately disposed about the periphery of said bottom panel, and

e. eight generally rectangular glue flaps having a base, an inner edge, and an outer edge, one each of said glue flaps being attached along its base to one each of the nonparallel sides of said side walls along a common fold line.

4,054,242 NOVELTY PACKAGE

Carl J. Strobe, Atlanta, Ga., assignor to The Pangburn Co., Fort Worth, Tex.

Filed Feb. 11, 1976, Ser. No. 657,050
Int. Cl.² A63H 33/00; B04B 27/04

U.S. Cl. 229-71

6 Claims

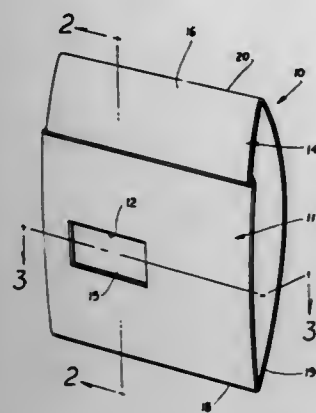
1. A novelty package for receiving and retaining a product, said package comprising:

a primary panel having a window defined therethrough;

a secondary panel adjacent to said primary panel and slidably assembled with respect thereto, a first area of said secondary panel being normally visible through said window, and a second area of said secondary panel being visible through said window upon sliding of said secondary panel with respect to said primary panel;

a back panel attached to the upper edge of said secondary panel and to the lower edge of said primary panel, and spaced apart from said primary and secondary panels to

define a space therebetween for receiving the product within said novelty package; said back panel being longer than the combined length of said primary and secondary panels in assembly, so that said back panel provides a resilient means for normally urging said secondary panel to a first position in which



said first area is visible through said window, and for yieldingly permitting said secondary panel to be slidably displaced to a second position with respect to said primary panel to align said second area with said window; and means associated with said primary panel to retain the product within said space in either slidable relation of said primary and secondary panels.

4,054,243

PREPARATION-MAKING ULTRACENTRIFUGE

Gennady Ivanovich Volkov, ulitsa Borskaya, 17, kv. 2; Vladilen Mikhailovich Densov, ulitsa Avtomobilnaya, 16, kv. 13; Anatoly Efimovich Ermishin, prospekt Kirova, 43a, kv. 42; Jury Petrovich Zaozersky, pereulok Rulevoi, 7, kv. 36; Vladimir Veniaminovich Zozin, ulitsa Komsomolskaya, 2, kv. 14, all of Gorky; Viktor Pavlovich Kapitonov, ulitsa Marshala Birjuzova, 40, kv. 90, Moscow; Isak Kushelevich Kikoin, ulitsa peschanaya, 10, kv. 14, Moscow; Vladimir Alexandrovich Lebedev, ulitsa Gamalie, 2, kv. 41, Moscow; Nikolai Markovich Lystov, ulitsa Rogova, 4, Kottedzh 11, kv. 2, Moscow; Leonid Ivanovich Matveev, ulitsa Rogova, 3, kv. 132, Moscow; Timofei Vasilievich Popov, ulitsa Vatutina, 4, kv. 14, Gorky; Vasily Andreevich Ryabov, Avtomekhanicheskaya ulitsa 14, kv. 4, Gorky; Albert Grigorievich Sukhov, ulitsa Uritskogo, 12, kv. 9, Gorky; Vitaly Mikhailovich Sysoev, ulitsa Krasnodontsev, 9a, kv. 1, Gorky; Alexandr Alexeevich Shishin, ulitsa Starykh proizvodstvennikov, 6, kv. 52, Gorky; Nikolai Mikhailovich Shatalin, ulitsa Vatutina, 2, kv. 3, Gorky; Stanislav Alexeevich Shesterikov, Frunzenskaya naberezhnaya, 26, kv. 55, Moscow, all of U.S.S.R.; Sergei Petrovich Martynov, deceased, late of Gorky, U.S.S.R.; by Nina Fedorovna Martynova, administrator, ulitsa Komsomolskaya, 11, kv. 22, Gorky, U.S.S.R.; by Olga Sergeevna Martynova, administrator, ulitsa Komsomolskaya, 11, kv. 22, Gorky, U.S.S.R., and Alexandr Sergeevich Martynov, ulitsa Komsomolskaya, 11, kv. 22, Gorky, U.S.S.R.

Continuation of Ser. No. 513,133, Oct. 8, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,774

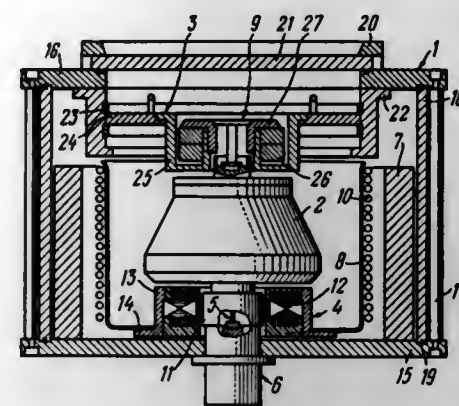
Int. Cl.² B04B 9/02, 15/02

U.S. Cl. 233-11

8 Claims

1. A preparation-making ultra centrifuge comprising: an evacuated housing which contains a vertically installed rotor; a temperature-regulating shell which surrounds said rotor, said rotor being adapted for accommodation of vessels containing preparation; a magnetic suspension disposed within said evacuated housing above and coaxially with said rotor; a drive of said rotor disposed under and coaxially therewith; a support of said rotor disposed under and coaxially therewith; said drive

including an electric motor with an armature thereof being made in the form of a sleeve fixedly secured to said rotor and



wherein said magnetic suspension includes an annular permanent magnet with a magnetic support.

4,054,244

CENTRIFUGE DRUM EQUIPPED WITH DISCHARGE VALVES

Theodor Paschedag, Beckum, Germany, assignor to Westfalia Separator AG, Oelde Westfalen, Germany

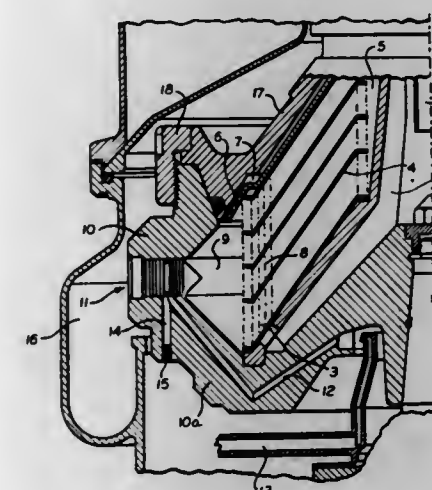
Filed Sept. 1, 1976, Ser. No. 719,638

Claims priority, application Germany, Sept. 3, 1975, 2539074

Int. Cl.² B04B 1/14

U.S. Cl. 233-20 A

3 Claims



1. In a centrifuge having a drum bottom and a drum lid defining a separating chamber, discharge valves having valve seats, movable valve bodies for the opening and closing of the valves by movement of the valve bodies off and onto the valve seats, for discharge of solids settled out in the clarification or separation of solids-containing liquids, and valve housings in which the valve bodies are housed and which shield the valve bodies against the pressure of the drum charge, and means defining passages from the chamber to the valve seats for discharge of the solids from the chamber when the valves are open, feed passages for control liquid for operation of the valves, in which the valves are uniformly distributed about the periphery of the separating chamber, and are closed by centrifugal force during operation, and means for opening the valves with a control fluid while the drum is at full speed, the improvement which comprises said means for opening the valves with control fluid comprising feed passages for the control fluid disposed in the drum bottom and bores in the housings in communication with the feed passages in the drum bottom, for conveyance of control fluid to the moveable valve bodies for the operation thereof for opening and closing of the valves.

4,054,245

TIMER CONTROLLED SPACE THERMOSTAT WITH BATTERY OPERATED TIMER

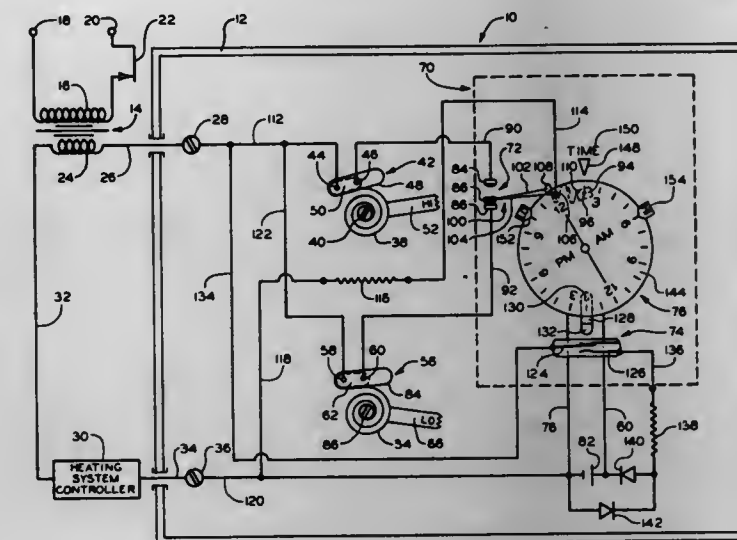
Wayne J. Bennetsen, St. Louis, Mo., and Robert C. Krump, Waterloo, Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 8, 1976, Ser. No. 730,795

Int. Cl.² G05D 23/00; H02J 7/00

U.S. Cl. 236-47

8 Claims



1. In a timer controlled space thermostat for controlling operation of electrically operated space conditioning apparatus control means,

an alternating current power source;

first circuit means connected across said power source through said space conditioning apparatus control means for energization thereof including temperature responsive switching means and a first timer operated switching means;

an electrically operated timer movement;

a rechargeable storage battery connected to said timer movement for energization thereof;

second circuit means connected across said power source through said space conditioning apparatus control means for recharging said battery including a second timer operated switching means; and

said second timer operated switching means being cyclically operative to ensure complete de-energization of said space conditioning apparatus control means and to effect recharging of said battery.

4,054,246

BUILDING STRUCTURE FOR SOLAR ENERGY RECOVERY AND UTILIZATION

Arthur F. Johnson, 203 Creole Lane, Franklin Lakes, N.J. 07417

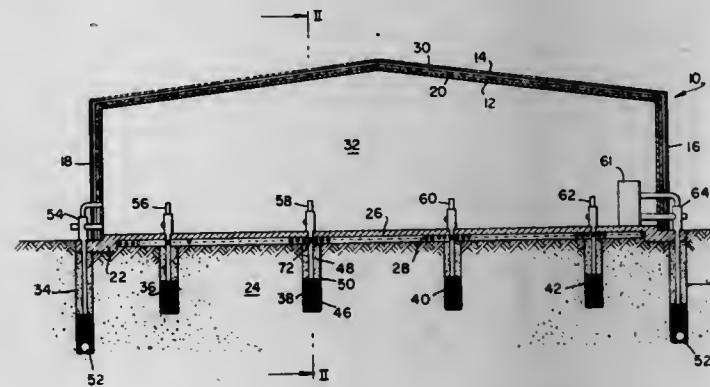
Continuation of Ser. No. 551,075, Feb. 20, 1975, abandoned.

This application Nov. 18, 1976, Ser. No. 742,798

Int. Cl.² F24J 3/02

U.S. Cl. 237-1 A

21 Claims



1. A building structure comprising:

exterior walls and roof structure including spaced inner and outer walls and means for circulating air therebetween; first heat storage means comprising subterranean pits filled with gravel, air spaces between said gravel forming an air passage therethrough, said first heat storage means being located beneath or adjacent said building structure; second heat storage means comprising a load-bearing layer of gravel supporting the floor of said building structure, air spaces between said gravel forming an air passage therethrough; means for circulating air through said first and second heat storage means; conduit means connecting said respective circulating means and the interior space of said building structure; and control means governing air flow through said conduits, heat storage means and between said inner and outer walls.

10. A building structure comprising: exterior walls and roof structure including spaced inner and outer walls;

heat storage means comprising subterranean trenches filled with gravel sized to provide air spaces between said gravel and forming horizontal air passages therethrough, said gravel having an average particle diameter in the range of 1/2 to 2 inches, said heat storage means being in heat-exchange relation with the ground and located beneath or adjacent said building structure;

means for circulating air between said walls and through said heat storage means;

conduit means connecting said circulating means and the interior space of said building structure; and

control means governing air flow through said conduits, heat storage means and between said inner and outer walls.

4,054,247

DEVICE FOR ELASTICALLY FASTENING A RAIL ON ITS SUPPORTS

Michel Duchemin, Lambres les Douai, France, assignor to Ressorts du Nord S.A., Paris, France

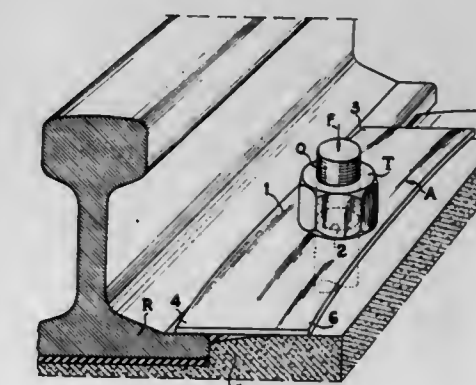
Filed Oct. 3, 1975, Ser. No. 619,465

Claims priority, application France, Oct. 11, 1974, 74.34234

Int. Cl.² E01B 9/30

U.S. Cl. 238-349

10 Claims



1. A structure comprising in combination a railway track rail having a flange, a support for the rail and a device for fastening the rail to the support, the device comprising at least two fasteners which are disposed on opposite sides of the rail and clamping means for maintaining each fastener, each of the fasteners comprising a spring strip having a first edge which is rectilinear in plan substantially throughout the extent of the spring strip longitudinally of the rail and extends in a direction parallel to the rail and a second edge which is opposed to the first edge transversely of the rail, the strip being, in a free unstressed state of the strip, bent on and alongside said first edge and bearing at ends of the first edge on the flange of the rail and bearing on the support in at least one part of the strip adjacent the second edge, the clamping means extending through the center of the strip, the spring strip being capable of

being clamped down by the clamping means so that said first edge can assume a position flat against the rail flange, and the strip being, in the intended state of the structure for fastening the rail, put in a clamped down and stressed state by the clamping means and having its initially bent first edge applied on the flange of the rail substantially throughout the length of said first edge.

4,054,248

FUEL INJECTOR PUMP FOR A UNIT FUEL INJECTOR

John M. Beardmore, South Lyon, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 1, 1976, Ser. No. 701,812
Int. Cl.² B05B 1/30

U.S. Cl. 239-88

8 Claims



1. A unit fuel injector - pump including a housing, a bushing positioned in said housing to form therewith a fuel supply chamber externally of said bushing and connectable to a source of fuel, said bushing having a pump cylinder therein with an inlet for fuel from said fuel supply chamber opening into said pump cylinder intermediate its ends and an outlet associated therewith at one end of said bushing, a plunger having a piston reciprocable in said pump cylinder for displacing fuel therefrom via said outlet and, a fuel injector nozzle assembly secured to said one end of said bushing to receive fuel discharged therefrom, said bushing further having an enlarged secondary pump cylinder therein on the opposite side of said pump cylinder from said outlet, said secondary pump cylinder having at least one secondary side port for the ingress of fuel into said secondary pump cylinder and a flow control passage means axially spaced from said secondary side port for effecting controlled fluid flow communication between said secondary pump cylinder and said fuel supply chamber and, said plunger further having an enlarged secondary piston portion reciprocable in said secondary pump cylinder to control inlet fuel flow through said secondary port into said secondary pump cylinder and to effect the discharge of fuel from said secondary pump cylinder through said flow control passage means to said fuel supply chamber.

METHOD AND APPARATUS FOR PACKAGING LINEAR MATERIAL

Jerome P. Klink, and Arnold J. Eisenberg, both of Granville, Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio

Filed June 26, 1975, Ser. No. 590,742
Int. Cl.² B65H 54/02

U.S. Cl. 242-18 G

10 Claims



1. Apparatus for winding a linear element from a supply into a package comprising:
 - a. a driven rotatable collet having a package collection region and a temporary collection region for the linear element, the collet including a circumferential groove having a substantially frusto-conical guide surface and an elongated fixed member located in the temporary collection region, the guide surface being adapted to automatically guide the element being linearly advanced through the temporary collection region to the fixed member for engagement therewith;
 - b. rotatable interim means for advancing the linear element during times the element is not collected on the collet, the interim means being located in spaced relation with the collet adapted to advance the element along a path into contact with the guide surface in the temporary collection region so that the element is automatically guided by the surface to the fixed member for engagement therewith during rotation of the collet to begin collection of the element in the circumferential groove; and
 - c. element engaging means movable to a position whereby the element is moved from collection in the temporary collection region to the package collection region of the collet for package formation.

4,054,250

TEXTILE WINDING MACHINE

Jean Frederic Herubel, Guebwiller, France, assignor to N. Schlumberger & Cie, Guebwiller, France

Filed Mar. 22, 1976, Ser. No. 668,903

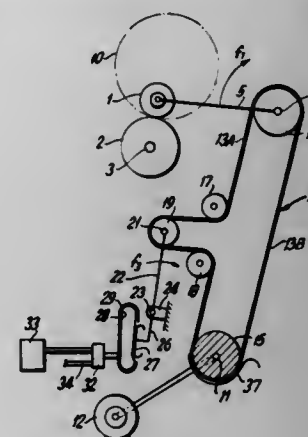
Claims priority, application France, Nov. 4, 1975, 75.11365
Int. Cl.² B65H 54/42

U.S. Cl. 242-18 DD

2 Claims

1. A textile winding machine comprising a rotary driving roller, a pair of supporting arms for supporting a slubbing bobbin in a winding position resing on said rotary driving roller to be driven thereby, engagement means carried on one end of each of said arms so that said engagement means each engage an opposite end of the bobbin, a first wheel mounted for rotation about a horizontal axis, the other ends of said arms being secured to said first wheel, an endless band extending

around and engaging said first wheel, a second wheel spaced from said first wheel and around which said band extends in engagement with said second wheel, a motor drivingly connected to said second wheel, said motor being arranged to drive said second wheel selectively in one direction and in the opposite direction and when not being driven to block rotation of said second wheel, a movable tension roller being freely rotatably mounted, one run of said band extending around and over said movable tension roller, and tension control means operatively connected to said movable tension roller and capable of assuming selectively one of an operative position and an inoperative position wherein said tension control means when in the inoperative position permits displacement of said movable tension roller when the rotation of said second wheel is



blocked by said motor whereby movement of said arms supporting the bobbin during winding or manual operation are made possible by the provision of slack in said endless band, and wherein said tension control means when in the operative position displaces said tension roller against said endless band for taking up the slack in said endless band when rotation of said second wheel by said motor in said one direction serves to drive said endless band which in turn drives said first wheel for raising said arms supporting the bobbin for displacing the bobbin from said arms and for replacement by a fresh bobbin, and rotation of said second wheel by said motor in said opposite direction serves to return said arms supporting the fresh bobbin into the winding position resting against said driving roller.

4,054,251

DISPLACEMENT SENSING AND GUIDE APPARATUS

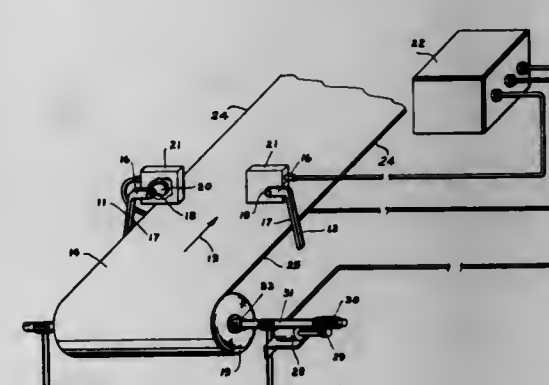
James G. Henderson, Dalton, and David O. Hanon, Ringgold, both of Ga., assignors to James G. Henderson, Dalton, Ga.

Filed May 4, 1976, Ser. No. 683,168

Int. Cl.² B65H 25/26

U.S. Cl. 242-57.1

19 Claims



1. A displacement sensing and guide apparatus for guiding a moving web or the like along a path comprising:
 - a first voltage means for providing a first voltage which varies in response to the change in position of an edge of the moving web at a position along the path;
 - a second voltage means for providing a second voltage, a circuit electrically connected between said first voltage

means and said second voltage means, including a first source of impedance and a second source of impedance; a switching means responsive to a change of a preselected magnitude in the voltage at the point in said circuit between said first source of impedance and said second source of impedance for providing an output; and a means responsive to the output of said switching means for guiding the movement of the web.

4,054,252

MAGNETIC TAPE CASSETTE

Kengo Oishi, and Osamu Suzuki, both of Odarawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

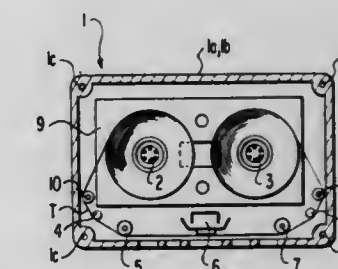
Filed Sept. 28, 1976, Ser. No. 727,563

Claims priority, application Japan, Sept. 29, 1975, 50-117351

Int. Cl.² G03B 1/04; G11B 15/32, 23/04

U.S. Cl. 242-199

2 Claims



1. A magnetic tape cassette including a hollow case, a pair of reels mounted within said hollow case, a magnetic tape wound onto at least one of said reels, a pressing pad for urging said tape against a recording and reproducing head, a pair of round rod guide members for guiding said tape and a pair of rotary guide members individually mounted between said round rod guide members and said pressing pad; the improvement comprising, a pair of tape guide mechanisms individually disposed between each of said reels and said round rod guide members in a position which will reduce the contact angle between said round rod guide members and said tape as compared to what it would be in the absence of said tape guide mechanisms; said tape guide mechanisms having flange portions for supporting the tape in the width direction as it reels onto and unreels from the respective reels.

4,054,253

CINEMATIC PROJECTOR WITH INTEGRAL TAKE-UP REEL

Antoine Heurtier, Saint-Etienne-Loire, France, assignor to Etablissements Heurtier et Cie-Societe anonyme, Saint-Etienne-Loire, France

Filed Jan. 12, 1976, Ser. No. 648,746

Claims priority, application France, Jan. 13, 1975, 75.01363; July 31, 1975, 75.25582

Int. Cl.² G03B 1/02

U.S. Cl. 242-205

27 Claims

1. A cinematic projector comprising a reversible drive motor, a drive shaft driven by said drive motor, an internal take-up reel, support means for an external film supply reel, a pivotably mounted control means for transmitting drive from said motor for advancing film between said reels, said control means being movable between first and second positions for drivingly engaging said drive shaft and in said first position transmitting drive from said shaft for forward and reverse drive of the film respectively according to the direction of drive of the drive motor, and in said second position transmitting drive from said shaft which is driven in forward drive by said motor, and operating means drivingly coupled to said control means for engaging the film on said internal reel and rewinding the film on the external reel when the control means is in said second position.

4,054,254

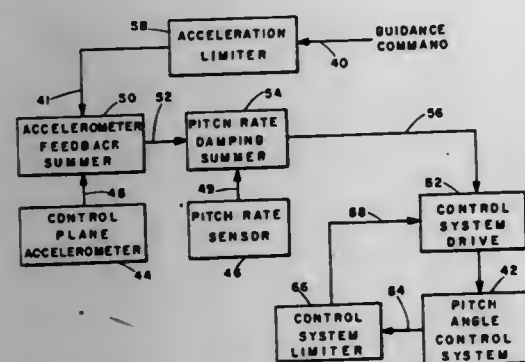
ROLLING AIRFRAME AUTOPILOT

Donald E. Cole, Covina, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Dec. 4, 1975, Ser. No. 637,565
Int. Cl.² F42B 15/02

U.S. Cl. 244-3.21

8 Claims



1. An autopilot for an intentionally continuously axially rolling airframe having a pitch angle control system for producing pitch rotation of the airframe in a control plane in response to a rotation related guidance command signal to said control system by a control circuit comprising:
an accelerometer means responsive to cyclically varying acceleration for mounting on the airframe and for detecting acceleration in the control plane and transverse to the longitudinal axis of the airframe during the continuous rolling of the airframe as a function of the rotation of said airframe and for producing acceleration signals corresponding to the detected acceleration,
an acceleration feed-back summer means in the control circuit for summing said acceleration signal and the guidance command signal to produce a control signal, said acceleration signal is summed as a negative feed-back to said guidance command signal,
and control system drive means for driving said control system to produce a change in the pitch angle of attack in response to said control signal.

4,054,255

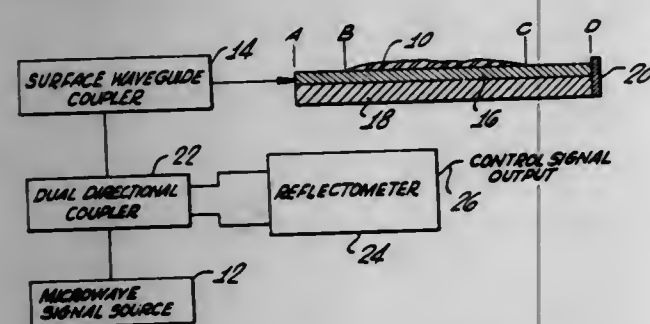
MICROWAVE ICE DETECTOR

Bertram Magenheimer, Bethesda, Md., assignor to System Development Corporation, Santa Monica, Calif.

Filed Apr. 1, 1976, Ser. No. 672,616
Int. Cl.² B64D 15/20

U.S. Cl. 244-134 F

5 Claims



1. Aircraft ice detection apparatus, comprising:
a source of microwave electromagnetic energy;
surface waveguide coupling means for coupling the microwave energy to a surface layer of ice in such a manner that the ice functions as a surface waveguide and the energy is transmitted along the layer in a direction substantially parallel with the layer and with the surface on which it is formed, and is at least partially reflected back to said coupling means on reaching the end of the ice layer;
signal monitoring means for comparing microwave signals transmitted into and reflected from the ice layer;

whereby variations in the amount of ice result in corresponding variations in the reflected energy signal.

4. A method of detecting ice on exterior surfaces of aircraft, comprising the steps of:
generating a microwave electromagnetic signal;
coupling the microwave signal to a permanent surface waveguide of dielectric material having a dielectric constant approximately the same as that of ice;
transmitting the microwave signal along the surface waveguide in a direction substantially parallel with a surface on which ice is to be detected;
reflecting at least a portion of the microwave energy back along the waveguide from its remote end; and
detecting in a reflectometer a ratio between transmitted and reflective energy with respect to the waveguide;
whereby accretion of ice on the surface waveguide results in a different reflection characteristic of the composite waveguide comprising the ice layer and the permanent surface waveguide, and the presence and location of ice may be detected by means of the reflectometer.

4,054,256

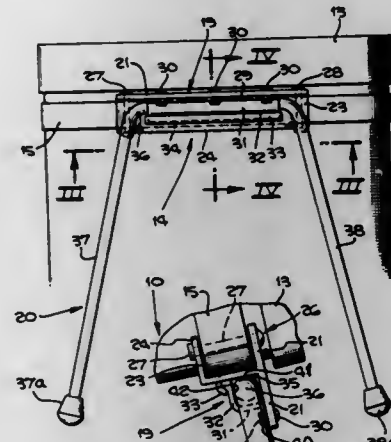
SUPPORT FOR A GOLF BAG

Elwood W. Buck, Jr., 3330 San Pasqual, Pasadena, Calif. 91107;
Thomas M. Shiroma, 1162 Ridgside Drive, Monterey Park, Calif. 91754; Charles E. Amos, 4613 Trujillo Ave., Covina, Calif. 91722, and Yoshiharu Takenaka, 662 Ranlett Ave., La Puente, Calif. 91744

Filed Aug. 18, 1976, Ser. No. 715,634
Int. Cl.² A63B 55/00

U.S. Cl. 248-96

9 Claims



1. A support for supporting a golf bag having an open top in a fixed position at an angle of less than 90° to a supporting surface comprising:

a flange means fixedly secured to said bag at a position adjacent to the open top thereof; said flange means including spaced parallel flange portions having configured edges to seat against said bag,
a base flange portion interconnecting said parallel flange portions,
and spaced pins interconnecting said spaced flange portions in spaced relation to said base flange portion,
a stop flange portion extending in the direction opposite to said spaced parallel flange portions,
a leg support receiving means secured to said stop flange portion and said base flange portion and defining an open ended space;
and a support means having at least two support legs interconnected by a transverse member receivable within said open ended space,
said legs having a supporting first position with said legs in abutment with said stop flange portion to support said bag, said legs having other positions generally alongside said bag and in angular relationship thereto as determined by gravity.

4,054,257

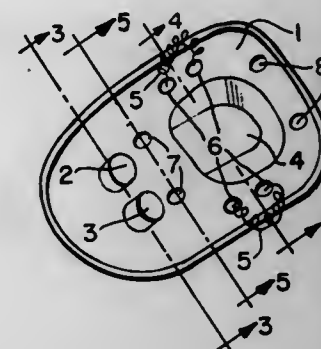
ICE SLED

Warren Christie Miller, Jr., 412 Southampton Drive, Silver Spring, Md. 20903

Filed Apr. 13, 1976, Ser. No. 676,580
Int. Cl.² B28B 7/16

U.S. Cl. 249-97

7 Claims



1. A mold for forming an ice sled when filled with water to be frozen, said mold comprising a bottom forming a single compartment receptacle and a cover therefore, said cover further comprising a sheet of material covering said receptacle entirely and further comprising forward depressions and a rear depression, said cover having apertures receiving handle means passing therethrough and into the water, and means for fastening said cover to said bottom, whereby when said bottom is filled with water and said cover is fastened to said bottom, the depressions in said cover form feet and seat receptacle means, respectively, when said water is frozen.

4,054,258

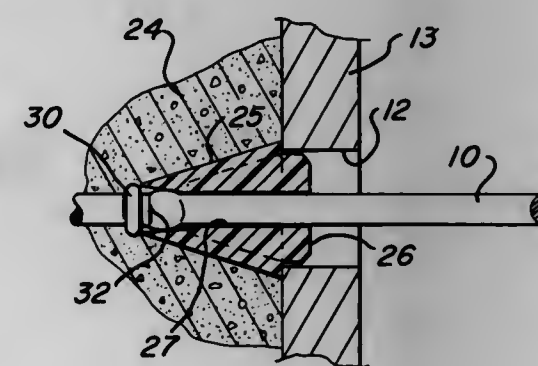
BREAKBACK FORM TIE

James A. Holmboe, 850 Kalmia, Boulder, Colo. 80302

Filed Mar. 15, 1976, Ser. No. 666,856
Int. Cl.² E04G 17/08

U.S. Cl. 249-214

8 Claims



1. A tie rod for concrete forming structure, the tie rod comprising:

an elongated member having at least one engaging means at an end thereof;
a frangible section defined in the elongated member at a position spaced inward along the elongated member from the engaging means;
an enlarged cross section portion formed on the elongated member within the length thereof defined at one end by the frangible section and defined at the other end by the engaging means; and
an annular shoulder formed on the elongated member adjacent the frangible section and on the opposite side thereof than the enlarged cross section portion;
plug means having a channel defined therethrough positioned with the elongated member extending through the channel, the channel being at least in part of a restricted cross sectional area insufficient to permit the enlarged cross section portion of the elongated member to pass therethrough and having a larger diameter end portion of greater cross section than the enlarged cross section portion but of a smaller cross section than the shoulder with

the larger diameter end portion of the channel facing the shoulder and being of a length greater than the distance between the shoulder and the enlarged cross section portion of the elongated member;

whereby, the shoulder may seal against the plug means to isolate the frangible section from poured concrete and, after being cast in concrete, a portion of the elongated member may be severed at the frangible section and the severed portion of the elongated member and plug means concurrently removed from the concrete by means of the enlarged cross section portion of the severed portion of the elongated member bearing directly upon the restricted cross sectional area of the channel through the plug means.

4,054,259

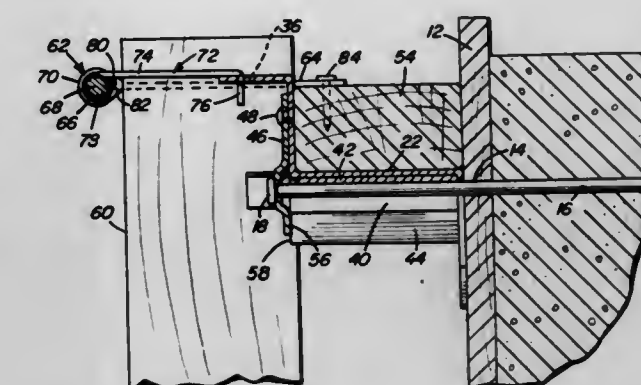
WALER-STIFFBACK BRACKET

Calvin R. Johnson, 2711 Winston Ave., Las Cruces, N. Mex. 88001

Filed May 14, 1976, Ser. No. 687,382
Int. Cl.² E04G 17/02

U.S. Cl. 249-219 W

21 Claims



1. A waler and stiffback bracket including a first elongated upper horizontal flange and a second lower upstanding flange, said flanges being joined at adjacent inner and upper ends thereof, respectively, the outer end of said first horizontal flange terminating in an upstanding waler retaining flange, said second flange including an opening formed therethrough closely below said first flange for receiving a horizontal tie rod therethrough, and rotary cam means supported from said waler retaining flange on the outer side thereof for angular displacement about an axis generally normal to said waler retaining flange, said cam means including a cam portion thereof swingable into position below said first flange and including cam surfaces for engaging a head portion on the end of said rod projecting through said opening, an elongated horizontal abutment member supported from and extending lengthwise beneath said first flange and registered with said opening, one end of said abutment member being abutted against the adjacent side of said second flange and the other end of said abutment member being at least substantially coplanar with the outer side of said waler retaining flange, said other end of said abutment member and said cam portion including coacting thrust bearing surfaces for transferring tension forces applied to said rod by said cam means directly lengthwise through said abutment member to said second flange, said first, second and waler retaining flanges comprising first end, intermediate and second end sections of a single elongated metal strap member oppositely right angularly oriented along transverse zones spaced along said strap member.

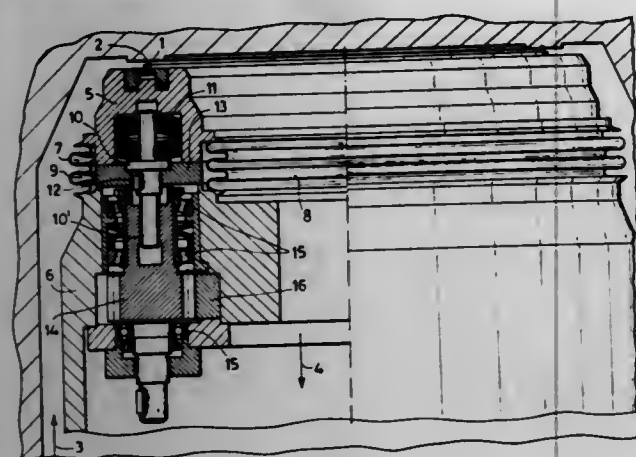
4,054,260

DEVICE FOR CONTROLLING THE FLOW OF FLUIDS, PARTICULARLY CORROSIVE AND POLLUTING FLUIDS

Vasco Mezzedimi, Poggibonsi (Siena), Italy, assignor to Nuovo Pignone S.P.A., Italy
Filed Jan. 29, 1976, Ser. No. 653,585
Claims priority, application Italy, Jan. 29, 1975, 19701/75
Int. Cl.² F16K 31/53

U.S. Cl. 251—80

3 Claims



1. A device for controlling the flow of fluid by moving an internal annular sealing member to and from its annular sealing seat on an outer housing to control the flow of fluid from between the housing and the device, across the sealing seat and member, and into and through the device, comprising:
a displaceable rigid holder ring within the housing which supports the annular sealing member,
a series of annular springs lodged underneath and within said ring for urging the annular sealing member against its annular sealing seat,
a series of vertically spaced moving pins having one end positioned annularly underneath said ring and engagement with said annular springs, each of said pins having an integral key intermediate its ends and being threaded at its other end,
an annular fixed part beneath said ring having a plurality of internal vertically spaced splines in which said keys are slidably positioned to allow only slidable movement of said pins,
a series of annularly spaced externally toothed pinions housed within said fixed part having internal threads for engagement with said threaded ends of said pins, and
an annular driving gear mounted within said fixed part which engages said pinions for rotation thereof to cause sliding movement of said pins, whereby rotation of said gear in one direction causes rotation of said pinions geared thereto and displacement of said engaged pins toward said ring and against said annular springs to thereby move said ring and annular sealing member to its seat to cut off fluid flow from between the housing and the device into and through the device, and whereby rotation of said gear in the other direction causes rotation of said pinions geared thereto to thereby displace said engaged pins away from said ring and said annular springs to thereby move said ring and annular sealing member from its annular sealing seat to allow fluid flow from between the housing and the device into and through the device.

4,054,261

GUILLOTINE VALVE WITH IMPROVED SEALING MEANS

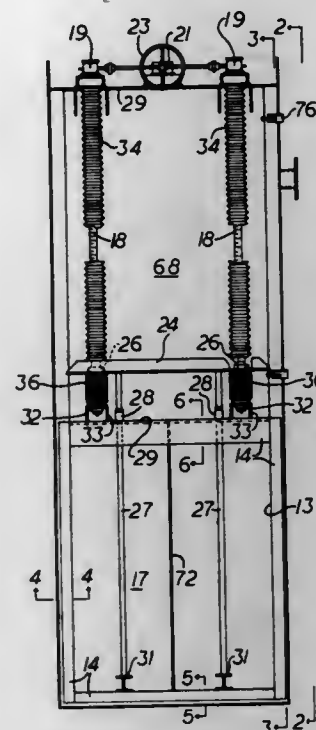
Thomas F. Gilmore, and John E. Hughey, both of Birmingham, Ala., assignors to Zurn Industries, Inc., Birmingham, Ala.
Filed May 6, 1976, Ser. No. 683,643
Int. Cl.² F16K 31/05

U.S. Cl. 251—130

1 Claim

1. In a valve for controlling fluids under pressure different

from atmospheric pressure and of the kind having a plate-like closure movable from closed to open position relative to an opening, the improvement comprising,
seal means located about the periphery of the opening to be closed by the closure and cooperatively sealing between the walls of the opening and the movable closure,
means to apply fluid pressure to the seals which is of a magnitude in excess of the pressure being controlled by the closure,



a pair of power driven screws for moving the plate-like closure from open to closed position,
means mounting each of the screws for rotation but held against axial movement,
nuts on the screws intermediate the ends thereof, and
means operatively connecting the nuts to the closure, effective upon rotation of the screws in a given direction to move the closure and to impart the stress of moving the closure as a tension load on the screws.

4,054,262

COCK HAVING A ROTATING VALVE REMOVABLE FROM ABOVE

Raymond A. Laignel, Ginestas, and Patrick F. Mommeja, Arles, both of France, assignors to Constructions Metalliques de Provence, Perret, France

Filed July 1, 1976, Ser. No. 701,815
Claims priority, application France, July 11, 1975, 75.22455
Int. Cl.² F16K 27/06

U.S. Cl. 251—367

6 Claims

1. A cock having a rotating valve and comprising: a hollow body having first and second opposite end portions with said first end portion having a circular aperture formed therein; a valve rotatably positioned in said body for rotation about an axis extending between said first and second end portions of the housing, said valve having first and second pivot members thereon respectively located adjacent said first and second end portions of the housing, and said valve being dimensioned for removal through said aperture; a removable cap mounted on said housing for closing said aperture and receiving said first pivot member of said valve; said hollow body having a generally annular groove formed therein about said opening with said groove opening inwardly towards said axis; and an open resilient ring having an internal surface and an external surface with said external surface being received in said groove for keeping said cap in place, said internal surface of said resilient ring being precision machined and defining a frusto-conical bearing surface diverging outwardly from said axis and away from said second end portion of the housing, and said cap having a precision-machined peripheral bearing surface of

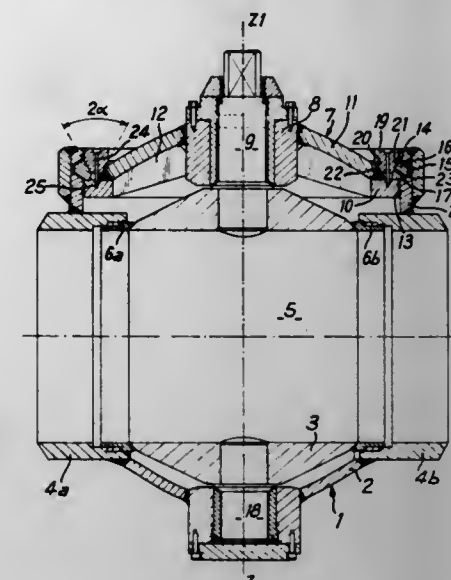
4,054,264

TOOL FOR MOVING A LONG FLEXIBLE LEADING WIRE THROUGH HOLLOW PASSAGES

Tord Elvesson, Akargatan 19, S-828 00 Edsbyn, Sweden
Filed Dec. 6, 1976, Ser. No. 748,141
Int. Cl.² E21B 9/00

U.S. Cl. 254—134.3 FT

18 Claims



verge towards each other and towards said second end portion of the housing; said cap centering ring being positioned with its external surface bearing upon said internal surface of said resilient ring and its internal surface bearing against said truncated conical bearing surface of said cap.



1. Tool for moving a long flexible leading wire through hollow passages, e.g., in order to draw electric cables through hidden conduits or the like, comprising two tubes being telescopically movable in relation to each other and denominated feed tube and guide tube respectively, the feed tube being associated with a retaining mechanism which, on one hand, is arranged to seize the leading wire and firmly connect the same to the feed tube during the displacement thereof in a first direction in relation to the guide tube, but on the other hand, on displacement of the feed tube in an opposite second direction, leave the hold of the leading wire so as to allow the last-mentioned displacement without conveying the leading wire, characterized in that the retaining mechanism comprises at least one locking body having two spaced apart seizing areas and being adjustable into two different working positions or ranges, said locking body, on one hand, in a first working position attending to the conveyance of the leading wire on displacement of the feed tube in the first direction in relation to the guide tube, and on the other hand, in a second working position attending to a conveyance of the leading wire on displacement of the feed tube in said second direction in relation to the guide tube and release of the leading wire from the engagement with the feed tube on displacement thereof in said first direction in relation to the guide tube, whereby the tool can feed the leading wire into as well as out of said passage, the locking body is mounted pivoting about an axis extending across the feed direction of the leading wire and co-operates with an abutment in order to on one hand, allow free relative movement of the leading wire between the locking body and the abutment when the locking body assumes a neutral position of pivoting, in which the two seizing areas of the body are located at approximately equal distances from the abutment, and on the other hand clamp the leading wire between the abutment and either of the seizing areas of said body by the locking body being pivoted about its axis from said neutral position to a seizing position.

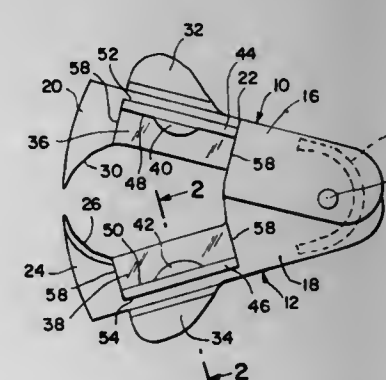
4,054,263

MAGNETIZED STAPLE REMOVER

Michael Delia, 110 Warwick Ave., Douglas Manor, N.Y. 11363
Filed June 23, 1976, Ser. No. 698,904
Int. Cl.² B25C 11/00

U.S. Cl. 254—28

4 Claims



1. A magnetized staple remover comprising a pair of elongated arms, each of said pair of arms pivotally interconnected to each other at one end thereof, the other ends of said pair of arms having complementary jaws disposed thereat, means to bias said pair of arms pivotably outwardly from each other at said other ends thereof, said each of said pair of arms having a pair of parallel spaced apart plates extending along a portion of the length thereof, said pair of plates fabricated from a non-magnetic material, said other ends of said pair of arms fabricated from a magnetic material, means to magnetically attract metallic staples intermediate said pair of plates, said one end of said each of said pair of arms devoid of magnetic properties adjacent the pivotable interconnection thereinbetween.

4,054,265

DEVICE FOR GRIPPING ROPES, CABLES OR WIRES

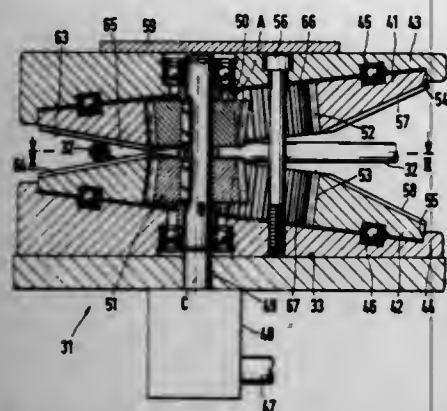
Rudolf Magg, Argenstrasse 2, and Gotz Siegmann, Rosenstr. 4, both of Kressbronn, Germany (7993)
Filed Dec. 12, 1975, Ser. No. 640,327
Claims priority, application Germany, Jan. 10, 1975, 2500731
Int. Cl.² A01K 73/06

U.S. Cl. 254—138

17 Claims

1. In a device, in the nature of a winch, for gripping ropes, cables and wires, particularly for use on sailing yachts as a sheet and anchor winch, of the type in which the rope to be gripped is guided over a driven member comprising two conical discs operatively coupled to each other and having their conical surfaces facing each other, the improvement comprising, in combination, said two conical discs having their facing conical surfaces opening outwardly, without obstruction to entry of a rope therebetween, around the entire peripheries of said discs; a common drive shaft operable to rotate both said discs; and means mounting said two conical discs for rotation

about an axis fixedly inclined relative to the axis of said drive shaft; whereby the discs conjointly define, along a part of their circumferences, a wedge-shaped opening, having a fixed included angle, received ropes of different diameters to be



gripped said mounting means comprises two plates; said two conical discs being positioned between and supported by said plates; and means interconnecting said plates against relative movement thereof and extending through said conical discs.

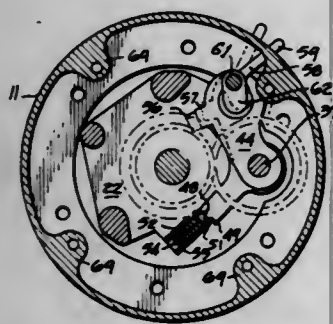
4,054,266 THREE SPEED DECK WINCH

Jesus Guangorena, Atherton, Calif., assignor to Barient Company, San Carlos, Calif.

Filed Dec. 8, 1975, Ser. No. 638,330
Int. Cl.² F16H 5/52

U.S. Cl. 254-150 R

9 Claims



1. A three speed winch comprising:

- a base;
- a generally cylindrical drum rotatably supported on the base;
- a rotatable shaft extending centrally and axially through the drum and the base, including means for receiving a driving means;
- a rotatable member mounted on the base and in driving engagement with the drum;
- internal gearing means and clutch means associated with the shaft and the rotatable member for driving the rotatable member and the drum in a single direction at two different speeds when the shaft is rotated at the same speed in opposite directions, providing second and third speeds;
- a first speed drive gear connected to and rotatable with the shaft;
- a corresponding gear rotatably mounted on the base and generally coplanar with and spaced from the first speed drive gear, said corresponding gear being in driving connection with the rotatable member;
- idler gear means for selectively engaging both the first speed drive gear and the corresponding gear; and
- means for disengaging the idler gear means from at least one of the first speed drive gear and the corresponding gear in response to rotation of the shaft in a predetermined one of said opposite directions.

4,054,267

STRAP WINCH

Odd Berg, Myntvagen 9, 890 23 Sjalevad, and Nils Nasstrom, Asvagen 22, 891 00 Ornskoldsvik, both of Sweden

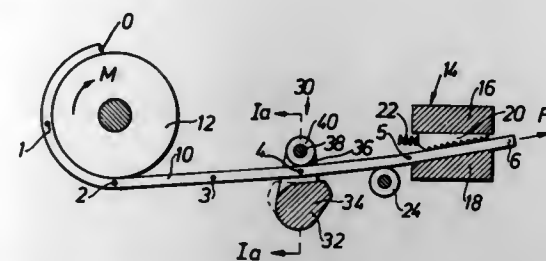
Filed July 7, 1975, Ser. No. 593,200

Claims priority, application Sweden, July 12, 1974, 7409199

Int. Cl.² A63B 61/04

U.S. Cl. 254-164

10 Claims



1. A strap winch for pulling in and storing a strap, particularly synthetic fibre strap characterized by surface slipperiness, plastic deformability and high tensile strength, said winch comprising:

- a storage device for continuously collecting a strap arriving at the winch;
- a step-wise pulling mechanism through which the strap passes to said storage device and which is arranged to grip and with great force pull the strap for further passage to said storage device;
- a locking means through which the strap is to be pulled by said step-wise pulling mechanism for allowing the strap to pass freely in the direction of pull, but automatically locking the strap against movement in the opposite direction;
- said step-wise pulling mechanism including means pivotable for oppositely bending adjacent parts of said strap into at least an S shape and therewith pulling lengths of said strap from both said storage device and locking means, and reversely pivotable for freeing the S-shaped portion of said strap for addition of a corresponding portion of said strap to said storage device, in which said pivotable means comprises a camshaft having a cam peak thereon, said camshaft having a longitudinal axis fixed with respect to at least one of said storage device and locking means, said camshaft being rotatable on its longitudinal axis, a counter piece, a support means pivotally mounted on said camshaft and orbitally carrying said counter piece, the strap being arranged to pass between said camshaft and counter piece, the minimum spacing between said counter piece and cam peak being less than the thickness of the strap, and an operating means fixed to said camshaft and rotatable for forcibly wrapping said strap in said S-shape about said counter piece and along the side of said camshaft, through continued orbital movement of said counter piece.

8. A strap winch for pulling in and stowing a strap, comprising:

- storage means for exerting a relatively light tension on the strap and retrieving same;
- a locking means spaced along the strap from said storage means, in a direction toward the load engageable end of the strip for locking the strap against unwanted movement towards the load-engaging end thereof while permitting strap movement therethrough in the opposite direction away from said load-engaging end thereof and toward said storage means;
- a cam shaft rotatable about its own longitudinal axis, said camshaft axis being fixedly located between and with respect to said storage means and locking means, said cam shaft having an eccentrically protruding lobe located with respect to said axis, a support member carried by said camshaft axis for rotation thereabout, a counter member orbitally carried by said support member for rotation through an arcuate path around said cam shaft for disposition of said strap therebetween, the minimum radial distance between said counter member and cam lobe being

somewhat less than the thickness of said strap and the radial distance between said counter member and the unlobed portion of said cam shaft being greater than the thickness of said strap;

means actuable to rotate said cam shaft about said camshaft axis, with said strap engaged between said lobe and said counter member, for drawing additional strap material from both said storage means and locking means into a loop surrounding said counter member and lying along one side of said camshaft.

4,054,268

GLASS PANEL RAILING

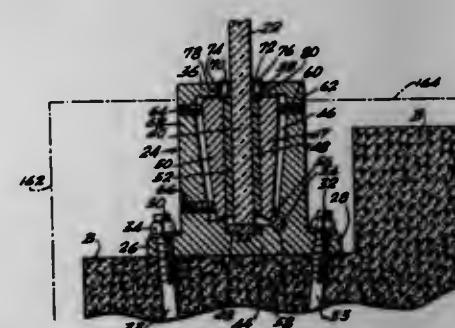
Emil Z. Sher, 1735 SW. 90 Ave., Miami, Fla. 33165

Filed May 12, 1976, Ser. No. 685,703

Int. Cl.² E04H 17/14

U.S. Cl. 256-24

14 Claims



1. A railing for mounting to a building structure relative to an open stairway, hallway or the like comprising,
 - a plurality of aligned glass panels, each of a predetermined length and height;
 - a continuous handrail fixed along the top lengths of said glass panels;
 - mounting means, fixed to the building structure, including means to supportingly engage the bottom lengths of said glass panels;
 - means to engage along lower end, first face portions of said glass panels,
 - means to adjust said means to engage to bring the plurality of glass panels into said alignment;
 - means to exert pressure along lower end, second face portions of said glass panels, in an opposed relation to said means to engage, to maintain said panels in alignment;
 - said mounting means comprising an elongated, generally tubular member provided with a slot of a predetermined width, through a top wall thereof, opening into an interior chamber, defined in said tubular member;
 - said means to supportingly engage comprising a bottom wall of said tubular member;
 - a pad, fixed relative to said bottom wall, between said bottom lengths and bottom wall;
 - said glass panels extend loosely through said slot into engagement with said pad, and said means to engage along lower end, first face portions comprises adjustment plate means in said interior chamber;
 - said adjustment plate means, along a first edge, is pivotally engaged with said tubular member within said interior chamber.

4,054,269

FENCE POSTS

Karl Stabler, Kurnbacher Str. 2, D-7131 Sternfels, Germany
Filed Aug. 27, 1976, Ser. No. 718,374

Claims priority, application Germany, Sept. 9, 1975, 2540157

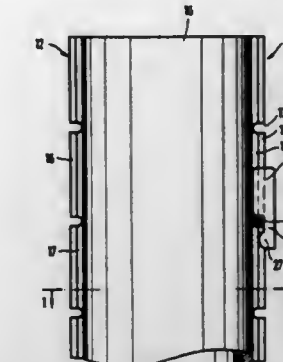
Int. Cl.² E04H 17/00

U.S. Cl. 256-48

6 Claims

1. Apparatus for supporting a wire for the construction of picket fences and the like comprising a cylindrical post, at least one longitudinal extending guide web formed on the exterior surface of said post, at least one radially open groove formed in said web for receiving a wire, and retaining member slidably

mounted on said web having an extended portion adapted to engage over said groove and enclose the wire therein, said guide webs having a T-shaped cross-section having a stem projecting radially from the surface of said post and trans-



versely directed end arms extending in a direction parallel to a tangent to the surface of said post and the retaining member comprises a slide member having a T-shaped guide groove conforming to the guide webs.

4,054,270

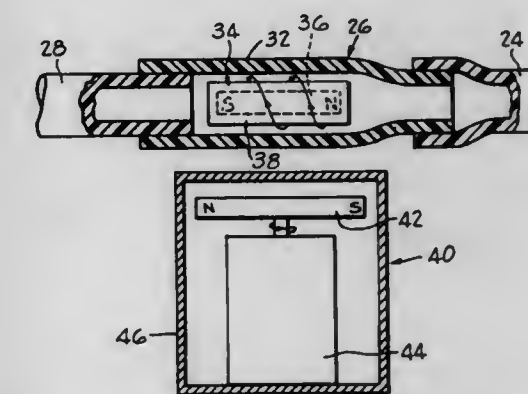
MICRO MIXING APPARATUS AND METHOD

Robert E. Gugger, Willow Grove, and Samuel M. Mozersky, Elkins Park, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 481,414, June 20, 1974, abandoned. This application Mar. 30, 1976, Ser. No. 671,752
Int. Cl.² B01F 13/08

U.S. Cl. 366-143

14 Claims



1. A method of thoroughly mixing the continuously flowing confluent fluid from multiple low velocity streams of individual solutions comprising passing the flowing confluent fluid through a tubular shaped chamber having enclosed therein a movable means for agitating and mixing the fluids, said movable means, when activated, being subjected to forces tending to rotate said means around an axis perpendicular to its longitudinal axis and said means having longitudinal and diametrical space limitations in said chamber so as to be restricted in its movement, and activating said movable means thereby causing said means to yaw, pitch, and roll.

4,054,271

DEVICE FOR THE WORKING OF CANDY DOUGH HARD AND/OR FILLED CANDIES AND A DEVICE FOR CARRYING OUT THIS PROCEEDING

Ascanio Lanzillo, Genova, Italy, assignor to Carle & Montanari S.p.A., Milan, Italy

Continuation of Ser. No. 466,555, May 3, 1974, abandoned. This application Mar. 5, 1976, Ser. No. 664,169

Claims priority, application Italy, May 8, 1973, 12609/73

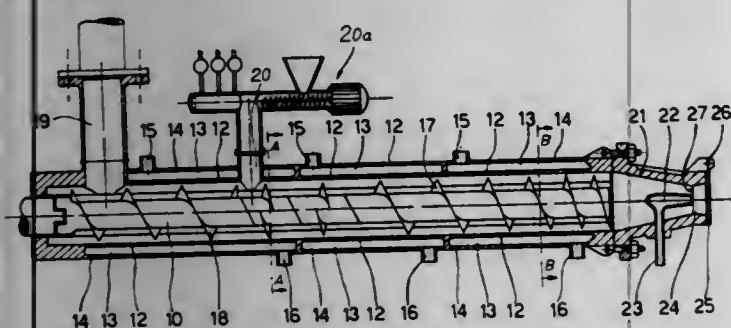
Int. Cl.² B01F 7/00; A21C 1/06

U.S. Cl. 366-70

14 Claims

1. A machine for the manufacture of a candy mass compris-

ing; means defining at least two circular cross section cylindrical containers, said containers being longitudinally connected along lines formed on the surface thereof between the end points of a cord defined by the intersection of the circumferences of said containers thereby limiting the area of the cross sections thereof and cooperating to form a continuous enclosed chamber sealed from the environment therearound; an elongated rotor provided within each container, said rotors being in axially parallel relationship; means for effecting rotation of said rotors about the respective longitudinal axes thereof; means defining an inlet passageway for said candy mass into said chamber located adjacent one end of said chamber; means defining an outlet passageway for said candy mass located adjacent the end of said chamber opposite said one end; a first screw feeder on each of said rotors on respective end portions



of said rotors adjacent said one end of said chamber; a second screw feeder on each of said rotors located on the end portion of the respective rotors adjacent said opposite end of said chamber; a series of kneading blades provided on each rotor and being located on a respective rotor intermediate said first and second screw feeders; means defining a shell surrounding said container and being disposed radially outwardly therefrom to create an intervening volume; means sectionalizing said volume longitudinally to provide separate heat transfer compartments within said volume of preselected longitudinal extent; a fluid inlet and a fluid outlet being provided for each of said compartments; conduit means communicating between a candy mass additive source and said chamber and entering said chamber at a point contiguous with said series of kneading blades for introducing additives into said candy mass.

4,054,272

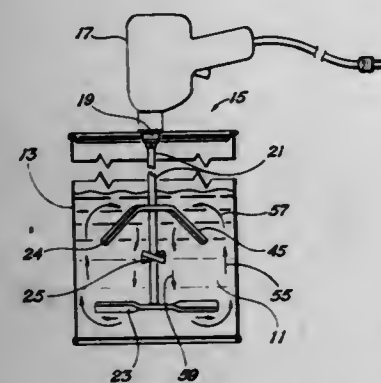
PAINT AND BEDDING BLENDER

Bernard G. Cooke, Rte. 1, Box 122AA, Boyd, Tex. 76023
Filed Apr. 26, 1976, Ser. No. 680,103

Int. Cl.² B01F 7/16

U.S. Cl. 366—343

4 Claims



1. A portable blender for mixing in a portable container slurries, suspensions and the like that include particulate solids in a liquid comprising:

- a. an elongate central shaft having a central longitudinal axis and first and second ends serving in an operational position respectively as top and bottom ends; said shaft being adapted at its top end for being connected into a chuck for a controllable speed electric drill motor of predetermined size for rotation in a predetermined direction; and
- b. a plurality of blades fixedly connected with said shaft at

predetermined locations therealong and extending radially outwardly therefrom; said blades being balanced on each side of said shaft for minimum rotational vibration; said plurality of blades including:

- a first blade disposed at a first location adjacent the bottom end of said shaft; said first blade having a twist such that it defines a plurality of angles with respect to a plane that is radially perpendicular at all points to said central longitudinal axis of said shaft; said first blade including a central portion that is substantially parallel with said plane for moving said solids radially outwardly and respective outer radial portions that have a critical first angle α with a trailing edge tilted upwardly for moving said solids radially outwardly and upwardly such that said solids are circulated radially outwardly and upwardly to be thoroughly mixed; said critical first angle α being within the range of 15°–35°;
- a second blade disposed at a second predetermined location intermediate the ends of said shaft and adjacent a top of a predetermined mixing zone along the bottom portion of said shaft; said second blade also having a twist such that it defines a plurality of angles with respect to said plane; said second blade having a central portion that is substantially parallel with said plane and outer radial portions that are bent downwardly at a critical second angle β and also define a critical third angle γ with the trailing edge tilted downwardly with respect to a second plane at said angle β and passing through said blades where the angle γ is measured such that splashing outside said container is prevented and said solids are circulated inwardly and downwardly to a plurality of blades therebelow for more thorough mixing; said critical second angle β being within the range of 35°–55° and said critical third angle γ being within the range of 10°–30°;
- at least one intermediate blade disposed at a predetermined third location intermediate said first and second blades; said intermediate blade having a twist such that it defines a plurality of angles with respect to said plane; said intermediate blade including a central portion that is substantially parallel with said plane and respective outer radial portions that have a critical fourth angle ϕ with the trailing edge tilted downwardly for mixing said solids and moving said solids downwardly to said first blade for repeated mixing and circulation; said critical fourth angle ϕ being within the range of 15°–35°;

said blades having a width that is no greater than 1½ inches and substantially uniform therealong; said blades being affixed to the shaft in operation such that each lower adjacent blade is offset at a predetermined angle with respect to the adjacent higher blade such that thorough mixing and a substantially uniform admixture of said solids in said liquid is formed rapidly with nominal torque requirements and without requiring torque so high as to damage said electric drill motor.

4,054,273

DISPERSION APPARATUS FOR INJECTION MOLDING FILTER

Clayton L. Neuman, Coon Rapids, Minn., assignor to A-1 Engineering, Inc., Coon Rapids, Minn.

Filed Aug. 9, 1976, Ser. No. 712,610

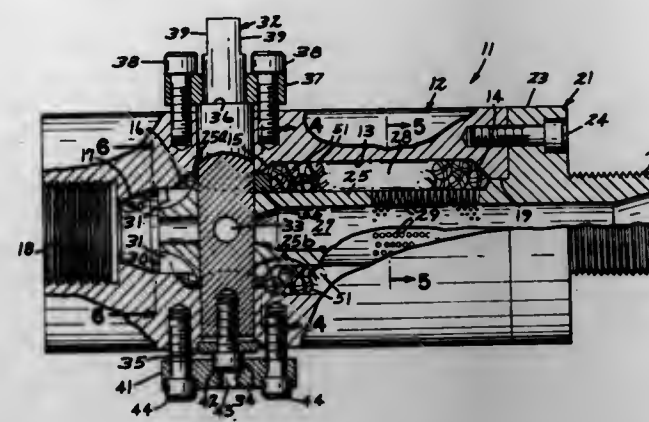
Int. Cl.² B01F 15/02; B29B 1/06

U.S. Cl. 366—69

25 Claims

1. Apparatus for dispersing flowable material, comprising:
 - a. a housing defining a dispersion chamber;
 - b. inlet means for admitting flowable material to the chamber;
 - c. outlet means for discharging dispersed flowable material from the chamber;
 - d. a plurality of spherical bodies within the chamber in contacting engagement with each other and with the chamber wall, and defining tortuous paths therebetween to disperse the material;

e. each of said bodies having at least one groove formed therein which extends substantially around its periphery



to assist in dispersing the flowable material and to reduce back pressure in the chamber.

4,054,274

METHOD AND APPARATUS FOR AVOIDING THE EMISSION OF CARBON MONOXIDE FROM CONVERTER EXHAUST GASES

Winfried Hogner, Oberhausen, Germany, assignor to Gutehoffnungshütte Sterkrade Aktiengesellschaft, Germany

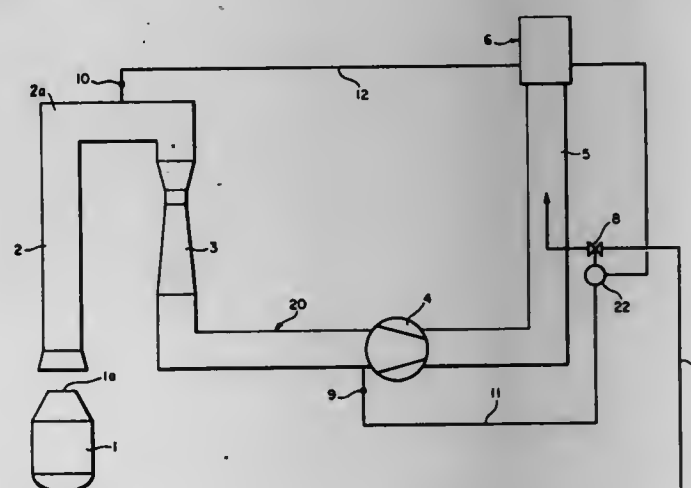
Filed May 25, 1976, Ser. No. 689,852

Claims priority, application Germany, June 7, 1975, 2525427

Int. Cl.² C21C 5/40

U.S. Cl. 266—80

3 Claims



1. An apparatus for avoiding the emission of carbon monoxide from the exhaust gases of an oxygen converter, comprising a cooling gas stack adapted to be positioned over the converter to receive the gases discharged therefrom, a clean gas stack having a top opening for the emission of gas, a connection gas conduit between said cooling gas stack and said clean gas stack, a dust separator in said connection gas conduit, means for circulating gases from said cooling gas stack through said connection gas conduit to said clean gas stack, a separate fuel gas supply connection connected into said clean gas stack, means for sensing the oxygen content and the carbon monoxide content of gases passing through said connection gas conduit, and control means connected to said sensing means and said fuel gas supply connection to regulate the flow of fuel gas into said clean gas stack in accordance with the carbon monoxide and oxygen content of the gas which are sensed by said sensing means.

4,054,275

CONTINUOUS STREAM TREATMENT OF DUCTILE IRON

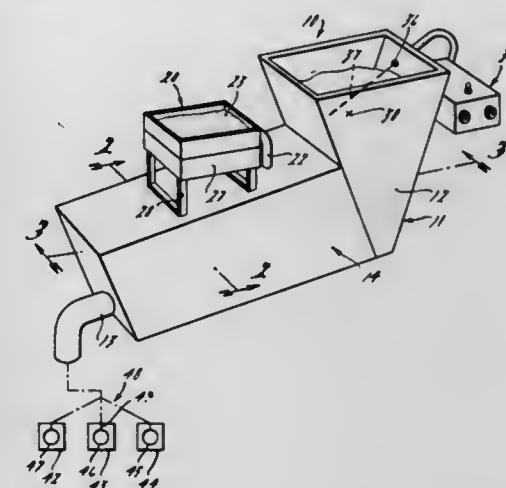
Gerald S. Cole, Dearborn; Bela V. Kovacs; Robert A. Sensoli, both of Dearborn Heights, and Herschel B. Smartt, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 569,029, April 17, 1975, Pat. No. 4,028,099.
This application Feb. 2, 1976, Ser. No. 654,665

Int. Cl.² C21C 1/00

U.S. Cl. 266—93

1 Claim



1. An apparatus for manufacturing nodularized cast iron, comprising:

- a. means defining an inclined flow course,
- b. a refractory receptacle interposed in said course and having means providing a gas tight chamber presenting space for collecting an inclined pool of molten iron therein, said receptacle having means for injecting a nodularizing agent thereinto at a predetermined flow rate so as to mix, react and allow for expansion of the reaction products before proceeding further through said course, said receptacle having an inlet and outlet respectively connecting with said course,
- c. means effective to control at least one of said inlet or outlet for developing said inclined pool of molten iron therein during said flow, and
- d. regulator means effective to sense iron flow through said course in advance of said chamber whereby the presence of flow at said sensed station triggers the injection of said nodularizing agent and the absence of flow stops the introduction of said agent to said chamber.

4,054,276

PROCESS AND APPARATUS FOR COOLING HOT ROLLED STEEL ROD

Norman A. Wilson, Shrewsbury, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Division of Ser. No. 516,767, Oct. 21, 1974, Pat. No. 3,930,900.

This application Sept. 17, 1975, Ser. No. 614,301

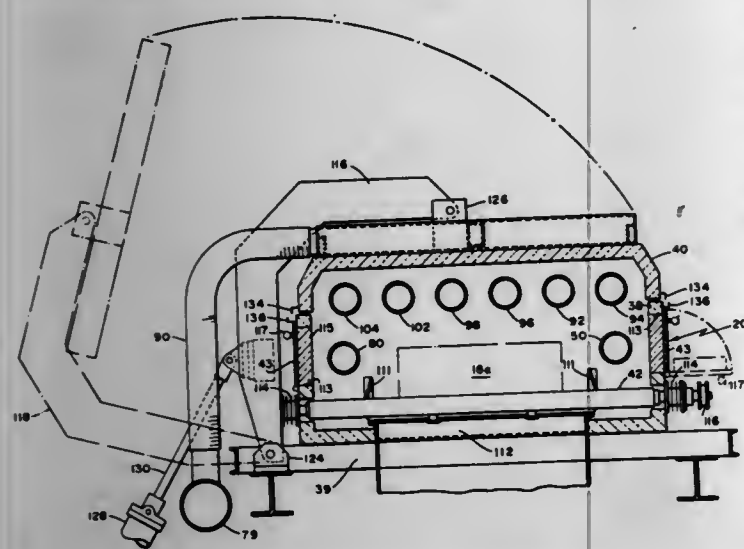
Int. Cl.² C21D 9/56

U.S. Cl. 266—106

4 Claims

1. An apparatus for treating hot steel rod comprising:
 - a. a cooling chamber;
 - b. a conveyor adapted to receive hot steel rod in the form of spread-out rings and for moving said rings through said chamber;
 - c. the interior of said chamber being provided with radiation control means having a plurality of extended surfaces facing said conveyor and displaced therefrom whereby a space is provided through which said conveyor is adapted to move said rod;
 - d. some of said surfaces being disposed adjacent the center of said conveyor on which the center of said rings are carried and others of said surfaces being disposed adjacent the

sides of said conveyor on which the edges of said rings are carried;
 e. temperature control means for maintaining said surfaces adjacent the center of said conveyor at preselected temperatures and for maintaining said surfaces adjacent the sides of said conveyor at other preselected temperatures;



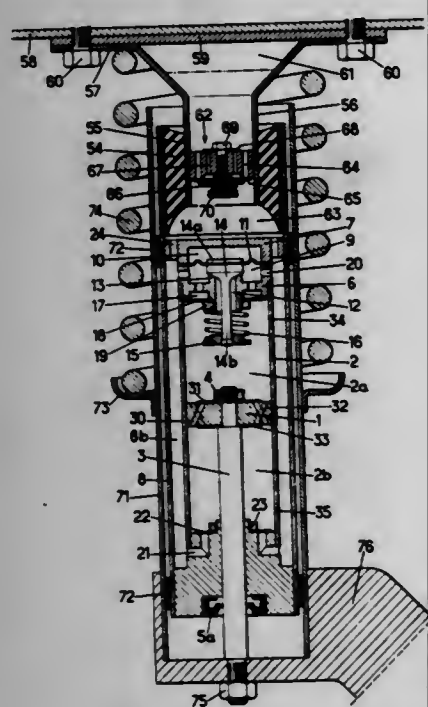
f. and means for controlling said temperature control means to maintain the first of said preselected temperatures at higher value than the second of said preselected temperatures;
 g. said radiation control means comprising spaced heating elements.

4,054,277 HYDRAULIC SHOCK ABSORBER

Jacques Marie Michel Sirven, La Colline rue Francois Leroux, 91400 Orsay, France
 Filed Oct. 10, 1975, Ser. No. 622,276
 Claims priority, application France, Oct. 11, 1974, 74.34286
 Int. Cl.² F16F 9/34

U.S. Cl. 267-35

17 Claims



1. A shock absorber device comprising a cylinder containing a hydraulic fluid; a main piston located in and dividing said cylinder into a first chamber and a second chamber, a rod connected to said piston and extending through said second chamber for actuating said piston in said cylinder; means defining an intermediate space; means external to said first chamber for providing fluid communication between said intermediate space and said second chamber; a spring biased control valve coupling said first chamber and said intermediate space and responsive to the pressure of the fluid in said first chamber to establish fluid communication between said first chamber and

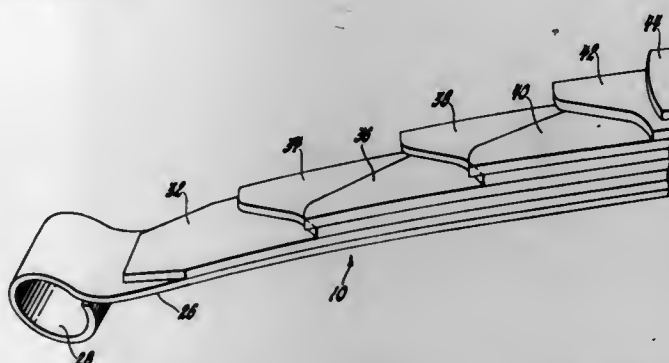
said intermediate space during compression movement of the shock absorber device; means defining a hydraulic fluid reservoir; flow restriction means providing fluid communication between said hydraulic fluid reservoir and said intermediate space and including valve means dividing said hydraulic fluid reservoir into first and second parts; said valve means increasing the fluid pressure in said intermediate space when the fluid flow rate increases therethrough; a movable wall member defining one wall of said intermediate space and integrally connected to said control valve such that movement of said wall member causes a corresponding opening of said control valve in response to increase of the pressure in said intermediate space during rapid compression movement of the shock absorber; and means including said movable wall member defining a reference chamber containing a gas at a substantially constant reference pressure for urging said movable wall member and said control valve in a direction to close said control valve and thereby stop fluid communication between said first chamber and said intermediate space.

4,054,278 LEAF SPRING ASSEMBLY

John Bilobran, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
 Filed July 19, 1976, Ser. No. 706,624
 Int. Cl.² F16F 1/22

U.S. Cl. 267-47

5 Claims



1. A method of manufacturing the intermediate leaves of a vehicle suspension leaf spring structure including a conventional longest bowed leaf and a conventional shortest flat leaf, the method comprising the following steps:

- cutting bar stock of a predetermined finished width and thickness and a predetermined multiple leaf spring length into a predetermined number of individual length leaves, having ogee-shaped end cuts and progressively shorter lengths, and concurrently piercing a hole in the longitudinal center of each leaf;
- cambering said leaves to predetermined shape;
- assembling said cambered leaves on said longest bowed leaf such that each successive leaf is shorter than the underlying leaf and its ogee-shaped end is mounted in the oppositely disposed attitude relative to the underlying leaf;
- mounting said shortest flat leaf on the last assembled and shortest cambered leaf; and
- mounting a bolt through the aligned center holes to prevent longitudinal displacement of said leaves during operational conditions, and mounting a clamp around at least one of the end portions of the assembly adjacent an end of the shortest leaf to prevent lateral displacement of said leaves during operational conditions.

4,054,279 THREE-WAY VISE

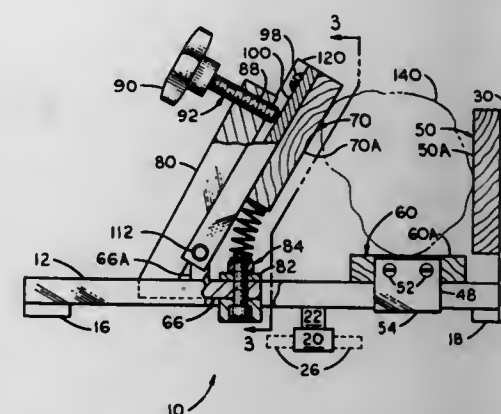
Harry C. Wain, Hampden Road, Somers, Conn. 06071
 Filed Nov. 26, 1976, Ser. No. 745,308
 Int. Cl.² B25B 1/04

U.S. Cl. 269-154

5 Claims

1. A workpiece clamping vise comprising a frame, a fixed jaw secured to the frame, a base and a sliding jaw mounted on

the frame for sliding movement toward and away from the fixed jaw, a rigid angularly inclined arm secured to and projecting from the base toward said fixed jaw, a clamping jaw disposed in overlying relation to the sliding jaw and pivotally



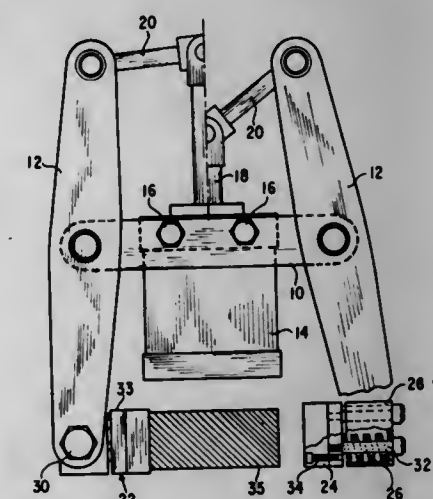
supported on the base for swinging movement toward and away from the fixed jaw, and jaw pressing means mounted on the rigid arm of the base for selectively pressing the clamping jaw toward the fixed and sliding jaws to positively lock the jaws and the workpiece in relation to the frame.

4,054,280 SPRING BOX ASSEMBLY FOR USE IN CLAMPING MECHANISMS OF THE OVER-CENTER TYPE

Russell Alberts, Sikeston, Mo., assignor to Noranda Mines Limited, Toronto, Canada
 Filed Nov. 29, 1976, Ser. No. 745,689
 Int. Cl.² B23Q 3/08

U.S. Cl. 269-34

5 Claims



1. In a clamping mechanism of the over-center type including a support member; two pivot linkages pivotally mounted, one at each end of said support member; a hydraulic or air cylinder secured to said support member between said pivot linkages; two arms having one end pivotally connected to the piston of said cylinder and each other end pivotally connected to a respective one end of the pivot linkages; and a spring box assembly secured to the other end of each pivot linkage; the improvement being wherein said spring box assembly comprises

- two nested metal housings, one being pivotally connected to said other end of the pivot linkage and the other being secured to a clamping block;
- at least one spring located between said housings for biasing said housings apart; and
- means for resiliently holding said housings together with a predetermined initial tension applied to said spring.

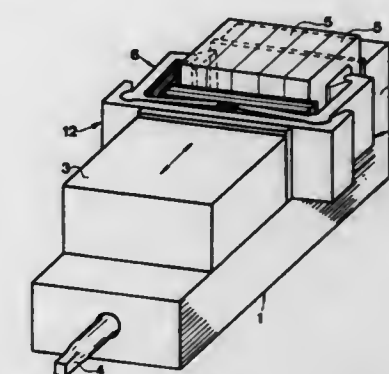
4,054,281

CLAMPING DEVICE FOR HOLDING WORKPIECES
 Per Erik Bertil Martinsson, N. Fiskargatan 1 F, 803 50 Gavle, Sweden

Filed Oct. 26, 1976, Ser. No. 735,511
 Int. Cl.² B25B 5/14

U.S. Cl. 269-110

12 Claims



1. A clamping device of the kind comprising at least two jaws arranged in spaced relation and defining a workpiece receiving space, means mounting said jaws for relative movement to clamp one or more workpieces between the jaws, and at least one lever, means mounting said lever for pivoting in relation to said jaws, said lever having two arms, a first of said arms being positioned for actuation when said jaws move towards each other in order to tend to pivot said lever, a second of said arms being arranged to exert a clamping force on a workpiece substantially perpendicularly to the direction of relative movement of said jaws in response to actuation of said first arm, said first arm of said lever being located between one of said jaws and said workpiece receiving space for being subjected to a compressive force via workpieces in response to movement of said jaws towards each other to effect pivoting of said lever.

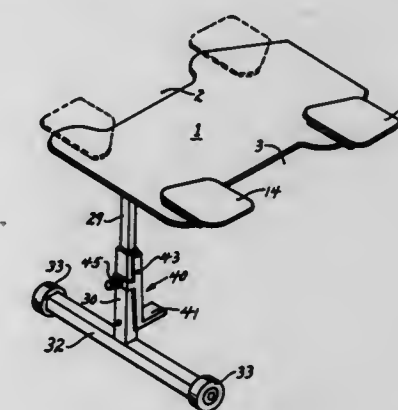
4,054,282

AUXILIARY OPERATING TABLE FOR HAND SURGERY AND THE LIKE

Merlin L. Hamer, La Jolla, Calif., assignor to Louis O. Scheu, Jr.; Alvin C. Kniss and Kleinert, Kutz & Lister, all of Louisville, Ky., part interest to each
 Filed Nov. 19, 1976, Ser. No. 743,140
 Int. Cl.² A61G 13/00

U.S. Cl. 269-328

8 Claims



1. An auxiliary operating table for supporting a patient's upper extremity normally at about 90° to the side rail of the frame of a body table on which the patient is supported during upper extremity surgery, comprising:

- An auxiliary operating table top having an inner or front bed end, an outer or rear leg end and opposite side margins along each of which a surgeon may be seated;
- rail clamping means carried from the bed end portion of said table top and securable to said side rail of a patient-

supporting body table for supporting the inner end of the auxiliary table upon the frame of said body table; and

C. adjustable floor-engaging table-supporting leg means, under the control of a seated surgeon, for enabling the outer end of said table top to be adjusted to and supported at any selected level within a limited vertical range without subjecting the surgeon to hand contamination,

1. said leg means including a vertical leg secured at its upper end to said table top,

a. said vertical leg including an extensible-retractable telescopic gas spring of a type which automatically tends to extend the leg and thereby raise said outer end and which may be retracted by a seated surgeon exerting on the table top downwardly directed elbow pressure sufficient to lower said outer end.

4,054,283

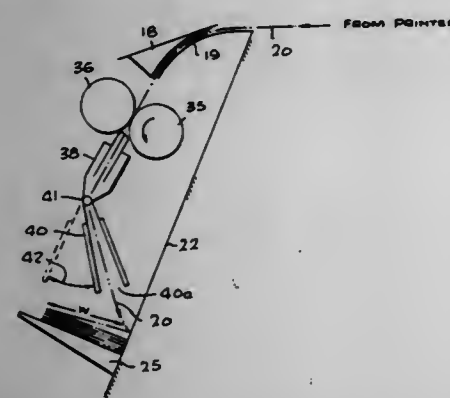
FAN FOLD FORM STACKER

Harry F. Rayfield, Reseda, Calif., assignor to Data Products Corporation, Woodland Hills, Calif.

Filed July 17, 1975, Ser. No. 596,723
Int. Cl.² B65H 45/20

U.S. Cl. 270-79

24 Claims



1. For use with a device from which paper, fan-folded along equally spaced folds in the paper is supplied, the distance between successive folds defining a form length, the device providing a sequence of discrete electrical signals, each signal representing a certain length of paper supplied by said device, the rate of such signals representing the speed at which paper is supplied by said device, an apparatus for stacking the fan-folded paper supplied thereto from said device, the apparatus comprising:

- a paper reception station including a movable base member on which fan-folded paper is to be stacked;
- a chute having an outlet and disposed above said base member;
- input means for receiving fan-folded paper supplied thereto from said device and for directing the received paper through said chute toward said base member, the paper exiting said chute through the outlet end thereof; and
- control means including means connected to said device and responsive to the electrical signals provided by said device for controlling said chute outlet end to oscillate between first and second positions at a rate related to the rate at which said electrical signals are provided by said device, the distance between said first and second positions defining an oscillation stroke.

4,054,284

PAPER ANTI-SKEW DEVICE

Janusz W. Kupisiewicz, Arcadia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 5, 1975, Ser. No. 555,654
Int. Cl.² B65H 1/04

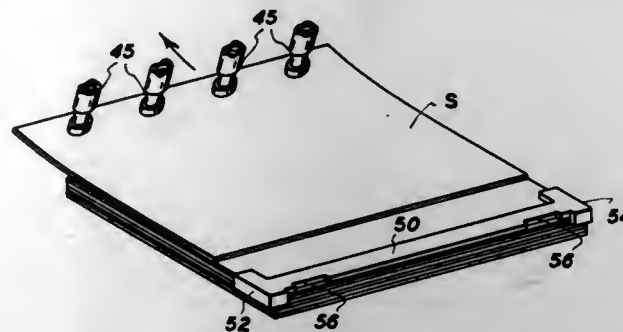
U.S. Cl. 271-8 R

8 Claims

1. In an electrostatic copying machine in which copies of documents are reproduced on copy sheets which are fed from a stack by a top feeding device along a copy sheet path,

an improved sheet anti-skew device for maintaining alignment of the edges of the topmost sheets of the stack comprising:

an elongated member positioned to rest on a top of a stack of sheets to be fed, said member longitudinally extending along the trailing edge of said stack, said member having



corner portions extending vertically at an angle of 90° from the longitudinal extent of the member for a predetermined distance to receive corners of the topmost sheets to prevent the skewing thereof as they are fed from the top of said stack.

4,054,285

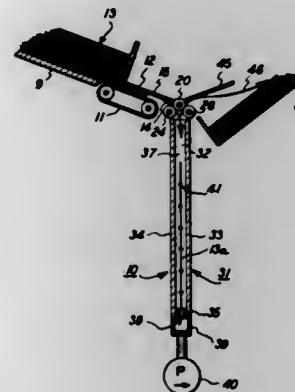
APPARATUS FOR REGISTERING AND INVERTING SHEETS

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 8, 1976, Ser. No. 664,846
Int. Cl.² B65H 29/24

U.S. Cl. 271-186

7 Claims



1. Apparatus, comprising:

- a. a structure having a vertically disposed pocket, said pocket being defined by a pair of wide walls bounded by oppositely disposed narrow side walls and a narrow bottom wall;
- b. means for serially dropping sheets having any one of a range of sizes in the pocket;
- c. fluidic means for discharging sheets from the pocket, including at least one port in the bottom wall and means for injecting fluid through said at least one port to provide a fluid stream in the structure which discharges sheets therein;
- d. means for collecting discharged sheets; and
- e. means for guiding discharged sheets to said collecting means, whereby the serially deposited sheets are inverted.

4,054,286

CRYSTAL BALL

Richard J. Dressler, Sr., 900 W. Warrior Drive, Round Lake, Ill. 60073

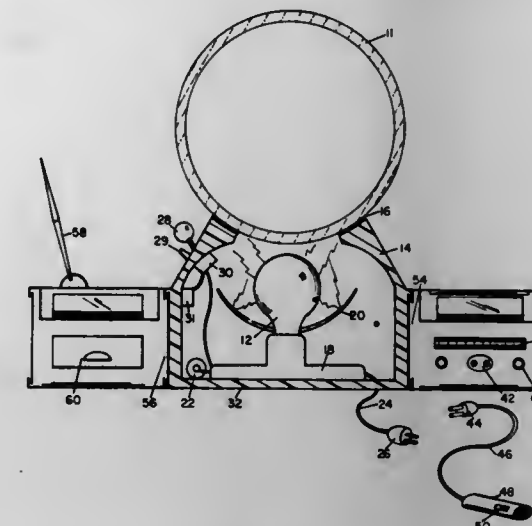
Filed Aug. 3, 1976, Ser. No. 711,423
Int. Cl.² A63H 33/26

U.S. Cl. 273-161

4 Claims

1. A lamp and accessory set suitable as an amusement device comprising a translucent spherical object mounted on an

opaque base, which also mounts at least one electrical lamp bulb and a dimmer switch for controlling the lamp, conductors to a source of electrical energy; the base being polygonal in plan view and having an opening disposed between said lamp



bulb and said spherical object, at least one of the sides of the polygon provided with grooves for attaching other objects, one such object being an electronic amplifier which may be a radio receiver, and a microphone connectable thereto.

4,054,287

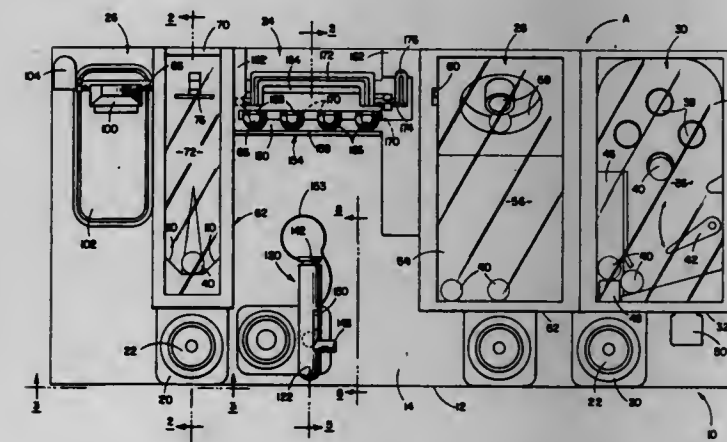
TOY AMUSEMENT ARCADE

Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Friedlich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe, both of Northridge, Calif.

Filed Feb. 12, 1976, Ser. No. 657,485
Int. Cl.² A63B 65/12; A63F 7/00

U.S. Cl. 273-101

7 Claims



1. A children's toy arcade game having a plurality of toy game features, said gam comprising:

- a. a game frame means,
- b. shooter game means simulating a gun range on said frame means, said shooter game means comprising:
 - 1. a projectile shooter member simulating a gun for issuing a projectile,
 - 2. a plurality of aligned target members located to be contacted by said projectile,
 - 3. and flexible connection means connecting said projectile to said shooter game means,
 - 4. manually operable return means operatively connected to said target members to shift said target members to their initial positions.
- c. a second game means on said frame means for play with a spherical element, said second game means comprising:
 - 1. a completely enclosed first housing,
 - 2. an optically transparent upper surface forming part of said first housing to view the interior thereof;

- 3. a spherical element shooter mechanism located in said first housing for issuing a spherical element,
- 4. a score depicting section having at least one aperture to receive the spherical element to attain a score,
- 5. an actuating mechanism located externally of said housing member for manual actuation to actuate said shooter mechanism to release the spherical element and to enable same to be moved toward a receiving member, and
- 6. return means to return the spherical element to the shooter mechanism completely within said first housing,
- d. a third game means on said frame means, said third game means comprising:
 - 1. a completely enclosed second housing,
 - 2. an optically transparent second upper surface forming part of said second housing to view the interior thereof,
 - 3. a scoring element projecting device for issuing a spherical scoring element,
 - 4. a target section located within said second housing and located to be contacted by said scoring element,
 - 5. a rod mounting said target section in said second housing and said rod extending outwardly of said second housing,
 - 6. linking means operatively connecting said rod to said target section,
 - 7. a simulated bath device located outwardly of said second housing,
 - 8. a simulated person carried on said rod outwardly of said second housing and being pivoted into said simulated bath device when said target section is contacted by said scoring element, and
 - 9. a manually operable return means located externally of said housing and being operatively connected to said rod for returning said simulated person to its initial position,
- e. means forming a recess in said frame means at each of said game means in proximity to a player end of each of said game means, and
- f. a simulated player element provided for insertion into said recess at the game means to indicate the game means being played.

4,054,288

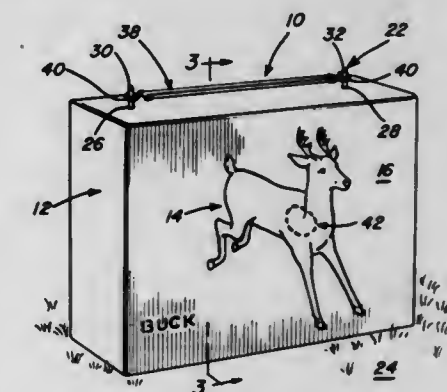
FOAM PLASTIC ARCHERY TARGET WITH INTERNAL FRAME

Ronald E. Perrine, Sr., 3995 Navajo Trail, Jamestown, Ohio 45335

Filed July 6, 1976, Ser. No. 703,076
Int. Cl.² F41J 3/00, 1/10

U.S. Cl. 273-102 S

3 Claims



1. An archery target comprising, in combination:

- a. a backstop provided with markings forming a target area; and
- b. anchor means engaging the backstop for releasably retaining the backstop at a predetermined location, the backstop being in the form of a rectangular parallelepiped constructed from a foam material and provided with a pair of spaced, parallel through holes, with the anchor means including a pair of rods disposed in the holes and insert-

able into a support surface on which the backstop is arranged, said pair of rods disposed in said holes substantially perpendicular to the support surface, and the anchor means further including an elastic element detachably attached to and arranged extending between the rods, the parallelepiped arranged between the elastic element and the support surface, with the elastic element biasing the rods toward one another in order to bias the parallelepiped toward the support surface.

4,054,289

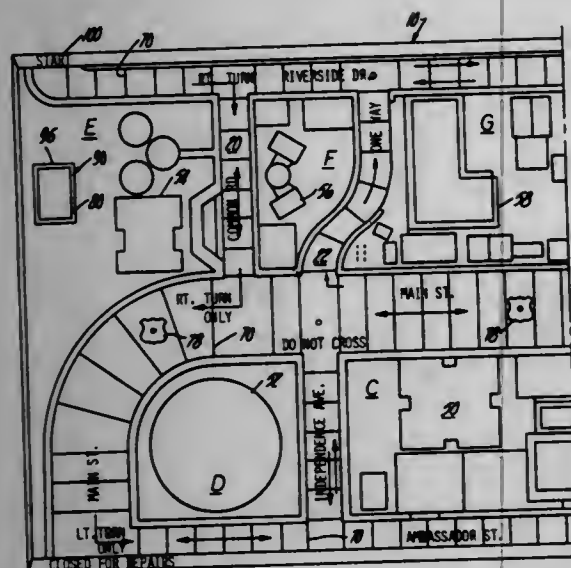
BOARD GAME APPARATUS

Nora Ann Burkett, 12728 Monica, Detroit, Mich. 48238
Filed Sept. 20, 1976, Ser. No. 724,515

Int. Cl.² A63F 3/04

U.S. Cl. 273-134 AC

1 Claim



1. A traffic game comprising:

- a game board having a plurality of intersecting streets imprinted thereon to symbolize a geographical section of a city, the streets dividing said board into a plurality of blocks;
- the streets of said game board being coated with a protective, plastic coating, each street being subdivided into a plurality of numbered spaces;
- a card-holding tray carried by said game board on a portion adjacent one of said streets;
- a plurality of playing cards disposed in said tray, each of said playing cards being provided with indicia representing a traffic violation and the fine associated with said violation;
- a plurality of mileage markers indicative of a prescribed travel by a player along said streets of said game;
- a plurality of playing pieces adapted to move along said numbered spaces on each of said streets;
- a spinner mechanism adapted to indicate the number of such spaces that a player may move said playing pieces; and
- a plurality of color-coded, player directive symbols strategically located on the spaces of said streets, each of said color-coded symbols providing instructions to the player who lands in the space associated with such symbols, a selected number of said symbols instructing said player to utilize one of said playing cards.

4,054,290

LIGHT GUN HAVING SELECTABLE MODULATED INFRARED OUTPUT

Alvaro J. Villa, Northridge, Calif., assignor to Walt Disney Productions, Burbank, Calif.

Filed June 18, 1976, Ser. No. 697,323

Int. Cl.² A63F 9/02

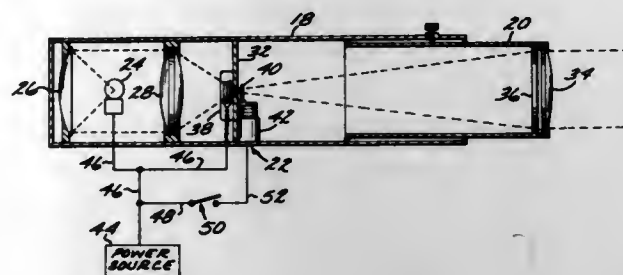
U.S. Cl. 273-101.1

15 Claims

1. A light gun comprising:

- a source of continuous visible and infrared light directed along a common predetermined path;

means for periodically interrupting said infrared light along said path while passing said visible light; and



means for selectively blocking said interrupted infrared light along said path while passing said visible light.

4,054,291

TURNABLE ASSEMBLY FOR PHONOGRAPH RECORDS

Keijiro Maeda, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

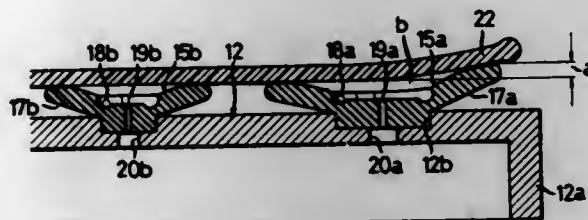
Filed Apr. 8, 1975, Ser. No. 566,537

Claims priority, application Japan, Apr. 16, 1974, 49-43404[U]

Int. Cl.² G11B 3/60

U.S. Cl. 274-39 R

9 Claims



- 1. A phonograph turntable assembly comprising: a rotatable turntable and a plurality of support means on said turntable for supporting a phonograph record, each of said support means being of an elastically flexible material and shaped as an upwardly dished member having a central lower portion mounted on said turntable and a relatively raised upwardly facing peripheral portion of larger diameter than the lower portion thereof, the peripheral portion of each of said support means being flexibly vertically engageable with the undersurface of a phonograph record to cooperate with the undersurface of a phonograph record supported thereon for defining air space therebetween, and each of said record support means having means defining at least one air passage of small cross-sectional area through which said space communicates with the atmosphere outside of said space such that if said record tends to vibrate vertically, the volume of said defined air space changes to produce high viscous resistance of air flowing through said passage to damp said vertical vibrations of said record.

4,054,292

GAS SEAL FOR ROTATING GRINDING MILL HAVING PERIPHERAL DISCHARGE

Tyrus Hartsel Stone, Belpre, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,109

Int. Cl.² B02C 4/28; B65D 53/06

U.S. Cl. 277-12

1 Claim

- 1. A seal for a rotating mill having a rotatable cylindrical shell and a plurality of apertures arranged in a circumferential row, said seal comprising a first pair of spaced, parallel, planar, circular, rotatable ring members sealably attached to said shell with said circumferential row of apertures lying between said rotatable ring members, each of said rotatable ring members having a circumferential bearing surface at its side remote from said row of apertures, a fixedly mounted annular gas-tight seal

housing member arranged around said row of apertures and said first pair of ring members, said housing member having a pair of spaced fixedly mounted ring members arranged adjacent said pair of rotatable ring members, each of said pair of fixedly mounted ring members having a first portion with a circumferential planar bearing surface in sliding contact with a bearing surface of an adjacent rotatable ring member and a second portion with a circumferential surface slightly spaced

in surrounding relationship to said spaced groups of knife edges and radially spaced therefrom to define spaces therebetween; and magnetic fluid captured in said spaces and partially filling said third chamber to provide liquid sealing between said housing and said shaft.

4,054,294

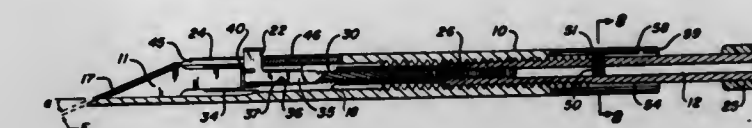
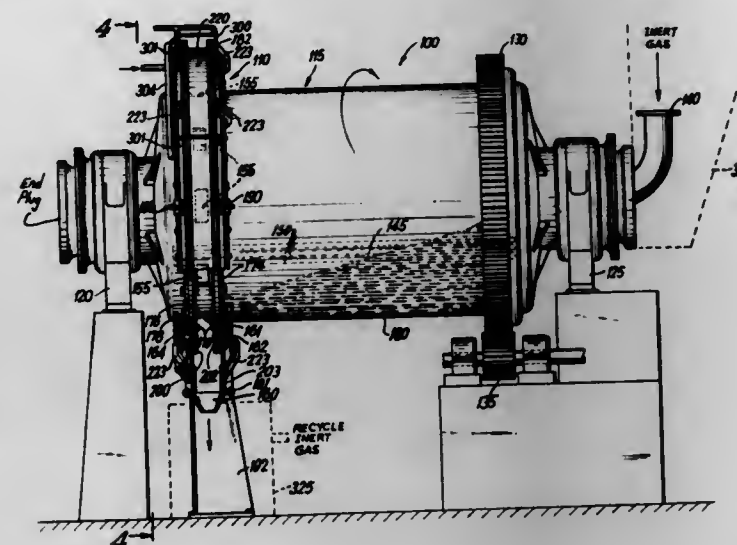
SECURE TOOL GRIPPING CHUCK

Royzell F. Wells, 6936 S. Sycamore St., Littleton, Colo. 80120
Division of Ser. No. 558,709, March 17, 1975, Pat. No. 3,967,377. This application Mar. 15, 1976, Ser. No. 666,799

Int. Cl.² B23B 31/10; B26B 1/08

U.S. Cl. 279-44

4 Claims



- 1. Apparatus for selectably gripping a tool or planar member in a chuck having two flexible arms defining a slot with said chuck being contained within an enclosing housing and with the interior portion on the open end between the arms being adapted for gripping the tool or planar member when the arms are forced together comprising:

lever means pivotally attached to the flexible arms of the chuck and having an arm in offset relation to the pivotal attachment for extending through an opening in the housing,

collar means having divergently sloped interior surfaces attached to said lever means for engaging the outer edges of the flexible arms on either side of the slot therebetween, and

means associated with said housing for biasing said sloped surfaces of said collar means in wedging angled relation against the outer surfaces of the flexible arms for maintaining a closure force on the flexible arms relative to the slot defined therebetween.

4,054,293

HYBRID MAGNETIC FLUID SHAFT SEALS

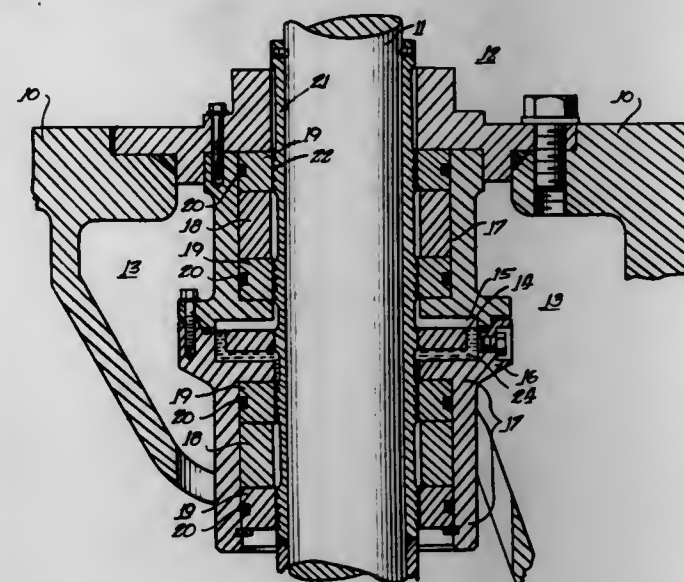
Donald F. Hoeg, Mount Prospect, and John J. Tuzzon, Evanston, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,195

Int. Cl.² F16J 15/42

U.S. Cl. 277-13

1 Claim



- 1. In a device having a stationary housing, a vertical shaft rotatably mounted in said housing, dynamic seal means including said housing for sealing said shaft to said housing, said seal means comprising a plurality of spaced groups of knife edges on said shaft; an annular flange on said shaft interposed between said spaced groups of knife edges; said housing including means defining first and second chambers for receiving magnets and a third chamber for receiving the annular flange; magnet means disposed within said first and second chambers

4,054,295

VEHICLE BODY SUPPORT AND LEVELER DEVICE

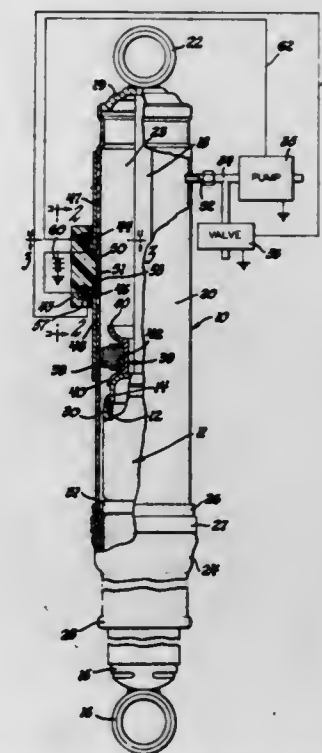
James O. Elliott, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,587

Int. Cl.² B60G 11/26

U.S. Cl. 280-6.1

1 Claim



- 1. In an auxiliary vehicle body support and leveler device of

the type including a main body fixed to vehicle running gear and a cover fixed to the body, the cover being made of a non-magnetic material, being vertically movable with respect to the main body and defining with the main body a variable volume chamber having means adapted for communication with a source of high pressure fluid through means to control said communication and a fluid outlet adapted for communication with a low pressure fluid sump through means to control said communication, whereby the pressure of fluid within the chamber and thus the load supporting capacity of the device can be varied, the improvement comprising

a pair of vertically oriented, vertically separated strips of magnetic material fixed to the cover;
a pair of magnetically responsive reed switches fixed to the cover, each of the reed switches being associated with a different one of the strips, having a pair of contact reed adapted to close in response to magnetic flux thereacross and being oriented horizontally with one of the reeds adjacent the associated vertical strip, the reed switch adjacent the upper strip being adapted for connection to the high pressure fluid source communication control means for actuation thereof when closed, the reed switch adjacent the lower strip being adapted for connection to the low pressure fluid sump communication control means for actuation thereof when closed;

and a permanent magnet fixed to the main body within the chamber and adjacent the vertical strips, the magnet having poles and being oriented with the poles horizontally juxtaposed, one adjacent the strips and one separated therefrom, the magnet being effective, as the cover reciprocates vertically, to close only the upper reed switch when adjacent the upper strip, only the lower reed switch when adjacent the lower strip and neither reed switch when between strips.

4,054,296

SKATEBOARD BRAKE

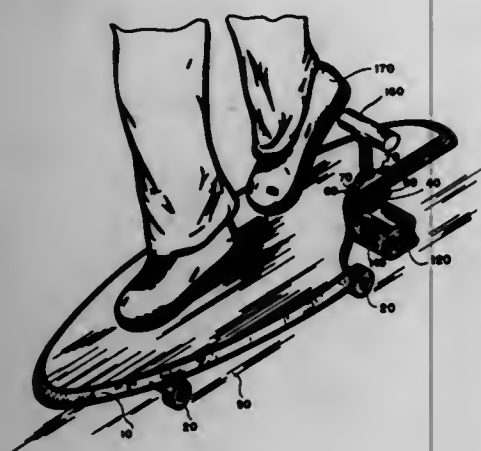
Lloyd Sallins, Lomita, Calif., assignor to The Raymond Lee Organization, Inc., a part interest

Filed May 4, 1976, Ser. No. 683,015

Int. Cl.² A63C 17/14

U.S. Cl. 280—11.2

1 Claim



1. A skateboard device comprising:

a horizontally disposed skateboard having front and rear ends and having a vertical bore therein adjacent the rear end, said board having top and bottom surfaces;
front and rear roller means secured to the bottom surface of the skateboard intermediate the bore and the front end;
first and second guide pieces secured to the top and bottom surfaces respectively each guide piece having a hole aligned with said bore, each hole having two diametrically opposed tongues therein which are spaced from each other, the tongues in one piece being aligned with the tongues in the other piece;
a vertical cylindrical plunger extending slidably through the bore, said plunger having oppositely disposed vertical grooves in its outer surface engaged by said tongues

whereby the plunger is vertically slidable in the bore but cannot rotate therein, said plunger having an upper end extending above the guide piece on the top surface of the board and a lower end extending below the guide piece on the lower surface of the board;

a horizontal pedal secured to the upper end of the plunger; a horizontally elongated block secured to the lower end of the plunger; and

a coil spring disposed around the plunger between the handle and the guide piece on the top surface of the board to normally bias the plunger into fully raised position.

4,054,297

WEIGHT BIASED STEERING MECHANISM

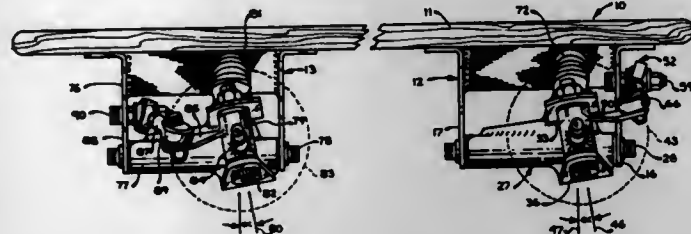
John S. Solimine, San Francisco, Calif., assignor to Ermico Enterprises, San Francisco, Calif.

Filed June 18, 1976, Ser. No. 697,463

Int. Cl.² B62B 3/00

U.S. Cl. 280—87.04 A

12 Claims



1. A weight biased steering mechanism for supporting a platform, comprising the combination of a rocker member carried on the platform for pivotal movement about a first axis extending lengthwise of said platform, a pair of spindles mounted on the rocker member for rotation about upright steering axes which are spaced apart in a direction lateral of said platform, and steering linkage means interconnecting each spindle with a lateral mid-portion of the platform for applying a force moment to a respective spindle about its steering axis responsive to pivotal movement of the platform relative to the rocker member as weight is shifted on the platform.

4,054,298

STEP MEMBER FOR TRACTOR

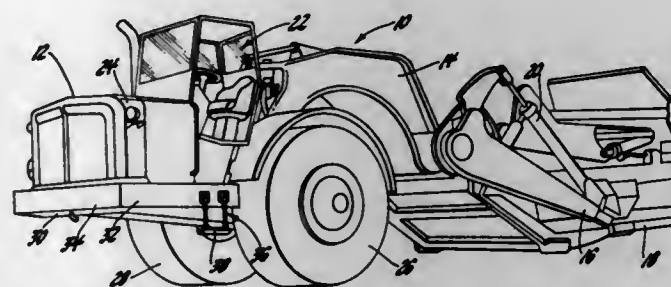
Vincas Urbaitis, Mayfield Heights, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 4, 1976, Ser. No. 692,656

Int. Cl.² B60R 3/00

U.S. Cl. 280—163

2 Claims



1. In a tractor having an exposed lower frame portion susceptible to encountering obstacles and having a vertically oriented outer surface, a step member attached to and depending from said frame portion, said step member comprising a horizontal foot supporting plate having an aperture formed adjacent each end of the supporting plate, a pair of flexible cables, each of said cables having the lower end thereof rigidly fixed with a coupling member having a projection that extends through one of the apertures in supporting plate and is of a size that allows limited pivotal movement of the coupling member relative to the supporting plate, a cap secured to each projection below said foot supporting plate for connecting the latter to the cables, a pair of L-shaped brackets for connecting the

upper ends of said cables to said outer surface of the frame portion, each of said L-shaped brackets having a vertical leg and a horizontal leg, a pivotal connection for connecting the vertical leg to said outer surface with the horizontal leg being rigidly fixed with the upper end of the associated cable so as to laterally space said cable from the outer surface, the arrangement being such that said foot supporting plate is free to pivot in a vertical plane about the pivotal connection of each vertical leg of said pair of brackets when the tractor is moving in a fore or aft direction and the foot supporting plate encounters an obstacle.

4,054,299

STEP MEMBER FOR TRACTORS

Vincas Urbaitis, Mayfield Heights, Ohio, assignor to General Motors Corporation, Detroit, Mich.

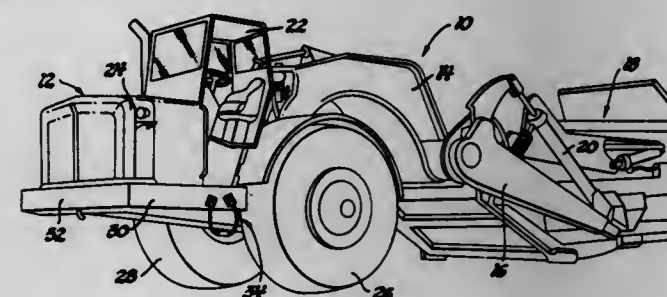
Filed June 4, 1976, Ser. No. 692,655

The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.

Int. Cl.² B60R 3/02

U.S. Cl. 280—163

3 Claims



1. In a tractor having an exposed lower frame portion susceptible to encountering obstacles and having a vertically oriented outer surface, a step member attached to and depending from said frame portion, said step member comprising a continuous flexible cable having opposed end portions; a bracket member for each end portion of said cable, each of said bracket members serving to connect the associated end portion of said cable to said outer surface of the frame portion so as to form said cable into a bowed configuration so that said step member has a pair of vertically oriented curved legs and a horizontal base, a pivotal connection for connecting one part of the bracket member to said outer surface with another part of said bracket member being rigidly fixed with the associated end portion of the cable so as to laterally space said cable from the outer surface, a foot supporting plate secured to said horizontal base, the arrangement being such that said foot supporting plate is free to pivot in a vertical plane about the pivotal connections when the tractor is moving in a fore or aft direction and the foot supporting plate encounters an obstacle.

4,054,300

CAMBERING VEHICLE WITH TRAILING ARMS INTERCONNECTED BY GEARED STABILIZER AND EQUALIZER MECHANISM

Frank J. Winchell, Orchard Lake, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1976, Ser. No. 727,586

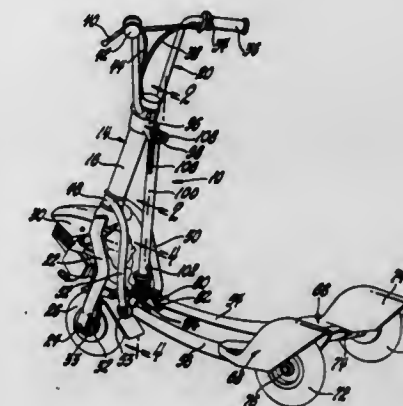
Int. Cl.² B60G 19/00; B62K 15/00

U.S. Cl. 280—278

4 Claims

1. A cambering vehicle for movement along a support surface comprising a steering frame secured at a first selected rake angle with respect to the support surface, a pair of laterally spaced and elongated trailing arms extending from said frame, pivot means pivotally connecting a forward end portion of each of said arms to said frame thereby supporting said arms for swinging movement on said pivot means, contact means adjacent to the free end portions of each of said trailing arms for engaging the support surface, steerable front contact means operatively supported on said frame for engaging the support surface, manual steering means operatively connected to said front steerable contact means, foot support means on each

of said trailing arms for receiving the feet of an operator so that the operator can stand on the vehicle and manually grip said manual steering means, gear unit means interconnecting said trailing arms so that they swing in equal and opposite directions as said operator cambers said vehicle, said gear unit means incorporating first gear means secured to one of said arms and a second gear means secured to the other of said arms and additional gear means operatively connected to said steering frame and intermeshing with said first and second gear



means to thereby provide a geared drive connection between said trailing arms so that they swing in equal and opposite directions, manual means operatively connected to said additional gear means for disengaging said additional gear means from meshing engagement with said first and second gear means to release the drive connection between said arms so that said frame can be pivoted toward said trailing arms and subsequently positioned at a selected angle with respect to said first selected rake angle.

4,054,301

WASTE COLLECTION SYSTEM AND APPARATUS

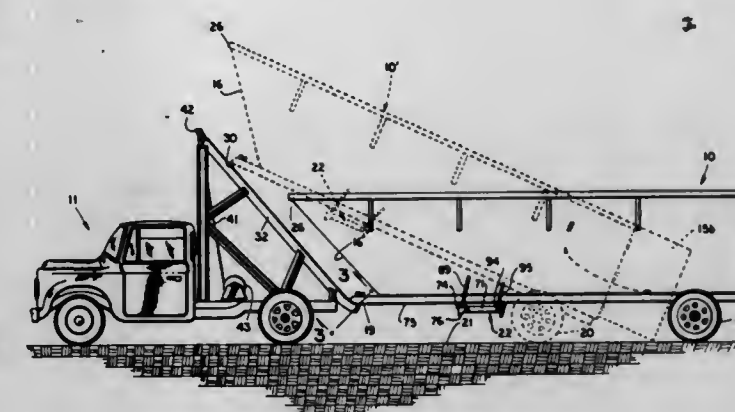
Ronald L. Bond, Valdosta; E. Chris Daughdrill, Lake Park; Henry T. Brice, Valdosta, all of Ga., and Phineas E. Horton, III, Portsmouth, Va., assignors to Swacars, Inc., Valdosta, Ga.

Continuation-in-part of Ser. No. 480,606, June 12, 1974, abandoned, which is a continuation of Ser. No. 377,752, July 9, 1973, Pat. No. 3,858,939. This application Sept. 8, 1975, Ser. No. 611,133

Int. Cl.² B60P 1/28

U.S. Cl. 280—400

5 Claims



1. Towable vehicle apparatus for collecting and dumping waste material, comprising:
floor means having a forward end, a rear end, and a pair of spaced apart sides;
a pair of side walls spaced apart from each other and extending upwardly from the sides of said floor means;
said floor means supported in part by at least one wheeled axle mounted to the underside of said floor means adjacent the rear end thereof;
said floor means having trailer hitch means mounted at the forward end of said floor means;
a front wall mounted to said floor means at the said forward

end and extending diagonally upward therefrom in a forward direction, so that said front wall terminates at an upper end which is spaced above and forward of the forward end of said floor means; each of said side walls extending forwardly and upwardly from said forward end of said floor means to join said diagonally extending front wall; and said upper end of said front wall being spaced above and in front of said trailer hitch means.

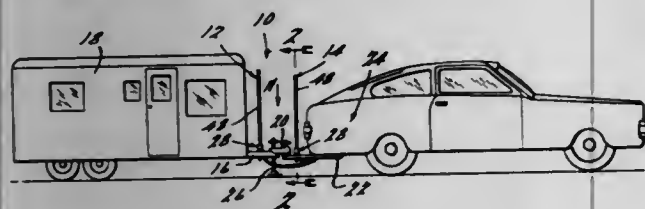
4,054,302

TRAILER HITCH GUIDE MEANS

Jack R. Campbell, 505 W. Sycamore, Mason, Mich. 48854
Filed Mar. 31, 1976, Ser. No. 672,413
Int. Cl.² B60Q 1/26

U.S. Cl. 280—477

1 Claim



1. A trailer hitch guide means for use in assisting the driver of an automotive hauling vehicle to align a trailer hitch ball, carried by the hauling vehicle, with a trailer hitch socket, carried by a trailer, said guide means comprising, in combination, a pair of guide members, each of said guide members including a base of generally C-shaped configuration and having spaced first and second flange portions integrally joined by a web portion, clamping means threadably engaging said first flange portion and operable to clamp one of said guide members to a hauling vehicle in longitudinal alignment with said hitch ball and to clamp the other of said guide members to a trailer in longitudinal alignment with said hitch socket, means for manually actuating said clamping means, an elongated guide tube projecting from said base, said guide tube incorporating fluorescent means emitting visible light upon absorption of radiation from an external source, tubular retainer means carried by said second flange portion of said base and defining a recess adapted to receive one end portion of said guide tube whereby said guide tube is supported by said retainer means, and electric lamp means disposed in the recess defined by said retainer means, said electric lamp means projecting into said guide tube and being energizable to render said guide tube highly visible.

4,054,303

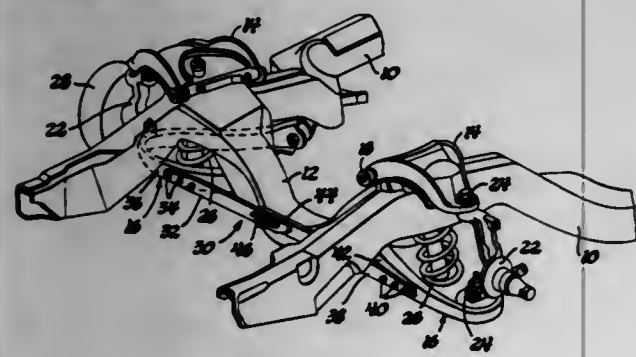
VEHICLE FRONT SUSPENSION STABILIZER BAR

Bob deKruyff, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 23, 1976, Ser. No. 698,907
Int. Cl.² B60G 11/20

U.S. Cl. 280—689

3 Claims



1. For use in conjunction with an independent front suspension for vehicles having a frame, an upper control arm pivotally connected at its inner end to an upper portion of each of opposite side walls of said frame, a lower control arm pivotally connected at its inner end to a lower portion of each of oppo-

site side walls of said frame, a wheel spindle assembly pivotally connected at its upper and lower ends to the outer ends of each set of upper and lower control arms, and a steerable wheel rotatably supported on each of said wheel spindle assemblies, stabilizer means operatively connected between said oppositely disposed lower control arms, said stabilizer means comprising a first cross-bar rigidly secured at the outer end thereof to a surface of one of said lower control arms and extending transversely therefrom toward the other of said lower control arms, a second cross-bar rigidly secured at the outer end thereof to a surface of said other of said lower control arms and extending transversely therefrom toward said one of said lower control arms, the respective inner ends of said first and second cross-bars being juxtaposed one in front of the other, a lateral slot formed in one of said inner ends, and a pin secured to the other of said inner ends and extending horizontally through said lateral slot, said pin and slot accommodating equal and opposite lateral movements of said cross-bars and lower control arms, and said pin and slot resisting opposing vertical movements of said cross-bars and lower control arms when said vehicle is subjected to control arm displacements encountered in a turning operation, thereby limiting tilting of said vehicle during said turning operation.

4,054,304

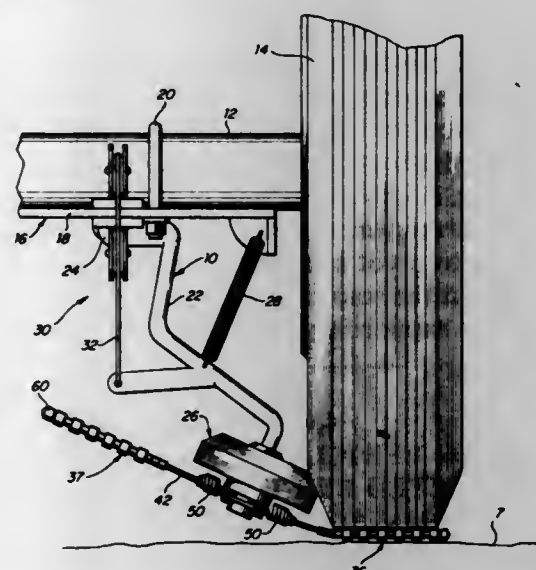
TRACTION ARMS FOR VEHICLE ANTI-SKID DEVICE

Rosaire J. Sirois, Caribou, Maine, assignor to Reneey Industries, Caribou, Maine

Filed Sept. 29, 1975, Ser. No. 617,290
Int. Cl.² B60S 9/00

U.S. Cl. 280—757

2 Claims



1. In a traction arm for a vehicle anti-skid device of the type having a hub rotatably mounted on a carrier, said carrier being mounted for swinging movement between a retracted position remote from a vehicle traction wheel and a position adjacent the lower portion of the traction wheel the improvement comprising: a plurality of traction segments slidably mounted on a common central core, at least one of the traction segments beveled internally to enable it to tip on the common central core, stop means on the common central core at each end of the plurality of traction segments to maintain the traction segments on the common central core, said common central core having flexibility to allow the plurality of traction segments to conform to road and traction wheel contours, and means to attach the common central core to the hub.

4,054,305

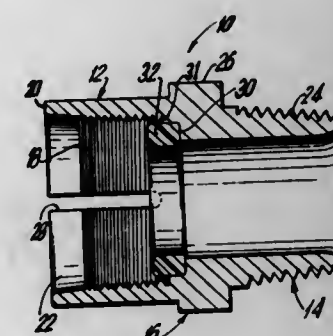
THREAD MAKING FITTING FOR UNTHREADED CONDUIT

Padej Gajajiva, Elmhurst, and John Stokes, East Northport, both of N.Y., assignors to I-T-E Imperial Corporation Efcor Division, East Farmingdale, N.Y.

Filed Apr. 15, 1976, Ser. No. 677,380
Int. Cl.² F16L 35/00

U.S. Cl. 285—39

5 Claims



1. An elongated fitting for forming threads onto an end of a conduit, comprising: a tubular portion at one end of the fitting having an internal thread and adapted to receive the end of the conduit; said tubular portion being provided with slot means to allow outward transverse expansion of said tubular portion for reducing tightening torque between said tubular portion and the conduit, and for permitting visible inspection of the conduit when inserted in said tubular portion; a stem portion on an opposite end of the fitting adapted to couple said fitting to external parts; an intermediate portion providing means for rotating said fitting relative to the conduit, to thereby provide the threads on the end of the conduit which is inserted into the tubular portion; said slot means including a longitudinal slot axially extending in a path from an outer end of said tubular portion to a spaced distance from said intermediate portion along a wall of said tubular portion, said slot extending transversely through said wall for entire length of said path to permit said expansion; a transverse wall section being provided within said tubular portion at one end of said internal thread adjacent to said intermediate portion for providing a stop to the inserted conduit; and said slot being axially spaced from said stop.

4,054,306

TUBE AND CYLINDRICAL SURFACE SEALING APPARATUS

Bernard J. Sadoff, Jr., Rockville, and Horace P. Halling, Laurel, both of Md., assignors to Pressure Science Incorporated, Beltsville, Md.

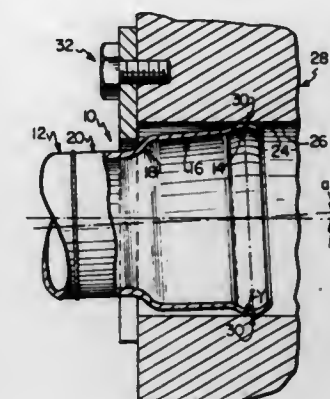
Filed May 28, 1976, Ser. No. 691,160
Int. Cl.² F16L 21/00

U.S. Cl. 285—233

19 Claims

1. A fluid-tight sealing apparatus for sealing a tube inserted into a cylindrical surface having an inner diameter of X wherein the tube and the cylindrical surface are subject to relative angular misalignment, axial movement and rotation, the combination comprising: a metallic, resilient sealing member extending, at the end of the tube, axially of the tube in the direction of insertion of the tube into the cylindrical surface, said sealing member comprising a ring portion having a curved surface for contacting the cylindrical surface, and a tapering portion, said tapering portion extending axially and expanding radially in the direction of insertion of the tube into the cylindrical surface, said ring portion extending axially away from the larger end

of said tapering portion in the direction of insertion of the tube into the cylindrical surface, said ring portion and said tapering portion being formed from a single piece of material,



said ring portion curved surface having a free diameter larger than X to provide an interference fit between said curved surface and the cylindrical surface, thereby forming a fluid-tight seal therebetween.

4,054,307

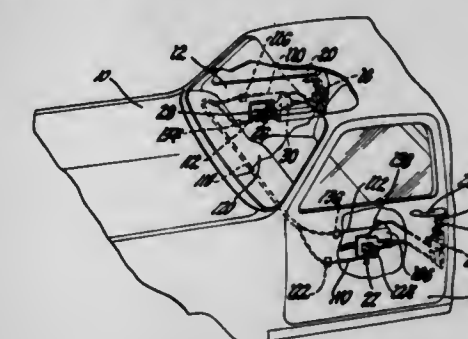
MECHANICAL CONTROL SYSTEM FOR VEHICLE DOOR LOCK

Richard F. Carella, Mount Clemens, Mich., and Thomas W. Perry, South Bend, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1976, Ser. No. 739,564
Int. Cl.² E05C 7/00

U.S. Cl. 292—50

5 Claims

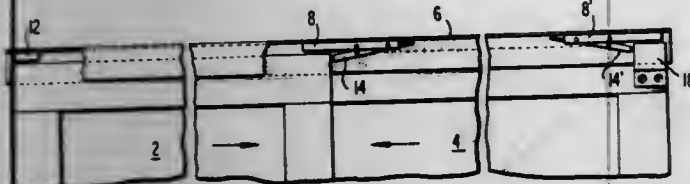


1. In combination with a vehicle door hinged to a vehicle body and movable between fully opened and closed positions with respect to said body, a door lock operatively supported by said door, said door lock having latching lever means operable to unlatch said door so that it can be moved from said closed position, said door lock further having locking lever means operable to lock said door in said closed position and to unlock said door so that it can be unlatched and subsequently moved from said closed position, the improvement comprising a remote control handle assembly mounted on the interior of said door in a position spaced from said door lock, said handle assembly comprising a manual handle and an actuator plate, pivot means mounting said actuator plate on said door for turning movement in a first plane for actuation of said locking lever means, pivot means mounting said manual handle on said actuator plate for turning movement independent of said actuator plate in a second plane for actuation of said latching lever means and to permit said actuator plate to be turned by said manual handle in said first plane, first connector means interconnecting said actuator plate with said locking lever means so that said manual handle can be turned to turn said actuator plate in said first plane to thereby control the locking and unlocking of said door, second connector means interconnecting one end of said manual handle to said latching lever means so that said manual handle can be turned in said second plane for the unlatching of said door to thereby permit said door to be moved from its closed position to an open position.

4,054,308
LOCK FOR SLIDING CLOSURES
 Peter J. H. Prohaska, Rte. 5, Box 683-A, Ocala, Fla. 32670
 Filed Oct. 30, 1975, Ser. No. 627,396
 Int. Cl.² E05C 3/04

U.S. Cl. 292-204

14 Claims



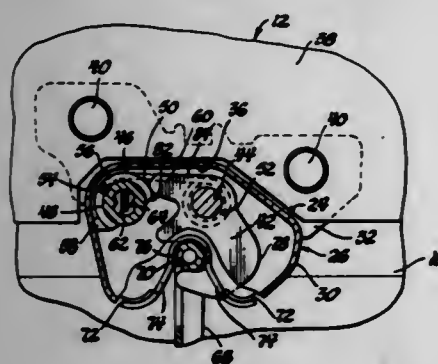
1. In a sliding closure assembly including an upper track and a sliding closure having an upper portion slidably movable in said upper track, a device for preventing unauthorized movement of said closure from a closed position to an open position, said device comprising,
 a stop member located within the track,
 said stop member being elongated in a direction parallel to the track,
 pivot means supporting said stop member for pivotal movement about a horizontal axis, means on opposite sides of said stop member connecting said pivot means to the track,
 a closure-abutting portion on said stop member located between the closure and said pivot means, said closure-abutting portion being movable vertically by said pivotal movement between an upper retracted position removed from the path of the closure to a lower closure-abutting position located in the path of the closure to prevent movement thereby of the closure,
 a tail portion on said stop member, said pivot means being located between the tail portion and the closure, means for limiting to an uppermost position the upward movement of said tail portion thereby limiting the downward movement of the closure-abutting portion to establish its closure-abutting position.

4,054,309
CLOSURE LATCH

Hans J. Borlinghaus, Clarkston, Mich., assignor to General Motors Corporation, Detroit, Mich.
 Filed Apr. 7, 1976, Ser. No. 674,627
 Int. Cl.² E05C 3/26

U.S. Cl. 292-216

2 Claims



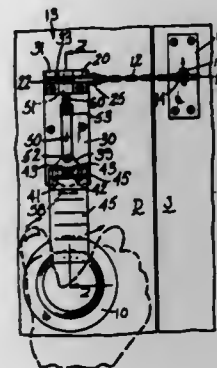
1. A vehicle body closure latch comprising, in combination, a latch frame, a cam member pivoted to the frame for movement between blocking and unblocking positions and including a blocking edge portion, a latch bolt pivoted to the frame for rotational movement between latched and unlatched positions and including a blocking leg having an edge portion, the cam member and bolt edge portions being contoured to generally mate with each other to block movement of the bolt to unlatched position independent of movement of the cam member and permit movement of the cam member to unblocking position independent of movement of the bolt, common spring means biasing the cam member to blocking position and biasing

the bolt to unlatched position, means on the frame engageable by an abutment of the cam member to locate the cam member in blocking position and engage the cam member and bolt edge portions to maintain the bolt in latched position against the action of the spring means, operating means operable to rotate the cam member to unblocking position and move the edge portion thereof past the edge portion of the bolt while the bolt remains relatively stationary, the spring means thereafter rotating the bolt to unlatched position, means locating the bolt in unlatched position, cessation of operation of the operating means permitting the spring means to return the cam member to blocking position, engagement of the bolt with a striker moving the bolt from unlatched position past the latched position to engage the blocking leg of the bolt with a shoulder of the cam member and rotate the cam member toward unblocking position to permit the edge portion of the blocking leg of the bolt to move past the cam member shoulder, the spring means thereafter rotating the cam member to blocking position and rotating the bolt toward unlatched position to engage the edge portions of the bolt and cam member and maintain the bolt in latched position.

4,054,310
DOOR CHAIN LOCK AND RELEASE SYSTEM
 Leo Coopersmith, Ivoryton, Conn., assignor to Leigh Products, Inc., Coopersville, Mich.
 Filed Oct. 6, 1975, Ser. No. 620,033
 Int. Cl.² E05C 17/36

U.S. Cl. 292-264

18 Claims



1. A door lock and release system to be used on a door having a door operating member requiring rotation to open the door, comprising a linkage having one end connectable to the door jamb, and a lock and release mechanism adapted to be mounted on the door adjacent the knob, said mechanism including a locking pin adapted to be engaged with the free end of the linkage, means for holding the pin releasably in engagement with said free end of the linkage and means adapted for juxtaposition with the door operating member for actuating said holding means to release the linkage from the pin when said juxtaposed means is moved by the manual rotation of the door operating member.

4,054,311
ENERGY ABSORBER WITH INTERNAL PRESSURE RELIEF VALVE

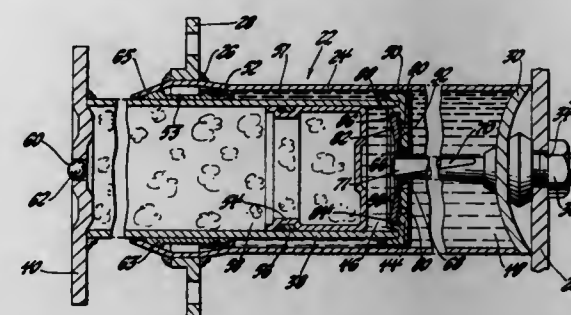
Loren R. Gute, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
 Filed Oct. 29, 1975, Ser. No. 626,732
 Int. Cl.² B60R 19/06; F16F 9/06

U.S. Cl. 293-70

2 Claims

1. An impact energy absorbing unit mounting a bumper assembly to a support on an automotive vehicle comprising first and second cylinders, support means mounting said first cylinder for telescoping movement with respect to said second cylinder between an extended position and a retracted position, said first and second cylinders having cooperating stop means to establish the extended position of said cylinders, said first

cylinder having cap means at one end thereof slidably disposed in said second cylinder to provide variable volume first and second fluid chambers in said energy absorbing unit, a hydraulic fluid in said first and second chambers, fluid flow control means for controlling the flow of fluid from said first chamber into said second chamber in response to the telescopic movement of said cylinders to said retracted position, said fluid flow control means comprising separate first and second valve means in parallel with each other for controlling fluid flow through said cap means between said chambers as said cylinders are moved toward said retracted position to dissipate energy of an impact load applied to said bumper assembly, said first valve means comprising a centralized orifice in said cap means and cooperating restriction means to progressively restrict said orifice for hydraulically connecting said chambers in response to any impact relatively moving said cylinders toward said retracted position, said second valve means comprising a plurality of auxiliary fluid passages through said cap means surrounding said centralized orifice and hydraulically interconnecting said chambers and an annular valve spring



means concentric with said centralized orifice for controlling fluid flow through said auxiliary fluid passages, fastener means integral with said cap means for securing the outer periphery of said valve spring means to said cap means, said valve spring means being a one-piece conical spring having a central opening surrounding said centralized orifice of said first valve means and having an inner annular contact face adjacent to said central opening that normally engages the inner face of said cap means to effectively seal and close said auxiliary fluid passages from transmitting fluid between said first and second chambers until a predetermined pressure is built up in said first chamber to deflect said valve spring and move said contact face from the inner face of said cap to thereby open said auxiliary passages to provide for internal pressure relief of said unit, and return spring means for moving said cylinders to said extended position as said conical valve closes said auxiliary fluid passages and in response to removal of said impact load that forces fluid from said second chamber to said first chamber through the restriction means provided by said first valve means which controls movement of said cylinders to said extended position.

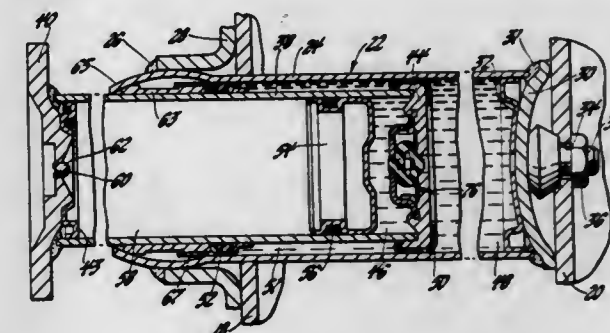
4,054,312
TELESCOPING ENERGY ABSORBER WITH ELASTOMERIC PRESSURE RELIEF VALVE
 James O. Strader, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
 Filed Aug. 13, 1976, Ser. No. 714,096
 Int. Cl.² B60R 19/02

U.S. Cl. 293-70

3 Claims

1. An impact energy absorbing unit mounting a bumper assembly to a support on an automotive vehicle comprising: first and second cylinders, support means mounting said first cylinder for telescopic movement with respect to said second cylinder between an extended position and a retracted position, motor means for moving said cylinders to said extended position, said first and second cylinders having cooperating stop means to establish the extended position of said cylinders, said first cylinder having cap means fixed at one end thereof and slidably disposed in said second cylinder to provide variable volume first and second fluid chambers in said unit, a hydraulic fluid in said first and second chambers, two-way flow control

means for hydraulically interconnecting said chambers, said flow control means comprising an opening in said cap means and valve means normally closing said opening to prevent fluid flow in either direction through said opening, said valve means comprising a one-piece valve element of elastomeric material, said valve element having a resilient main body and having a flow control portion normally biased by said main body into seated engagement with said opening to normally block the passage of fluid therethrough, entrapping means disposed over said valve element and fastened to said cap means for securing said valve element thereto to thereby yieldably hold said flow

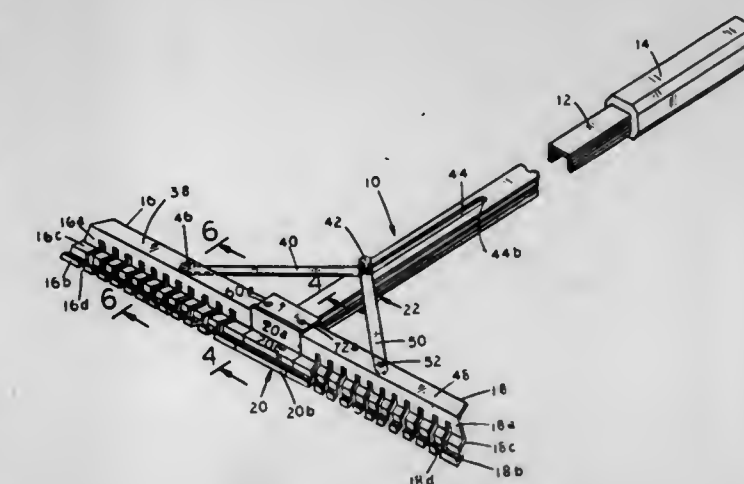


control portion in seated engagement with said opening, said flow control portion of said valve element being deflected from said opening in response to an increase in pressure in said first chamber from an impact load applied to the bumper assembly moving said cylinders to a retracted position to thereby open a restricted passage through said opening and to allow the flow of fluid from said first to said second chamber, said motor means being subsequently operative to move said cylinders to said extended position and force fluid from said second to said first chamber between said opening and said flow control portion of said valve element when seated therein.

4,054,313
FOLDABLE SAND TRAP SMOOTHER
 Richard W. Ciuci, 3 Marcellus Drive, Lattingtown, Locust Valley, N.Y. 11560
 Continuation-in-part of Ser. No. 626,090, Oct. 28, 1975, abandoned. This application Sept. 10, 1976, Ser. No. 722,044
 Int. Cl.² A01D 7/00

U.S. Cl. 294-53.5

4 Claims



1. A sand trap smoother including in combination a shaft handle, first and second blade members pivotally attached to said shaft handle at one end thereof, a closed position of said blade members in which said blade members are folded substantially adjacent said shaft handle, an open position of said blade members in which said blade members are substantially aligned at right angles to said shaft handle, a longitudinal slot formed in said shaft handle, a blade control member disposed in said slot and telescopically movable therein relative to said shaft handle, first and second connecting rods pivotally attached to said first and second blade members respectively and

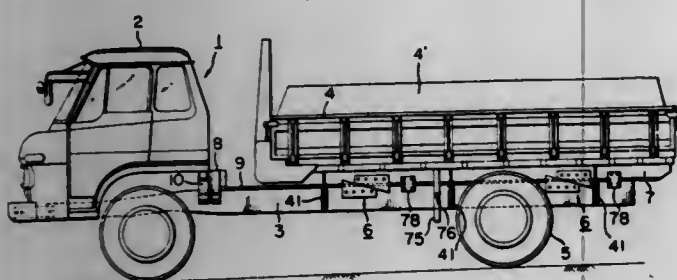
to said blade control member, handle means attached to said blade control member whereby said blade members can be moved between said open and closed positions, said handle means including screw means for fastening said blade control member in position in said slot whereby said blade members are retained in fixed position.

4,054,314 MOTOR TRUCK

Akira Yamanaka, Yokohama, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 503,398, Sept. 5, 1974, abandoned. This application July 28, 1976, Ser. No. 709,313
Int. Cl.² B62D 27/06

U.S. Cl. 296—35 R

6 Claims



1. A motor truck comprising a frame device, a body device movable relative to the frame device, bolt members extending vertically at opposite sides of said frame and body devices to hold said devices together, and an energy transforming means including a first plate member fixed to one of said devices and having an inclined first sliding surface and a second plate member fixed to the other of said devices and having a second sliding surface which slidably contacts with at least a portion of said first sliding surface and is inclined at an angle complementary to said first surface, said body device being moved upwardly by said energy transforming means when a longitudinal impacting force of or greater than a predetermined value is applied, and at least one shear plate fixed between said body and frame devices and adapted to be sheared by said longitudinal impacting force, but normally limiting the relative movement of said devices, said first and second sliding surfaces being linear.

4,054,315 TABLE ASSEMBLY FOR A WHEELCHAIR

Arnold A. Czarnowski, 12413 S. Moody Ave., Palos Heights, Ill. 60463

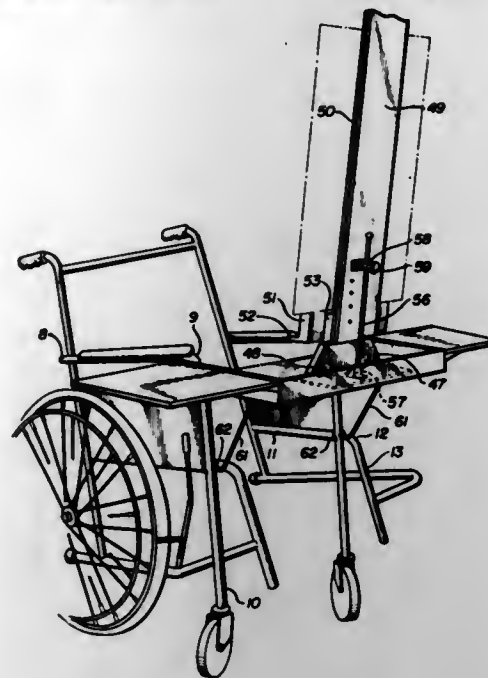
Filed Apr. 19, 1976, Ser. No. 677,918
Int. Cl.² A47C 7/70

U.S. Cl. 297—153

10 Claims

1. A mountable and demountable table assembly for a wheelchair which has a pair of vertical leg members extending to arm rest members and horizontal frame members which are substantially parallel to said arm rests, including a planar table member having an inner edge, spaced side edges and an outer edge, leg braces pivotally mounted to the underside of the table member adjacent to the outer edge, said braces having looped and biased seats to engage frame member portions of the wheelchair, locking means associated with the table member adjacent the inner edge to engage frame members at a level higher than the frame portions engaged by the leg braces, said locking means including an inner edge locking slot having an open end located along said inner edge to engage a vertical leg member adjacent the arm rest member, and a side edge locking slot having an open end located along one of said side edge for engaging the other of said vertical leg members, mounting means positioned on said planar table member, and an easel assembly joined to said mounting means,

said easel assembly including a pivotally mounted base member, an elongated easel member, and an elongated adjust-



ing means to fix the elongated easel in a selectively pivoted position.

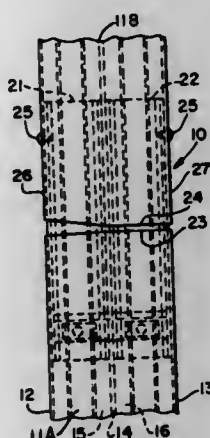
4,054,316 BENCH SEATS WITH END ALIGNING AND REINFORCING INSERTS

David C. DeLong, 1221 Broad St., Grinnell, Iowa 50112
Continuation-in-part of Ser. No. 519,601, Oct. 31, 1974, Pat. No. 3,960,405, which is a continuation of Ser. No. 326,600, Jan. 26, 1973, abandoned. This application Mar. 8, 1976, Ser. No. 664,668

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.
Int. Cl.² A47C 11/00

U.S. Cl. 297—248

5 Claims



1. Mass seating equipment comprising end-to-end positioned, multi-channeled, elongate support planks with a support surface; a front channel and a rear channel in each of said elongate support planks, said front and rear channels having a common inner wall; channel inserts sized to be snug sliding fits inserted in the respective front and rear channels; anchor means for each of said channel inserts anchoring said inserts in an insert-receiving channel of one of each end-to-end pair of said support planks; said front and rear channels of said elongate support planks being partially open to the bottom between web lips extended from channel side walls; said channel inserts being channel-shaped with two sides and an interconnecting top, and open to the bottom by an extent greater than that defined by said channel web lips, and with the bottom extremes thereof being space-separated from the end extremes of said web lips; said channel inserts being of adequate length to extend into end-to-end positioned channels of said elongate support planks, with overlap in each giving structural alignment

and mutual support to end-to-end positioned ones of said support planks; and mount means for said end-to-end positioned planks, said mount means including bolt-clip assemblies and fixed mounting flanges, said bolt-clip assemblies engaging only said web lips in a clamping action to said fixed mounting flanges through areas of channel insert overlap and through areas outside of channel insert overlap without bolt-clip assembly interference with said channel inserts; with said end-to-end positioned support planks mountable both as seat benches and as footboards; and with said end-to-end positioned planks positioned with an expansion gap between plank ends.

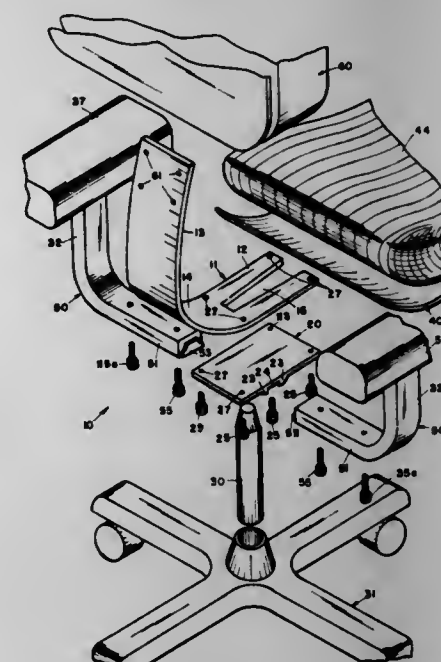
4,054,317 CHAIR CONSTRUCTION

William E. Stumpf, Winona, Minn., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Jan. 13, 1976, Ser. No. 648,796
Int. Cl.² A47C 3/00

U.S. Cl. 297—297

7 Claims



1. A chair frame having a seat and a back comprising: a narrow elongated strap member having a straight, forward seat portion and an upstanding back portion, said back and seat portions connected by an integral curved portion; a spindle plate underlying and seated against the forward part of said seat portion of said strap member; the forward portion of said strap being bifurcated and defining a channel opening through the forward end of said strap for accommodating a portion of a seat tilting mechanism projecting into the plane of the strap; said seat having a shell; fastener means detachably securing both said spindle plate and said strap to said seat shell; a pair of arm brackets; a pair of spaced, depending guide members on each side of said spindle plate, each pair forming a tongue track therebetween for detachably engaging the ends of said arm brackets; each of said brackets being generally L-shaped having an upstanding portion and a generally horizontal portion, the end of said horizontal portion having a tongue projecting from said end, said tongue being offset from the upper surface of said arm bracket an amount at least equal to the combined thickness of said strap and plate and of a width to be received in said tongue track and to slidably seat between said guide members for holding said ends against fore and aft movement.

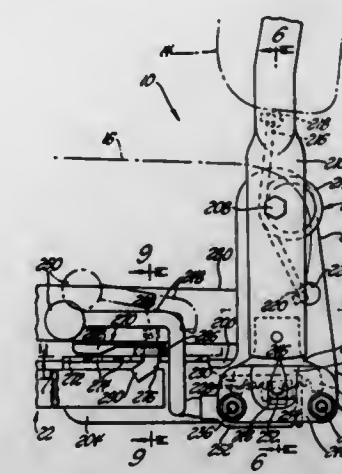
4,054,318

SEAT CUSHION MOUNTING ARRANGEMENT

Robert W. Costin, Troy, Mich., assignor to Lear Siegler, Inc., Detroit, Mich.
Division of Ser. No. 622,574, Oct. 15, 1975, Pat. No. 4,014,593, which is a division of Ser. No. 554,863, March 3, 1975, Pat. No. 3,954,245. This application Aug. 20, 1976, Ser. No. 716,054
Int. Cl.² A47C 1/023, 1/024

U.S. Cl. 297—313

14 Claims



1. In a vehicle seat adapted to be mounted on a vehicle and including a generally vertical seat back, a seat cushion component having front and rear edges and laterally spaced sides, and a base component, an adjustable arrangement for mounting the seat cushion component on the base component, the mounting arrangement comprising:

- a keeper mounted on one of the components and having a plurality of elongated openings spaced along an axis parallel to the seat cushion component sides, the openings extending laterally with respect to said axis;
- a latch member mounted on the other component for pivotal movement between latching and nonlatching positions, the latch member including a latching portion that is aligned with the laterally extending orientation of the openings while in the nonlatching position so as to be movable through any one of the openings as the cushion component is positioned on top of the base component, the location of the forward edge of the seat cushion being adjustably determined by the particular opening through which the latch member moves, the latching portion of the latch member moving into an unaligned relationship with respect to the openings upon movement of the latch member to the latching position, the unaligned relationship of the latching portion and the particular opening that receives the latch member maintaining the cushion component on the base component in the associated adjusted position of the cushion component with respect to the seat back, and the latching portion having a component extending along said axis in the latching position to permit tilting movement of the seat cushion component on the base component.

4,054,319

STAND-AID INVALID WHEELCHAIR

Robert K. Fogg, Jr., and Christopher P. Staehli, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 23, 1975, Ser. No. 625,220
Int. Cl.² A62B 35/00

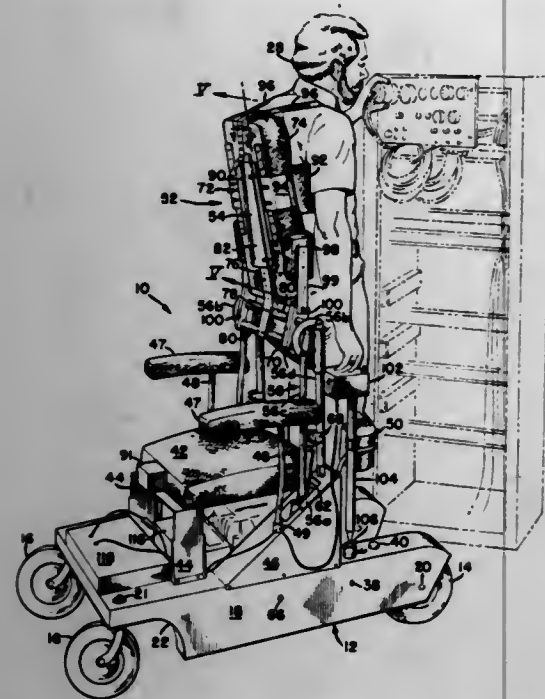
U.S. Cl. 297—384

11 Claims

1. An invalid stand-aid wheelchair including:

- a chassis;
- a seat fixedly mounted on the chassis for supporting the invalid in a sitting position;
- a flexible lifting strap for supporting the invalid in lifting and standing positions, said lifting strap in a seated position lying in contact with and conforming to said fixed seat;

articulated linkage connected to the chassis for supporting the lifting strap;
a freely movable backrest assembly mounted on said linkage and supporting the back of the invalid throughout a lifting and lowering movement from the seated position to and from a standing position;
means for clamping the invalid against the backrest; and



means connected between the chassis and the linkage for moving said backrest and lifting strap to create a minimum sliding movement between the surface of the backrest and the surface of the lifting strap to avoid friction with the respective portions of the invalid's body that may cause irritation and disheveling of his clothes.

4,054,320

METHOD FOR THE REMOVAL OF RADIOACTIVE WASTE DURING IN-SITU LEACHING OF URANIUM

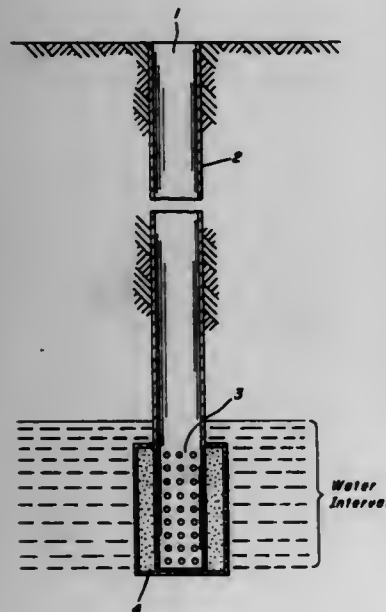
Robert P. Learmont, Feeley Township, Itasca County, Minn., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 24, 1976, Ser. No. 717,066

Int. Cl.² E21B 43/28; E21C 41/14

U.S. Cl. 299—4

8 Claims



1. In the process for the in-situ leaching of mineral values from an underground formation, wherein an aqueous solution of a leaching agent is delivered to the formation through an injection well, the solution remains in contact with the formation for a period of time sufficient to effect the solubilization of said mineral values therefrom, whereby said contact also effects the solubilization of undesirable mineral values including radium-ion containing radioactive waste, and the pregnant

solution with said mineral values dissolved therein is thereafter pumped from the formation to a level aboveground through a production well, comprising a tube-like member having apertures at a lower section thereof, said apertured section having a length at least coterminous with the interval of pregnant solution which is to be pumped from said production well, whereby the radioactive waste-containing pregnant solution results in the contamination of aboveground equipment and the creation of waste disposal problems;

an improved process, for abating said contamination and minimizing said problem of waste disposal, which comprises, substantially coterminous with the interval of said pregnant solution to be pumped from said well, interposing a sand pack between the outer surface of said tube-like member and the pregnant solution in the formation, said sand pack containing a graded size fraction of a barium containing ion exchange material in an amount sufficient to decrease the radium-ion concentration of said pregnant solution to a level which is no greater than 0.1 the level of the incoming unexchanged pregnant solution in said formation.

4,054,321

TRACK-MOUNTED SHOE-SUPPORTED INCLINING MINING MACHINE

William Joseph Jarvis, Bestwood, England, assignor to Coal Industry (Patents) Ltd, London, England

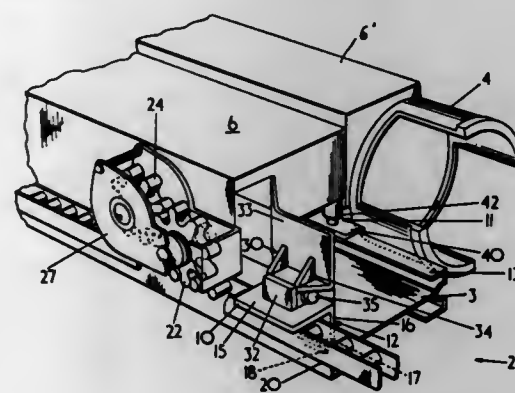
Filed July 27, 1976, Ser. No. 709,244

Claims priority, application United Kingdom, Aug. 13, 1975, 33644/75

Int. Cl.² E21C 27/36, 27/24

U.S. Cl. 299—43

9 Claims



1. A mining machine which in use traverses to and fro along a track including an armoured face conveyor extending along a longwall mineral face, at least a part of the machine being supported by the track, comprising a body, and a number of track engaging shoes for supporting at least a part of the body and adapted to engage the track for movement along the track, at least one of the track engaging shoes comprising a first component for engaging the track and a second component connected to the body and pivotally mounted on a horizontal pin connected to the first component, at least one further of the track engaging shoes being connected to the body at a location remote from the previously mentioned at least one track engaging shoe and including a ram which in use is adjustable to vary the inclination of the machine body with respect to the track, the said second component pivoting relative to the said first component.

4,054,322

RIM CONSTRUCTIONS

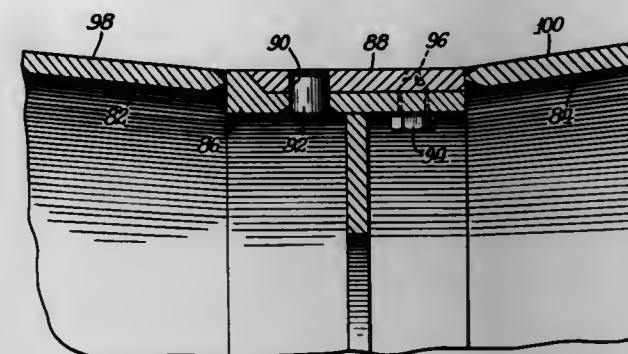
Charles E. Grawey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 476,102, June 3, 1974, abandoned, which is a division of Ser. No. 402,268, Oct. 1, 1973, Pat. No. 3,877,504. This application Jan. 16, 1976, Ser. No. 649,621

Int. Cl.² B60B 21/00

U.S. Cl. 301—35 BJ

1 Claim



1. A rim assembly for a pneumatic tire carcass comprising: a first annular rim portion defining a plurality of angled slots; a second annular rim portion; a plurality of posts fixed to the second rim portion, and corresponding to the angled slots and positionable so that each post is disposed in a slot, the slots being angled so that rotation between the first and second rim portions in one direction draws the post disposed in the slots more deeply into the slots and draws the first and second rim portions together; some of the angled slots being angled at variance with the remaining angled slots so that the initial drawing together of the first and second rim portions takes place at a rate slower than subsequent drawing together of the first and second rim portions upon relative rotation thereof.

4,054,323

HUB CAP LOCKING DEVICE

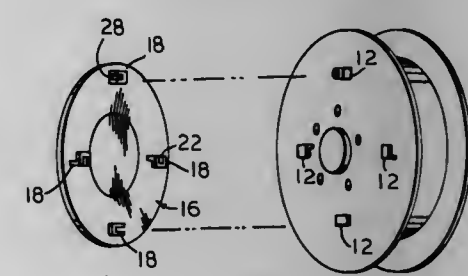
Edson Lewis, 383 Sumner Ave., Brooklyn, N.Y. 11221

Filed Oct. 13, 1976, Ser. No. 731,919

Int. Cl.² B60B 7/06

U.S. Cl. 301—37 AT

5 Claims



1. A hubcap locking arrangement for a vehicle wheel comprising:

a vehicle wheel including a plurality of L-shaped lugs spaced about the exterior circumference of said wheel, each of said lugs having a horizontal leg extending in the same direction about the wheel circumference; and a hubcap including a plurality of L-shaped brackets spaced about the interior circumference of said hubcap, each of said brackets having a horizontal leg extending in the same direction about the hubcap circumference and in the same direction as the horizontal legs of said lugs when the interior circumference of said hubcap is facing the exterior circumference of said wheel, each of said brackets including a slot for receiving a lug on said wheel with the horizontal legs of said lug and said bracket overlying each

other to preclude said hubcap from being pryed from said wheel.

4,054,324

SPOKED WHEEL PARTICULARLY FOR MINIATURE VEHICLES

Pietro Casadio, Via Jacopo di Paolo, 34, Bologna, Italy

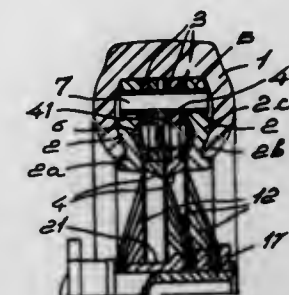
Filed July 9, 1975, Ser. No. 594,489

Claims priority, application Italy, July 11, 1974, 3442/74

Int. Cl.² B60B 1/04

U.S. Cl. 301—56

4 Claims



1. A spoked wheel particularly for miniature vehicles, characterized in that it comprises a tubular member constituting a wheel hub and having at one end an outer collar, at least one washer overlying said tubular member, a sleeve overlying said tubular member between said washer and said collar such as to define two respective annular grooves therebetween, a pair of rims arranged concentrically with said tubular member and each rim having an inner edge which defines an axially projecting annular ridge, said rims being arranged in a mirror image relationship to each other, thereby said ridges also act as shoulder members for the beads of the wheel tire, at least one ring spacer concentric to said tubular member and intervening between said rims, said spacer having a thickness dimension which is smaller than the length of said sleeve and defining together with the rims respective annular seats, a spoke forming wire, at least one pair of spoke-carrying rings positioned within said annular seats and each provided with circumferentially arranged projections at equal angles apart for stretching said spoke forming wire between successive diametrically opposite said projections and bending it over said projections thereby obtaining radial lengths thereof passing between said spacer and said rims and extending tangentially past said tubular member at said annular grooves, means for clamping in one component said rims and spacers and spoke-carrying rings, and means for locking axially said washer and sleeve against said collar.

4,054,325

PNEUMATICALLY CONTROLLED HYDRAULIC TRAILER BRAKE SYSTEM

Roger C. Popp, Chesaning, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Sept. 27, 1976, Ser. No. 727,282

Int. Cl.² B60T 13/60

U.S. Cl. 303—7

4 Claims

1. A braking system carried in a towed vehicle and a towing vehicle for operating the brakes of the towed vehicle comprising:

control apparatus on the towing vehicle comprising signal means operable throughout an input signal range, and electrical means responsive to the signal means to generate a solenoid activating output current throughout a range of current corresponding to said signal range; a power brake booster on the towed vehicle having a brake actuating rod, a sealed housing partitioned by a flexible diaphragm dividing the housing into first and second chambers, said rod extending through the first chamber into connection with a central portion of said diaphragm, and spring means urging said diaphragm and rod to a

brake-off position deflating said second chamber and inflating said first chamber;

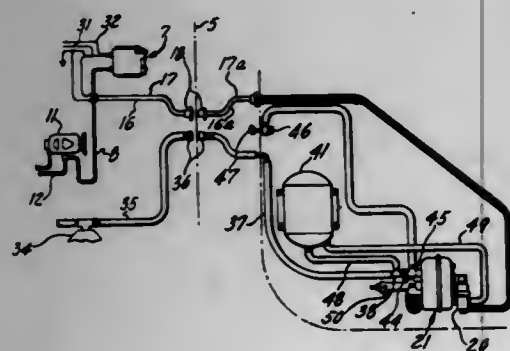
a solenoid valve on one of the vehicles comprising a solenoid having a coil, a central plunger, and a valve assembly attached thereto for supplying a fluid at a control pressure in a range between a higher supply pressure and a lower supply pressure in proportion to an electric current passed through the coil of the solenoid by said electrical means, said valve assembly comprising:

a housing enclosing in the order named proceeding in a direction away from said solenoid, a first chamber and an inlet port therefor for said lower pressure fluid, a second control chamber and an outlet port therefor, a third chamber and an inlet port therefor for said higher pressure fluid, and an annular valve seat located at the end of the third chamber nearer the solenoid and facing away therefrom, said second and third chambers being communicable through said seat;

a valve member supported in said third chamber for reciprocation toward and away from said seat and being normally engaged with the seat;

resilient means for urging said member toward said seat; a spool in axial tandem-connected relation with said plunger and reciprocally supported within said first and second chambers of the valve assembly;

a flexible diaphragm in concentric relation with the spool and connected in sealed relation with the spool and the housing for separating the first and second chambers of the valve assembly;



said spool having an open end remote from said plunger and a central passageway extending from an opening of the spool in said first chamber to said open end;

separate spring means seated in said housing and seated on the spool to act toward each other on said spool to axially urge the spool toward a neutral position corresponding to equal pressures in the first and second chambers in the housing with said open end in spaced relation with said member when said solenoid is deenergized and said member is in seated position;

said spool being movable by said plunger to engage said member and then carry it to a position spaced from said seat with said member closing off said open end to enable passage of fluid from said third chamber to said second chamber;

a source for said lower supply pressure connected with said inlet port of said first housing chamber and said first booster chamber;

a source for said high supply pressure connected with the inlet port of said third chamber;

said plunger upon electrical excitation of the solenoid being movable from a retracted position corresponding to a neutral position of the spool permitting communication of the first housing chamber with the second housing chamber and equal pressures therewithin to a second position against said valve member terminating communication between the first and second housing chambers and, thence, to a third position wherein communication of the first and second housing chamber remains terminated and said member is unseated to place the third chamber in communication with said

second housing chamber to transmit a higher pressure to said second booster chamber.

4,054,326

HYDRAULIC BRAKING SYSTEMS FOR VEHICLES
Bernd Holger Röhling, Andernach, Germany, assignor to Girling Limited, Birmingham, United Kingdom

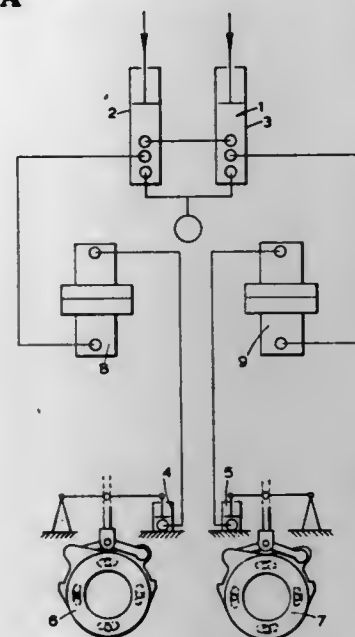
Filed Dec. 16, 1975, Ser. No. 641,235

Claims priority, application United Kingdom, Jan. 2, 1975, 147/75

Int. Cl.² B60T 8/14

U.S. Cl. 303—24 A

7 Claims



1. In a wheel mounted vehicle having a high centre of gravity hydraulically-operated brakes are provided for braking at least one wheel on each side of said vehicle, and an hydraulic braking system is incorporated for operating said brakes, wherein said braking system comprises hydraulic actuators for applying said brakes, a pedal-operated hydraulic master cylinder assembly having first and second modes of operation, which in its first mode supplies hydraulic fluid to said actuators simultaneously for pure vehicle retardation and in its second mode supplies hydraulic fluid to said actuators independently to assist steering, and inertia-controlled valve means interposed between said master cylinder assembly and said actuators, said inertia controlled valve means being normally open to permit the flow of hydraulic fluid between said master cylinder assembly and said actuators for the brakes on both sides of said vehicle but closing when subjected to a vehicle deceleration exceeding a predetermined value whereby the pressure of fluid from said master cylinder assembly to said actuators is reduced by closure of said valve means at least when said brakes are applied simultaneously for pure vehicle retardation and said vehicle deceleration has exceeded said predetermined value, said predetermined value exceeding that to which said vehicle can be subjected in said second mode of operation of said master cylinder assembly.

4,054,327

AIR BRAKE SYSTEM WITH LINE PRESSURE LOSS PROTECTION

Vernon A. Rebenstorf, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 20, 1976, Ser. No. 724,432

Int. Cl.² B60T 17/18

U.S. Cl. 303—84 R

10 Claims

1. In an air brake system for a vehicle which has air-controlled brakes and a compressed air source, the combination comprising:

brake control means for receiving said compressed air and for selectively applying said compressed air to said brakes

and for selectively releasing said compressed air from said brakes, first and second compressed air reservoirs each having an outlet port communicated with said brake control means, first air supply passage means for transmitting compressed air from said source to said first reservoir, second air supply passage means for transmitting compressed air from said source to said second reservoir, and

said dependence being such that the duration of said steep pressure variation becomes longer, the longer the duration of said steep and slower pressure variations in said preceding cycle.

4,054,329

ANTILOCKING CONTROL SYSTEM FOR VEHICLES
Hans Müller; Hans-Herbert Wupper, and Wolf-Dieter Jonner, all of Sandhausen, Germany, assignors to Teldix GmbH, Heidelberg, Germany

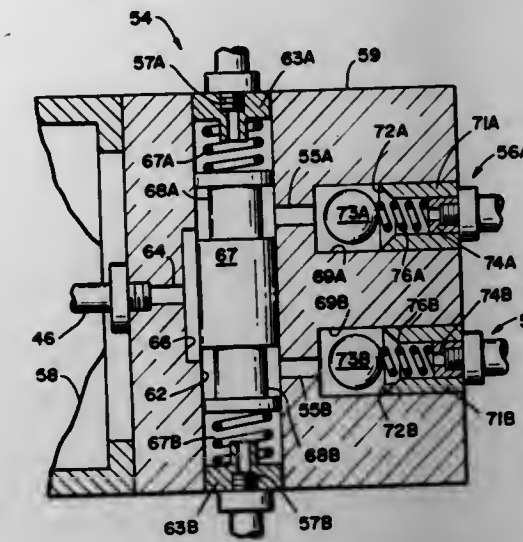
Filed June 21, 1976, Ser. No. 698,198

Claims priority, application Germany, June 20, 1975, 2527471

Int. Cl.² B60T 8/02

U.S. Cl. 303—106

10 Claims



air delivery control means, connected between said compressed air source and first and second air supply passage means, for closing the flow path from said source to either of said air supply passage means in response to air leakage therein while continuing to provide an open flow path from said source to the other of said air supply passage means in order to enable indefinitely continued operation of said air brake system.

4,054,328

AUTOMATIC ANTILOCK CONTROL SYSTEM
Heinz Leiber, Leimen; Jürgen Gerstenmeyer, Waldhilsbach, and Wolfgang Korasiak, Ketsch, all of Germany, assignors to Teldix GmbH, Heidelberg, Germany

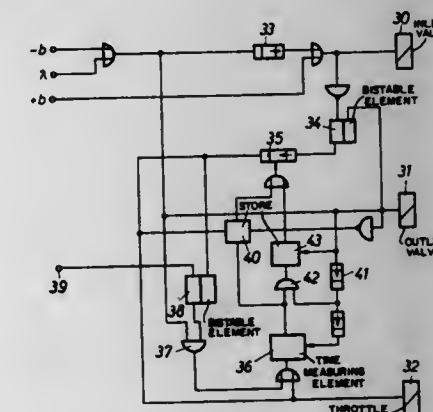
Filed Nov. 18, 1975, Ser. No. 632,917

Claims priority, application Germany, Dec. 21, 1974, 2460904

Int. Cl.² B60T 8/02

U.S. Cl. 303—103

17 Claims



1. An automatic antilock control system for the brakes of the wheels of a vehicle comprising: a sensor for determining a tendency to lock of a vehicle wheel, a brake pressure control device for varying the brake pressure at the brakes of said vehicle wheel, an evaluation circuit for processing signals from said sensor and producing control signals for controlling said brake pressure control device, circuit means in said evaluation circuit for producing control signals for producing a steep pressure variation and thereafter a slower pressure variation in the same direction as said steep pressure variation in the course of an antilock control phase, and control means in said evaluation circuit for varying the duration of said steep pressure variation in dependence on the duration of said steep and slower pressure variations in at least the preceding cycle, with

1. In an antilocking control system for wheel brakes of a wheeled vehicle, comprising sensors for monitoring the rotational behavior of the wheels, an evaluation circuit which receives the signals from the sensors and which generates control signals based on the signals from the sensors, and a pressure reduction unit which receives the control signals from the evaluation circuit and which in addition to a setting for pressure buildup has a setting for pressure reduction and a setting for keeping the pressure at least approximately constant, the evaluation circuit including switching means for, within a single control cycle, (a) emitting a control signal for causing pressure reduction upon the occurrence of a tendency to lock, (b) emitting a control signal for keeping the pressure constant upon a subsequent wheel acceleration of a certain value and (c) normally also emitting a control signal for keeping the pressure constant in the transition phase between the end of the generated control signal for reducing pressure and the beginning of the signal indicating wheel acceleration (U_{+b}); the improvement wherein said evaluation circuit further includes: a monitoring circuit means for determining whether within a given period of time T_1 after the end of the pressure reduction signal a wheel acceleration signal (U_{+b}) occurs and, upon the absence of such a signal within said period of time T_1 , for effecting a change in the normal regulation operation by causing the pressure reduction in subsequent control cycles to be prolonged until the occurrence of an acceleration signal (U_{+b}) (Special operation); and further switching means for resetting the system to normal operation if an acceleration signal (U_{+b}) appears within a period of time $T_2 < T_1$ after the end of a subsequent pressure reduction signal.

4,054,330

SUSPENSION SYSTEM FOR USE WITH HIGH SPEED PRINTERS

Zong S. Luo, Longmont, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 21, 1975, Ser. No. 606,693

Int. Cl.² F16C 29/02; 308 3 A; 3.6.3.9; 37

U.S. Cl. 308—3 R

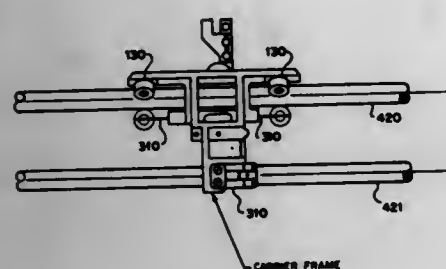
1 Claim

1. A suspension system comprising:

a bar;
a carrier coupled to the bar and having a plurality of sealed bearings positioned on the carrier to contact the bar, at

at least one of said sealed bearings being coupled to the carrier by a leaf spring, thereby supplying a predetermined contact pressure between the plurality of sealed bearings and the bar;

a second bar;



a second plurality of sealed bearings positioned on the carrier to contact the second bar, at least one of the second plurality of sealed bearings being coupled to the carrier through a leaf spring; and at least one damping element coupled to the carrier and disposed to contact the second bar.

4,054,331 SEALING MEANS

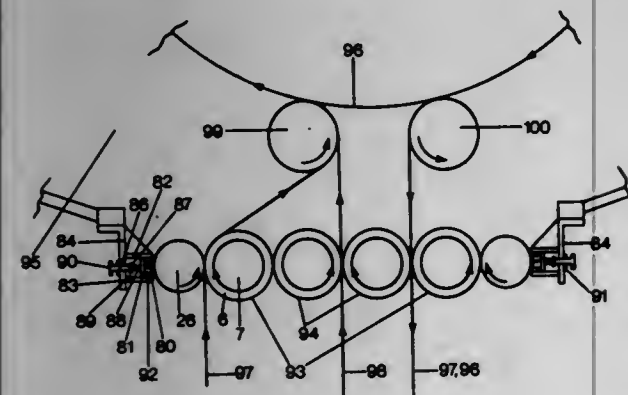
Guillaume Ward Jamin, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Oct. 28, 1975, Ser. No. 627,773

Claims priority, application United Kingdom, Nov. 4, 1974, 47645/74; May 1, 1975, 18206/75

Int. Cl.² F16C 33/74

U.S. Cl. 308—3.5

10 Claims



1. Sealing apparatus for permitting continuous passage of a web material through a gap in a wall separating two zones at different pressures while minimizing the flow of air from one zone to the other, comprising:

- a first and second bearing members between which the web material passes, said bearing members being built into the gap, the first bearing member comprising a cylindrical roller rotatable about a longitudinal axle and the second bearing member comprising a cylindrical roller rotatable about a longitudinal axle which is parallel to the axle of the first bearing member and which roller comprises a solid cylindrical core the lateral face of which is covered by a layer of compressible material, the distance between the two longitudinal axles being such that the two cylindrical rollers are maintained in contact,
- first sealing means provided between the lateral faces of both bearing members and edges of the gap adjacent thereto, said first sealing means comprising two cylindrical auxiliary rollers of rigid material mounted axially parallel to the bearing members, one of said auxiliary

rollers being maintained in urgent contact with the lateral face of each of both bearing members, and two pressure loaded bearing blocks one bearing upon the lateral face of each of both of the auxiliary rollers and mounted in housings integral with the wall surrounding the gap, characterized in that the material comprising the bearing blocks has a coefficient of expansion greater than that of the material comprising the housings, and means for heating the bearing blocks;

- c. second sealing means provided between the end faces of both bearing members and edges of the gap adjacent thereto.

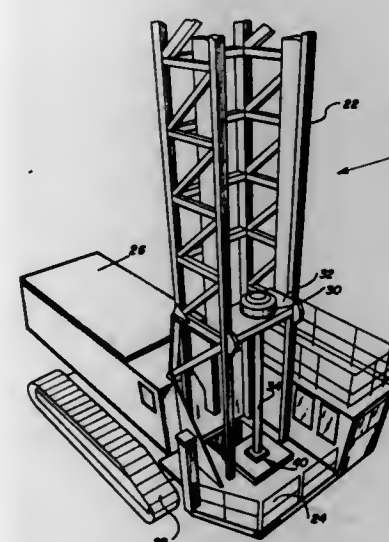
4,054,332 ACTUATION MEANS FOR ROLLER GUIDE BUSHING FOR DRILL RIG

John F. Bryan, Jr., Dallas, Tex., assignor to Gardner-Denver Company, Dallas, Tex.

Filed May 3, 1976, Ser. No. 682,510
Int. Cl.² F16C 33/04, 1/28

U.S. Cl. 308—4 A

18 Claims



1. A drill pipe bushing comprising:
 - a. a plurality of rollers in a circular array with the surfaces of said rollers facing said drill pipe,
 - b. a fixed frame and a rotatable member encircling the axis of said drill pipe,
 - c. support arms, each said support arm rotatably supporting one of said rollers and having one end pivotally secured to said frame,
 - d. toggle arms secured to the free ends of said support arms and attached to said rotatable member, and
 - e. means for rotating said rotatable member in either of two senses relative to said frame to move said toggle arm and support arm linkages thereby moving said rollers toward and away from the drill pipe, respectively.

4,054,333 BEARING UNIT

William G. Esmond, 800 Country Club Road, Havre de Grace, Md. 21078

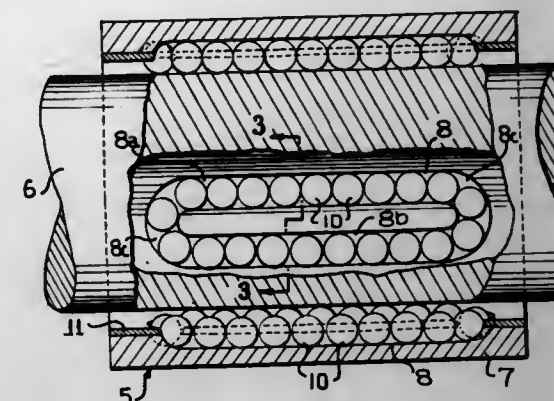
Filed Aug. 5, 1976, Ser. No. 711,827
Int. Cl.² F16C 17/16

U.S. Cl. 308—6 C

6 Claims

1. A bearing unit particularly adapted for association with a separate race surface, said bearing unit comprising a race member having at least a portion thereof defining a raceway, rolling elements engaging said raceway, said rolling elements being formed of magnetically attractable material, and at least said

raceway having magnetic characteristics with said rolling elements being magnetically attracted to said raceway by a



force sufficient to overcome gravitational forces normally urging said rolling elements away from said raceway.

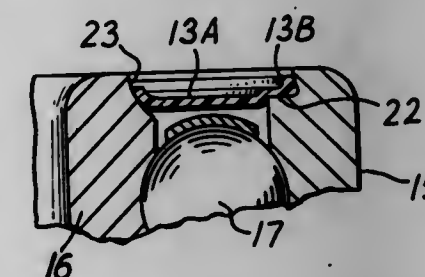
4,054,334 METHOD AND APPARATUS FOR INSTALLING A BEARING SHIELD OR SEAL INTO THE ANNULAR SPACE OF A BEARING

William D. McAllister, Poughkeepsie, and Frank D. Rajcz, Hyde Park, both of N.Y., assignors to Schatz Federal Bearings Co. Inc., Poughkeepsie, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,964
Int. Cl.² F16C 33/76

U.S. Cl. 308—187.1

6 Claims



1. An antifriction bearing comprising an inner annular race ring concentrically located within an outer annular race ring such as to define an annular chamber therebetween containing a complement of rolling elements, one of said race rings having a peripheral groove spaced on each side thereof, the other of said race rings having a land opposite each of said peripheral grooves, and a substantially rigid plastic annular seal deformably mounted in the annular chamber on each side of said rolling elements with the periphery of said seal radially deformed into said peripheral groove and substantially filling the space therein, said plastic seal having a durometer hardness of over 50 and ranging up to about 100, said annular seal in a selected cross section being characterized by a permanently deformed annular neck adjacent to the peripheral groove.

4,054,335 CASTOR WHEEL

Hendrikus Jacobus Maria Timmer, Tiel, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

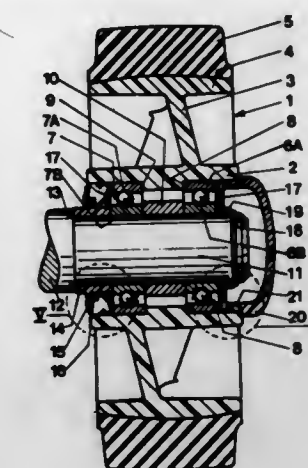
Filed June 12, 1975, Ser. No. 586,506
Claims priority, application Netherlands, June 17, 1974, 7408023

Int. Cl.² F16C 33/76; A63C 17/22

U.S. Cl. 308—191

11 Claims

1. In a wheel having a hub, at least one rolling bearing mounted in said hub, a sealing ring in said hub at the side of said bearing, said ring having an angular cross-section, a first por-



tion of which extends into contact with said hub and a second portion of which extends radially of the hub along said side of said bearing; the improvement wherein said sealing ring further comprises fastening means formed on a side thereof away

from said bearing, for enabling the fastening of cap a to said sealing ring, and a radially extending contact surface on the side thereof away from said bearing for contacting sealing means for said bearing.

4,054,336 GUIDE BEARING

Horst Manfred Ernst, Eltinghausen; Armin Olschewski, Schweinfurt; Rainer Schuriger, Schwanfeld; Lothar Walter, Schweinfurt; Manfred Brandenstein, Aschfeld, and Erich Burkl, Stammheim, all of Germany, assignors to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

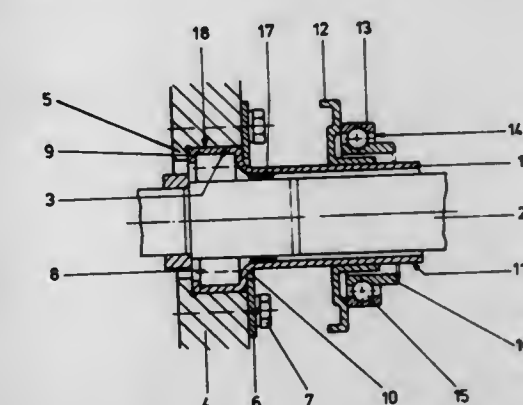
Filed Mar. 4, 1976, Ser. No. 663,724

Claims priority, application Germany, Mar. 22, 1975, 7509224[U]

Int. Cl.² F16C 19/10

U.S. Cl. 308—233

10 Claims



1. A guide bearing for guiding a power take-off shaft and for cooperation with a disengaging clutch comprising a casing, seating means for attaching one end of the casing of said guide bearing into a borehole in the wall of a gear box, an axially displaceable release bearing positioned on said casing, said casing forming the outer rolling path of a rolling gear bearing in the end thereof seated in said wall, for supporting said power take-off shaft, the outside of said casing comprising the seating for attaching said casing in said borehole in the wall of said gear box.

4,054,337

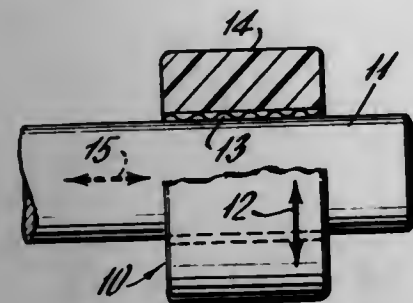
LOW-FRICTION FABRIC BEARING

Richard J. Matt, W. Simsbury, and Richard T. Thompson, Had-
dam, both of Conn., assignors to Textron Inc., Providence,
R.I.

Division of Ser. No. 511,086, Oct. 1, 1974. This application Oct.
24, 1975, Ser. No. 625,631

Int. Cl.² F16C 33/20

U.S. Cl. 308—238



1. A low-friction bearing element for slidable support of a load along a particular desired directional path of movement, said element comprising an annular body with inner and outer axially extending surfaces, one of said surfaces being in said path and characterized by an exposed face of a cured resin-impregnated tubular knitted fabric of loosely twisted yarn consisting of TFE filaments and aromatic polyamide filaments, the exposed filaments at said face being primarily oriented in a direction generally transverse to the said particular desired directional path of movement.

4,054,338

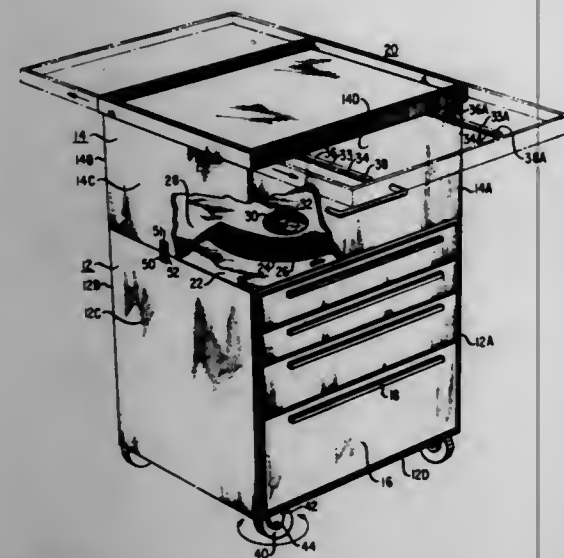
ROTATABLE CABINET WITH SLIDABLE TOP

Michael G. Martin, 597-1 Auten Road, Somerville, N.J. 08876

Filed May 24, 1976, Ser. No. 688,972

Int. Cl.² A47B 87/00

U.S. Cl. 312—250



1. In a cabinet
a first section,
a second section;
bearing means fixed to said first section,
said second section supported above said first section on said bearing means whereby said second section is rotatable with respect to said first section,
said first and second section are volume enclosing members, said second section has a base member with a center aperture formed therein;
said first section has a top member with a central aperture formed therein;
said second section central aperture and said first section central aperture are mutually aligned on a common axis

18 Claims

for allowing access from said second section to said first section.
said first section and said second section are each adapted as containers.

4,054,339

HIGH IMPACT BEARING AND METHOD OF MAKING SAME

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Sept. 29, 1975, Ser. No. 617,479

Int. Cl.² F16C 33/00, 33/58, 33/64

U.S. Cl. 308—216

15 Claims



1. A high impact, high load capacity antifriction bearing assembly for use in a forklift vehicle lifting mechanism and the like comprising an inner race member having a radially outward facing annular raceway extending around the outside thereof coaxially positioned with the axis of rotation of said bearing assembly, an outer race member circumferentially encompassing and disposed radially outward of said inner race member and comprising a radially inward facing annular raceway extending circumferentially around the inside thereof coaxial with the axis of rotation of said bearing assembly, a plurality of antifriction rolling elements confined between said inner race member and said outer race member and rolling in said raceways thereof, the raceway of at least one said race having small rounded shock absorbing protrusions projecting outwardly from the surface thereof with surface finishes between 75 and 250 microinches R.M.S.

4,054,340

PLASTIC ANTIFRICTION BEARING CAGE

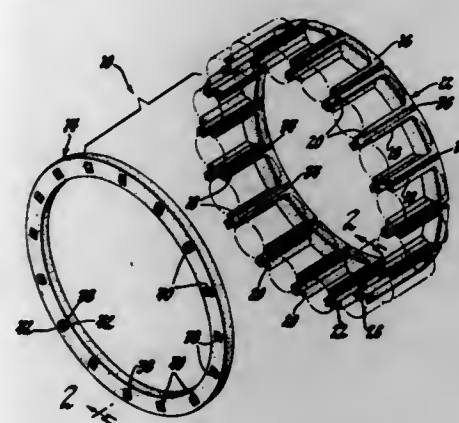
Constantine P. Broshkevitch, and Robert E. Hooper, both of Huron, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1976, Ser. No. 718,753

Int. Cl.² F16C 33/46, 33/50

U.S. Cl. 308—217

3 Claims



1. A two piece, snap assembled bearing cage of molded plastic construction comprising:
a first piece having a ring portion,

a plurality of circumferentially spaced finger portions extending axially from said ring portion and
a shank portion extending axially from an axial end face of a number of said plurality of finger portions,
each of said shank portions having a radial projection spaced from the axial end face of its associated finger portion, said first piece having an axial groove extending through each of said number of finger portions and said ring portion in axial alignment with said radial projection to facilitate molding of said first piece, and
a second piece comprising a second ring portion having said number of circumferentially spaced holes respectively receiving said shank portions of said first piece, each of said holes having a radial enlargement at one end which forms an internal radial shoulder engaging the radial projection of the shank portion received therein and extends to an end surface of said second ring portion to facilitate molding of said second piece.

mation of said central portion to adjust the effective diameter of said bushing.

4,054,342

HOSPITAL CABINET

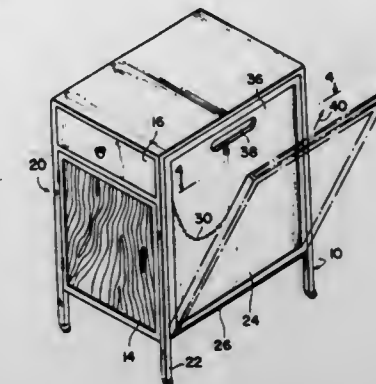
Amy Cook, 22 Squire Lane, Bellingham, Mass. 02019

Filed May 7, 1976, Ser. No. 684,278

Int. Cl.² A47B 81/00, 67/02

U.S. Cl. 312—209

1 Claim



1. A hospital cabinet comprising:
a housing supported on a surface by a plurality of legs, means on said housing for mounting a planar board for use in cardio-pulmonary resuscitation, said mounting means including:
a channel-shaped panel pivotally mounted in an opening in the side of said housing by a self-closing hinge receiving said planar board, said channel-shaped panel being smaller than said opening in the side of said housing and said planar board being substantially the same size as said housing whereby said board made be received within said panel and have an exposed portion accessible from the exterior of said housing,
a pull on said exposed portion of said board, and
a chain connected between said panel and housing for limiting the extent of pivotal movement of said panel relative to said housing.

4,054,341

ADJUSTABLE LOW FRICTION BEARING

Rudolf Spleth, Kennenburger Strasse 42, D 7300 Esslingen (Neckar) Kennenburg, Germany

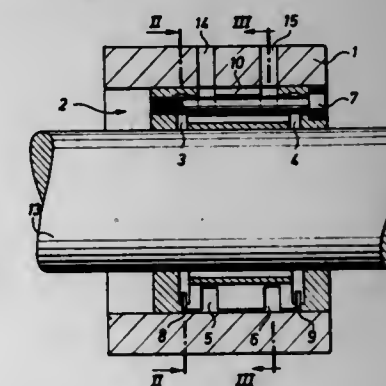
Filed Oct. 4, 1976, Ser. No. 729,071

Claims priority, application Germany, Oct. 4, 1975, 2544497

Int. Cl.² F16C 17/00

U.S. Cl. 308—237 R

8 Claims



1. A slide bearing with a clamping bushing of which the diameter is variable in response to axial compression to change the bearing play comprising
a cylindrical body having inner and outer generally cylindrical surfaces, one of said surfaces constituting an integrally formed bearing surface for the bushing;
means defining first and second pairs of annular circularly extending grooves in said body, said pairs of grooves being axially spaced apart to separate the body into first and second annular end portions and an annular central portion, the endmost one of each of said pairs of grooves extending radially into said body from said bearing surface, said pairs of grooves forming spring-like bridge portions interconnecting said end portions and said central portion;
a plurality of clamping means extending axially between said end portions and through openings in said central portion for engaging said end portions and urging them toward each other, said clamping means being circularly evenly spaced apart and being located at about the radial mid-points of said end portions;
means in said central portion for defining a plurality of axially extending slits extending into said central portion from the one of said surfaces opposite the bearing surface to form axially extending hinge zones in said central portion, said plurality of slits including
a first group of slits adjacent to and intersecting the openings in said central portion for said clamping means, and
a second group circularly offset from said first group, whereby axial compression of said body causes radial defor-

4,054,343

PRESCRIPTION DRUG-DISPENSING APPARATUS

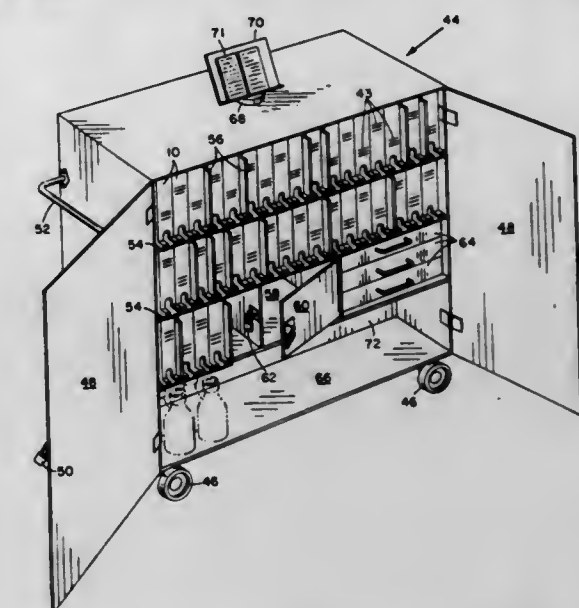
Gary Heyland, 7718 Lewis Pasteur Drive, San Antonio, Tex. 78229

Filed Mar. 24, 1976, Ser. No. 669,761

Int. Cl.² A47F 5/08; B01L 9/02

U.S. Cl. 312—209

2 Claims



1. A system for dispensing medication to a large number of patients located in a health care facility, said system comprising:

portable cart having a totally enclosed cabinet mounted on wheels;
 first lockable doors on sides of said portable cart for locking said cabinet closed, said first lockable doors maintaining prescription drugs under a single lock;
 lockable compartment within cabinet having a second lockable door thereon for maintaining controlled drugs therein under double lock;
 refillable cassette-type dispensers located on dispenser shelves in said cabinet, said dispensers being used for dispensing strip packaged medication therefrom, a separate refillable dispenser being used for each strip packaged medication of each patient; a first storage area in said cabinet for ointments and injectable drugs to be dispensed to said patients;
 second storage area in said cabinet for liquid medication to be dispensed to said patients; and
 means for maintaining a record on said portable cart of medications to be given to said patients;
 each of said refillable cassette-type dispensers being color coded on the front thereof to indicate times for giving medication to a patient, all of each patient's strip packaged medication being maintained in a fixed position by divider means in said shelves;
 said refillable cassette-type dispenser having an opening in the lower front thereof large enough for a finger to be inserted therethrough and move said strip packaged medication through a dispensing tab on the bottom front of said cassette-type dispenser, said cassette-type dispenser having a slidable cover maintained at the top thereof for refilling.

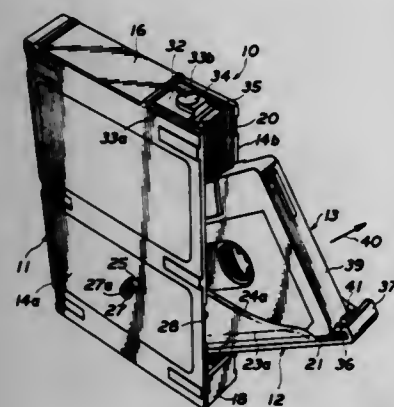
4,054,344

STORAGE RECEPTACLE FOR MAGNETIC TAPE CASSETTE

Kazumi Fujimoto, and Kishio Ikeda, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
 Filed Apr. 5, 1976, Ser. No. 673,590
 Int. Cl.² A47B 81/06

U.S. Cl. 312-319

4 Claims



1. A storage receptacle for a magnetic tape cassette comprising:
- a housing including spaced apart, parallel side walls which, between their forward edges, define an opening of said housing;
 - a holder for embracing a magnetic tape cassette and which is movable with the cassette carried by said holder through said opening of the housing between said side walls of the latter; and
 - pivot means connecting said holder with said housing for swinging relative to the latter between an opened position in which said holder projects forwardly from said housing for receiving and relinquishing a cassette, and a closed position in which said holder cooperates with said housing for enclosing a cassette in said holder;
 - said pivot means being spaced rearwardly from the center of gravity of said holder, calculated with a cassette therein, in all positions of said holder ranging from said closed position to said opened position so that the force of grav-

ity urges said holder with a cassette therein from said closed position to said opened position.

4,054,345

CONNECTOR ASSEMBLY

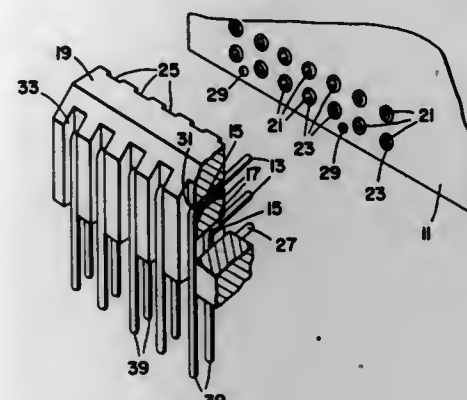
Theodore R. Sherwood, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 29, 1976, Ser. No. 653,329

Int. Cl.² H01R 21/02

U.S. Cl. 339-17 M

7 Claims



1. A connector to make electrical connection between a first board and a second board which comprises:
- a. a first header having a first face portion oriented parallel to said first board and a second face portion oriented parallel to said second board, and having a plurality of channels therethrough, each of said channels having an enclosed horizontal portion perpendicular to said first face portion and extending throughout said first header and a vertical portion perpendicular to said second face portion which is non-inclusive throughout its length;
 - b. a plurality of elongated pins of electrical conducting material, each of said pins having a 90° bend which is accommodated by said channels and a dimpled section for inserting into said channels such that when said pins are inserted in said channels said dimpled sections contact said channels to retain said pin; and
 - c. a second header having a top located adjacent said second face portion and a bottom located adjacent said second board, and having a plurality of channels therethrough for said pins to pass through;
- whereby removal of individual pins is allowed without breaking total electrical connection.

4,054,346

CATHODE RAY TUBE SOCKET WITH INCREASED TUBE BASE RETENTION

Ronald L. Schultz, Northfield, Ill., assignor to Chromalloy-Alcon, Inc., Chicago, Ill.

Filed Apr. 1, 1976, Ser. No. 672,539

Int. Cl.² H01J 5/60; H01R 13/76

U.S. Cl. 339-75 T

20 Claims

1. A cathode ray tube socket, comprising:
- a molded dielectric body carrying an array of electrical terminals for frictional push-on electrical engagement with complementary terminals on cathode ray tube base means;
 - increased retention means on said body separate from said array of terminals for axial push-on retaining engagement with the tube base means;
 - and said increased retention means comprise resiliently flexible frictional gripping structure molded integrally on one piece with said body and having rectilinear surfaces extending generally in the direction of the axis of the body for slidable engagement with rectilinear surface areas of the tube base means when the tube base means is pushed

axially into assembly with the body for thoroughly retaining the tube base means against separation from fully



assembled relation with the socket body until the socket and tube base means are deliberately pulled apart.

4,054,347

CONTACT ASSEMBLY

Bob Mouissie, Berlicum, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

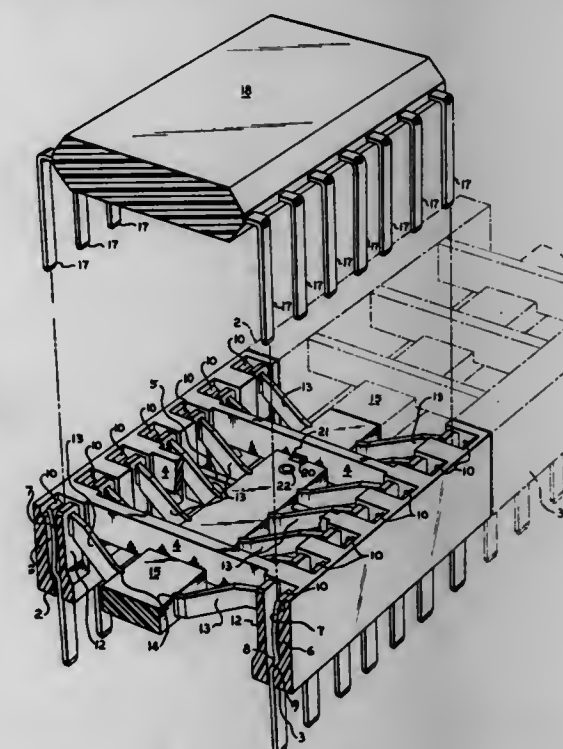
Filed May 17, 1976, Ser. No. 686,940

Claims priority, application Netherlands, May 21, 1975, 7505939

Int. Cl.² H01R 13/62; H05R 1/08

U.S. Cl. 339-75 M

6 Claims



1. In a contact assembly comprising a plastic housing including a pair of spaced rows of terminal receiving cavities and a contact mounted in each cavity for receiving a male terminal of a modular circuit package, each cavity having a flexible wall and a link having one end connected to the flexible wall and the other end engaged with a drive operatively mounted between the spaced rows of terminal receiving cavities for extending each link, flexing the wall and engaging a male terminal inserted in each cavity with the contact in each cavity to establish an electrical connection between the terminal and the contact.

4,054,348

ELECTRICAL CONNECTOR

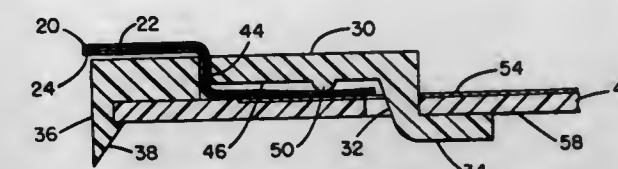
John R. Stroupe, Cambridge, and Kenneth L. Shooter, Seneca, Ohio, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed July 29, 1976, Ser. No. 709,740

Int. Cl.² H01R 13/54; H05K 1/04

U.S. Cl. 339-91 R

15 Claims



1. A connector for positioning a first electrical conductor in contact with a second electrical conductor on a substrate comprising:

- a. an elongated support member having upper and lower surface portions;
- b. means extending through said upper and lower surface portions for locating a first electrical conductor from the upper surface portion of said support member to the lower surface portion of said support member;
- c. connecting means secured to the lower surface portion of said support member to rotatably connect the support member to said substrate wherein the first electrical conductor is positioned adjacent said second electrical conductor;
- d. biasing means formed in the lower surface portion of the support member and extending outwardly therefrom a predetermined distance to a position adjacent said first electrical conductor;
- e. and latch means secured to said support member and adapted to engage the edge of the substrate to releasably latch the support member to the substrate wherein said biasing means is moved, upon the latching of the support member, to a positioning biasing said first electrical conductor into a contact relation with said second electrical conductor.

4,054,349

APPARATUS FOR ESTABLISHING MULTI-POINT ELECTRICAL CONTACT WITH AN INSULATED CONDUCTOR

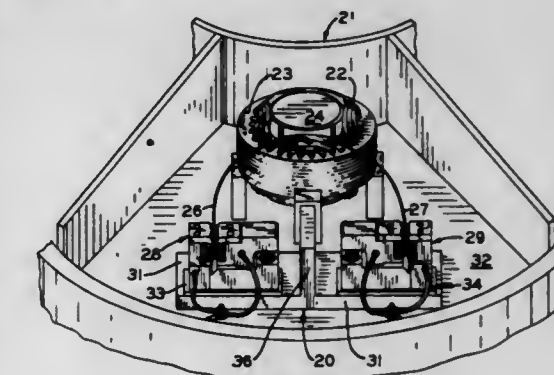
Rudolph A. Wuttke, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 28, 1974, Ser. No. 455,831

Int. Cl.² H01R 11/24

U.S. Cl. 339-99 R

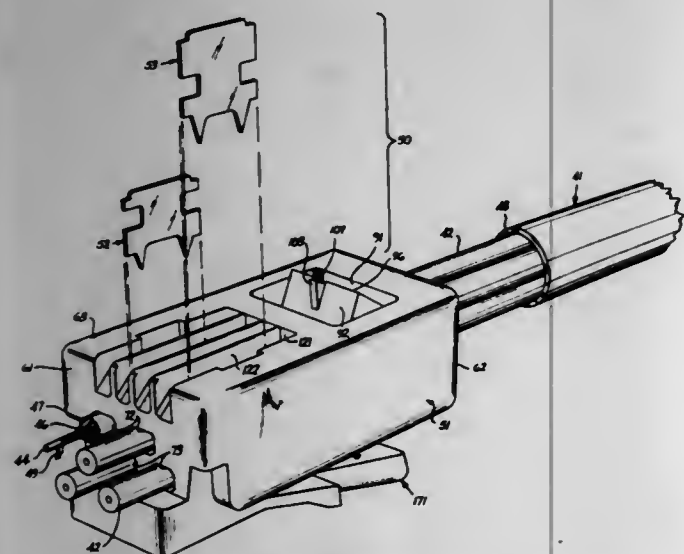
3 Claims



1. An electrical connector assembly for use in conjunction with connecting a high energy power circuit to an insulated conductor, said connector assembly including a stationary first jaw assembly having first spaced apart teeth and a second jaw assembly having second spaced apart teeth movable longitudinally relative to the first spaced apart teeth and along an arcuate path; each of said jaw-assemblies having at least one contact

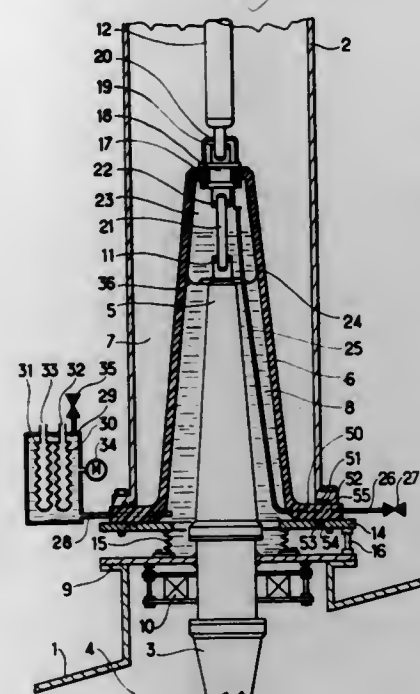
portion formed with the spaced apart teeth, with the teeth having cutting faces; the at least one contact portion of the second jaw being movable along an arcuate path so that the spaced apart teeth thereof sequentially pinch and engage a segment of insulated conductor that is disposed adjacent to the first jaw assembly and that is engageable by the at least one contact portion of the second jaw; at least one of the contact portions of at least one of the jaw assemblies having at least one surface and being clamped between two portions of said at least one of the jaw assemblies, with an electrical circuit being established through at least one surface of the at least one contact portion so clamped; and wherein one jaw assembly includes a rocker arm; the at least one contact portion so clamped is carried by said rocker arm, the rocker arm is pivotable about a pivot member, and the assembly includes a spring that urges the rocker arm in a direction to pinch a segment of insulated conductor disposed adjacent to the first jaw assembly.

4,054,350
MODULAR PLUG FOR TERMINATING CORD HAVING NON-PLANAR ARRAY OF CONDUCTORS
Edwin Charles Hardesty, Perry Hall, Md., assignor to Western Electric Company, Inc., New York, N.Y.
Filed Dec. 3, 1976, Ser. No. 747,436
Int. Cl.² H01R 13/38
U.S. Cl. 339—99 R 20 Claims



1. A device for making an electrical connection with a cord, which includes a plurality of insulated conductors, and with components external to the device, which comprises:
a dielectric housing which includes a plurality of conductor-receiving cells disposed in at least two tiers and a plurality of terminal-receiving openings associated with the cells, each of the openings including a slot extending generally parallel of and communicating with the associated cell, the length of each slot being exposed to an exterior surface of the device; and
an electrically conductive terminal, seated within each of the terminal-receiving openings and formed to include:
an internal contact portion extending into the associated cell for piercing the insulation of and making electrical engagement with the conductor in the cell;
an external contact portion having an edge surface for making electrical engagement with a component external to the housing to establish an electrical connection with the component; and
oppositely disposed edge surfaces in compressive engagement with walls of the housing which define the terminal-receiving openings to support the terminals against unintended movement.

4,054,351
CONNECTION BETWEEN A DEVICE IN A METALLIC SHEATH AND A TRANSFORMER
Maurice Gallay, Aix-les-Bains, and Jacques Fournier, Lyon, both of France, assignors to Alsthom-Savoisienne S.A., Saint-Ouen and Delle-Alsthom S.A., Villeurbanne, both of France
Filed Jan. 12, 1977, Ser. No. 758,749
Claims priority, application France, Jan. 16, 1976, 76.01154
Int. Cl.² H01R 3/04
U.S. Cl. 339—117 R 4 Claims

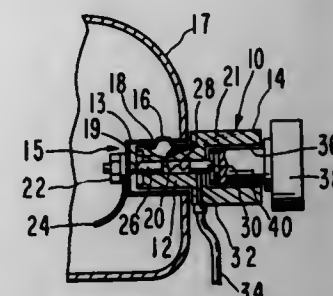


1. A connection between a device in a metallic sheath insulated by a gas under pressure and a transformer insulated by a dielectric liquid, said transformer including a capacitor bushing and said sheath concentrically surrounding the upper end of said bushing, said connection comprising: a jacket separating the transformer from that of the device, the interior volume of the jacket being filled with a dielectric liquid at a low pressure and delimited by two surfaces, an interior surface constituted by the exterior surface of the capacitor bushing, and an exterior surface formed mainly by a frustoconical insulating wall shielding the capacitor bushing and penetrating into the metallic sheath, the frustoconical insulating wall comprising, at its base, an external flange having two concentric annular surfaces, one of said annular surfaces contacting the metallic sheath of the device and defining a sealing plane between the interior volume of the device under gas pressure and the atmosphere and the other of the annular surfaces defining with another part a sealing plane between the interior volume of the jacket filled with the dielectric liquid and the atmosphere.

4,054,352
ELECTRICAL POWER TAKE-OFF UNIT FOR CIGARETTE LIGHTER SOCKET OF VEHICLE
Marvin B. Rudin, 555 Middlefield Road, Mountain View, Calif. 94040
Continuation of Ser. No. 607,736, Aug. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 581,313, May 27, 1975, abandoned, which is a continuation of Ser. No. 450,943, March 14, 1974, abandoned. This application Feb. 2, 1977, Ser. No. 764,935
Int. Cl.² H01R 33/00
U.S. Cl. 339—154 A 14 Claims

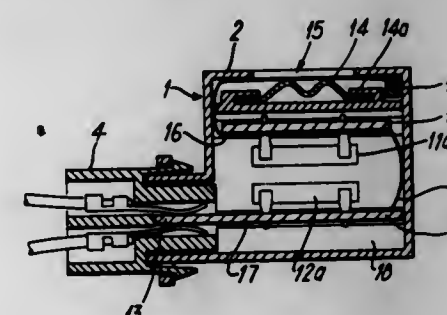
1. An auxiliary power source for a vehicle of the type having a cigarette lighter unit provided with a socket for receiving a cigarette lighter member with the vehicle socket having at least one side slot, said source comprising: an adaptor having a first part for insertion into the vehicle socket and a second part integral with and adjacent to the first part and disposed exteriorly of the vehicle socket when the first part is disposed there-within said first part having a side projection movable into and

out of the side slot of the vehicle socket; and means carried by the adaptor for releasably holding the side projection and preventing movement of the side projection out of the side slot to thereby releasably lock the adaptor thereto, said second part having a socket of a size and depth for removably receiving a cigarette lighter member, said first part having first electrically conducting lead means for electrically interconnecting the vehicle socket and the socket of the second part when said first



part is inserted into the vehicle socket, said adaptor having second electrically conducting lead means in said second part electrically coupled to and extending laterally from the first conducting lead means, there being a cable coupled to and extending outwardly of the second conducting lead means for attachment to an electrical accessory spaced from the vehicle socket when the first part is inserted therein to provide continuous electrical power to the accessory.

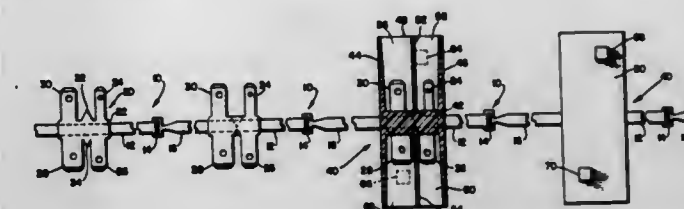
4,054,353
ELECTRICAL EQUIPMENT UNIT
Laurie A. Saunders, Fleet, and Robert W. Donnelly, Basingstoke, both of England, assignors to International Telephone and Telegraph Industries, New York, N.Y.
Continuation of Ser. No. 509,135, Sept. 25, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,189
Int. Cl.² H01R 9/12
U.S. Cl. 339—176 MF 6 Claims



1. An electrical equipment unit comprising:
a box-like case;
a flexible printed circuit having a flexible portion and at least one portion thereof rigidized to provide an integral, planar board-like portion adapted to support electrical components thereon, said flexible circuit having conductive tracks covered by insulation;
means mounting said circuit within said case, said means cooperating with and supporting said board-like portion within said case;
a hole formed in one side of said case;
said flexible portion of said circuit extending across said hole in generally parallel relation to said side;
the insulation on the surface of said flexible portion facing said hole being removed to provide bare conductive tracks thereat;
a connector device removably mounted on said one side of said case over said hole;
means on said connector device for supporting a flexible circuit on the surface of said device overlying said hole; and
spring means in said case urging said flexible portion of said flexible printed circuit outwardly toward said surface of

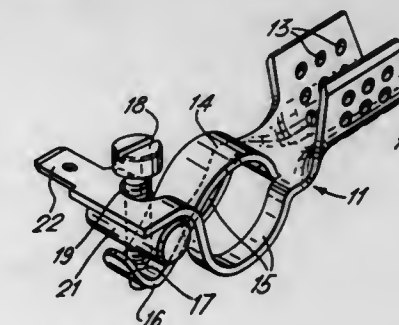
said connector device for electrically engaging said flexible portion to a flexible circuit on said surface.

4,054,354
CONNECTOR HOUSING
William Lewis Unger, Stewartstown, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 1, 1975, Ser. No. 618,370
Int. Cl.² H01R 13/50
U.S. Cl. 339—205 2 Claims



1. An electrical connector including a housing, a terminal and a carrier strip, said terminal attached to said carrier strip, said housing being integrally molded and surrounding said carrier strip and said terminal, said carrier strip being a wire tie.

4,054,355
BATTERY TERMINAL
Friedrich Kourimsky, Bensheim, and Lothar Heinrich Willi Nix, Walldorf, both of Germany, assignors to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 30, 1976, Ser. No. 746,265
Claims priority, application Germany, Dec. 5, 1975, 7538900[U]
Int. Cl.² H01R 11/26
U.S. Cl. 339—230 C 5 Claims

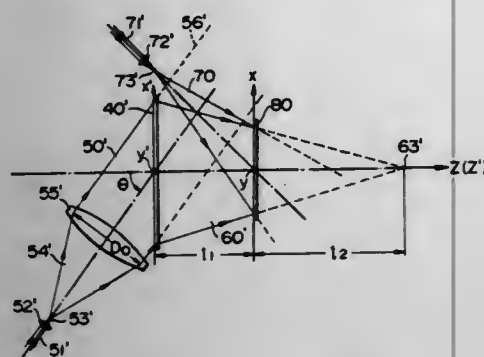


1. A terminal for connecting a lead to a battery post which terminal is stamped and formed from a single piece of sheet metal stock and comprises a ferrule forming portion for crimping to the battery lead and a first clamping arm and a pair of second clamping arms, the first arm being struck out from the centre of the stock and lateral edge portions of the stock on each side of the first arm defining the second arms which are joined at their ends, the first and second clamping arms being bowed in opposite directions for receiving between them the post and the first arm having a free end returned between the second arms which free end is adapted to receive a clamping bolt with the shank of the bolt extending between the second arms.

4,054,356
METHOD OF MAKING HOLOGRAM LENSES
Masaru Noguchi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Oct. 16, 1975, Ser. No. 622,855
Claims priority, application Japan, Oct. 18, 1974, 49-120479
Int. Cl.² G02B 5/32; G03H 1/04
U.S. Cl. 350—3.5 4 Claims

1. A method of making a hologram lens comprising directing a diverging light beam at an angle to a first hologram recording material and directing a converging light beam coherent to

said diverging light beam at an angle different from said angle to said first hologram recording material simultaneously with said directing of the diverging light beam characterized in that said converging light beam is formed by obliquely directing a collimated light beam at a second hologram to provide a con-



verging first-order diffraction light beam emanating therefrom at an angle orthogonal thereto whereby the first-order diffraction light beam emanating from the hologram constitutes said converging light beam directed to said hologram recording material.

4,054,357

PROVIDING A REPRESENTATION OF INFORMATION STORED IN A HOLOGRAM

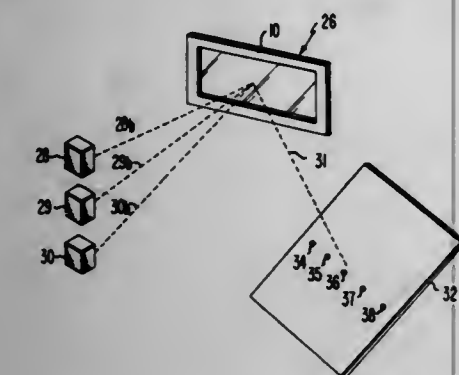
Michael Jay Lurie, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 12, 1975, Ser. No. 640,146

Int. Cl.² G06G 9/00

U.S. Cl. 350—3.5

4 Claims



1. Apparatus used with a hologram for providing a signal representation of first and second groups of elements of an image recorded in said hologram, comprising:
reconstructing means for providing a single beam of light incident to said hologram;
means for controlling the angle of incidence of said beam with said hologram; and
detector means, including a fixedly disposed array of photo-detectors, for providing a signal representation of elements of said first and second groups in response to a projection of holographic reconstructions thereof caused by said beam having first and second angles of incidence, respectively.

4,054,358

RECORDING A PHASE HOLOGRAM HAVING REDUCED INTERMODULATION DISTORTION

William Joseph Burke, and Ping Sheng, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 7, 1976, Ser. No. 684,238

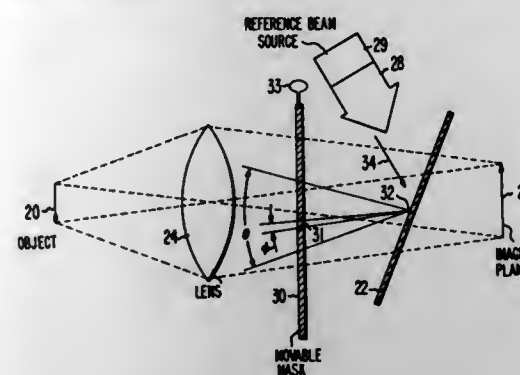
Int. Cl.² G03H 1/04

U.S. Cl. 350—3.5

4 Claims

1. A method of recording a phase hologram with reduced distortion due to intermodulation between angular components of the object beam, comprising the steps of directing an object beam and a reference beam along differ-

ent, spatially fixed paths towards a fixedly disposed recording medium, positioning a mask having a pinhole aperture in the path of said object beam so that said object beam reaches any particular point on said recording medium from a narrow range of angular directions determined by the size of the aperture and the distance of the aperture from the record-



ing medium, whereby to record a subhologram of the object on the recording medium without disturbing intermodulation of different angular components of the object beam, and moving said mask to sequentially pass additional portions of the object beam, and to record additional superimposed subholograms of the object on the recording medium.

4,054,359

APPARATUS FOR SYNCHRONOUSLY SCANNING A FLAT PLATEN WITH A ROTATING MIRROR USING PULLEYS

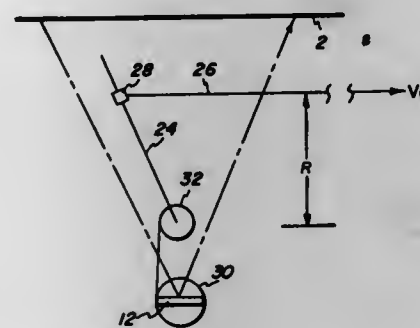
David K. Shogren, Ontario, and Thomas N. Taylor, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1976, Ser. No. 691,067

Int. Cl.² G02B 27/17; G03B 27/70

U.S. Cl. 350—6

3 Claims



1. A system for scanning a flat object surface with a rotating mirror at a constant scan velocity V_o including:
a flat object surface,
a rotatable mirror disposed relative to said object surface to scan the same,
a mirror drive operatively connected to said mirror to impart a variable angular scan velocity w to said mirror according to the following relationship:

$$w = V_o \cos^2 \theta / Y$$

wherein:

w = Angular velocity of mirror

V_o = Velocity of scan along object surface

θ = Angle at any instant between principal ray and normal to object plane

Y = Normal distance from object surface to mirror axis

said mirror drive including a pivoted mirror drive arm operatively connected to said rotatable mirror, a linear drive means acting at a constant moment arm R from the pivot

axis of said drive arm and operatively connected to said drive arm and slidable relative thereto so that said moment arm R is constant during movement of said drive means, said drive means being movable at a constant linear velocity V_d and driving said mirror drive arm at an angular velocity $2w$ according to the following relationship:

$$2w = V_d \cos^2 \theta / R$$

wherein:

$2w$ = angular velocity of mirror drive arm

V_d = linear velocity of drive means

θ = angle at any instant between mirror drive arm and its position at center of scan

R = moment arm - drive means (constant) to mirror axis (constant)

and reduction means operatively connecting said mirror drive arm to said mirror by which the angular displacement of said mirror is half that of said drive arm, said reduction means including a drive pulley integral with said mirror drive arm and rotatable therewith about the same pivot axis, a driven pulley integral with said mirror and rotatable therewith about the same mirror pivot axis, said driven pulley having a radius twice that of said drive pulley, and a flexible drive member in engagement with the periphery of both said drive pulley and said driven pulley operatively connecting same, whereby an angular displacement of said mirror drive arm effects an angular displacement of said mirror half that of said drive arm.

4,054,360

APPARATUS FOR REMOVING THE SCANNING ERROR DUE TO AN ERROR IN PARALLELISM OF A ROTARY POLYHEDRAL MIRROR

Shigenori Oosaka, and Akihiro Ohga, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

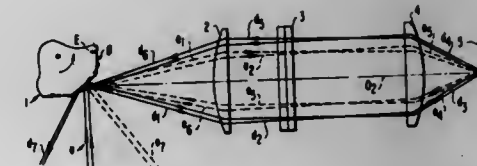
Filed Jan. 29, 1976, Ser. No. 653,565

Claims priority, application Japan, Jan. 31, 1975, 50-13073

Int. Cl.² G02B 27/17

U.S. Cl. 350—7

2 Claims



1. Apparatus for eliminating the vertical deviation of a horizontally scanned beam of light caused by errors in parallelism of a rotary polyhedral mirror having mirror surfaces and an axis of rotation, said axis of rotation and the scanning direction being relatively vertical and horizontal, respectively, the improvement comprising, optical means comprising mirror means and lens means for directing a beam of light, once reflected from a deflection point on said polyhedral mirror surface, back to said deflection point at the same vertical angle of

incidence but different horizontal angle of incidence as that of said once reflected beam, whereby said beam after a second reflection from said deflection point will have a horizontal direction dependent upon the rotational position of said polyhedral mirror and a vertical direction independent of said rotational position or said error in parallelism, said optical means comprises, first and second cylindrical lenses positioned to affect only the horizontal direction of light beams passing therethrough, said first lens being positioned at a distance from said deflection point equal to the focal distance of said lens, a mirror positioned a focal distance away from said second lens, said first and second lenses being positioned between said polyhedral mirror and said mirror and separated by a distance equal to the sum of the focal lengths of said first and second lenses, and a third cylindrical lens positioned to affect only the vertical direction of the light beams passing therethrough, said third lens positioned equidistant between said polyhedral mirror and said mirror and having a focal length equal to said distance.

4,054,361

BEAM SCANNING DEVICE WITH LINE IMAGE FORMED BY AND REFLECTED TO OPTICAL ELEMENT

Masaru Noguchi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

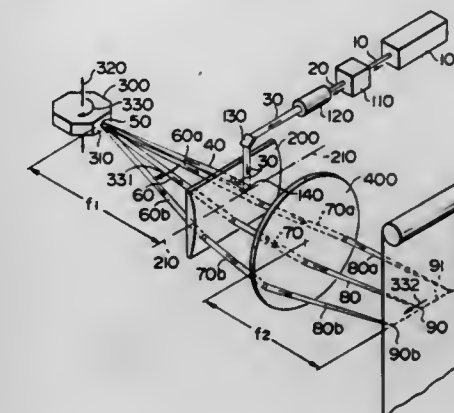
Filed Oct. 14, 1976, Ser. No. 732,393

Claims priority, application Japan, Oct. 15, 1975, 50-124040

Int. Cl.² G02B 27/17

U.S. Cl. 350—7

9 Claims



1. A beam scanning device comprising in combination:
a light source for generating a light beam,
a rotating multi-face mirror for reflecting and deflecting the light beam,
an optical element having major and minor axes of different focal length located between the light source and the rotating multi-face mirror for forming on the reflecting surface of the rotating multi-face mirror a line image perpendicular to the axis of rotation of the rotating multi-face mirror and for receiving the light beam reflected and deflected by the rotating multi-face mirror and transforming it into a deflected beam of collimated light, and
a focusing system for focusing the deflected beam of collimated light and producing a scanning light spot on the focal plane thereof,
whereby the scanning lines produced by the scanning light spot are not displaced in the direction perpendicular to the direction of scan by error in parallelism between the optical axis and the reflecting surfaces of the rotating multi-face mirror.

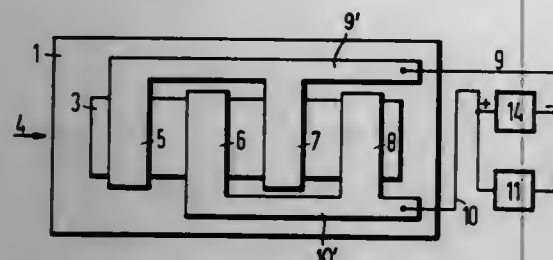
4,054,362

DEVICE FOR MODULATING LIGHT

Peter Baues, Krallings, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
 Filed Sept. 10, 1975, Ser. No. 611,920
 Claims priority, application Germany, Sept. 12, 1974, 2443733
 Int. Cl.² G02B 5/14

U.S. Cl. 350—96 WG

10 Claims



1. A device for modulating polarized light comprising a substrate of material having an index of refraction n_s ; an electro-optical crystal of a material having an index of refraction $n_{ko} > n_s$ disposed in an integrated manner on a surface of the substrate to form a waveguide, a layer of dielectric intermediary material having an index of refraction $n_z < n_{ko}$ covering a surface of the electro-optical crystal which is opposite to the substrate; a plurality of electrode strips disposed on the layer to extend perpendicular to the direction of propagation of light in the waveguide with adjacent strips connected to different poles to form an interdigital electrode structure, each of said strips having a width equal to an integral multiple of π of the propagation phase of the waveguide mode of the electro-optical crystal, and means for applying a voltage to said electrode strips whereby application of a modulation voltage to the interdigital structure creates electrical fields in the crystal extending parallel to the direction of propagation of the light in the crystal to create changes in the index of refraction of the crystal.

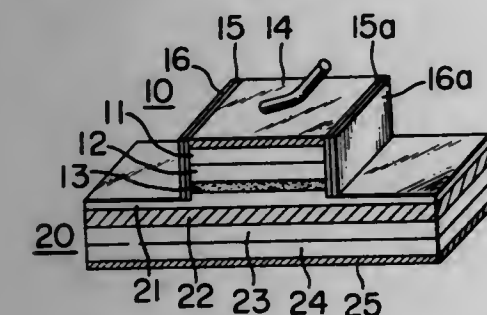
4,054,363

MULTI-HETERO-STRUCTURE WAVEGUIDE TYPE OPTICAL INTEGRATED CIRCUITRY

Yasuharu Suematsu, Kawasaki, Japan, assignor to Tokyo Institute of Technology, Tokyo, Japan
 Filed Dec. 15, 1975, Ser. No. 640,922
 Int. Cl.² G02B 5/14; H01S 3/00

U.S. Cl. 350—96 WG

13 Claims



1. A multi-hetero-structure waveguide type optical integrated circuit, comprising mesa type thin film oscillator passive or active elements, a directional coupler, a multi-hetero-structure waveguide having a small loss at the wavelength of the laser light to be transmitted, said oscillator being integrally formed through said directional coupler upon said waveguide, and a thin-film mode-matching output circuit formed integral of the waveguide upon the upper surface thereof and direction-coupled thereto.

4,054,364

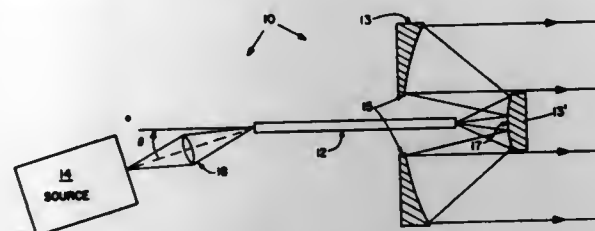
APPARATUS FOR TRANSMITTING LIGHT THROUGH CASSEGRAIN OPTICS

Willard P. Webster, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
 Filed Feb. 2, 1976, Ser. No. 654,308

Int. Cl.² G02B 5/16, 5/10

U.S. Cl. 350—96 B

3 Claims



1. An active optical system comprising:
 a light source;
 a centrally apertured primary mirror where the aperture is small compared to the overall size of the primary mirror;
 a secondary mirror placed with respect to said primary mirror so it can receive light from the aperture and reflect it onto the primary mirror;
 a fiber optic bundle placed with respect to said light source and said primary mirror such that the angle of incidence to receive light from the source and transmit it through the aperture and exit as annularly shaped beam toward the secondary mirror is less than the critical angle of total reflection for the given materials used between the source and the fiber optic bundle; and
 means for directing the light so that the angle of incidence on the fiber optic bundle is other than zero degrees for plane waves and so that the non zero angle for converging light refers to the incident angle of the ray traveling along the axis of symmetry of the converging light.

4,054,365

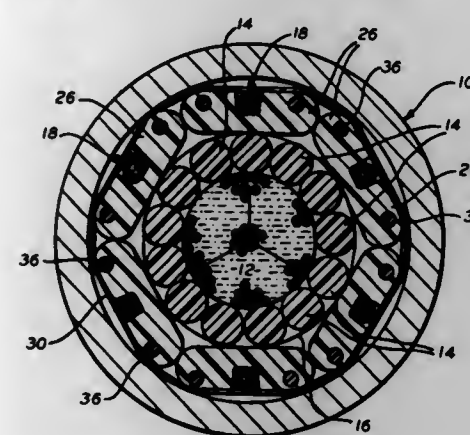
FIBER OPTIC CABLE CONSTRUCTION

Walter H. Marx, Berkeley Heights; Stanton M. Smith, West Orange, and Eugene J. Gavaletz, Toms River, all of N.J., assignors to General Cable Corporation, Boonton, N.J.
 Filed May 28, 1976, Ser. No. 691,031

Int. Cl.² G02B 5/16

U.S. Cl. 350—96 B

11 Claims



1. A fiber optic cable including in combination a central core subject to tension applied to the cable, an outer jacket, a transmission medium comprising an optic fiber, and a carrier extending lengthwise of the cable and located within the jacket and surrounding the core and having a preformed groove therein of greater cross-section than the fiber, said groove opening through a top surface of the carrier and extending downward from said top surface of the carrier, and in which the optic fiber is supported, said carrier protecting the optic fiber from stresses imposed upon the cable, the surface of the groove that contacts with the optic fiber, being smooth so as to

support the optic fiber free of microbending of the optic fiber, the optic fiber having a neutral axis along which the fiber bends where it extends in a changing direction, and the groove being shaped and so located in the carrier that the neutral axis of the optic fiber substantially coincides with a neutral axis along which the carrier bends when it changes its direction of longitudinal extent.

4,054,366

FIBER OPTICS ACCESS COUPLER

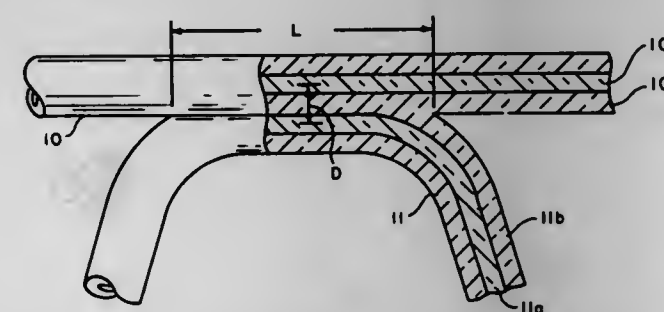
Michael K. Barnoski, Pacific Palisades; Howard R. Friedrich, Woodland Hills, and Robert J. Morrison, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 12, 1976, Ser. No. 704,274

Int. Cl.² G02B 5/14

U.S. Cl. 350—96 C

6 Claims



1. A fiber optic single fiber direct access coupler comprising:
 a. first and second single fiber optical waveguides each of said waveguides comprising a core of material having an index of refraction n_1 and a cladding material surrounding said core, said cladding material having an index of refraction n_2 which is less than n_1 such that a major portion of optical energy propagated through said core of either of said waveguides in one or more predetermined optical modes of propagation is internally reflected at the interface between said core and said cladding and is thereby waveguided through said core; and
 b. means for forming a unitary coupling section for coupling a minor portion of said optical energy from said first waveguide to said second waveguide, said means comprising a portion of said cladding of said first fiber which is fused with a portion of said cladding of said second fiber to maintain in said fused portions a predetermined spatial relationship between said cores of said first and second fibers along a predetermined axial length of said core of said first fiber; the degree of coupling of optical energy from said first core to said second core being dependent on said predetermined spatial relationship between said cores, on the magnitude of said predetermined fused length, on the angle between the axial direction of said first core at the entrance end of said fused length and the common axial direction of said cores in said fused length and on said optical propagation modes in said first core.

4,054,367

PROCESS AND APPARATUS FOR HIGH RESOLUTION NON-MECHANICAL DEFLECTION OF LIGHT BEAMS

Hans Eschler, Munich, and Gerd Goldmann, Taufkirchen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 31, 1975, Ser. No. 645,818

Claims priority, application Germany, Jan. 7, 1975, 2500380

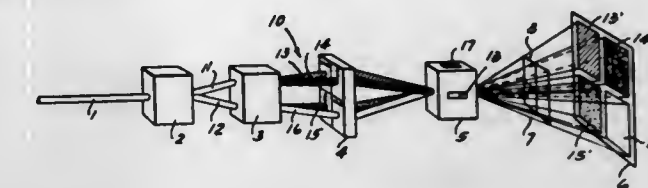
Int. Cl.² G02F 1/29

U.S. Cl. 350—150

12 Claims

1. A method of non-mechanical deflecting of a beam of light with high resolution by means of a two-dimensional analogue acousto-optical deflector and at least one digital electro-optical deflector and particularly adapted for use in optical printers and optical storage systems, said method comprising directing

a linearly polarized beam of light through at least one electro-optical light deflector, selectively operating the electro-optical light deflectors to deflect the beam in one of a plurality of



selected directions, directing the beam at an acousto-optical light deflector, and selectively operating the acousto-optical light deflector to further deflect the beam into a two-dimensional array of beam directions.

4,054,368

COMPOUND INDICATOR DEVICE CONTAINING AT LEAST ONE LIQUID CRYSTAL CELL

Hans Krueger, and Wolfgang Welsch, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

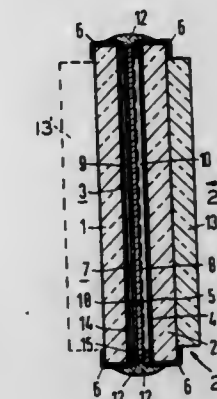
Filed Jan. 29, 1975, Ser. No. 545,107

Claims priority, application Germany, Dec. 16, 1974, 2459488

Int. Cl.² G02F 1/13

U.S. Cl. 350—160 LC

10 Claims



1. In an indicator device having at least two sealed chambers arranged in tandem directly behind one another in the direction of travel of light in the device, said device including a stack of spaced members sealed together at their margins by glass solder, said stack including a pair of outer glass plate members with one transparent, thin carrier member interposed therebetween to form two chambers being separated by the carrier member, at least one of the chambers contain a liquid crystal layer and having transparent conductive material on the surfaces of the members facing the layer to form a liquid crystal cell, the improvements comprising each of said chambers containing a liquid crystal layer, the surfaces of the members facing each chamber having transparent conducting material with the material on the surfaces of at least one chamber being configured to impose an electric field on selective portions of the liquid crystal layer therein, the liquid crystal layer in one of said chambers being a nematic material having a positive dielectric anisotropy and a homogeneous orientation with the molecules of the layer being twisted in a direction perpendicular to the plane of the surfaces to form a rotation cell, the liquid crystal layer in the other chambers being a nematic, homogeneously oriented material with a positive dielectric anisotropy and containing at least one pleochroic dye mixed therein to form a polarizing cell, a polarizer adjacent one of the plate members which is separated from the polarizing cell by the rotation cell so that selective application of separate electric fields on the rotation cell and polarizing cell both independently and simultaneously produces a multi-color indication on a multi-color background.

4,054,369

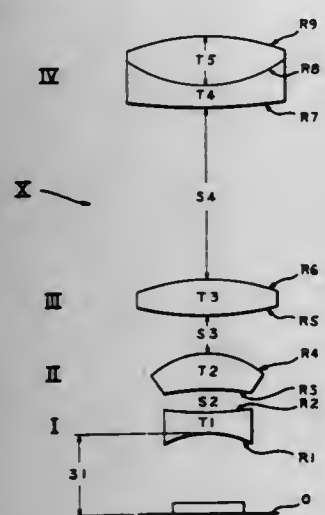
FOUR-COMPONENT MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed June 17, 1976, Ser. No. 696,996

Int. Cl.² G02B 9/34

U.S. Cl. 350—175 ML



1. A microscope objective having a numerical aperture of 0.25 which consists of, in alignment along an optical axis, a biconcave negative singlet I, a positive meniscus singlet II concave to the object side, a biconvex positive singlet III and a biconvex positive doublet IV consisting of a negative meniscus and a positive biconvex lens

4,054,370

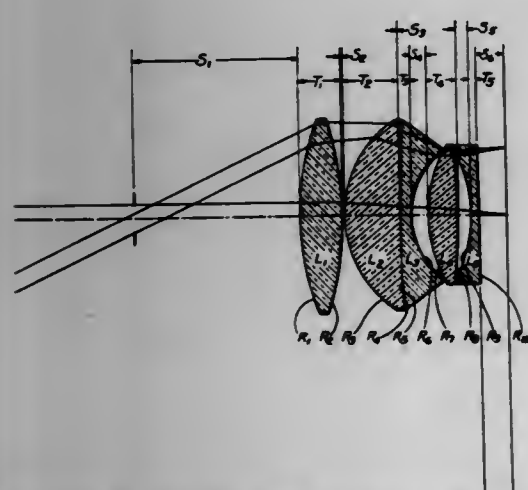
FULL-FOCUS EYEPiece

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed July 9, 1976, Ser. No. 703,879

Int. Cl.² G02B 25/00, 13/16, 9/34

U.S. Cl. 350—175 E



1. An optical system for an eyepiece, having substantially the following specifications:

EFL = 1.0431 inches (26.50mm) Half Angle of Field = 25.61°					
Lens	Radii (in.)	Thickness (in.)	Spacing (in.)	V	N _D
STOP					
L ₁	R ₁ = 2.173 R ₂ = 2.1730	T ₁ = 0.2758	S ₁ = 1.1810	54.8	1.691
L ₂	R ₃ = 0.7640 R ₄ = -8.6130	T ₂ = 0.4140	S ₂ = .0070	54.8	1.691
L ₃	R ₅ = 8.6130 R ₆ = -0.5420	T ₃ = 0.0700	S ₃ = 0	25.4	1.805

3 Claims

-continued

EFL = 1.0431 inches (26.50mm) Half Angle of Field = 25.61°					
Lens	Radii (in.)	Thickness (in.)	Spacing (in.)	V	N _D
L ₄	R ₇ = 0.8494 R ₈ = 3.8610	T ₄ = 0.2130	S ₄ = .1160	51.7	1.734
L ₅	R ₉ = -0.9400 R ₁₀ = Inf.	T ₅ = 0.0600	S ₅ = .0840	25.4	1.805
			S ₆ = .1885 BFL		

wherein the first column lists the lens elements L₁ to L₅ numerically, starting at the ray entrance side of the system. The second column lists the respective radii R₁ to R₁₀ of the elements, the third column lists in inches the thicknesses T₁ to T₅ of the respective elements, the fourth column lists the axial spacings (in inches) between the respective elements and the image plane at which the light rays are imaged for viewing, and the fifth and sixth columns list respectively the dispersive index V and the refractive index N_D of the optical materials.

4,054,371

COMPACT VARIFOCAL LENS SYSTEM CAPABLE OF MACROPHOTOGRAPHY

Mitsuo Yasukuni, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

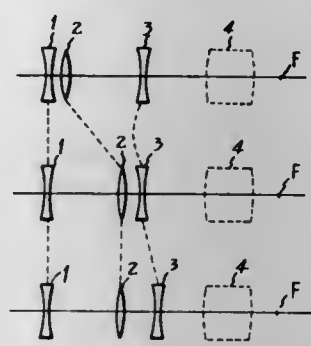
Filed Dec. 19, 1975, Ser. No. 642,459

Claims priority, application Japan, Dec. 28, 1974, 50-565

Int. Cl.² G01B 15/18

U.S. Cl. 350—184

19 Claims



1. A compact varifocal lens system capable of both a zooming and macrophotography mode of operation having a predetermined focal plane comprising:

- a first front lens component of overall negative refractive power;
- a second lens component of overall positive refractive power movable along an optical axis on the image side of said first front lens component;
- a third lens component of overall negative refractive power movable along the optical axis on the image side of said second lens component; and

mounting means for said second and third lens components to provide a first mode of movement to vary the total focal length of the lens system without significant image-plane deviation and a second mode of movement to provide image-plane deviation for the purpose of focusing in the macrophotography range, one of said second and third lens components consists of positive and negative subcomponents, the negative subcomponent being located on the image side of the positive subcomponent, said subcomponents capable of being combined as a unit in said first mode and are separable from each other in said second mode.

4,054,372

FOCUSING MECHANISM FOR VARIFOCAL OBJECTIVE

Wolfgang Schroeder, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Germany

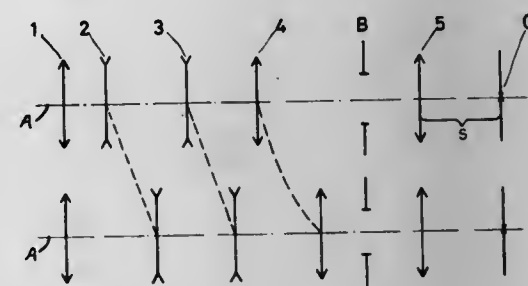
Filed July 28, 1976, Ser. No. 709,324

Claims priority, application Germany, July 29, 1975, 2533825

Int. Cl.² G02B 15/18

U.S. Cl. 350—186

8 Claims



1. In a varifocal objective comprising a plurality of coaxial lens members constituting an axially fixed object-side first component, an axially shiftable second component following said first component, an axially shiftable third component following said second component, a fourth component following said third component and an image-side fifth component following said fourth component, the combination therewith of:

- zooming means operatively coupled with said second and third components for axially shifting same at different rates to selectively vary the overall focal length of the objective while maintaining a stationary image plane beyond said further lens members; and
- focusing means operatively coupled with said second and third components for jointly shifting same to vary the distance at which objects can be sharply focused on said image plane, one of said lens members disposed on the image side of said third component being axially shiftable and operatively coupled with said focusing means for displacement thereby concurrently with said second and third components to maintain the selected overall focal length.

4,054,373

MICROFORM VIEWER

George Davies, and Hedda Wertheimer, both of 8 Duhamel Place, Jersey, Channel Islands, England

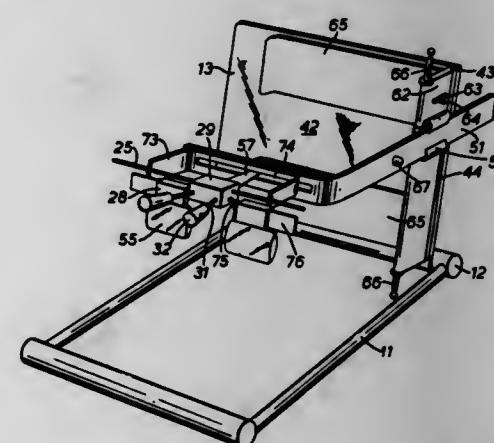
Filed Feb. 17, 1976, Ser. No. 658,751

Claims priority, application United Kingdom, Feb. 17, 1975, 6599/75

Int. Cl.² G02B 27/04

U.S. Cl. 350—241

9 Claims



1. A viewer comprising a base, a table pivotally mounted on the base, clamp means for temporarily gripping matter to be

viewed on the table, a lens unit including a lens for viewing the matter mounted on the clamp means, the lens being adjustably positioned on the lens unit, and the lens unit being laterally adjustable in relation to the clamp means, and a head rest extending from the lens unit above the lens towards the user including means for enabling the user to move the lens unit laterally by pressure of his head on the head rest.

4,054,374

NONGLARE REAR VIEW MIRROR

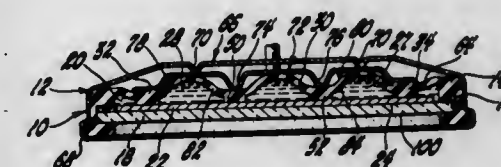
Gale M. Craig, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 1, 1976, Ser. No. 728,782

Int. Cl.² G02B 17/00

U.S. Cl. 350—279

5 Claims



1. A nonglare rear view mirror comprising a transparent front plate having a front planar extent defining a viewing surface and an inboard surface, a mirror member having a light reflective surface disposed in parallelism to said front plate, a flexible member having a bellows segments sealingly engaged with the periphery of said front plate to define a variable volume chamber behind said plate, said flexible member including a diaphragm segment integrally formed with said bellows segment and extending across the outboard surface of said mirror member to define a pump chamber, bosses on the inboard side of said diaphragm segment secured to said mirror member for reinforcing the planar extent of said mirror member against flexural distortion, means filling said chambers with opaque liquid, and means including said diaphragm segment forming a pressurizable chamber on the outboard side of said diaphragm segment selectively connected to a differential pressure source to move said diaphragm segment toward and away from said front plate, said diaphragm segment positioning said mirror member spaced from said front plate in response to a first pressure in said pressurizable chamber to cause opaque liquid to flow between said light reflective surface uniformly around the outer perimeter of said mirror member and said front plate to block passage of light rays to said mirror element and produce a nonglare reflection from the outer surface of said front plate, said diaphragm segment positioning said mirror member against said front plate in response to a second pressure in said chamber to displace said opaque liquid from the viewing field to produce direct reflection of light rays through said front plate from the reflective surface of said mirror member.

4,054,375

REAR VIEW CYCLING MIRROR

Carl Ribeca, 443 Ashland Ave., Chicago Heights, Ill. 60411

Continuation-in-part of Ser. No. 677,699, April 15, 1976,

abandoned. This application Nov. 15, 1976, Ser. No. 741,561

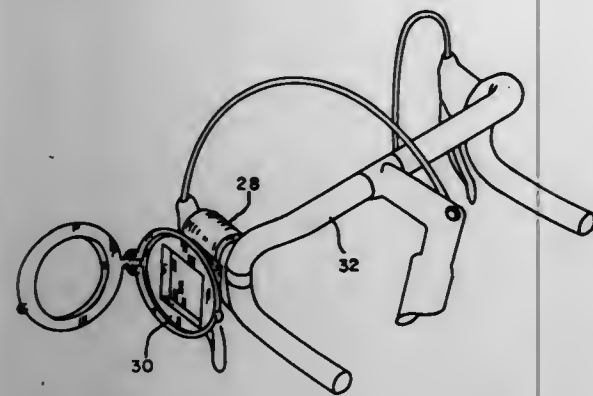
Int. Cl.² G02B 5/08

U.S. Cl. 350—307

7 Claims

1. A rear view cycling mirror comprising a base having a bottom wall and an annular generally up-standing rim; a cover having a top wall, an annular generally depending rim and mirror means mounted to the inside surface of said top wall; universal hinge means joining said base and said cover for moving said cover from a closed position wherein said base rim and said cover rim are in generally sealed and continuous engagement to any one of many open positions

wherein an image may be reflected by said mirror means; and
mounting means connected to said base to accept one of a



plurality of mounting devices said mounting means comprising a dropped portion of said bottom wall, said dropped portion defining a slot for acceptance of either a wrist strap or a bicycle mounting clip.

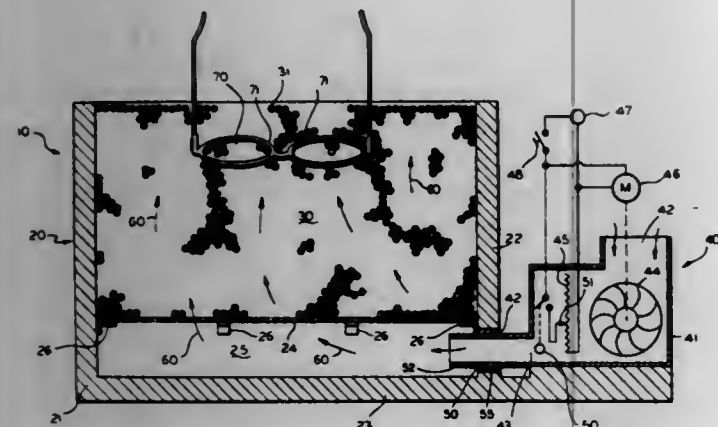
4,054,376

METHOD AND APPARATUS FOR HEATING EYEGGLASS FRAMES

Richard C. Wareham, 2372 N. 90th St., Milwaukee, Wis. 53227
Continuation-in-part of Ser. No. 555,436, March 5, 1975,
abandoned. This application Mar. 8, 1976, Ser. No. 664,534
Int. Cl.² G02C 13/00

U.S. Cl. 351-178

2 Claims



1. A method for heating eyeglass frames to permit insertion of lenses therein comprising:
containing a quantity of heat retentive particles having a regular shape in a container over a screen having openings sized to permit the free flow of air therethrough,
injecting heated air into a plenum chamber below said screen at a pressure only slightly in excess of atmospheric pressure and insufficient to fluidize said beads and at a sufficient flow rate to heat said beads,
passing said air freely upwardly through said screen to slowly agitate said beads while maintaining the beads in contact with adjacent beads,
inserting at least the rim portion of said frames into said particles for a time sufficient to heat the same to a deformable state.

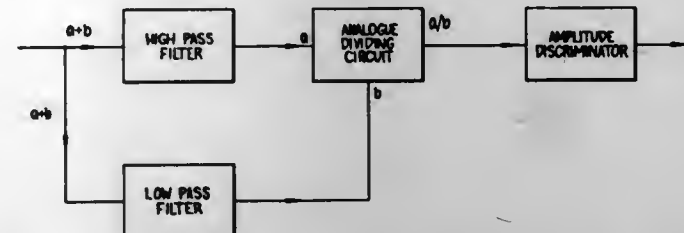
4,054,377 METHOD AND APPARATUS FOR EXAMINING SHEET MATERIAL

William Gibson, Newcastle upon Tyne, England, assignor to Ciba-Geigy AG, Basel, Switzerland
Filed Dec. 15, 1975, Ser. No. 640,371

Claims priority, application United Kingdom, Dec. 19, 1974, 54869/74

Int. Cl.² G01N 21/16, 21/18, 21/30, 21/32
U.S. Cl. 356-199

7 Claims



1. A method of examining sheet material to detect faults therein in which the surface of the sheet material is scanned by a moving beam of electromagnetic radiation which radiation is thereafter directed to a photoelectric cell to produce therefrom a wideband electric signal comprising both high and low frequency components in which the said wideband signal is electronically processed to provide a quotient signal corresponding to the high frequency component divided by the low frequency component and applying said quotient signal to an amplitude discriminator the output of which indicates the presence of a fault in the sheet material by generation a signal of digital form in response to a disturbance in the wideband signal exceeding in amplitude a given proportion of the amplitude of said low frequency component.

4,054,378

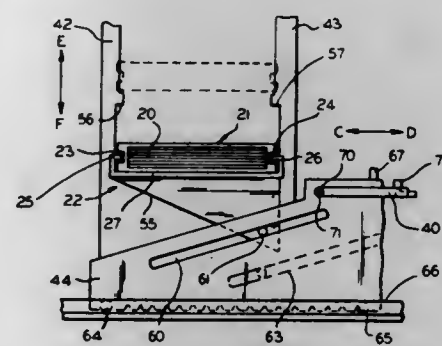
SELECTOR INTERLOCK FOR MICROFICHE CARTRIDGE

Thomas R. Wells, Des Plaines, Ill., and Theodore E. Dahlen, West Bend, Wis., assignors to Bell & Howell Company, Chicago, Ill.

Filed Oct. 2, 1975, Ser. No. 618,996
Int. Cl.² G03B 23/08

U.S. Cl. 353-27 R

7 Claims



1. A system for selecting one of a plurality of microfilm stored in a library file contained inside a cartridge; said plurality of microfilm being suspended in a spaced parallel relationship within said cartridge;
a housing;
elevator means disposed in said housing to receive and support said cartridge with said microfilm disposed therein; said elevator means being selectively movable between a normal position and any of a plurality of off-normal positions for moving said file to a selected loading station at any of said off-normal positions;
reciprocally movable microfilm extractor means having hooks positioned in said housing adjacent said cartridge, said extractor means being movable between two extremities, one of said extremities being a position wherein with movement out of and into said position said extractor means hooks and removes a microfilm from said car-

tridge and returns said microfilm into said cartridge respectively;
control plate means operatively connected to said elevator means for moving said elevator between said normal position and any of said off-normal positions adjacent said extractor means;
said control plate means movable in a direction perpendicular to the direction of movement of said elevator means; selective elevator locking means operatively connected between said control plate and said extractor means for normally engaging said control plate and thereby locking said elevator while a microfilm is removed from said cartridge;
said extracting means engaging said locking means at the extracting extremity for unlocking said elevator;
said locking means relocking said elevator responsive to movement of said extracting means away from the extremity of said extracting means motion and thereafter continuously maintaining said elevator in said normally locked condition throughout an entire period beginning when a microfilm begins to move off its normal position in said cartridge, continuing for the entire time while said microfilm is out of said cartridge, and ending when said microfilm returns to its normal position in said cartridge.

4,054,379

READER-PRINTER

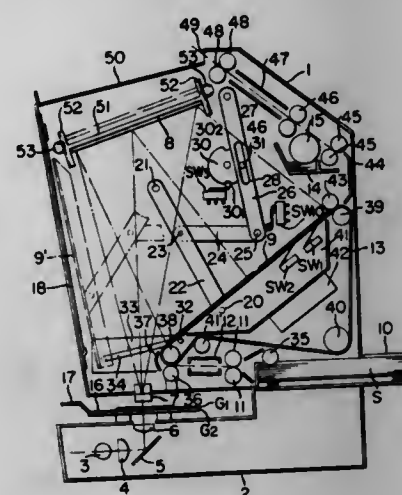
Yoshiaki Sone, Tokyo; Takamasa Sawada, Yokohama, and Masanari Shirai, Chigasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 26, 1975, Ser. No. 617,238
Claims priority, application Japan, Sept. 28, 1974, 49-111845

Int. Cl.² G03G 15/26, 27/70

J.S. Cl. 355-5

22 Claims



17. A recording device comprising: a housing having a viewing window;
means for forwarding a photosensitive recording medium to a recording position, and from said recording position to a developing position in said housing;
means for projecting an image onto said recording medium at said recording position, and for forming a latent image on said recording medium;
developing means disposed at said developing position to render visible the latent image formed on said recording medium; and
screen means having a light diffusing and reflecting surface, said screen means being mounted for movement between a viewing position adjacent said recording position, and a second position wherein said screen means intercepts light entering through said viewing window.

4,054,380

CONTROL SYSTEM FOR HIGH SPEED COPIER/DUPLICATORS

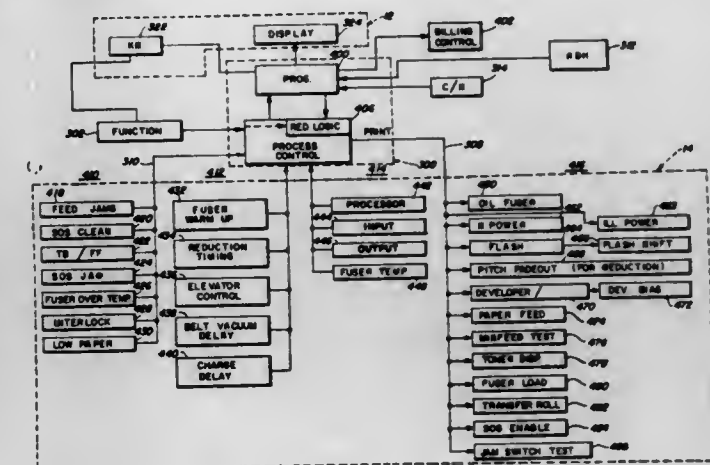
James M. Donohue, Rochester; Ronald J. Carter, Webster; Kenton W. Fiske, Fairport; Daniel L. Mueller, Fairport; Donald S. Post, Fairport; Edward G. Reehill, Henrietta, and Edward L. Steiner, Macedon, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 22, 1974, Ser. No. 445,014

Int. Cl.² G03G 15/00

U.S. Cl. 355-14

30 Claims



1. In an automatic document processing system for reproducing one or more copies of an original document comprising in combination
central process control means;
means for supplying said original document to be reproduced;
an output device for accumulating said copies; and
a feed path for said copies, said feed path including a plurality of copy processing components for processing said copies, said process control means including electronic sequencing means progressable through a plurality of states, means for generating plural timed control signals within said states for actuating said copy processing components to produce said copies, means for monitoring the movement of copies along said feed path, said monitoring means including means effective on an unscheduled interruption in the movement of copies along said feed path to intervene and interrupt operation of said sequencing means whereby to stop processing of said copies, said sequencing means including a multi-stage shift register, gating means coupled to said multi-stage shift register for shifting signals there through in synchronism with the movement of copies along said feed path at a rate of one shift signal per copy, and means responsive to completion of processing of the last of said copies to terminate operation of said system.

4,054,381

TONER FILTER ARRANGEMENT

John S. Bernhard, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 5, 1976, Ser. No. 673,763

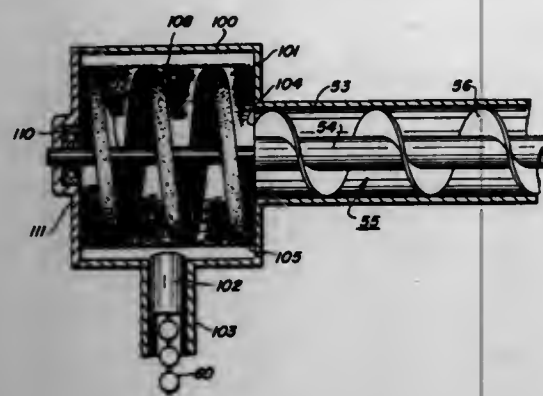
Int. Cl.² G03G 21/00

U.S. Cl. 355-15

6 Claims

1. An electrophotographic reproduction machine comprising a cleaning station for removing residual toner particles remaining on an imaging surface after completion of a copy cycle, a toner filter including a housing having a first opening through which said residual toner enters from said cleaning station, a helically wound fiber brush mounted for rotation in said housing, an open mesh screen supported intermediate said housing and said brush, the interior of said screen being in communication with said first opening, a second opening in

said housing located to gravity feed toner exiting said housing, whereby rotation of said brush causes toner to sift through the



openings in said screen and fall by gravity through said second opening.

4,054,382

OPTICAL VIEWING APPARATUS

Martin Raymond Percival Seib, 81, Camberwell Grove, Camberwell, London S. E. 5, England

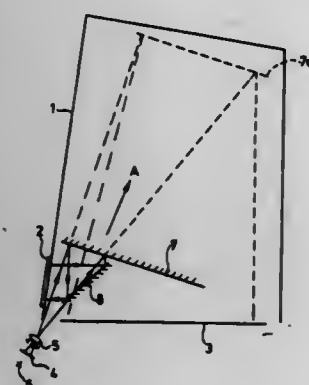
Filed Mar. 10, 1976, Ser. No. 665,502

Claims priority, application United Kingdom, Mar. 10, 1975, 9068/75

Int. Cl.² G03B 13/28

U.S. Cl. 355-45

8 Claims



1. A view/print apparatus comprising a casing, a back-projection viewing screen forming part of the casing on which an image to be viewed is projected from within the casing, image projection means, a print plane on which a light-sensitive sheet of image recording material is located for exposure to said image when the print facility is to be employed, a mirror movable between "view" and "print" positions, in the former of which said image is projected on the screen with a selected accuracy of focus and in the latter of which said image is projected on the print plane with substantially no change in the accuracy of focus, and means to vary the size of said image up to a maximum rectangular frame size, characterised in that the screen is dimensioned and positioned in the casing to accommodate only a part of said image when the size-varying means is set for maximum frame size, that part including one complete edge of the maximum sized frame and a region adjacent thereto.

4,054,383

JIG AND PROCESS FOR CONTACT PRINTING

Bern Jeng Lin, Somers; John Sebastian Montesana, Poughkeepsie, both of N.Y.; William Godfrey Santy, New Canaan, Conn., and Janusz Stanislaw Wilczynski, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,428

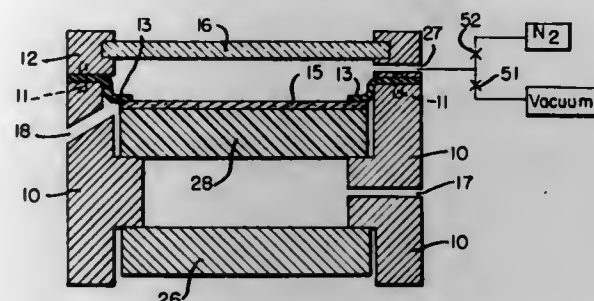
Int. Cl.² G03B 27/20

U.S. Cl. 355-91

10 Claims

1. A jig for positioning an image mask and an image receiving medium for contact or proximity printing, comprising: a housing having a central bore;

first means located within said central bore for supporting an image mask or an image receiving medium; a flexible diaphragm attached to said housing surrounding the periphery of said central bore and juxtaposed to said first means to permit both said image mask and said image receiving medium to be located between said flexible diaphragm and said first means; second means for drawing a vacuum in said central bore on one side of said flexible diaphragm to move said image mask or said image receiving medium toward said first means and into position for contact or proximity printing; and



third means for applying superatmospheric pressure to the other side of said flexible diaphragm to urge said flexible diaphragm toward said first means to ensure intimate contact of said image mask and said image receiving medium, and wherein said flexible diaphragm extends into said central bore a limited extent sufficient for forming a vacuum seal when drawing a vacuum in said central bore; and being positioned short of the center of the bore for permitting radiant energy exposure of said image mask and said image receiving medium.

4,054,384

SAMPLE-BACKGROUND-SIGNAL AUTOCANCELLATION IN FLUID-SAMPLE ANALYZERS, USING SYMMETRICAL TIME-DELAY OR TIME-AVERAGING

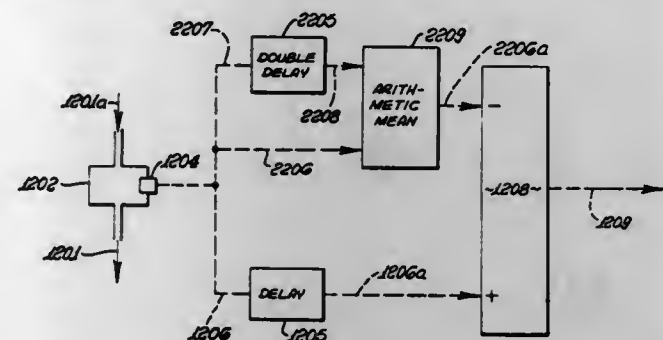
Roland C. Hawes, 771 Oakglade Drive, Monrovia, Calif. 91016

Continuation of Ser. No. 574,618, May 5, 1975, which is a continuation-in-part of Ser. No. 416,233, Nov. 15, 1973, Pat. No. 3,897,154. This application Nov. 18, 1976, Ser. No. 743,155

Int. Cl.² G01N 21/34; G01J 3/42

U.S. Cl. 356-51

13 Claims



1. A system for monitoring a first constituent in a fluid stream, which stream may also include a second constituent whose concentration in the stream changes slowly relative to the changes in concentration of the first constituent, comprising:

a monitoring station, having sensing means for deriving a first component of a first measurement signal in quantitative response to presence of such first constituent in the station; said sensing means also deriving an additional component of such first measurement signal in quantitative response to presence of such second constituent in the station, such additional signal component constituting a spurious signal component;

flow means, connected to the fluid stream and the monitoring station, for directing fluid from the fluid stream through the station;

primary signal-processing means, connected to receive the first measurement signal from the sensing means, for deriving in response to the first measurement signal a second measurement signal which has a first component and an additional component corresponding respectively to the first and additional components of the first measurement signal, said primary signal-processing means comprising: signal-splitting means, connected to receive the first measurement signal from the sensing means, for generating a pair of intermediate signal versions in response to the first measurement signal, each having substantially the same sequence of amplitudes and frequencies as the first measurement signal, but each independently being subject to displacement in time relative to the first measurement signal;

first delay means, connected to receive the two intermediate signal versions from the signal-splitting means, for establishing a relative time delay between the two intermediate signal versions; said relative time delay being substantially consistent and not directly controlled by any of the signals; and

combining means, connected to receive the two intermediate signal versions with the said relative time delay, for generating the said second measurement signal by additive combination of the two intermediate signal versions in specified proportions;

secondary signal-processing means, connected to receive the first measurement signal along a signal path from the sensing means and the second measurement signal from the said combining means, for deriving in response thereto a third signal which is a substantially continuous mathematical function of the first and second measurement signals, the function being such as to effect substantially complete mutual cancellation of the said additional measurement signal components, whereby the third signal comprises substantially only components corresponding to presence of the first constituent in the stream;

second delay means, connected in the signal path of the first measurement signal between the sensing means and the secondary processing means, for establishing relative time delays between the first measurement signal as it enters the secondary processing means and the two intermediate signal versions; said second delay means introducing time delay which is partway between the time delays applied to the two intermediate signal versions respectively; and utilization means responding to the third signal.

4,054,385

APPARATUS FOR DETERMINING THE POSITION OF A SPOT OF LIGHT ON A PLANE SURFACE

Desmond Wheable, Overton, England, assignor to Bell & Howell Limited, Basingstoke, England

Filed Aug. 23, 1976, Ser. No. 716,764

Claims priority, application United Kingdom, Aug. 27, 1975, 35439/75

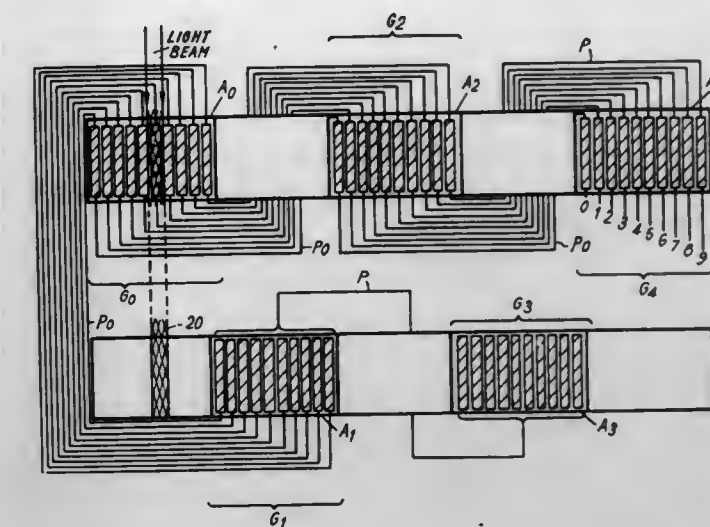
Int. Cl.² G01B 11/00

U.S. Cl. 356-138

39 Claims

1. Apparatus for determining the position on a substantially plane surface where a beam of light strikes the surface in relation to a datum position, comprising an electrooptic device having a common electrode on one surface and a plurality of spaced, segmental, electrodes in a predetermined pattern on the other surface to define a corresponding plurality of electrooptic cells of which at least one of the common electrode and the plurality of segmental electrodes is transparent, means for changing the light-transmission characteristics of the electrooptic cells in a predetermined sequence from a datum position, means for directing a beam of light towards the electrooptic device and detector means positioned in relation to the device and the light-directing means for detecting a change in the light-level of the beam transmitted through the electroop-

tic device when the light-transmitting characteristic of a cell receiving the beam is changed to provide a detector output signal and means responsive to the detector output signal for



providing an indication of the cell receiving the beam, thereby to provide an indication of the position on the surface of the electrooptic device struck by the beam.

4,054,386

APPARATUS FOR DETERMINING MUTUAL POSITIONAL RELATIONSHIP OF PLURAL PATTERNS IN A SINGLE VIEWING FIELD

Akiyoshi Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

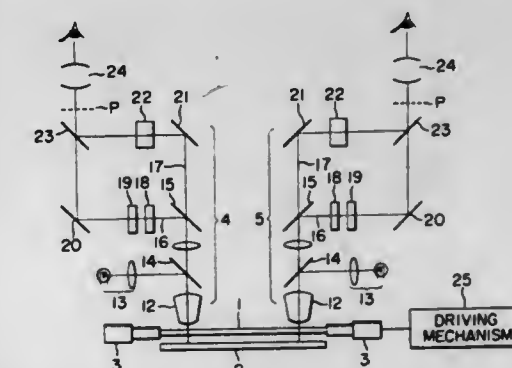
Filed July 13, 1976, Ser. No. 704,826

Claims priority, application Japan, July 17, 1975, 50-87555

Int. Cl.² G01B 11/26

U.S. Cl. 356-153

10 Claims



1. An apparatus for detecting mutual positional relationship of a first pattern and a second pattern present in a single viewing field, comprising:

an objective lens of which viewing field contains the first and second patterns of which mutual positional relationship is to be determined;

a beam splitter member provided between said objective lens and an image focusing plane for splitting a light beam containing information of the first and second patterns into a first light beam and a second light beam respectively advancing along first and second optical paths;

a beam recombiner for reuniting the first and second light beams and thus forming on the image focusing plane a first image of the first and second patterns by the first light beam passing along the first optical path and a second image of the first and second patterns by the second light beam passing along the second optical path;

image displacing means provided at least in one of the first and second optical paths for mutually displacing the second image of the first and second patterns formed by the second light beam passing through the second optical path with respect to the first image of the first and second patterns formed by the first light beam passing through

the first optical path so as to bring the second image to a position predetermined with respect to the first image; and means for detecting the amount of displacement performed by said image displacing means, the mutual positional relationship between the first and second patterns being determinable from the amount of the displacement.

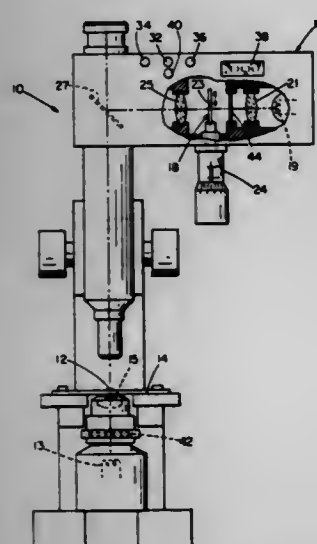
4,054,387 MEASURING WITH MICROSCOPE

James Whitton, Los Gatos, Calif., assignor to Vickers Instruments, Inc., Woburn, Mass.

Filed Dec. 22, 1975, Ser. No. 642,792
Int. Cl.² G01B 9/04, 11/04

U.S. Cl. 356—156

10 Claims



1. An inspection or measurement microscope including means for producing and projecting a fiduciary image of fixed form onto the field of view of the microscope concurrently with means for projecting the image of an object to be measured and a calibrated mechanism adapted to translate the fiduciary image relative to the object image along a straight line to effect measurement of said object, said means for producing said fiduciary image adapted to produce said fiduciary image in the form of first and second pre-defined fixed boundaries each demarcating visually appreciable areas of relatively light and dark value, said boundaries being movable relative to the object image in the direction of said straight line and the sequence of light and dark areas at one of the boundaries being the reverse of the sequence at the other boundary, said calibrated mechanism enabling said fiduciary image to be relatively translated to determine between each said fiduciary boundary and a respective boundary of the image of said object a visually determinable null position when the boundary of said fiduciary image exactly coincides with the boundary of said object image as determined visually by the relative brightness of areas at said boundaries, said apparatus enabling measurement of the width of said object by determination of the position of said calibrated mechanism at said null positions thereby avoiding the need to split a beam into two object images and to move said images relatively.

4,054,388 OPTICAL CONTROL MEANS

David Malcolm Marsh, and Richard Daniel Slater, both of Cambridge, England, assignors to T.I. (Group Services) Limited, Birmingham, England

Filed Aug. 22, 1975, Ser. No. 607,022

Claims priority, application United Kingdom, Aug. 22, 1974, 34259/74

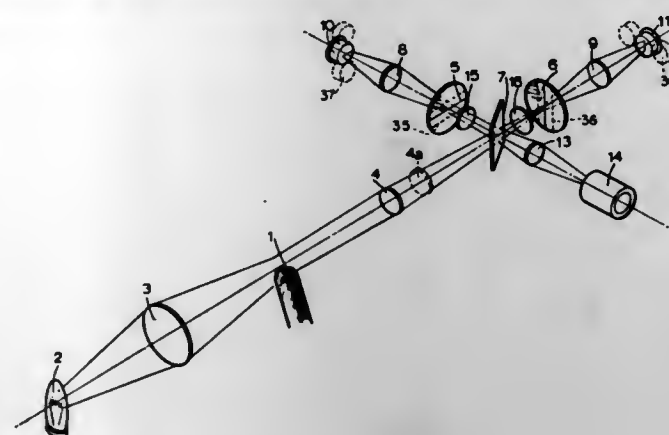
Int. Cl.² G01B 11/14

U.S. Cl. 356—172

12 Claims

1. Means for controlling the relative movement of a member towards a preset datum line, said means comprising an element in which an optical slit is formed, means causing an optical image of the region of said datum line to fall on said slit with

said datum line extending longitudinally of said slit, a photoelectric detector device placed to receive light radiation passing through said slit and an electric circuit connected to said photoelectric detector device, improved in that the said photoelectric detector device comprises an array of discrete photoelectric



tronic elements each associated with a different portion of the slit, and said electric circuit is operative to scan said photoelectric elements sequentially and produce an output signal when a preset change in incident light intensity is detected by any of said photoelectric elements indicating the presence of the movable member at the datum line.

4,054,389

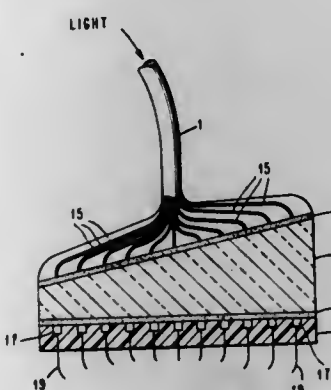
SPECTROPHOTOMETER WITH PHOTODIODE ARRAY
Theodore R. Owen, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 23, 1976, Ser. No. 724,795

Int. Cl.² G01J 3/50

U.S. Cl. 356—189

2 Claims



1. For use in a spectrophotometer for analyzing the spectra associated with a beam of light across a wide wave band, the combination of:

- a linear variable interference filter covering at least the spectrum of light to be analyzed;
- transmission means, comprising a fiberoptic bundle for carrying said beam of light, for causing said beam of light to impinge upon one side of said interference filter;
- the output end of said fiberoptic bundle comprising a plurality of fiberoptic strands distributed in a substantially linear manner across said one side of said interference filter, said strands being fixed to said interference filter;
- a linear array of photodiodes bonded to the other side of said interference filter for receiving light transmitted through said interference filter, said photodiodes each being operative to produce an electrical signal proportional to the intensity of light received by it; and
- means for selectively connecting said photodiodes to apparatus for measuring said electrical signal.

4,054,390

APPARATUS FOR INVESTIGATING FAST CHEMICAL REACTIONS BY OPTICAL DETECTION

Carl-Roland Rabl, Göttingen, Germany, assignor to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Germany

Division of Ser. No. 487,592, July 11, 1974, Pat. No. 3,972,627.

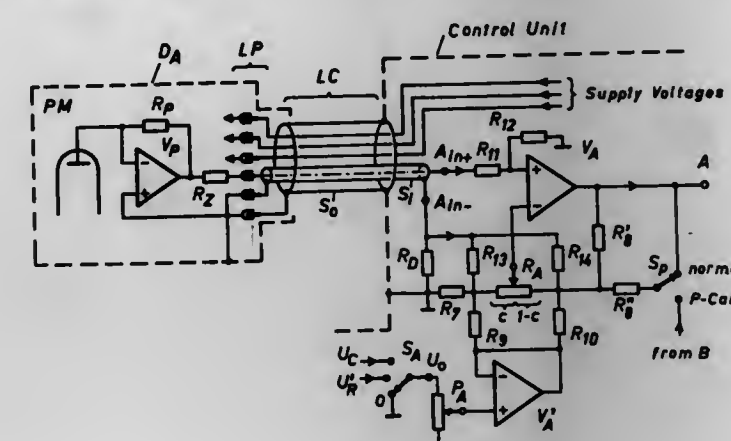
This application May 13, 1976, Ser. No. 686,029

Claims priority, application Germany, Dec. 19, 1973, 2363180

Int. Cl.² G01N 21/24

U.S. Cl. 356—206

3 Claims



1. In an apparatus for investigating the course of fast chemical reactions by optical detection, said reactions being initiated in a chemical system by an external perturbation using a high-voltage pulse, said apparatus comprising a sample cell holding a liquid sample of said chemical system, means performing said perturbation, monochromatic illumination means, a reference beam divider, at least one light path transversing said sample cell, and optical detection means including at least two photodetectors operatively connected to a signal processing unit provided with individual input amplifiers, the improvement wherein said photodetectors are arranged as individual photodetector heads in operative position, said photodetector heads comprising photomultiplier tube, dynode switching network, current-to-voltage transducer and housing and shielding means, said input amplifiers having differential input, each of said photodetector heads being connected to said signal processing unit by a shielded multi-lead cable and multi-lead connector, said cable comprising an inner shielded signal cable connected to said differential input, further comprising supply leads for operating said photomultiplier tube and said current-to-voltage transducer, and also respective photodetector head to the housing of said signal processing unit.

4,054,391

SPECULAR REFLECTANCE MICRODENSITOMETER
John C. Witte, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1975, Ser. No. 642,101

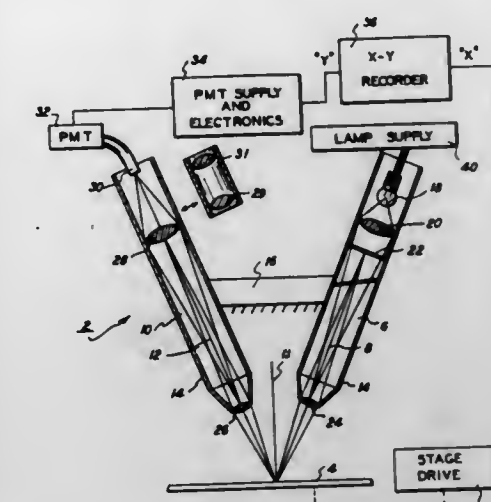
Int. Cl.² G01N 21/48

U.S. Cl. 356—209

3 Claims

1. A microdensitometer for measuring and recording relative reflectance of a specularly reflecting surface, including: an illuminating microscope disposed on an illumination optical axis relative to said reflecting surface and including a light source, a condenser lens, an aperture and a first objective lens in optical alignment along said illumination optical axis, said light source and said first objective lens being in conjugate relationship to said condenser lens, said aperture and said reflecting surface being in conjugate relationship relative to said first objective lens, a collecting microscope disposed on a reflection optical axis to said reflecting surface and including a second objective lens, a field lens, and an optical probe in optical alignment along said reflection optical axis, said reflecting surface and said field lens being in conjugate relationship relative to said second objective lens, said second objective lens

and said optical probe being in conjugate relationship relative to said field lens, said illumination and reflection optical axes being disposed at equal and opposite angles relative to said reflecting surface,



whereby an image of said reflecting surface is projected to said field lens to attenuate the light transmission of said field lens in proportion to the extent of particle coverage of said reflective surface.

4,054,392

RELEASABLE MECHANICAL JOINTS

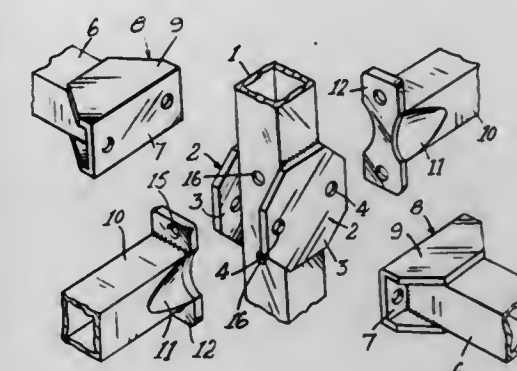
Frank C. Oppenheim, P.O. Box 31806, Braamfontein, 2017, Transvaal, South Africa

Filed Dec. 27, 1976, Ser. No. 755,544

Int. Cl.² F16B 9/00

U.S. Cl. 403—174

5 Claims



1. A system of structural members comprising a basic structural member having secured to opposite sides thereof a pair of corresponding plates which extend outwardly from the sides of the basic structural member, and are adapted to enable two secondary structural members to be secured thereto by means of releasable fasteners, and at least one further structural member having an end provided with two opposite recesses shaped to allow said end to fit between the plates with heads of any fasteners abutting the plates on the insides thereof located in the recesses, this end further having a flange for securing it to the basic structural member.

4,054,393

SNAP-LOCKING COUPLER

Ettore Talleri, Albonago di Vignello, Switzerland

Filed Apr. 12, 1976, Ser. No. 676,352

Claims priority, application Italy, Aug. 12, 1975, 5198/75

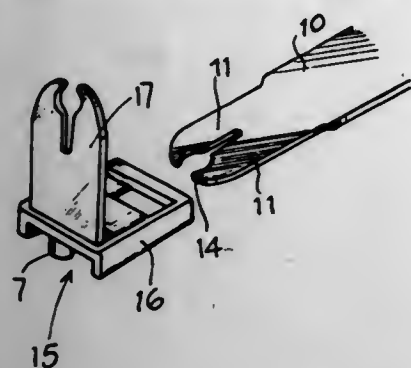
Int. Cl.² F16B 7/04

U.S. Cl. 403—174

10 Claims

1. A multi-component assembly comprising a coupler having upper and lower surfaces and a plurality of channelled seats

extending from the center thereof; at least one projection integral with each said seat; and a plurality of elongated laths



having a flexible bifurcated terminal at each end thereof and removably slidable in said respective channelled seat for engagement under snap pressure with said respective projection.

4,054,394

QUICK RELEASE LOCKING DEVICE

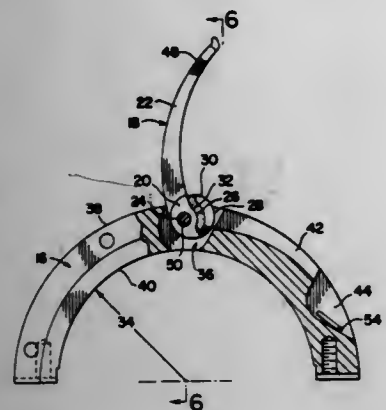
Don E. Neuman, Anderson, Ind., assignor to Dovey Manufacturing Company, Anderson, Ind.

Filed Dec. 1, 1976, Ser. No. 746,303

Int. Cl.² B26D 7/26

U.S. Cl. 403—344

9 Claims



1. A circular member locking device for use on a rotary shaft in which said circular member includes an aperture to receive said locking device therein comprising: a cylindrical cam; a hole eccentrically located through said cam and parallel to its longitudinal axis; a longitudinal slot in said cylindrical cam remote from said hole to form a resilient camming appendage; pin means receivable in said hole to rotatably mount said cylindrical cam in said aperture; and cam appendage biasing means interposed in said slot whereby when said circular member is mounted about said shaft, said cam appendage may be rotated into locking engagement with said shaft.

4,054,395

METHOD OF ERECTING MASS CONCRETE STRUCTURES

Alexandr Dmitrievich Kozlov, ulitsa Verkhaya Khokhlovka, 39/47, kv. 18; Boris Alexandrovich Krylov, ulitsa Kibaltchik, 12, korpus 2, kv. 153; Alexandr Vasilievich Lagolda, ulitsa Staroslobodskaya, 14, kv. 90; Viktor Petrovich Vetrov, ulitsa Kuskovskaya, 1, kv. 69, all of Moscow; Valentin Markovich Mikhailichenko, ulitsa Lenina, 7, kv. 22, Aprelevka, Moskovskoi oblasti, and Vladimir Sergeevich Isaev, naberezhnaya Fedorovskogo, 3, kv. 55, Gorky, all of U.S.S.R.

Filed June 17, 1976, Ser. No. 697,121

Int. Cl.² E02D 27/32; C04B 43/00; C08L 95/00

U.S. Cl. 404—79

2 Claims

1. A method for erecting mass concrete structures comprising: preparing a ground bed of frost-heaving or permafrost ground and covering it with an insulating cushion of dry concrete mix, laying on said cushion wet concrete mix, and compacting said wet concrete mix and heat-treating it.

4,054,396

TEMPLATE HOLDER

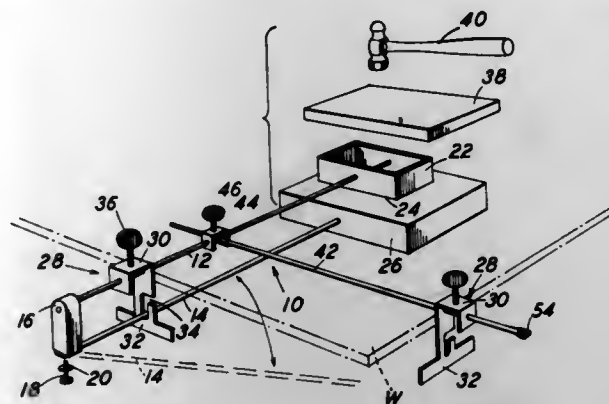
Charles E. Cassidy, P.O. Box 26, Star Lake, N.Y. 13690

Filed Aug. 24, 1976, Ser. No. 717,106

Int. Cl.² B23B 49/00; B25H 7/00

U.S. Cl. 408—91

9 Claims



1. A template holder comprising: a spacer block mounting a pair of rods one above the other in a parallel, horizontal planes, the lower one of said rods being pivotally connected to said block for movement in its horizontal plane relative to the upper one of said rods; template means fixed to an end of said upper rod; a backing block fixed to an end of said lower rod adapted to be positioned beneath said template means for clamping a workpiece therebetween; and a stop plate for abutment with the edge of a workpiece slidable on said upper rod, said stop plate including an inwardly and downwardly directed slot for receiving said lower rod in snap engagement.

4,054,397

WORK TOOL STABILIZING DEVICE

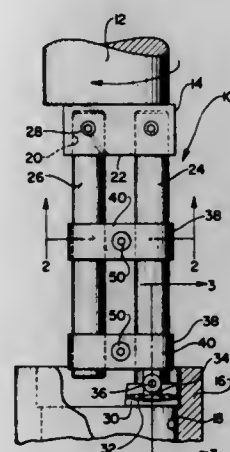
Edward C. Crevier, 9 Stoneham Drive, Riverside, R.I. 02915

Filed Jan. 17, 1977, Ser. No. 760,233

Int. Cl.² B23B 51/00; B26D 1/12; B23B 31/02, 29/00

U.S. Cl. 408—199

9 Claims



1. A device for stabilizing a work tool and the like comprising a first bar having means at one end thereof for supporting a tool, a second bar independent of such first bar and said tool and adapted for disposition in spaced parallel relationship to said first bar with one end thereof extending towards but spaced from said tool, connecting means including at least one rigid member adapted to span and interconnect said bars so as to stabilize movement of said tool during work, and a holding block having spaced openings for receipt of said other ends of said bars for positioning said bars with respect to each other.

4,054,398

CENTRIFUGAL COMPRESSOR OR CENTRIPETAL TURBINE

Robert Noel Penny, Solihull, England, assignor to Caterpillar Tractor Co., Peoria, Ill.

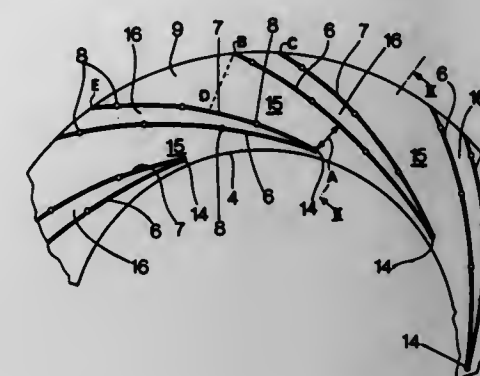
Filed July 28, 1975, Ser. No. 599,687

Claims priority, application United Kingdom, Aug. 8, 1974, 34917/74

Int. Cl.² F04D 29/44

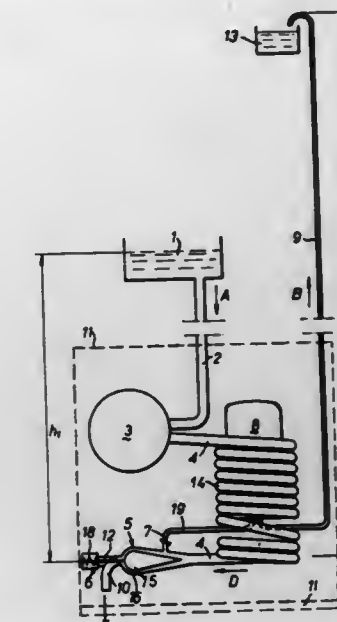
U.S. Cl. 415—211

7 Claims



1. A working fluid guidance assembly for a radial flow turbo-machine, the assembly comprising a pair of axially spaced walls defining an annular housing open at its inner and outer peripheries, each said wall having in the face thereof defining the interior of said housing a recess, a pair of plates located one in each said recess and a plurality of vanes extending between said plates and defining therewith, between adjacent vanes, working fluid passages open to the inner and outer peripheries of said housing, each vane comprising a pair of partitions having a common edge extending between said plates adjacent the inner periphery of the housing and spaced apart circumferentially at positions remote from the inner periphery of said housing, each said partition being of sheet form and supported at each axial edge thereof, said assembly also comprising adjacent each axial edge of each partition at least one interengaging pair of tongue and notch elements effecting the support of said partition, one element of each interengaging pair of elements provided on said partition adjacent the axial edge thereof to be supported by said interengaging pair of elements and the other element of said interengaging pair of elements supported by said plate adjacent said axial edge.

area and, when the valve is closed, to form a valve seat downstream of said gap (32) to close fluid communication through said ram valve (5), means (6; 20, 25, 31) coupled to the valve body (15) to adjust the relative axial travel of the valve body (15) in the housing (16) away from said valve seat and to form said gap (32),



force means (18, 27) acting on and biasing the valve (15) to open position counter the pressure exerted by fluid flow through the continuously constricting flow cross-sectional area; and a closed supply pressure vessel (3) having an air cushion therein connected upstream of the valve (5) in the supply line (4) and between the source (1, 2) of the fluid.

4,054,400

ENGINE PORT BRIDGING

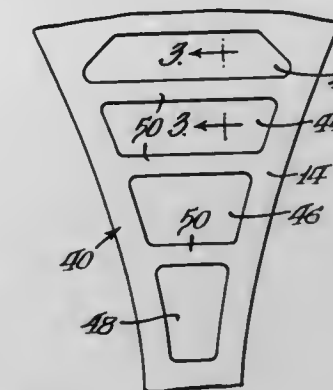
Ervin E. Mangus, Brimfield, and Alexander Goloff, East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1976, Ser. No. 675,024

Int. Cl.² F04C 29/04

U.S. Cl. 418—83

9 Claims



HYDRAULIC RAM VALVE UNIT

Alfred Maurer, Rankhofstrasse 30, 6006 Lucerne, Switzerland

Filed May 11, 1976, Ser. No. 685,309

Claims priority, application Switzerland, May 16, 1975, 6381/75

Int. Cl.² F04F 7/02

U.S. Cl. 417—226

22 Claims

1. Hydraulic ram valve unit comprising a supply line (4), a ram valve (5) in the supply line, a branch line (19) branching upstream from the valve (5), a branch pressure vessel (8) connected to the branch line (19) to supply fluid under pressure to a pressure supply riser and a check valve (7) in the branch line (7) preventing back flow from the branch pressure vessel (8) to the ram valve (5); the ram valve (5) including an elongated valve housing (16) and a movable valve body (15) in the housing, the valve housing being shaped to provide for smooth fluid flow therethrough, the valve body (15) being movable in a direction of its longitudinal axis, the valve body (15) and the valve housing (16) being relatively shaped to form, between the inner surface (36) of the valve housing (16) and the outer surface (35) of the valve body (15), in the direction of flow and when the valve is open, a gradually constricting gap (32), of smoothly continuously decreasing flow cross-sectional

1. An internal combustion engine, comprising: a. a housing having interior walls defining an operating chamber; b. a piston mounted for movement within said chamber and carrying at least one seal sealingly engaging an interior wall of said housing; c. an output shaft operatively associated with said piston and journaled within said housing; d. an exhaust port in said interior wall and comprised of a series of openings extending through said wall into said chamber and spaced from one another by at least one bridging element forming part of said housing; e. means defining at least one coolant passage within each said bridging element; and

f. said bridging element and said coolant passage being defined by at least one insert in said housing about said port of thin, tubular construction of high heat conductivity material and having a surface coated with a thin layer of wear resistant material defining a portion of said one wall; whereby said bridging element is cooled to maintain a good oil film at said exhaust port to minimize wear of said seal and said bridging element to support said seal as it moves across said exhaust port.

4,054,401

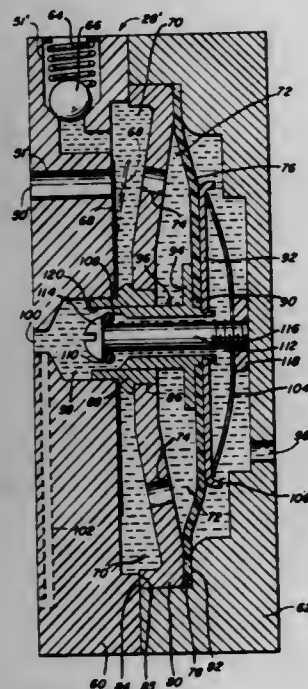
VACUUM PUMP WITH LUBRICANT CONTROL SYSTEM TO INTERRUPT LUBRICANT FLOW UPON LOSS OF PUMP PRESSURE

Vytautas Andriulis, Chicago, Ill., assignor to Central Scientific Company, Inc., Chicago, Ill.

Filed Jan. 16, 1976, Ser. No. 649,819
Int. Cl.² F01C 21/04; F04C 15/04, 29/02

U.S. Cl. 418-84

10 Claims

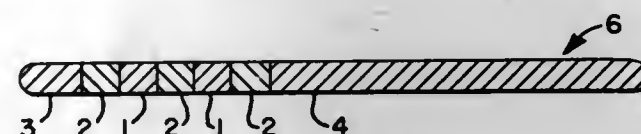


1. A vacuum pump comprising:
 - a stator assembly;
 - a pumping chamber, having an intake port and an exhaust port in communication therewith, located in said stator assembly;
 - a rotor in said pumping chamber being rotated to produce pumping action by drawing gases in said intake port and expelling gases and lubricant through said exhaust port;
 - a reciprocable plunger mounted in said stator assembly;
 - a flexible diaphragm mounted in said stator assembly with a fluid-tight seal and connected to said plunger with a fluid-tight seal, said diaphragm separating exhaust gases and lubricant on one side thereof from clean liquid lubricant on the other side thereof;
 - a lubricant conduit extending through said stator assembly, said diaphragm on said plunger to convey liquid lubricant from a bath immersing a portion of said stator assembly to said pumping chamber;
 - a sealing member; and
 - bias means urging said plunger toward said sealing means with a predetermined force, said diaphragm opposing said bias force with a force dependent upon the pressure at said exhaust port, so that upon the occurrence of inadequate pumping action said plunger will be forced against said sealing member to preclude introduction of lubricant into said pumping chamber.

4,054,402
APPARATUS FOR PRODUCING TUBULAR SHEATH-LIKE COVERINGS FOR ELECTRODES
Erik Sundberg, and John Andersson, both of Nol, Sweden, assignors to Aktiebolaget Tudor, Sundbyberg, Sweden
Filed Mar. 1, 1976, Ser. No. 662,916
Int. Cl.² B29C 17/00

U.S. Cl. 425-3

3 Claims



1. Apparatus for supporting a sheathing material comprising:
 - a mandrel comprising a sheath feed-in section, a sheath discharge section, a plurality of sections of magnetically conductive material disposed between said feed-in and discharge sections, and a plurality of essentially magnetically non-conductive sections disposed on opposite sides of and between said magnetically conductive sections to separate said magnetically conductive sections from each other and from said feed-in and discharge sections; and
 - a plurality of spaced magnets containing aligned circular apertures, said magnetically conductive sections being respectively disposed within said apertures and being centered therein by magnetic fields from said magnets applied uniformly around the periphery of said magnetically conductive sections; each magnetically conductive section forming a gap with its associated magnet sufficiently large to allow sheathing material to pass through said magnets.

4,054,403

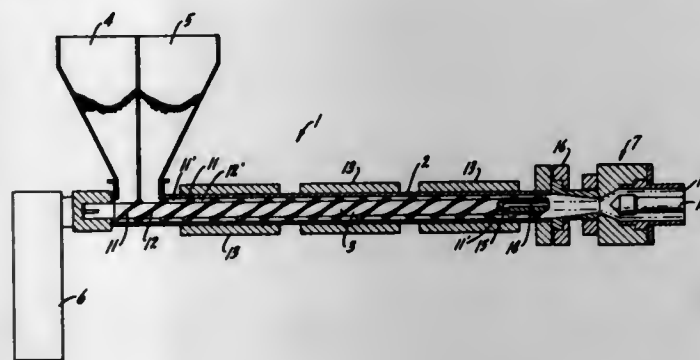
EXTRUDER WITH DUAL FLIGHTED EXTRUSION SCREW

Robert Lee Hornbeck, Mineral Wells, and Norman John Brozenick, Vienna, both of W. Va., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 16, 1976, Ser. No. 714,549
Int. Cl.² B29F 3/06

U.S. Cl. 425-133.1

2 Claims



1. A screw extruder adapted to convey thermoplastic materials from inlet to outlet in separate streams comprising a screw body rotatable within a barrel defining a cylindrical chamber having an inner wall, a feed inlet at one end of said chamber and a shaping die on the other end thereof, said screw body having a plurality of different, parallel flights on its outer surface providing a plurality of different parallel channels or passageways between the outer surface of the screw body and the inner wall of the barrel throughout substantially the axial extent of said chamber from said inlet to said die to prevent any mixing of the materials, and a plurality of separate feed hoppers connected to said feed inlet adapted to feed thermoplastic materials separately to the plurality of different parallel channels or passageways simultaneously.

4,054,404

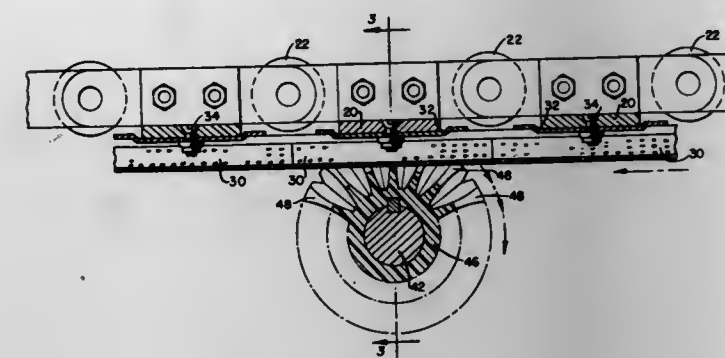
ROTATING DOCTOR BLADE

Mose Jackson Marsh, Chickamauga, Ga., assignor to Standard Brands Incorporated, New York, N.Y.

Filed June 7, 1976, Ser. No. 693,734
Int. Cl.² A21C 11/00, 15/02

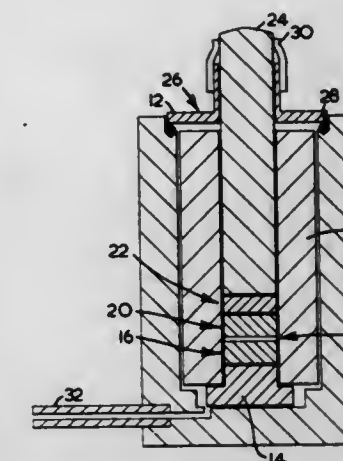
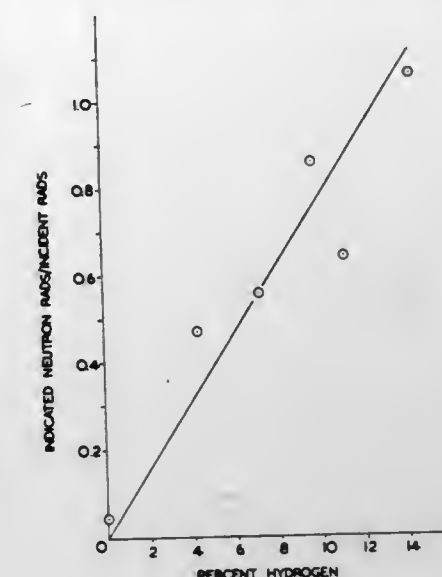
U.S. Cl. 425-231

3 Claims



1. A rotating doctor blade assembly for contacting and cleaning a mold for a food product, the assembly including:
 - a. an endless and rotatable segmented belt having upper and lower runs;
 - b. the belt carrying a plurality of aligned molds for a food product, each mold being of part cylindrical configuration, the longitudinal axes of the molds being coaxial along the belt, and parallel to the longitudinal axis of belt, the convex portion of the molds facing upwardly on the upper belt run and downwardly on the lower belt run;
 - c. a generally cylindrical doctor blade having a concave periphery, the doctor blade mounted for rotation about its longitudinal axis, with its longitudinal axis at right angles to the lower belt run and below it, the concave periphery of the doctor blade being of such size and extent to receive the complimentary sized convex surface of the mold, the doctor blade mounted in a position such that as it rotates it contacts and scrapes the convex surface of each mold as the endless segmented belt upon which the molds are mounted rotates.

second inserts being greater than that of the barrel whereby the lateral forces and the sealing between the



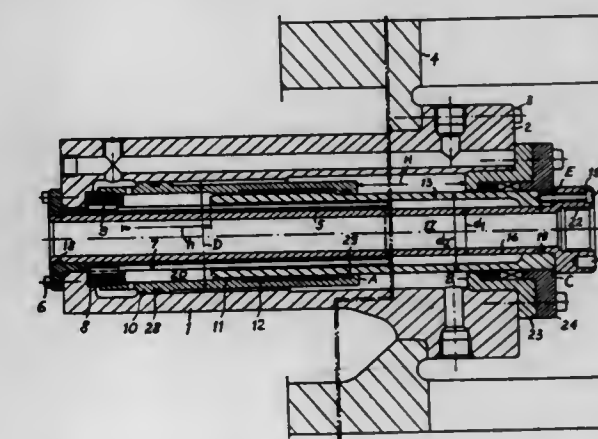
inserts and the barrel is enhanced at elevated temperatures.

4,054,406

HYDRAULIC EJECTOR OPERATING MECHANISM
Edwin Rüegg, Netstal, Switzerland, assignor to Maschinenfabrik und Giesserei Netstal AG, Switzerland
Continuation of Ser. No. 547,500, Feb. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 376,290, July 5, 1975, abandoned. This application May 13, 1976, Ser. No. 686,260
Int. Cl.² B29F 1/14

U.S. Cl. 425-444

7 Claims



4,054,405
THERMOLUMINESCENT DETECTOR FOR MIXED GAMMA AND FAST NEUTRON RADIATIONS
Robert A. Facey, Ottawa; Raynald A. Gravelle, Touraine, and Harry Sheffer, Ottawa, all of Canada, assignors to National Defence of Canada, Canada
Division of Ser. No. 543,014, Jan. 21, 1975. This application Mar. 10, 1976, Ser. No. 665,679
Claims priority, application Canada, Jan. 30, 1974, 191390
Int. Cl.² B30B 11/04

U.S. Cl. 425-405 R

5 Claims

1. A hot-pressing die for processing discs of chemical compounds, said die comprising:
 - i. a barrel closed at one end and open at the other end,
 - ii. a piston insert is slidable within said barrel,
 - iii. a first insert disposed within said barrel and abutting the closed end thereof,
 - iv. a second insert disposed and slidable within said barrel and spaced from said first insert to provide a space for a quantity of the said chemical compound, the said second insert being pressed into engagement with said compound by the said piston exerting a force on the second insert, the coefficient of linear expansion of the first and

1. In a hydraulic operating mechanism operably connected to a mold for ejecting a workpiece from a mold, including an ejector cylinder, the improvement comprising, in combination, an ejector piston movable axially of said cylinder; an externally threaded adjusting bush; said piston extending through said

adjusting bush and being fixedly connected thereto; an internally threaded sleeve mounted in said cylinder for movement axially thereof; means fixing said internally threaded sleeve against rotation; and abutment means operable to limit axial movement of said sleeve; said adjusting bush being threadedly engaged in said sleeve, whereby the axial position of said sleeve relative to said adjusting bush can be varied by rotating said ejector piston to determine the stroke of said ejector piston.

4,054,407

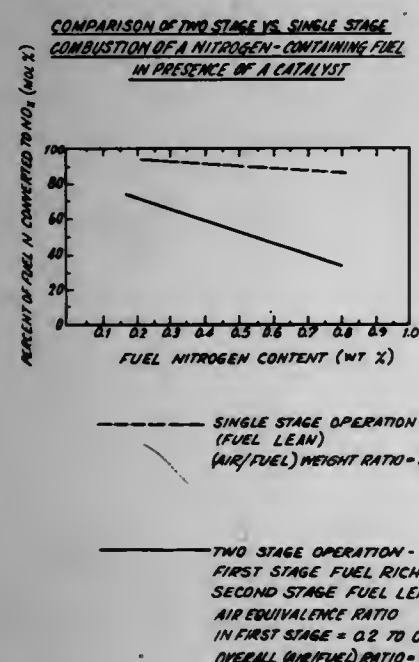
METHOD OF COMBUSTING NITROGEN-CONTAINING FUELS

Robert V. Carrubba, Bridgewater; Ronald M. Heck, Frenchtown, and George W. Roberts, Westfield, all of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.
Filed Dec. 29, 1975, Ser. No. 644,868

Int. Cl.² F23M 3/04

U.S. Cl. 431-10

23 Claims



1. The method of combusting nitrogen-containing fuel while suppressing formation of oxides of nitrogen from said nitrogen contained in the fuel, comprising:

forming a first mixture of said fuel and an amount of air substantially less than the amount needed for complete combustion of all the combustible components in said fuel but sufficient to support substantial combustion of said fuel

combusting said first mixture in a first combustion zone in the presence of a catalyst, having an operating temperature below a temperature that would result in any substantial formation of oxides of nitrogen or other fixed nitrogen compounds from atmospheric nitrogen present in said mixture, to form a first effluent;

mixing said first effluent with an additional amount of air at least sufficient for complete combustion of all combustible components remaining in said first effluent to form a second mixture;

and combusting said second mixture in a second combustion zone below a temperature that would result in any substantial formation of oxides of nitrogen from atmospheric nitrogen.

4,054,408

METHOD FOR OPTIMIZING THE POSITION OF A FURNACE DAMPER WITHOUT FLUE GAS ANALYZERS

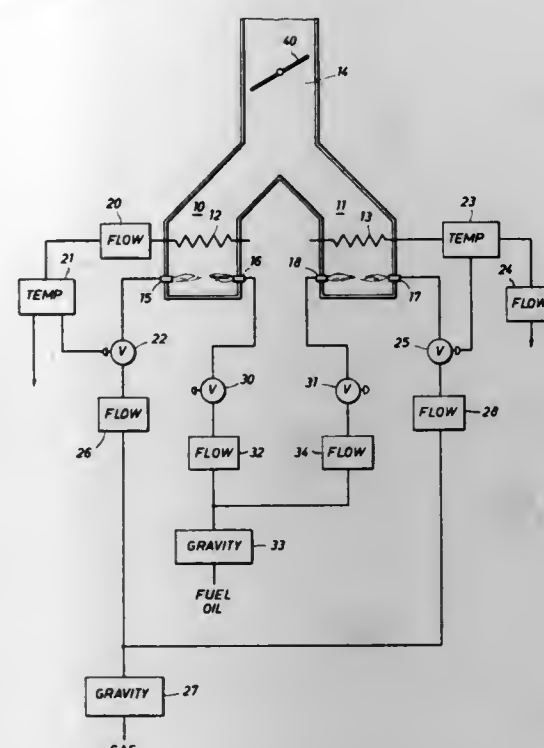
Robert E. Sheffield; Robert L. Chew, both of Metairie, La., and Charles R. Cutler, Katy, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 30, 1976, Ser. No. 719,031

Int. Cl.² F23K 5/00

U.S. Cl. 431-12

12 Claims



1. A process for optimizing the combustion of fuel in a furnace comprising:
measuring the fuel flow to the furnace per unit of time;
measuring the density of the fuel;
using the measured fuel flow and density to convert the fuel flow to the total weight of carbon and hydrogen supplied to the furnace per unit of time;
calculating the air flow required per unit of time for combusting the total weight of carbon and hydrogen plus the additional air flow required for excess oxygen; and
adjusting the air flow to the furnace in response to the calculated air flow.

4,054,409

SWIRLING BURNERS FOR USE IN HOT BLAST STOVES

Ryo Ando; Kazuo Sano, and Takao Miyazaki, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

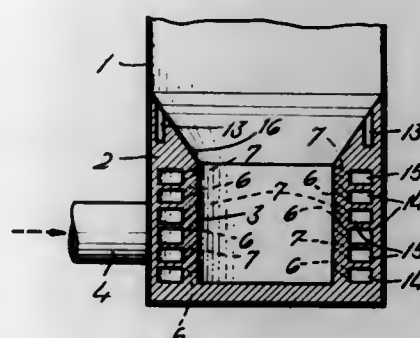
Filed May 12, 1976, Ser. No. 685,686

Claims priority, application Japan, May 15, 1975, 50-56714

Int. Cl.² F23C 5/18

U.S. Cl. 431-173

8 Claims



1. In a swirling burner for use in a hot blast stove, comprising:
a vertical combustion chamber; and
an annular blast member located beneath said combustion

chamber substantially in coaxial relationship therewith for forming a swirling flow of a gas and air mixture, said annular blast member including: a central cylindrical space; a plurality of fuel gas passages and a plurality of air passages arranged about said cylindrical space; and a plurality of fuel gas openings and air blow openings respectively connected to said fuel gas and said air passages; the improvement wherein:
the diameter of said cylindrical space is smaller than that of said combustion chamber;
said plurality of fuel gas and air passages are vertically alternately superposed above one another; and
said fuel gas and said air blow openings directly open into said cylindrical space and are inclined in the same horizontal direction with respect to the radii from the axis of said cylindrical space, and are further inclined with respect to the vertical axis of said cylindrical space.

4,054,410

FUSING DEVICE

Richard J. Murphy, Norwood, Mass., assignor to Xerox Corporation, Stamford, Conn.

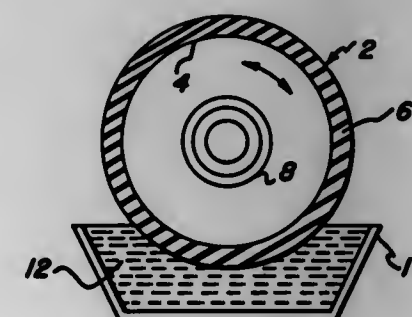
Division of Ser. No. 497,410, Aug. 14, 1974, Pat. No. 3,976,814.

This application May 3, 1976, Ser. No. 682,944

Int. Cl.² F27B 9/28; G03G 21/00

U.S. Cl. 432-60

6 Claims



1. A fusing device for use in a xerographic reproducing apparatus for fixing a resin-based powder image to a substrate comprising a fusing member having a water-degradable silicone rubber outer surface; means for heating the outer surface of the fuser member to form thereon a degradation product in

the presence of water; means for applying water to the surface of the fuser member; and means for contacting the heated fuser member with a substrate having a resin-based powder thereon.

4,054,411

HIGH TEMPERATURE FURNACE DOOR SEAL

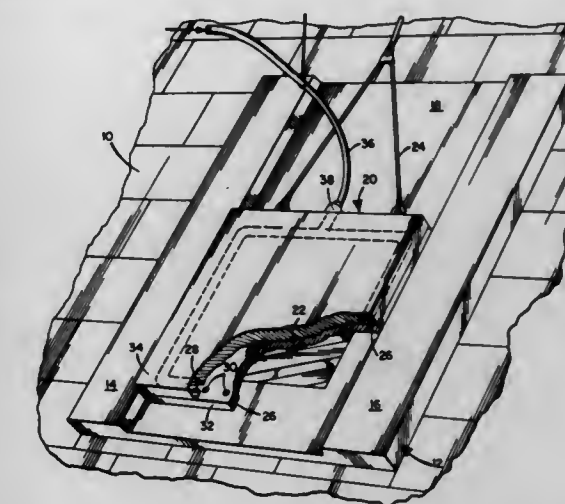
Jacob Howard Beck, Waban, Mass., assignor to BTU Engineering Corporation, North Billerica, Mass.

Filed June 22, 1976, Ser. No. 698,739

Int. Cl.² F27D 1/18

U.S. Cl. 432-242

7 Claims



7. For use in apparatus having an environmental chamber in which a predetermined gas environment is to be maintained, a door by which the chamber is accessible and having a surface for mating with a surface of said apparatus, a door seal comprising:

a gas orifice provided in at least one of said mating surfaces;
a gas supply path in fluid coupling relationship with said orifice, and

means for introducing sealing gas to said gas supply path to cause flow of sealing gas from said orifice between said mating surfaces thereby to prevent leakage of the gas contained within said chamber and leakage of air into the chamber.

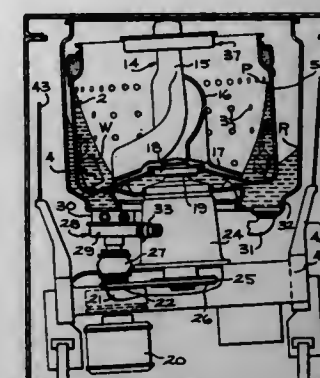
CHEMICAL

4,054,412 CLOTHES WASHING MACHINE AND METHOD OF WASHING CLOTHES

John F. Brummett, and Joseph L. Todd, both of Louisville, Ky.,
assignors to General Electric Company, Louisville, Ky.
Filed Dec. 9, 1976, Ser. No. 748,907
Int. Cl.² D06F 23/04, 37/24

U.S. Cl. 8—158

7 Claims



6. The method of improving unbalance capacity in a clothes washing machine during the centrifugal water extraction operation, said clothes washer including a tub, a clothes receiving basket in the tub, said basket having perforations arranged in a pattern from the top to the bottom of the side wall, a pump for removing water from the tub, the improvement comprising: accelerating the basket from zero to over 220 revolutions per minute; retaining between 20 and 40% of the initial water in the machine as measured under water only load conditions until 220 revolutions per minute is reached, and pumping water continuously from between the basket and tub during basket acceleration from zero to 220 revolutions per minute and discharging it from the machine, and restricting the flow of water from the basket to the tub such that the level of water between the tub and basket is lower than the level of water in the basket.

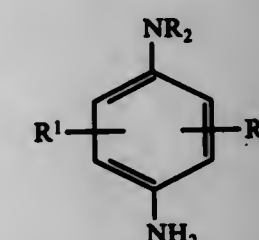
4,054,413 AUTOXIDIZABLE HAIR DYE CONTAINING PREPARATIONS

Raymond Feinland, Stamford, Conn.; Sigmund Iscowitz, Flushing, and Milos S. Bil, Forest Hills, both of N.Y., assignors to Clairol Incorporated, New York, N.Y.
Continuation-in-part of Ser. No. 489,317, July 17, 1974, Pat. No. 3,920,384. This application Apr. 23, 1975, Ser. No. 570,675
The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.
Int. Cl.² A61K 7/13

U.S. Cl. 8—10.2

6 Claims

3. In a process for preparing a hair dye composition comprising a solution of a tinctorially effective amount of:
a. a p-phenylenediamine of the formula



or an acid addition salt thereof; where R is hydrogen, 2-hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, or 2,3-dihydroxypropyl and where R¹ and R², which may be the same or different, are hydrogen or methyl; and
b. a tinctorially effective amount of a triol selected from the group 1,2,4-benzenetriol and 2,4,5-trihydroxytoluene; the improvement which comprises performing a solution containing a tinctorially effective amount of the triol by storing the triacetate of said triol at a temperature between

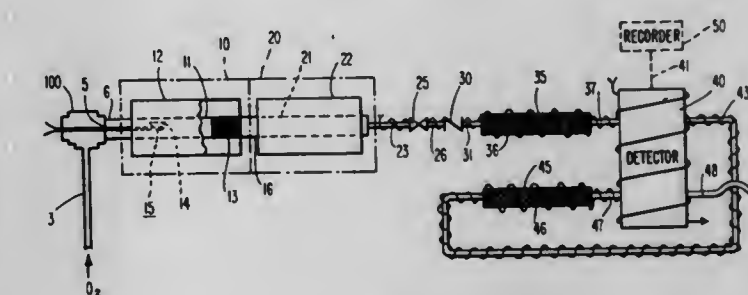
about room temperature and 50° C for about 12 to 72 hours with a lower aliphatic alcohol having from 1 to 3 carbon atoms and a concentrated inorganic mineral acid selected from the group consisting of sulfuric and hydrochloric, and then incorporating in said preformed solution water and a composition containing a tinctorially effective or an acid addition salt thereof.

4,054,414 GAS CHROMATOGRAPHIC METHOD FOR THE MULTI-ELEMENTAL MICROANALYSIS OF ORGANIC MATERIALS

Robert Lee Grob, Malvern, Pa., and Peter Wilson Rulon, Oxford, N.Y., assignors to Villanova University, Villanova, Pa.
Filed Nov. 30, 1976, Ser. No. 745,995
Int. Cl.² G01N 31/12

U.S. Cl. 23—230 PC

15 Claims



1. Method for the elemental analysis of an organic material to determine the content of each of the elements, carbon, hydrogen, sulfur, chlorine, bromine and iodine, said method comprising:

- substantially instantaneously igniting and rapidly combusting a small sample of a known weight of said organic material in a combustion zone containing a contact catalyst and maintained at an internal temperature in the range of from about 675° C. to about 725° C., and through which zone a stream of oxygen continuously flows in greater than stoichiometric quantities and at a pressure in the range of from about 6 p.s.i.g. to not greater than about 10 p.s.i.g.;
- conducting the gaseous mixture of oxygen and combustion products from said combustion zone through an equilibrium zone maintained at an elevated internal temperature sufficient to preclude substantially the formation of sulfur trioxide;
- conducting the gaseous mixture of oxygen and combustion products from said equilibrium zone through gas chromatographic separation means whereby the combustion products of the said elements are separated each from the others; and
- conducting the effluent from said gas chromatographic separation means through a detector means which separately and quantitatively measures the amount of the combustion product of each of the said elements, from which amounts the content of each of said elements in said organic material may be calculated.

4,054,415 BODY FLUID AND BLOOD ELECTROLYTE ANALYZER

David Seligson, Woodbridge; Stephen Clark Wardlaw, Branford, and Philip C. Surh, Hamden, all of Conn., assignors to Yale University, New Haven, Conn.

Filed Oct. 28, 1975, Ser. No. 626,060

Int. Cl.² G01N 1/14, 1/16, 1/18

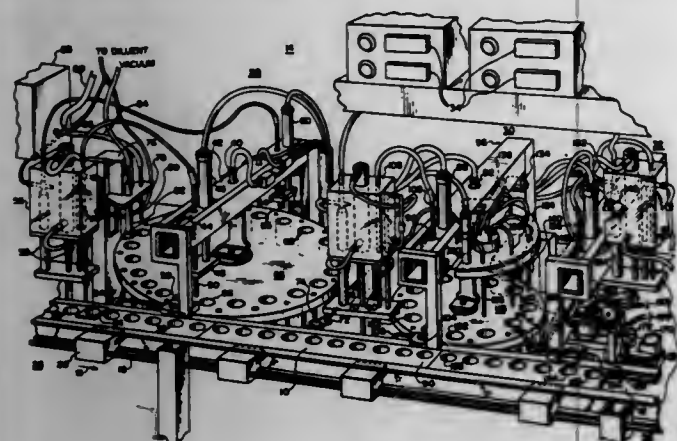
U.S. Cl. 23—253 R

68 Claims

1. An apparatus for testing a body fluid, such as for blood electrolytes in a blood sample including in combination; means for moving a plurality of blood samples serially and in a linear manner along a track from an input to an output, a first testing station for testing at least a first sample constit-

uent, said first testing station including means for removing a first portion of said sample at a first location along said track, first rotating means for receiving and storing said first portion in a container and for rotating said container to a first testing position at a first time, first testing means for testing said first portion while at said first testing position,

a second testing station for testing a second sample constituent, said second testing station including means for removing a second portion of said sample at a second location along said track, a second rotating means for receiving and storing said second portion in a container and for



rotating said container to a second testing position at said first time, second testing means for testing said second portion while at said second testing position,

a third testing station for testing a third sample constituent, said third testing station including means for removing a third portion of said sample at a third location along said track and testing means for receiving said third portion and operative to test same at said first time whereby said first, second and third tests are performed simultaneously, and

output means coupled to said first, second and third testing stations for simultaneously providing said test results.

4,054,416 APPARATUS FOR USE IN INVESTIGATING SPECIMENS

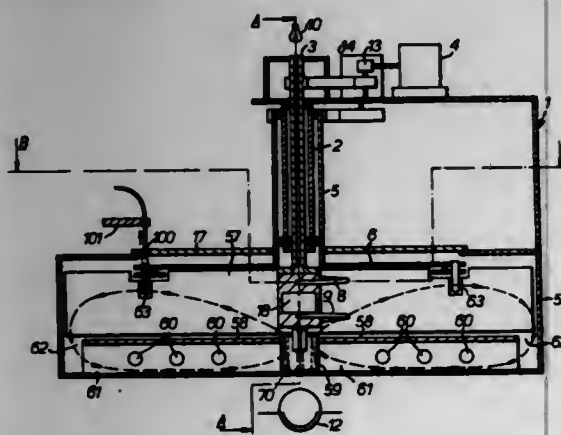
Ian David Duff, New York, N.Y., assignor to Secretary of State for Social Services, London, England

Filed Aug. 11, 1976, Ser. No. 714,677

Int. Cl.² F27D 11/00; B01L 7/02, 9/06; G01N 1/10

U.S. Cl. 23-259

6 Claims



1. Apparatus for use in investigating liquid specimens comprising a substantially horizontal turntable having a central rotational axis and being adapted to support a plurality of vessels for liquid specimens in a circular array centered on the said rotational axis such that the vessels extend below the underside thereof; means for stepwise rotation of the turntable for specimen investigation during dwell periods; an enclosure disposed beneath the turntable to define a space bounded laterally and at the bottom of said enclosure and upwardly by the turntable and into which the vessels extend when positioned in

the turntable; temperature changing means for changing the temperature of air in said space; air circulating means disposed in said space and arranged to circulate air between the temperature changing means and the vessels wholly within said space; a control device for the air temperature changing means arranged to maintain the temperature of the vessels substantially at a predetermined value; and a liquid dispenser mounted adjacent the turntable for dispensing liquid specimens into different vessels in the turntable during respective dwell periods thereof, the dispenser comprising a tubular body of a high thermal conductivity having an inlet through which liquid may enter said tubular body, and an outlet which comprises a dispensing tip of high thermal conductivity through which liquid may leave the tubular body, said tubular body also including a cavity adjacent said outlet, the dispenser being provided with means for charging the tubular body with liquid by way of said inlet and for dispensing predetermined quantities of such liquid, said tubular body including an electric heating coil, wound around substantially its length and a thermistor positioned in said cavity to control said heating coil to maintain the temperature of the liquid being dispensed substantially at a predetermined value.

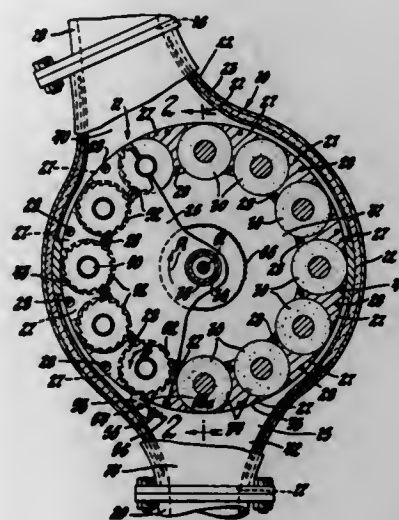
4,054,417 REGENERATIVE-FILTER-INCINERATOR DEVICE Theodore L. Rosebrock, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 23, 1976, Ser. No. 753,722

Int. Cl.² F01N 3/15; B01J 8/10

U.S. Cl. 23-277 C

4 Claims



1. A regenerative-filter-incinerator, for use in the exhaust system of an internal combustion engine of the type using diesel oil, said regenerative-filter-incinerator including a housing means of substantially drum-shaped configuration having an inlet at one end thereof and an outlet at the opposite end thereof, a hollow, cylindrical, regenerator-filter cage means rotatably supported in said housing, said regenerator filter cage means containing a ring-like arrangement of a plurality of heat exchange-filter means pervious to flow substantially radially therethrough with each of said heat exchange-filter means being supported for independent rotation, said regenerator-filter cage means forming with and dividing said housing means into an inlet flow path for exhaust gases adjacent said inlet and an outlet flow path adjacent said outlet with a reaction chamber substantially defined by the ring-like arrangement of said heat exchange-filter means intermediate therebetween and in flow communication therewith by radial flow through said heat exchange-filter means, drive means operatively connected to said regenerator-filter cage means for effecting rotation thereof at a first predetermined speed, second drive means operatively connected to said heat exchange-filter means to effect rotation thereof at a second predetermined speed and, auxiliary heater means operatively connected to said reaction chamber to supply additional heat to maintain exhaust gases

within said reaction chamber at a temperature for secondary combustion, said heat exchange-filter means being operative to heat up incoming exhaust gases flowing through said inlet flow path while filtering out particulates therefrom and to take up heat from the exhaust gases flowing from said reactor chamber into said discharge flow path.

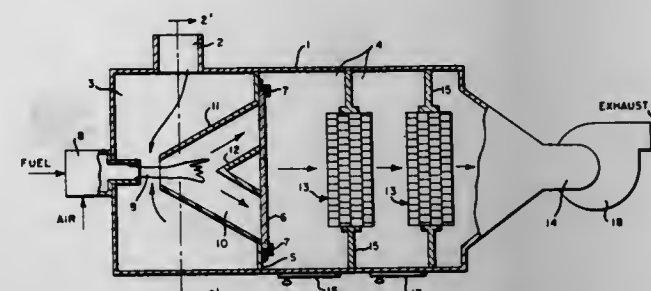
4,054,418 CATALYTIC ABATEMENT SYSTEM Steven T. Miller, Wilmington, Del., and William G. Hardison, Orangeburg, S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 10, 1975, Ser. No. 630,408

Int. Cl.² B01J 8/02, 35/04; F01N 3/10, 3/15

U.S. Cl. 23-277 C

3 Claims



1. In a catalytic thermal incinerator for removing undesirable components from an effluent gas stream having an elongated housing divided into a preheat section and a catalytic reactor section by transverse filter means, burner means positioned at an end of said housing to discharge hot burner gases axially into said preheat section, effluent gas inlet means connected to said preheat section, at least one transverse catalyst module in the catalytic reactor section, gas outlet means downstream of the catalyst module connected to said catalytic reactor section and blower means for moving gases through the housing, the improvement comprising:

a. in the preheat section a hollow frusto-conical baffle open at its smaller end and secured at its larger end to the transverse filter, said filter being provided with a diffuser cone secured at its base to the filter and oriented coaxially with said frusto-conical baffle, thereby forming an annular passage in which gases are mixed to give uniform distribution of heat and flow of the gases at the catalyst.

4,054,419 APPARATUS FOR CONDUCTING CHEMICAL REACTIONS IN THE PRESENCE OF TWO OR MORE FLUID PHASES

Glen C. Smith, and Frederick W. Sanders, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio
Continuation of Ser. No. 356,469, May 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 87,503, Nov. 6, 1970, abandoned. This application Oct. 23, 1974, Ser. No. 517,246

Int. Cl.² B01J 8/02, 21/18, 35/10

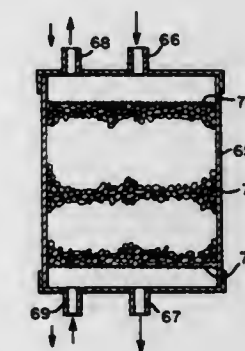
U.S. Cl. 23-288 A

2 Claims

1. Apparatus for conducting a thermodynamically spontaneous redox reaction, in which the free energy change is negative, between an aqueous fluid reductant reactant and air as a fluid oxidant reactant, said aqueous reductant reactant and said air forming an interface when in contact with each other, comprising

a. a column reaction chamber for receiving said fluid reactants,
b. a fixed bed of stationary solid catalyst particles positioned within said reaction chamber as a packing therein for catalyzing said reaction so as to produce reaction products, said solid catalyst particles being carbon particles having surface portions in contact with a hydrophobic sub-

stance consisting of polytetrafluoroethylene resin without being completely encapsulated by or encapsulating said hydrophobic material and resulting from treatment with from 0.1 to 100% by weight of carbon of said polytetrafluoroethylene resin, so as to prevent flooding of said catalyst particles by said aqueous fluid reactant and said solid catalyst particles being relatively free from chemical attack by said oxidant reactant, said reductant reactant and said reaction products,



c. means to introduce said aqueous fluid reductant into the top of said reaction chamber and into contact with said solid catalyst particles positioned within said chamber without significantly agitating said catalyst particles,
d. means to introduce said air into the top of said reaction chamber for concurrent downward flow with said aqueous reductant reactant and in contact with said solid catalyst particles without significantly agitating said catalyst particles thereby effecting the redox reaction, and
e. means for recovering unreacted reactants and reaction products.

4,054,420 PROCESS FOR THE DESULFURIZATION OF CARBONACEOUS FUELS WITH AQUEOUS CAUSTIC AND OXYGEN

James R. Longanbach, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Apr. 11, 1974, Ser. No. 460,155

Int. Cl.² C10L 9/10; C10B 57/00

U.S. Cl. 44-1 R

17 Claims

13. A process for reducing the sulfur content of carbonaceous fuel comprising the following steps:

a. introducing particulate carbonaceous fuel containing sulfur into an aqueous solution of caustic, said caustic comprising an alkali metal or an alkaline earth metal compound of a hydroxide, an oxide, a carbonate, or mixtures thereof;
b. heating said aqueous solution of caustic containing said particulate carbonaceous fuel to a temperature of about 200° to about 1600° F;
c. introducing into said solution which is maintained at a temperature of about 200° to about 1600° F, at least about 2 grams of oxygen for every one percent by weight of sulfur initially present in said particulate carbonaceous fuel for a period of time of about 1 minute to about 300 minutes, thereby reducing the sulfur content of said particulate carbonaceous fuel; and
d. removing said particulate carbonaceous fuel from said aqueous solution of caustic after said treatment with said oxygen in said aqueous solution of caustic.

4,054,421

METHOD FOR DESULFURIZING CHAR BY ACID WASHING AND TREATMENT WITH HYDROGEN GAS

Leon Robinson, Upland, and Allan Sass, Los Angeles, both of Calif., assignors to Occidental Research Corporation, La Verne, Calif.
Continuation of Ser. No. 541,175, Jan. 15, 1975, abandoned, which is a continuation of Ser. No. 461,897, April 18, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,900
Int. Cl.² C10L 9/10; C10B 57/00

U.S. Cl. 44-1 F

8 Claims

1. In a method for desulfurizing char, the steps comprising:
 - a. washing the char with an acid to react with and leach-out the inorganic compounds therein,
 - b. substantially removing said acid and said leached-out inorganic compounds formed in step (a) from said char, and
 - c. desulfurizing said acid washed char by treatment with a gas comprising hydrogen.
5. In a method for desulfurizing char, the steps comprising:
 - a. washing said char with an aqueous mineral acid in a concentration of at least 0.05 M. for at least about five minutes and in a ratio or at least about two parts of acid to about one part of char to react with and leach-out the inorganic compounds therein,
 - b. substantially removing said acid and said leached-out inorganic compounds formed in step (a) from said char, and
 - c. desulfurizing said acid washed char by treatment with a gas comprising hydrogen.

4,054,422

MANNICH BASES CONTAINING TERTIARY AMINES AND FUEL COMPOSITIONS CONTAINING SAID MANNICH BASES

Bruce Hollis Garth, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.
Filed Sept. 12, 1975, Ser. No. 612,726
Int. Cl.² C10L 1/22

U.S. Cl. 44-73

10 Claims

1. A composition of the formula



wherein Z is an alkyl- and hydroxy-substituted benzyl group wherein the alkyl has 20 to 1000 carbon atoms; n is 2 or 3; R is an alkyl of 1 to 20 carbon atoms; b is 1 to 5 and c is 1.

8. A composition comprising a major proportion of a normally liquid hydrocarbon boiling in the gasoline range and from 0.005 to 0.06 weight percent of the composition according to claim 1.

10. A concentrated solution in a hydrocarbon solvent boiling in the gasoline boiling range of 32° C to 205° C, of from 10 to 90 weight percent of the composition according to claim 1.

4,054,423

VARIABLE PRESSURE FUEL GENERATOR AND METHOD

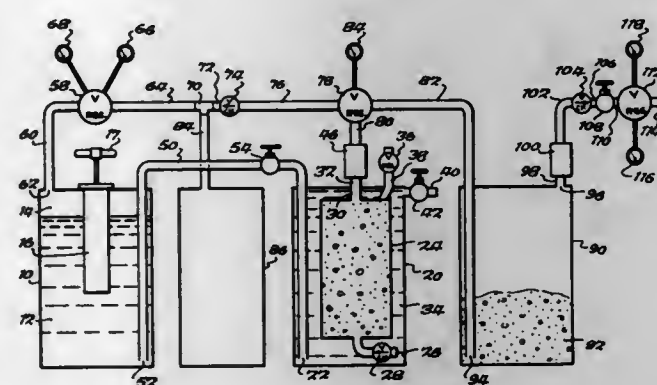
Orman L. Blenman, 69 Drexel Road, Buffalo, N.Y. 14214
Filed July 21, 1975, Ser. No. 597,342
Int. Cl.² C10H 5/00

U.S. Cl. 48-2

8 Claims

1. Apparatus for generating gas from the reaction between a first reactant in liquid form and a second reactant, said apparatus comprising:
 - a. means defining a gas-tight region containing the liquid reactant;
 - b. means for pressurizing the space over the liquid reactant in the gas-tight region;
 - c. means defining a gas-tight reaction zone containing the second reactant and having a gas product outlet for removing generated gas;
 - d. means for placing said gas-tight region in communication

- e. conduit means connected at one end to said gas product outlet of said reaction zone and at the other end to said gas-tight region for supplying a portion of the gas product to said region to maintain pressure over the liquid reactant;
 - f. pressure regulator means operatively connected to said conduit means for limiting the magnitude of pressure applied to said liquid reactant to a selected system operating pressure;
 - g. check valve means in said conduit means between said pressure regulator means and said gas product outlet allowing flow only in a direction from said outlet toward said regulator;
 - h. second pressure regulator means operatively connected to said conduit means between said check valve means and said gas product outlet, said second pressure regulator means limiting the pressure magnitude of generated gas product at a level above the selected system operating pressure as limited by said first-named pressure regulator means; and
 - i. reservoir means operatively connected to said conduit means between said first named regulator and said check valve means for storing a constant volume of gas product.
8. A method of generating acetylene gas by the reaction between water and calcium carbide comprising the steps of:
- a. providing a quantity of water in a gas-tight enclosure in a manner providing an empty region over said water;



- b. pressurizing said region over said water;
- c. transmitting said water by the force of the pressure acting thereon into a gas-tight enclosure containing calcium carbide and reacting said water and calcium carbide to produce acetylene gas product;
- d. withdrawing acetylene gas product of the reaction;
- e. returning a portion of the acetylene gas product to said region to maintain pressure acting on said water said step of returning including limiting the magnitude of said pressure applied to said water to a selected system operating pressure with a first pressure regulator, limiting the pressure magnitude of generated acetylene gas product at a level above said selected system operating pressure with a second pressure regulator, and storing a constant volume of acetylene gas product obtained from the product returned to said region for use in compensating for any decrease in the system operating pressure, said stored gas product being at said pressure level above said system operating pressure, and the flow of said returned acetylene gas product being limited to a single direction toward said first regulator; and
- f. using the water transmitted to said enclosure to absorb heat released by the reaction; and
- g. passing the acetylene gas product through a quantity of particulate calcium carbide whereby any water vapor in the acetylene gas product reacts with the calcium carbide to produce additional acetylene gas.

4,054,424

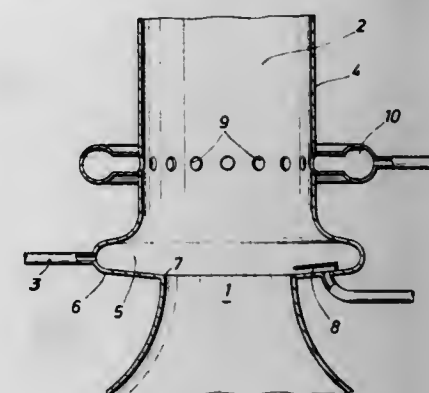
PROCESS FOR QUENCHING PRODUCT GAS OF SLAGGING COAL GASIFIER

Gernot Staudinger, Amsterdam, and Maarten J. van der Burgt, The Hague, both of Netherlands, assignors to Shell Internationale Research Maatschappij B.V., Netherlands
Filed June 5, 1975, Ser. No. 583,966
Claims priority, application Netherlands, June 17, 1974, 7408036

Int. Cl.² C10J 3/46, 3/84

U.S. Cl. 48-210

13 Claims



1. A process for quenching of the partial combustion product gas of a slagging coal gasifier containing suspended molten, sticky slag particles to a temperature at which the slag particles are no longer sticky which comprises:
 - a. passing the hot partial combustion product gas into a tubular quench zone;
 - b. introducing into said quench zone a cooling gas which is injected radially to effect admixture with, and direct quenching of, the hot product gas and
 - c. introducing circumferentially into said quench zone, at its inlet end, a particle-free shielding gas thereby forming an annular layer between the product gas and the quench zone walls, said annular layer being maintained for a sufficient distance along the axis of the quench zone to prevent contact between the quench zone walls and the hot product gas prior to quenching.

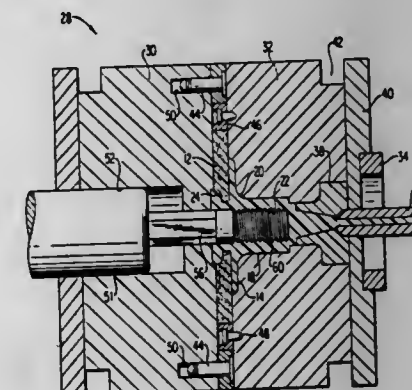
4,054,425

PROCESS OF MAKING A GRINDING WHEEL ASSEMBLY

William F. Sherman, 2 Burtenmar Circle, Paxton, Mass. 01612
Division of Ser. No. 450,261, March 11, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 632,024
Int. Cl.² C09K 3/14

U.S. Cl. 51-298 R

8 Claims



1. A process of making a grinding wheel assembly in a molding apparatus having two mold halves comprising sequentially the steps of:
 - inserting a thermoset phenolic plastic abrasive disc into one mold half of the molding apparatus;
 - moving the two mold halves together to form a die cavity

with a threaded insert being caused to extend through the abrasive disc; forcing under pressure by injection means through a nozzle a softened phenol-based thermoplastic resin into the die cavity to form a hub on the abrasive disc about the insert; and removing the insert.

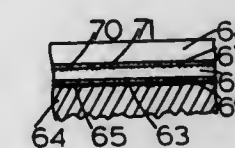
4,054,426

THIN FILM TREATED DRILLING BIT CONES

Gerald W. White, 5835 Elm Lawn St., Dallas, Tex. 75223
Continuation of Ser. No. 316,811, Dec. 20, 1972, abandoned. This application May 7, 1975, Ser. No. 575,260
Int. Cl.² B24D 3/06; C23C 15/00

U.S. Cl. 51-309 R

22 Claims



1. A material working tool comprised of a plurality of successively overlying material films comprising a first material film overlying a tool core material and including an outer-surface-defining material film; each said film being deposited by a vacuum ion plating process, with material film atoms driven into the atomic lattice of the material which it overlies in a phase zone between that film and the material which it overlies comprised of atoms of that film and those of the material which it overlies; said first and successive overlying films comprising one of a group of materials consisting of pure metals, metal oxides, metal nitrides and metal carbides, each of said films comprised of a material, the hardness of which is greater than that of the material which it overlies.

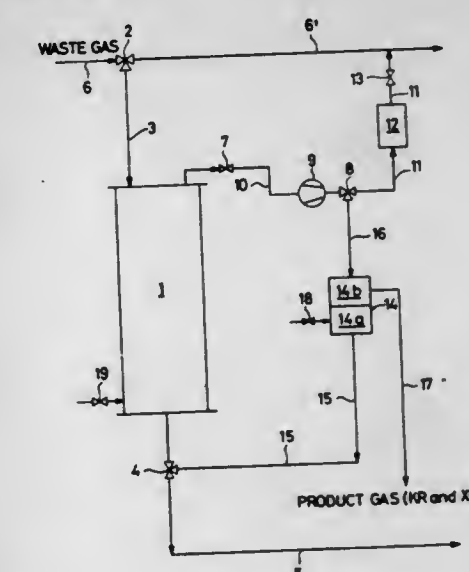
4,054,427

METHOD OF RECOVERING KRYPTON AND XENON NUCLIDES FROM WASTE GASES

Hans-Juergen Schroeter; Karl Knoblauch; Harald Juentgen, and Peter Kronauer, all of Essen, Germany, assignors to Bergwerksverband GmbH, Essen, Germany
Continuation of Ser. No. 338,397, May 5, 1973, abandoned. This application Dec. 26, 1974, Ser. No. 536,594
Claims priority, application Germany, Mar. 3, 1972, 2210264
Int. Cl.² B01D 53/02

U.S. Cl. 55-25

18 Claims



1. A method of recovering nuclides from waste gases, comprising the steps of conveying a stream of waste gas which includes krypton and xenon nuclides through adsorbing means containing a bed of adsorbent which is at a predetermined pressure so as to adsorb nuclides from said waste gas, said waste gas also including a carrier gas component constituting the major portion thereof and being conveyed through said

bed in a predetermined direction; interrupting said conveying step when the concentration of krypton nuclides in the gas escaping from said bed reaches substantially a predetermined value; reducing the pressure in said bed to between approximately 10 and 300 torr so as to partially evacuate said bed and obtain a desorption gas, said pressure-reducing step being carried out in such a manner that evacuation of said desorption gas from said bed occurs concurrent with the flow of said waste gas; rinsing said bed with rinsing fluid so as to desorb nuclides from said bed and obtain product fluid enriched in nuclides, said rinsing step being initiated before the concentration of krypton nuclides in said desorption was substantially exceeds the concentration of krypton nuclides in said waste gas, and said rinsing fluid being conveyed through said bed countercurrent to the flow of said waste gas and at pressures between approximately 10 and 400 torr; raising the pressure in said bed to substantially said predetermined pressure prior to repeating said conveying step by introducing into said bed a gaseous substance having a composition substantially the same as that of said carrier gas component and which is substantially free of nuclides; and admitting at least a portion of said desorption gas into an adsorbent for the adsorption of nuclides therefrom.

4,054,428

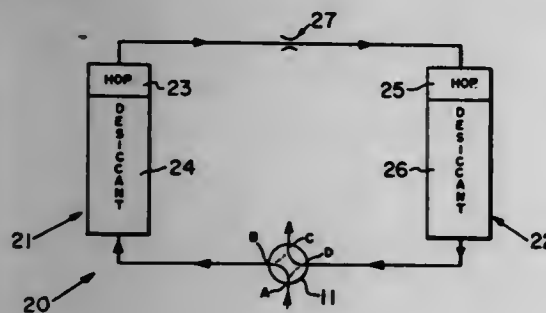
METHOD AND APPARATUS FOR REMOVING CARBON MONOXIDE FROM COMPRESSED AIR

Donald R. Foltz, Pittsburgh, Pa., assignor to Hankison Corporation, Canonsburg, Pa.

Filed May 3, 1976, Ser. No. 682,265
Int. Cl.² B01D 53/04

U.S. Cl. 55—33

10 Claims



1. A purifier for removing carbon monoxide from compressed air comprising:

- A. a valve means for receiving compressed air;
- B. a first tower communicating with the valve means and containing a dehumidifying agent and a carbon monoxide converting agent;
- C. a pressure reducer means communicating with the first tower for receiving and reducing the pressure of all the compressed air;
- D. a second tower communicating between the pressure reducer means and the valve means for receiving all the compressed air from the pressure reducer means and directing it to the valve means, said tower containing a carbon monoxide converting agent and a rehumidifying agent; said valve means adapted to reverse the direction of the compressed air flow between the towers so that dehumidified, compressed air simultaneously is rehumidified and the rehumidifying agent is converted into the dehumidifying agent by the expansion of all the pressure reduced compressed air, whereby there is no intentional loss of compressed air and water in the purifier and no external heat for converting the rehumidifying agent to the dehumidifying agent.

10. A method for removing carbon monoxide from compressed air comprising in sequence:

- A. dehumidifying the compressed air by passing a volume thereof through a first desiccant in a first tower;
- B. converting the carbon monoxide to carbon dioxide by

passing said volume through a first batch of hopcalite in the first tower;

- C. reducing the pressure of said volume of compressed air;
- D. further converting carbon monoxide to carbon dioxide by directing said volume through a second batch of hopcalite in a second tower;
- E. rehumidifying the volume of compressed air by passing said volume through a second desiccant containing moisture in the second tower and simultaneously regenerating said second desiccant through the expansion of the pressure reduced volume of compressed air; and
- F. reversing the flow by passing a second volume of compressed air through the second tower when the second desiccant is substantially regenerated, whereby there is no intentional loss of compressed air and water in carrying out the method and no external heat is necessary for regeneration of said desiccant.

4,054,429

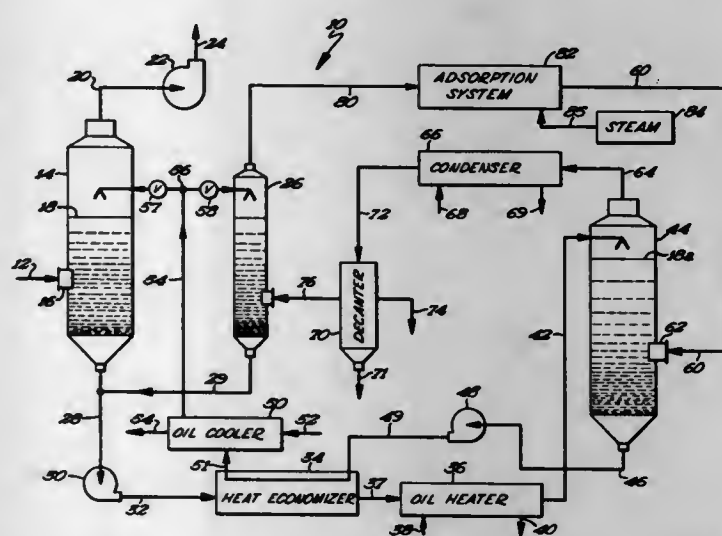
METHOD AND APPARATUS FOR SOLVENT RECOVERY

Nedeljko Ostojic, Hamden, and Vladimir G. Boscak, Hartford, both of Conn., assignors to Geo. A. Hormel & Co., Austin, Minn.

Filed June 4, 1976, Ser. No. 692,851
Int. Cl.² B01D 53/14

U.S. Cl. 55—48

10 Claims



1. A method of recovering a solvent from a gas contaminated therewith, said method comprising the steps of

- passing contaminated gas into a main absorber containing an absorbing liquid, said absorbent liquid being circulated in a predetermined closed cycle of flow through the main absorber, then through a stripper, thereafter through an auxiliary absorber and then being returned to said main absorber, the solvent being removed from the gas as solvent is absorbed by the absorbing liquid in the main absorber;
- circulating an inert gas in a predetermined closed cycle of flow, first through the stripper, whereby the solvent is absorbed by the inert gas and is stripped from the absorbing liquid;
- the inert gas containing the solvent then being circulated, in its closed cycle of flow, through a condenser whereby the solvent is condensed,
- thereafter circulating the inert gas and condensed solvent through a decanter to thereby collect and remove the condensed solvent therefrom;
- then circulating the inert gas through the auxiliary absorber containing absorbing liquid to remove any solvent from the gas,
- and thereafter returning said inert gas to the stripper.

5. Apparatus for recovering a solvent from a gas contaminated therewith, said apparatus comprising:

- first absorber means containing absorbent liquid and adapted

4,054,431

METHOD AND DEVICE FOR REGENERATING AN IMPURE EFFLUENT FLUID AND PRODUCT OBTAINED THEREBY

Michel Kotcharian, Paris, France, assignor to Technigaz, France
Filed Dec. 2, 1975, Ser. No. 636,961

Claims priority, application France, Nov. 27, 1974, 74.38902
Int. Cl.² B01D 3/14, 53/14

U.S. Cl. 55—70

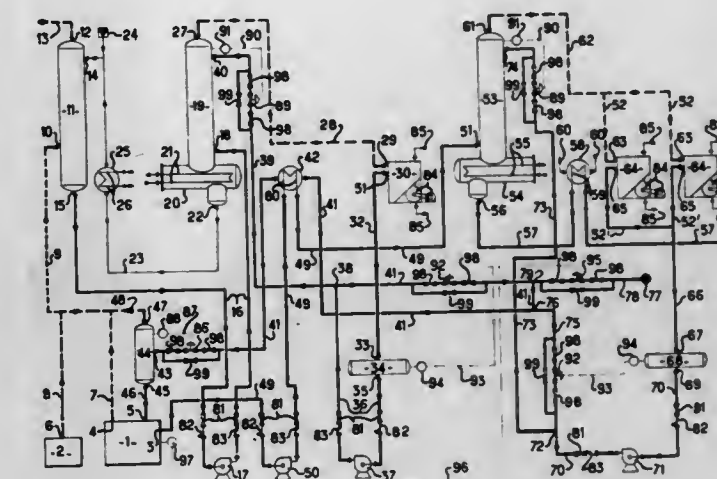
11 Claims

to receive said contaminated gas for removing solvent from said gas as solvent is absorbed by said absorbent liquid there within;

stripping means for removing solvent from said absorbent liquid by passing an inert gas therethrough, the inert gas thereby absorbing solvent to be recovered;

condenser means adapted to receive inert gas outputted from said stripping means for condensing at least a portion of said solvent and thereby recovering same;

second absorber means containing absorbent liquid and adapted to receive inert gas outputted by said condenser means for further removing solvent from said inert gas, said solvent being absorbed by said absorbent liquid within said second absorber; first conduit means interconnecting said first absorber, said stripping, and said second absorber means in communicating relation whereby absorbed liquid is circulated through the first absorber, said stripping and said second absorber means, and returned to said first absorber means from said stripping means in a closed pattern of flow, second conduit means interconnecting said stripping, second absorber and condenser means in communicating relation whereby the inert gas is circulated through said stripping, condenser, and second absorber means and returned to said stripping means in a closed pattern of flow.



4,054,430

METHOD FOR SEPARATING THE CONSTITUENTS OF A GAS MIXTURE BY MAKING USE OF A RAPID SELECTIVE ADSORBENT

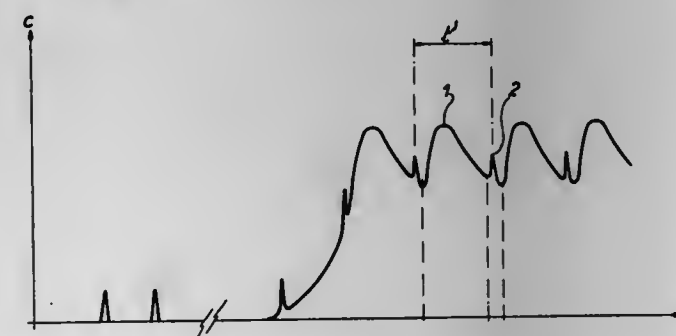
Patrick Valentin, Pont-Eveque; Germain Hagenbach, Vernalson; Jean-Louis Duran, and Maurice Fromager, both of Lyon, all of France, assignors to Societe Nationale Elf Aquitaine, Paris La Defense, France

Filed Feb. 6, 1976, Ser. No. 656,541

Claims priority, application France, Feb. 13, 1975, 75.04525
Int. Cl.² B01D 15/08

U.S. Cl. 55—67

12 Claims



1. A method for the treatment of a gas mixture which permits the separation of at least one of the constituents of the gas mixture, which comprises

- continuously injecting the gas mixture to be treated into a column swept by a continuous stream of carrier gas and containing a selective solid adsorbent of the chromatographic type, which will retain the desired constituent of the gas mixture without retaining the non-desired constituent, until saturation of said selective adsorbent by the desired adsorbed constituent of the gas mixture, and
- discontinuing the continuous injecting of said gas mixture while periodically injecting small quantities of the gas mixture to be treated and representing a fraction of the quantity injected into the column during step (1) so as to collect successively at the outlet of the column a fraction which is enriched in the non-adsorbed constituent and a fraction of the purified adsorbed constituent.

1. In a method for utilizing and recovering a given substance, the steps of feeding said substance in liquid form to an apparatus wherein said substance is utilized while part thereof is converted at the apparatus into gaseous and liquid phases each of which is in an impure state, washing the gaseous phase to derive therefrom a solution of said substance and distilling said solution to achieve a pure gaseous phase thereof, simultaneously with the above steps distilling said impure liquid phase to achieve also from the same a pure gaseous phase, condensing the pure gaseous phases derived from both of said impure phases to achieve a pure liquid condensate, and returning the latter pure liquid condensate to the apparatus, whereby the part of the substance which is not used at the apparatus is continuously recovered in a closed circuit to be returned as a pure liquid to the apparatus.

11. In a system for recovering and utilizing a given substance, feed means for feeding said substance in liquid form, utilizing means for utilizing part of said substance while converting another part thereof into gaseous and liquid phases each of which is in an impure state, washing means communicating with said utilizing means for receiving therefrom said gaseous phase and for washing the same to provide a solution of said substance, distilling means communicating with said washing means and with said utilizing means for receiving from both of the latter means said solution and said liquid phase and for distilling said solution and said liquid phase to provide therefrom a pure gaseous phase, condensing means communicating with said distilling means for receiving therefrom the pure gaseous phase and condensing the same into a liquid condensate, and said feed means communicating with said condensing means for receiving said condensate therefrom to return the same to said utilizing means, flash-vaporizing means connected between said feed means and said condensing means for flash-vaporizing the condensate prior to flow thereof to said feed means, whereby from said flash-vaporizing means there is provided for said feed means a pure liquid phase as well as a pure gaseous phase, said flash-vaporizing means communicating also with said washing means for delivering thereto the pure gaseous phase together with said impure gaseous phase.

4,054,432

POLYMER LINED CAPILLARY COLUMN AND METHOD FOR PRODUCING SAME

Paul J. Taylor, Fairborn, and Frank W. Harris, Xenia, both of Ohio, assignors to Wright State University, Dayton, Ohio
Filed June 11, 1976, Ser. No. 695,018
Int. Cl.² B01D 15/08

U.S. Cl. 55—386

4 Claims

1. A polymer-lined capillary column for use in gas chromatography having a thin layer of ethoxycarbonyl substituted polyphenylene resin, solvent-deposited and uniformly coated on the interior surface of the base column as a support for a stationary phase, said resin coated column further including a separate stationary phase with said resin.

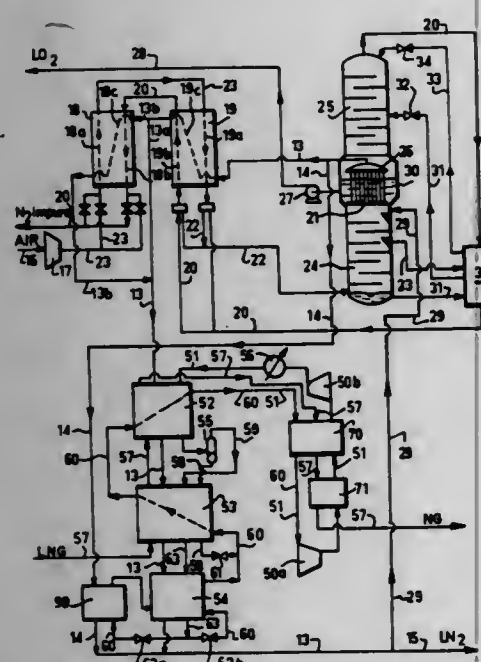
4,054,433

INCORPORATED CASCADE COOLING CYCLE FOR LIQUEFYING A GAS BY REGASIFYING LIQUEFIED NATURAL GAS

Jean-Pierre Buffiere, Saint Mande, and Gerard Vanderbussche, Fontenay-sous-Bois, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France
Filed Jan. 27, 1976, Ser. No. 652,807
Claims priority, application France, Feb. 6, 1975, 75.04403
Int. Cl.² F25J 3/04

U.S. Cl. 62—13

3 Claims



1. A process for fractionating air, utilizing a supply of stored liquefied natural gas and a cycle of the incorporated cascade type, comprising

- constituting at least one cycle mixture consisting of a plurality of components at least one of which is sufficiently volatile so as to have a boiling temperature which at the low pressure of the cycle is lower than the temperature of said stored liquefied natural gas;
- compressing said at least one cycle mixture, in gaseous phase, from said low pressure to a high pressure, said compression taking place in at least one compression stage;
- fractionally condensing at least the compressed cycle mixture at said high pressure, said fractional condensing comprising at least:
 - a first fractional condensation stage during which at least the compressed cycle mixture is partially condensed by heat exchange partially with at least one external refrigerant and partially with said liquefied natural gas in the course of reheating, and at least the partially condensed cycle mixture is separated into a first condensed fraction and a first vapor fraction which continues with the fractional condensation,
 - at least one intermediate fractional condensation stage during which a previously separated vapor fraction of said

cycle mixture is partially condensed by counter-current heat exchange with a refrigerant stream comprising a part of said cycle mixture in the course of revaporisation at said low pressure and said liquefied natural gas in the course of regasification and reheating,

- a last fractional condensation stage during which the last vapor fraction comprising said at least one volatile component of at least the cycle mixture is wholly condensed by countercurrent heat exchange with a refrigerant stream which at least in its final step is exclusively constituted by a part of the cycle mixture which is in the course of heating at said low pressure, so as to obtain a last condensed fraction,
- the gas to be liquefied is cooled by counter-current heat exchange with a cooling stream of the cycle mixture which is in the course of being vaporized and heated at a heating pressure equal to the said low pressure, and during said at least one intermediate fractional condensation by countercurrent heat exchange with said liquefied natural gas in the course of regasification and reheating, and at least a part of said gas to be liquefied is withdrawn in the condensed state as liquid product,
- at least the refrigerant stream which has been heated in stage (d) is recompressed in the manner set forth in stage (b) from said low vaporization pressure to the said high pressure, in order to form again at least part of the cycle mixture at the high pressure,
- the air is compressed to a pressure termed the higher pressure,
- the compressed air is cooled by heat exchange with at least one nitrogen-rich gaseous fraction which is obtained from the distillation step (d') and which is in the course of reheating at a pressure termed the lower pressure,
- the compressed air is cleaned of water and carbon-dioxide gas,
- the cooled and cleaned compressed air is distilled, by means of at least two distillation stages which operate at said higher pressure and said lower pressure respectively, by condensing at least part of a substantially pure gaseous nitrogen fraction which is obtained from the top of said higher pressure stage, by heat exchange with a substantially pure liquid oxygen fraction which is obtained at the bottom of said lower-pressure stage and which is at least partly in the course of evaporation, at least the said nitrogen-rich gaseous fraction and a substantially pure oxygen fraction being obtained at the said lower pressure, and wherein furthermore:
 - the gas to be liquefied is cooled in said stage (e) of the liquefaction cycle at a pressure substantially equal to said higher pressure, and
 - the gas to be liquefied is formed by a portion to be liquefied of the substantially pure gaseous nitrogen fraction which is obtained from the top of the high-pressure stage, this portion to be liquefied being heated before being cooled in said stage (e), by heat exchange with the compressed air in the course of cooling,

wherein of the gas to be liquefied which is obtained in the condensed state in said cooling stage (3), another portion is withdrawn as reflux and this reflux is fed to the top of said higher-pressure stage.

4,054,434

PRODUCTION OF GLASS FIBRES

John Stuart Thomas, St. Helens, and Allan Frank Mason, Wigan, both of England, assignors to Fibreglass Limited, St. Helens, England

Filed Apr. 29, 1976, Ser. No. 681,463

Claims priority, application United Kingdom, May 15, 1975, 20644/75

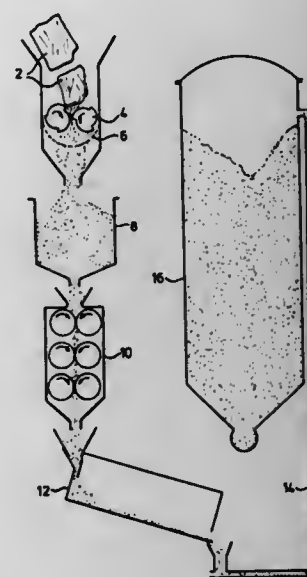
Int. Cl.² C03B 37/00, 5/18

U.S. Cl. 65—2

10 Claims

1. A process for forming glass fibers comprising: collecting scrap glass fiber material derived from at least one

glass fiberizing process, said glass fiber material containing on its surface a proportion of non-mineral, carbonaceous material;
reducing the scrap glass fiber material to a finely divided, milled form;
preparing a batch of glass fiber forming material by mixing between 5% and 25% by weight of said finely divided scrap with new material;



said proportion of non-mineral, carbonaceous material on said scrap glass fiber being sufficient to provide a carbon content of 0.4% to 0.05% in said batch;
feeding the batch so formed to a glass melting tank and converting the batch to a glass melt;
maintaining oxidizing conditions within the glass melt during the melting operation, and
transferring the melt to a fiberizing device and converting the melt into glass fibers by attenuating glass streams leaving the fiberizing device.

4,054,435

METHOD OF CRYSTALLIZING A TWO LAYER GLASS ARTICLE

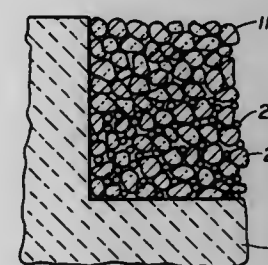
Takashi Sakane, Otsu, and Shigeharu Nakamura, Shiga, both of Japan, assignors to Nippon Electric Glass Company, Limited, Otsu, Japan

Filed Oct. 14, 1976, Ser. No. 732,451

Int. Cl.² C03B 23/20, 19/08, 32/00

U.S. Cl. 65—18

6 Claims



1. A method for producing a crystallized glass article comprising the steps of:

preparing first discrete small bodies of crystallizable glass, each of said first bodies having a property that when heat-treated at a temperature higher than the softening point of the glass but lower than the liquidus temperature thereof needle-like β -wollastonite crystals are formed, said crystals extending from the surface into the interior of the body in a direction generally perpendicular to the surface of the body while it is being softened and deformed,
preparing a mixture of second discrete small bodies and pore forming materials uniformly distributed in said mixture, each of said second bodies having a property that when

heat-treated at said temperature higher than the softening point of said first body glass but lower than the liquidus temperature of said first body glass crystals are formed while it is being softened and deformed,

packing said first bodies and said mixture into a mold to form a first layer of said first bodies extending from a surface of the pack to a predetermined depth and a predetermined thickness of second layer of said mixture beneath said first layer,

heat-treating said first bodies and said mixture in said mold at a temperature higher than the softening point of said first body glass but lower than the liquidus temperature of said first body glass until needle-like β -wollastonite crystals are formed in each first body and first bodies and second bodies are fusion-bonded together,

and thereafter cooling the resultant fusion-bonded body, whereby a crystallized glass article is obtained which comprises a first non-porous layer extending from a surface of the article to a predetermined depth and being characterized by a surface pattern defined by said first bodies forming a surface layer of said first layer due to a difference of orientation of the needle-like β -wollastonite crystals, and a second porous layer having a predetermined thickness beneath said first non-porous layer and being connected to said first non-porous layer.

4,054,436

CONTAMINANT DIVERTING THRESHOLD FOR DELIVERING MOLTEN SHEET GLASS TO A GLASS FORMING CHAMBER AND METHOD THEREOF

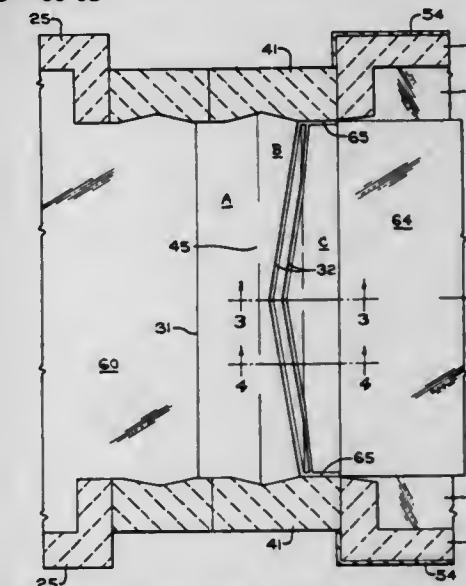
Thomas R. Trevorrow, Ford City, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 10, 1977, Ser. No. 767,253

Int. Cl.² C03B 18/02

U.S. Cl. 65—65 A

10 Claims



1. In an apparatus for delivering a layer of molten glass onto a pool of molten metal for forming flat glass comprising a threshold for supporting the molten glass during its delivery, side members for constraining the molten glass to a defined path of delivery and a movable metering member extending between the side members and in facing relation to the threshold, the improvement which comprises a threshold having at least one transverse groove in its upper glass-supporting surface which extends from a point in the vicinity of the center of the threshold outwardly toward each of the side members, the outwardly extending portions of the groove being oriented at an obtuse angle of less than 180° with respect to each other which angle faces in the direction of glass delivery toward the pool of molten metal; said groove being of sufficient width and depth for diverting a sufficient amount of glass flowing along the glass-supporting surface of the threshold toward the side members to free flat glass formed following delivery over the threshold of visually observable bottom surface marking that is linearly disposed and aligned with the direction of glass advance during forming.

7. In a method of delivering a layer of molten glass over a threshold onto a pool of molten metal for forming flat glass, the improvement which comprises diverting a small effective amount of the molten glass from a lowermost central portion of the layer being delivered toward and into two lowermost marginal portions of the layer being delivered substantially immediately prior to the advance of the marginal portions onto the pool of molten metal.

4,054,437

METHOD AND APPARATUS FOR CURVING SHEETS OF GLASS AND THE LIKE

Heinz Ueberwolf, Herzogenrath, and Hans-Pieter Siemonsen, Aachen, both of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

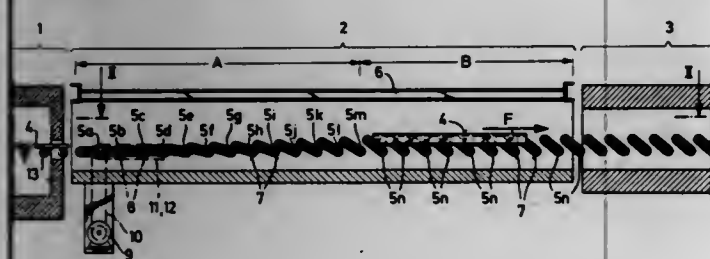
Filed May 25, 1976, Ser. No. 690,037

Claims priority, application France, Mar. 5, 1976, 76.06266

Int. Cl.² C03B 23/02

U.S. Cl. 65—107

10 Claims



1. A process for bending to a predetermined curvature a sheet of material in the plastic state, such as a sheet of glass brought to the softening temperature, on a curved bed formed by a series of curved rods mounted for pivoting about axes disposed in the same horizontal plane, which comprises inclining the curved rods at different angles of inclination with respect to said horizontal plane to form an ascending convex bed with a curvature profile which increases progressively to a curvature corresponding to the predetermined curvature which is to be imparted to the sheet, maintaining the rods at said angles of inclination to form a fixed bed having said increasing curvature profile and advancing the sheet on said fixed bed in the direction of increasing curvature thereof by a rotationally driven sleeve disposed about at least one of the curved rods.

7. Apparatus for bending to a predetermined curvature a sheet of material in the plastic state, such as a sheet of glass brought to softening temperature, which comprises a series of curved rods forming a curved bed for receiving said sheet, said rods having aligned end sections forming respective axes of rotation, means for pivotally mounting said curved rods with the axes of rotation thereof in the same horizontal plane, a rotationally driven sleeve disposed about at least one of said rods for advancing a sheet along said bed, and means for holding said rods at different angles of inclination to form a fixed ascending convex bed having a curvature profile which increases progressively in the direction of advancement of the sheet to a curvature corresponding to said predetermined curvature.

4,054,438

METHOD AND APPARATUS FOR CURVING SHEETS IN THE PLASTIC STATE

Claude Presta, Courbevoie, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed May 25, 1976, Ser. No. 690,038

Claims priority, application France, May 30, 1975, 75.16935

Int. Cl.² C03B 23/02

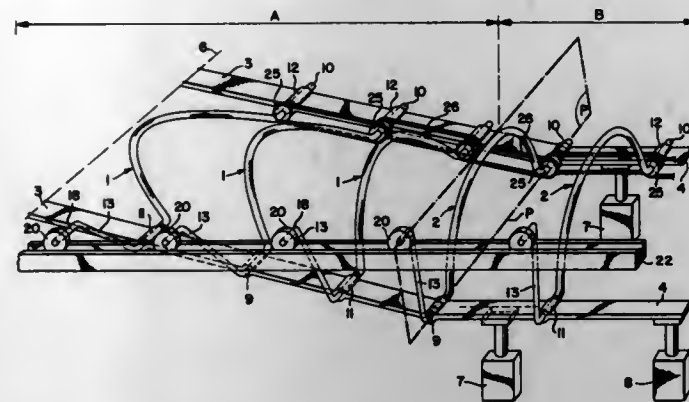
U.S. Cl. 65—107

20 Claims

1. A process for bending to a predetermined curvature a sheet of material in the plastic state, such as a sheet of glass brought to the softening temperature, on a bed formed by a series of curved rods pivotally mounted in a support structure, which comprises inclining the curved rods at different angles

of inclination to form a curved bed with a curvature profile which increases progressively to a curvature corresponding to the predetermined curvature, holding the rods at said angles of inclination to form a fixed curved bed with said increasing curvature profile, and advancing the sheet on said fixed bed in the direction of increasing curvature thereof by a rotationally driven sleeve disposed about at least one of the curved rods.

7. Apparatus for bending to a predetermined curvature a sheet of material in the plastic state, such as a sheet of glass



brought to softening temperature, which comprises a series of curved rods forming a curved bed for receiving said sheet, a rotationally driven sleeve disposed about at least one of said rods for advancing a sheet along said bed, said rods having aligned end sections forming respective axes of rotation of the rods, and means for holding said rods at different angles of inclination to provide a fixed bed having a curvature profile which increases progressively in the direction of advancement of the sheet to a curvature corresponding to said predetermined curvature.

4,054,439

ACETAL DERIVATIVES OF 4-(SUBSTITUTED AMINO)-3,5-DINITROBENZALDEHYDES

Quentin F. Soper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

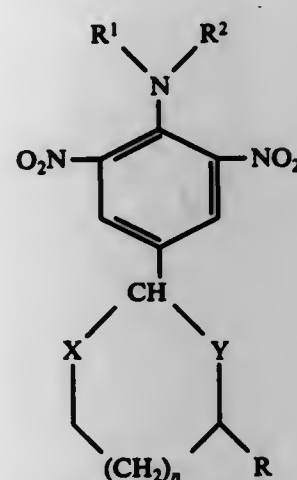
Division of Ser. No. 557,866, March 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 514,674, Oct. 15, 1974, abandoned. This application July 21, 1976, Ser. No. 707,416

Int. Cl.² A01N 9/12, 9/20; C07D 317/16, 339/06

U.S. Cl. 71—88

11 Claims

1. A compound of the formula



wherein

X and Y are the same or different and are oxygen or sulfur; R is hydrogen or methyl;

R¹ representsA. C₁-C₆ alkyl, optionally monosubstituted with

1. methoxy,
2. cyano, or
3. halo,

B. C₃-C₄ alkenyl,

C. halo(C₃-C₄)alkenyl,
D. C₃-C₄ alkynyl,
E. cyclopropylmethyl, or
F. tetrahydrofurfuryl;
R² represents

A. C₁-C₆ alkyl, optionally monosubstituted with

1. methoxy,
2. cyano, or
3. halo,

B. C₃-C₄ alkenyl,
C. halo(C₃-C₄)alkenyl,
D. C₃-C₄ alkynyl,
E. cyclopropylmethyl,
F. tetrahydrofurfuryl, or
G. hydrogen;

provided that R¹ and R² together contain no more than 8 carbon atoms; and

n is 0 or 1.

7. A method for inhibiting the growth of unwanted vegetation which comprises applying to a locus of said vegetation an herbicidally effective amount of a compound of claim 1.

4,054,440

4(3H)-OXOBENZO-2,1,3-THIADIAZINE-2,2-DIOXIDES

Lennon H. McKendry, Midland, Mich., and Walter P. Bland, Takoma Park, Md., assignors to The Dow Chemical Company, Midland, Mich.

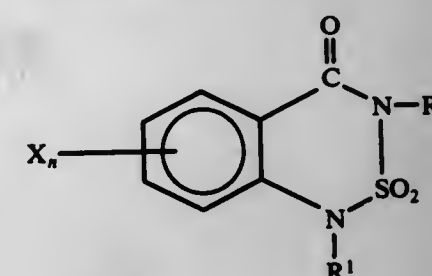
Filed Feb. 23, 1976, Ser. No. 660,575

Int. Cl.² C07D 285/16; A01N 9/12

U.S. Cl. 71—91

33 Claims

1. A compound of the formula:

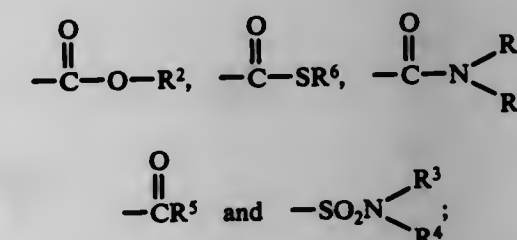


wherein:

each X independently represents halo, YR², Y'CF₂C(Z)₃, CF₃, nitro, or loweralkyl, with the proviso that at least one X is always halo or nitro;

n represents an integer of from 1 to 4, inclusive;

R represents straight or branched alkyl and haloalkyl, each of 1 to 6 carbon atoms; alkenyl, haloalkenyl, alkynyl and haloalkynyl, each of 3 to 6 carbon atoms, cyanoalkyl, alkylthioalkyl or alkoxyalkyl, each of 2 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, benzyl, phenyl, loweralkylphenyl and halophenyl;

R¹ represents

R² represents haloalkyl of 1 to 4 carbon atoms; alkenyl of 3 to 6 carbon atoms; cycloalkyl or 3 to 6 carbon atoms; phenyl, loweralkylphenyl and halophenyl;

R³ represents alkyl of 1 to 4 carbon atoms, and cycloalkyl of 3 to 6 carbon atoms;

R⁴ represents any of R₃ and alkoxy containing 1 to 4 carbon atoms, and R³ and R⁴ when taken together constitutes a 4 to 6 carbon heterocyclic radical together with the nitrogen from which each depends; and

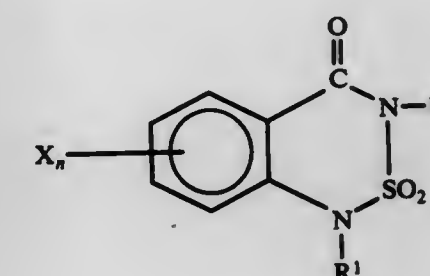
R⁵ represents alkyl of 1 to 5 carbon atoms, haloalkyl of 1 to

5 carbons, alkenyl, haloalkenyl, alkoxyalkyl or alkylthioalkyl, each of 2 to 6 carbon atoms, cycloalkyl of 3 to 6 carbons, alkoxyalkyl of 4 to 8 carbon atoms, phenyl, loweralkylphenyl and halophenyl;

R⁶ represents straight or branched alkyl or haloalkyl of 1 to 7 carbon atoms; alkenyl and haloalkenyl of 3 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; phenyl, loweralkylphenyl and halophenyl;

Y and Y' independently represent a chalcogen group having an atomic number of from 8 to 16, inclusive; and each Z independently represents bromo, chloro, fluoro, or hydrogen.

11. A method for controlling undesired plants which comprises applying to said plants and/or their habitats a herbicidally effective amount of a compound corresponding to the formula:



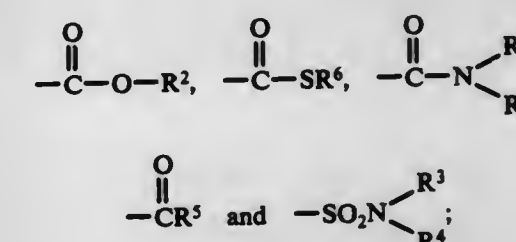
(I)

wherein:

each X independently represents halo, YR², Y'CF₂C(Z)₃, CF₃, nitro, or loweralkyl with the proviso that at least one X is always halo or nitro;

n represents an integer of from 1 to 4, inclusive;

R represents straight or branched alkyl and haloalkyl, each of 1 to 6 carbon atoms; alkenyl, haloalkenyl, alkynyl and haloalkynyl, each of 3 to 6 carbon atoms, cyanoalkyl, alkylthioalkyl or alkoxyalkyl, each of 2 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, benzyl, phenyl, loweralkylphenyl and halophenyl;

R¹ represents

R² represents haloalkyl of 1 to 4 carbon atoms; alkenyl of 3 to 6 carbon atoms; cycloalkyl or 3 to 6 carbon atoms; phenyl, loweralkylphenyl and halophenyl;

R³ represents alkyl or 1 to 4 carbon atoms, and cycloalkyl of 3 to 6 carbon atoms;

R⁴ represents any of R₃ and alkoxy containing 1 to 4 carbon atoms, and R³ and R⁴ when taken together constitutes a 4 to 6 carbon heterocyclic radical together with the nitrogen from which each depends; and

R⁵ represents alkyl of 1 to 5 carbon atoms, haloalkyl of 1 to 5 carbons, alkenyl, haloalkenyl, alkoxyalkyl or alkylthioalkyl, each of 2 to 6 carbon atoms, cycloalkyl of 3 to 6 carbons, alkoxyalkyl of 4 to 8 carbon atoms, phenyl, loweralkylphenyl and halophenyl;

R⁶ represents straight or branched alkyl or haloalkyl of 1 to 7 carbon atoms; alkenyl and haloalkenyl of 3 to 6 carbon atoms; cycloalkyl of 3 to 6 carbon atoms; phenyl, loweralkylphenyl and halophenyl;

Y and Y' independently represent a chalcogen group having an atomic number of from 8 to 16, inclusive; and each Z independently represents bromo, chloro, fluoro, or hydrogen.

4,054,441

SUBSTITUTED

 $(\alpha, \alpha, \alpha$ -TRIFLUORO-2,6-DINITRO-P-TOLYL)HYDRAZINES

James Richard Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

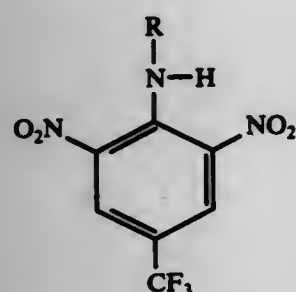
Filed Oct. 2, 1975, Ser. No. 618,999

Int. Cl.² C07D 211/98, 207/50; A01N 9/22

U.S. Cl. 71-94

7 Claims

1. A compound of the formula



wherein

R is selected from the group consisting of 2,5-dimethylpyrrolidino and 2,6-dimethylpiperidino.

4,054,442

METHOD FOR RECOVERING SCHEELITE FROM TUNGSTEN ORES BY FLOTATION

Ronald Vedova, Englehart, Canada, and Norman LeRoy Grauerholz, Lewiston, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 23, 1976, Ser. No. 659,999

Int. Cl.² B03D 3/06; C22B 3/00

U.S. Cl. 75-2

5 Claims

1. In a flotation process for recovering scheelite by the flotation thereof from an aqueous pulp of low-grade tungsten ore containing calcium bearing minerals in addition to scheelite said process involving the addition to the aqueous ore pulp of a carbonate alkalinizing agent and a dispersant followed by an anionic collector, the improvement which comprises adding to the ore pulp, prior to the addition of the anionic collector and the dispersant, if added as a silicate dispersant, an amount of calcium oxide sufficient to raise the pH of the aqueous media of the pulp by 0.1 pH unit and form a precipitate of calcium upon conditioning the pulp by agitation sufficient to suspend substantially all of the solids in the pulp in the aqueous pulp media, said conditioning being for at least about five minutes and the pH of the ore pulp, prior to the addition of anionic collector being in the range of about 9-12.

4,054,443

METHOD OF PREPARING IRON POWDER

Charles M. Jaco, Jr., York County, S.C., assignor to Midrex Corporation, Charlotte, N.C.

Filed Dec. 22, 1975, Ser. No. 643,046

Int. Cl.² B22F 1/00

U.S. Cl. 75-5 BA

14 Claims

1. A method for preparing iron powder from feed material selected from the group comprising particulate iron ore, lump iron ore iron oxide fines, pellets, nodules, balls, partially reduced iron and mixtures thereof, said method comprising:

- selecting ores which are subject to decrepitation to be included in the feed material;
- reducing the particle size of said feed materials;
- establishing continuous a gravitational flow of said feed material through a generally vertical direct reduction shaft furnace;
- chemically reducing said feed material by counter-current flow of a gaseous reductant through said feed material in said direct reduction furnace;
- controlling the reducing gas temperature between about

1550° and 2050° F to promote degradation of the feed material in said furnace;

f. controlling the pressure in the reduction furnace between 3 and 15 pounds per square inch to promote degradation; and

g. removing the reduced iron powder product from the furnace.

4,054,444

METHOD FOR CONTROLLING THE CARBON CONTENT OF DIRECTLY REDUCED IRON

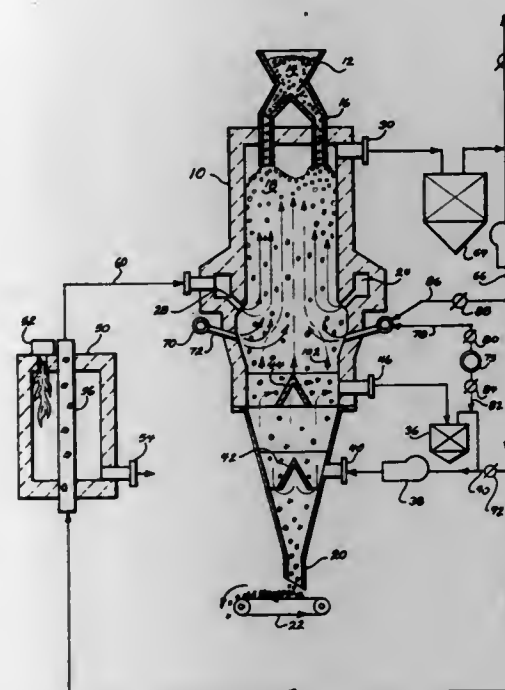
Donald W. Clark, North Litchfield Beach, and Allan C. Huestis, Georgetown, both of S.C., assignors to Midrex Corporation, Charlotte, N.C.

Filed Sept. 22, 1975, Ser. No. 615,459

Int. Cl.² C21B 13/02

U.S. Cl. 75-35

12 Claims



1. A method for controlling the carbon content of metallized iron pellets by counter-current flow of hot reducing gases through a downwardly moving iron oxide burden in a substantially vertical shaft furnace, said furnace having an upper reducing zone, a lower cooling zone and an intermediate buffer zone between the reducing and cooling zones, said method comprising:

- introducing particulate iron oxide to the interior of said furnace to establish a burden therein;
- removing a portion of said burden from the bottom of said cooling zone to establish a gravitational descent of said burden;
- introducing hot reducing gases to said furnace in said reducing zone to react with said descending burden and form a reacted top gas;
- introducing cooled cooling gas to the cooling zone of said furnace and removing heated cooling gas from the top of the cooling zone of said furnace;
- monitoring the carbon content of the metallized iron pellet product upon its discharge from said furnace;
- introducing a hydrocarbon gas selected from the group comprising methane, butane, propane, methane containing gas, and mixtures thereof to said shaft furnace in said buffer zone; and
- varying the rate of introduction of said hydrocarbon gas in response to the change in carbon content of the product, whereby the carbon content of said metallized iron pellet product is controlled by varying the hydrocarbon gas input conditions to the furnace.

4,054,445

DEOXIDIZING AND DESULPHURIZING STEEL

Aldo Ramacciotti, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Sept. 23, 1976, Ser. No. 725,857

Claims priority, application Italy, Sept. 26, 1975, 51517/75

Int. Cl.² C21C 7/10, 7/02, 7/06

U.S. Cl. 75-49

2 Claims

1. A process for deoxidizing and desulphurizing steel, comprising transferring the unkill steel substantially free from slag from a refining reactor to a degassing reactor, reducing the internal pressure of the degassing reactor to not more than 200 mm. Hg, adding to the molten steel in the degassing reactor calcium carbide in an amount such that the calcium therein is from 1 to 2 kg. per ton of steel, and maintaining the reduced pressure within the degassing reactor for 10 to 20 minutes.

4,054,446

PROCESS FOR THE REFINING OF A METAL SULFIDE MELT

Simo Antero Iivari Makiirtti, Nakkila, Finland, assignor to Outokumpu Oy, Outokumpu, Finland

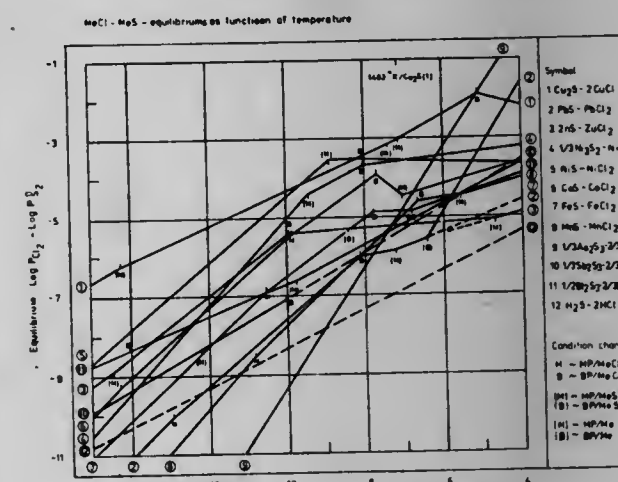
Filed June 28, 1976, Ser. No. 700,724

Claims priority, application Finland, Aug. 12, 1975, 752283

Int. Cl.² C22B 15/00

U.S. Cl. 75-76

5 Claims



1. A process for refining a copper sulfide melt exposing a melt solubility gap between the metal to be refined and its sulfide, comprising:

- first bringing the composition of the melt away from the range of the solubility gap by sulfidizing the copper sulfide melt to a sulfur concentration of about 19.5% to about 21.5% by weight;
- then removing impurities as vaporizable chlorides from the copper sulfide melt by chlorinating the sulfidized copper sulfide melt with elemental chloride containing gas at a temperature of 1150°-1250° C; and
- simultaneously maintaining the composition of the melt outside the melt solubility gap by controlling sulfur addition to the melt.

4,054,447

STEEL RESISTANT TO INTERGRANULAR STRESS CORROSION CRACKING

Gennosuke Tenmyo, 11-11, Honmachi, Den-enchofu, Ota-ku, Tokyo; Masayuki Tanimura, 51, Tokiwadai, Hodogaya, and Toshio Nakazawa, 786-1, Hinomachi, Konan, both of Yokohama, all of Japan

Continuation of Ser. No. 443,035, Feb. 15, 1974, abandoned.

This application Feb. 26, 1976, Ser. No. 661,517

Claims priority, application Japan, Feb. 16, 1973, 48-18408

Int. Cl.² C22C 38/06, 38/14

U.S. Cl. 75-124

2 Claims

1. A steel resistant to intergranular stress corrosion cracking consisting essentially of up to 0.20% C, 0.05 - 0.80% Si, 0.30 - 1.50% Mn, up to 0.03% P, up to 0.03% S, 0.05 - 0.25% Al (Sol.

Al), 0.03 - 0.20% Zr, the balance being iron and unavoidable impurities.

4,054,448

DUPLEX FERRITIC-MARTENSITIC STAINLESS STEEL

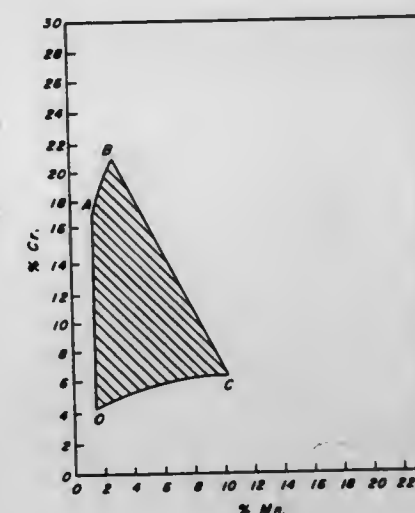
Roger N. Wright, Elnora, N.Y., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 508,376, Sept. 23, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,210

Int. Cl.² C22C 38/26, 38/28, 38/38

U.S. Cl. 75-126 B

6 Claims



1. A ferritic-martensitic duplex stainless steel consisting essentially of, by weight, from 4.5 to 20.5% chromium, from 2.5 to 10.5% manganese, from 0.005 to 0.1% carbon, from 0.1 to 1.0% of an element from the group consisting of titanium and columbium, balance essentially iron; said steel being additionally characterized by chromium and manganese contents within Area ABCD of the FIGURE; said steel being further characterized by a chromium equivalency of from 5.0 to 11.0, in accordance with the following equation:

$$\text{Chromium Equivalency} = \%Cr + 5(\%Si) + 7(\%Ti) + 4(\%Cb) + 4(\%Mo) + 12(\%Al) - 40(\%C) + \%N - 2(\%Mn) - 3(\%Ni) - \%Cu;$$

silicon, molybdenum, aluminum, nitrogen, nickel and copper being residuals, said steel having at least 5% ferrite and at least 20% martensite, said steel having an as-annealed tensile strength between 80 and 175 ksi and an as-annealed ductility between 18 and 25% elongation in one inch.

4,054,449

PROCESS OF MAKING A COMPOSITE HEAVY-DUTY POWDERED MACHINE ELEMENT

William M. Dunn, Farmington, and Myron C. Sarnes, Northville, both of shall Islands, assignors to Federal-Mogul Corporation, Detroit, Mich.

Division of Ser. No. 95,310, Dec. 4, 1970, Pat. No. 3,752,003.

This application Mar. 20, 1972, Ser. No. 235,963

Int. Cl.² B22F 7/00

U.S. Cl. 75-208 R

2 Claims

1. A method of making a composite heavyduty machine element comprising confining a first annular mass of low-performance powdered metal particles in a first annular compartment, confining a second annular mass of high-performance powdered manganese-molybdenum alloy particles in a second annular compartment adjacent said first annular compartment, one of said annular compartments surrounding the other annular compartment, bringing said annular masses into surface-to-surface abutting

engagement with one another along a common substantially annular junction between said compartments, compacting said annular masses simultaneously, and sintering said annular masses simultaneously while in said abutting engagement with one another whereby to secure said masses to one another in surface-to-surface coaxial relationship with their respective particles at the junction between said masses disposed in geometrically interlocking engagement.

4,054,450

INDIRECT ELECTROPHOTOGRAPHIC PROCESS WITH A NITRO-PHENOLSULTONEPHTHALEIN

Bauke Schoustra, Tegelen, and Hubertus W. H. M. Roncken, Helden, both of Netherlands, assignors to Oec-van der Grinten N.V., Venlo, Netherlands

Filed June 27, 1974, Ser. No. 483,566

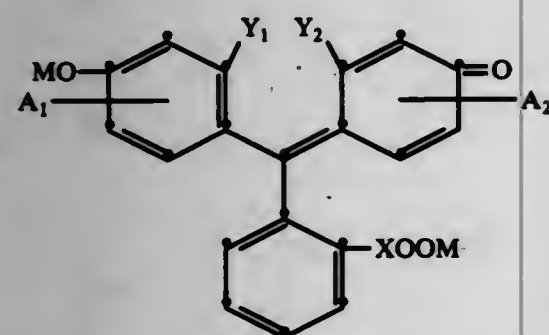
Claims priority, application United Kingdom, July 9, 1973, 3253/73; Nov. 15, 1973, 53088/73; Nov. 15, 1973, 53089/73

Int. Cl.² G03G 5/09

U.S. Cl. 96—1 R

8 Claims

1. In a process of indirect electrophotographic copying wherein a sheet material comprising a dye-sensitized photoconductive layer is repeatedly exposed imagewise to form on said layer by each exposure an image which as such or upon being developed is transferred from said material, the improvement wherein said material comprises a photoconductive layer sensitized by at least one dye selected from the group consisting of dyes represented by the following formula and mesomeric and tautomeric forms thereof:



in which M represents a hydrogen or metal atom or a methyl or ethyl group, A₁ or A₂ or both A₁ and A₂ represent a nitro group in an ortho position with respect to the —OM and/or keto group, X represents a carbon atom or a SO group and Y₁ and Y₂ represent a substituent selected from the group consisting of hydrogen and halogen atoms and lower alkyl, lower alkoxy, nitro, hydroxyl and esterified hydroxyl groups and the remaining positions may be unsubstituted or substituted by one or more substituents selected from the group consisting of halogen atoms and lower alkyl, lower alkoxy, nitro, hydroxyl and esterified hydroxyl groups.

4,054,451

METHOD OF POLYMERIZING A COPOLYMER OF GLYCIDYL METHACRYLATE AND ALLYL GLYCIDYL ETHER

Sheldon I. Schlesinger, East Windsor Township, Mercer County, N.J., and Veronica Cochran, Armonk, N.Y., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 509,685, Sept. 26, 1974, abandoned, which is a division of Ser. No. 297,829, Oct. 16, 1972, abandoned. This application June 17, 1976, Ser. No. 697,001

Int. Cl.² G03C 5/00, 1/68; C08F 8/18

U.S. Cl. 96—35.1

9 Claims

1. A method of polymerizing a copolymer of glycidyl methacrylate and allyl glycidyl ether, said copolymer being derived from reaction of a mixture consisting essentially of the monomers containing from about a 4 to 5 molar excess of glycidyl methacrylate per mole of allyl glycidyl ether and having pendant epoxy groups, an inherent viscosity of at least about 0.25

and an epoxy equivalent of at least about 0.65 epoxide equivalent per 100 grams of polymer, which comprises:

admixing said copolymer with a photosensitive aromatic diazonium salt of a complex halogenide which decomposes upon exposure to irradiation to release a halide Lewis Acid effective to initiate polymerization of said copolymer selected from compounds having the general formula (ArN₂)_m(MX_{n+m})^{-m} wherein Ar is an aryl or substituted aryl group, X is chlorine or fluorine, M is P, n is the oxidation state of M, and m is the number of diazonium groups as determined by the net charge on the anion (MX_{n+m})^{-m}; and exposing said mixture to electromagnetic or electron beam irradiation to effect said polymerization.

4,054,452

METHOD OF IMAGING A LAYER CONTAINING COPOLYMER OF GLYCIDYL METHACRYLATE AND ALLYL GLYCIDYL ETHER

Sheldon I. Schlesinger, East Windsor Township, Mercer County, N.J., and Veronica Cochran, Armonk, N.Y., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 509,673, Sept. 26, 1974, abandoned, which is a division of Ser. No. 297,829, Oct. 16, 1972, abandoned. This application June 18, 1976, Ser. No. 697,655

Int. Cl.² G03C 5/00, 1/58; C08F 8/18

U.S. Cl. 96—35.1

10 Claims

1. A method of preparing a photoresist image which comprises admixing a copolymer of glycidyl methacrylate and allyl glycidyl ether having an inherent viscosity of at least about 0.25, an epoxide equivalent of at least about 0.65 epoxide equivalent per 100 grams of polymer and derived from reaction of a mixture consisting essentially of the monomers containing from about a 4 to 5 molar excess of glycidyl methacrylate per mole of allyl glycidyl ether with a photosensitive aromatic diazonium salt of a complex halogenide which decomposes upon exposure to electromagnetic or electron beam irradiation to release a Lewis Acid effective to initiate polymerization of said copolymer selected from compounds having the general formula (ArN₂)_m(MX_{n+m})^{-m} wherein Ar is an aryl or substituted aryl group, X is chlorine or fluorine, M is P, n is the oxidation state of M, and m is the number of diazonium groups as determined by the net charge on the anion (MX_{n+m})^{-m}, applying said mixture to a substrate, screening predetermined portions of said substrate, exposing the substrate to electron beam or electromagnetic irradiation to effect polymerization of said copolymer, removing said screening means and applying a suitable solvent to remove unpolymerized portions of said mixture.

4,054,453

LIPPMANN FILM WITH REFLECTIVE LAYER

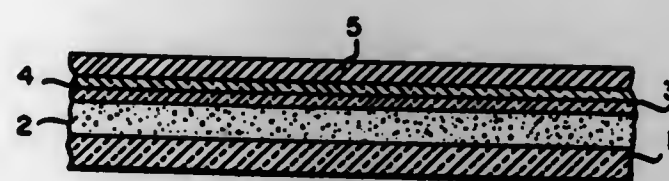
Allen W. Grobin, Jr., Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 563,437, July 7, 1976, abandoned. This application Sept. 15, 1970, Ser. No. 72,514

Int. Cl.² G03C 1/76, 7/00, 5/04, 1/90

U.S. Cl. 96—67

5 Claims



1. An element for use in the Lippmann process comprising a transparent base, a layer of an unexposed photosensitive silver halide emulsion over and in contact with said base, and a separable reflective composite layer over and in contact with

said emulsion; said composite layer including a first translucent coating sublayer in contact with said emulsion susceptible of being dissolved in a solvent which does not affect the photosensitivity of said emulsion, a second translucent coating sublayer over and in contact with said soluble coating sublayer which is insoluble in said solvent, and a light reflecting coating sublayer over and in contact with said insoluble coating sublayer.

4,054,454

PHOTOSENSITIVE COPOLYMER ON SILICON SUPPORT

Richard Joseph Himics, Skillman; Scott Oliver Graham, and Daniel Louis Ross, both of Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 555,728, March 6, 1975, Pat. No. 3,964,909. This application Feb. 20, 1976, Ser. No. 659,976

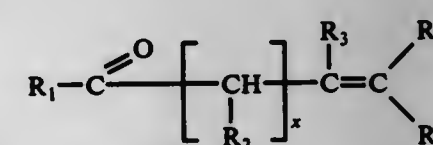
Int. Cl.² G03C 1/68, 5/00

U.S. Cl. 96—67

6 Claims



1. A recording medium comprising a film containing a sufficient amount of a photosensitive copolymer to form a photoresist wherein the photosensitive copolymer is a copolymer of SO₂ and a keto-olefin of the formula:



wherein R₁ is alkyl, aryl or substituted aryl; R₂ is hydrogen or methyl; x is an integer of 1 or 2; R₃ is hydrogen or is part of a carbocyclic ring with R₄ or R₅, with the proviso that when x is 2, R₃ is hydrogen; R₄ is hydrogen, alkyl or aryl; R₅ is hydrogen or when R₄ is hydrogen, is alkyl or aryl, or R₄ and R₅ together are part of a carbocyclic ring, on a support.

4,054,455

ARTICLE HAVING A LAYER CONTAINING A COPOLYMER OF GLYCIDYL METHACRYLATE AND ALLYL GLYCIDYL ETHER

Sheldon I. Schlesinger, East Windsor Township, Mercer County, N.J., and Veronica Cochran, Armonk, N.Y., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 509,678, Sept. 26, 1974, abandoned, which is a division of Ser. No. 297,829, Oct. 16, 1972, abandoned. This application June 18, 1976, Ser. No. 697,656

Int. Cl.² G03C 1/94, 1/78, 1/68

U.S. Cl. 96—86 P

10 Claims

1. As an article of manufacture, a composite sheet comprising (1) a support; and, in surface contact therewith, (2) a radiation-responsive organic-solvent-soluble layer of uniform thickness over part of the surface of said support and an organic solvent-insoluble layer over part of the surface of said support, said layers containing in admixture, a copolymer of glycidyl methacrylate and allyl glycidyl ether, derived from reaction of a mixture consisting essentially of the monomers containing

from about a 4 to 5 molar excess of glycidyl methacrylate per mole of allyl glycidyl ether in the presence of a free-radical polymerization catalyst and a solvent at a temperature below about 100° C, said copolymer having an inherent viscosity of at least about 0.25 and an epoxide equivalent of at least about 0.65 per 100 grams of polymer, and as a latent curing catalyst, an aromatic diazonium salt of a complex halogenide which decomposes upon exposure to electromagnetic or electron beam irradiation to release a Lewis Acid effective to initiate polymerization, said catalyst being present in an amount sufficient to effect polymerization of said copolymer and being selected from compounds having the general formula (ArN₂)_m(MX_{n+m})^{-m} wherein Ar is an aryl or substituted aryl group; X is chlorine or fluorine, M is phosphorous, n is the oxidation state of M, and m is the number of diazonium groups in the diazonium salt as determined by the net charge on the complex anion (MX_{n+m})^{-m};

said solvent-soluble layer having had substantially no exposure to irradiation and said solvent-insoluble layer having been exposed to electromagnetic or electron beam irradiation for a period of time sufficient to decompose said catalyst and polymerize said copolymer.

4,054,456

DIAZO PHOTOGRAPHIC MATERIALS CONTAINING 2-HYDROXY 3-NAPHTHANILIDE COUPLER

Motohiko Tsubota; Taiichi Nishimura, and Kinji Ohkubo, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 353,193, April 20, 1973, abandoned.

This application Aug. 27, 1975, Ser. No. 608,374

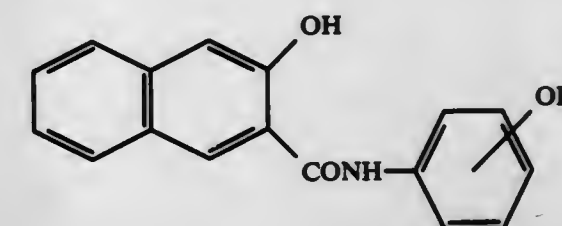
Claims priority, application Japan, Apr. 21, 1972, 47-40204

Int. Cl.² G03C 1/58

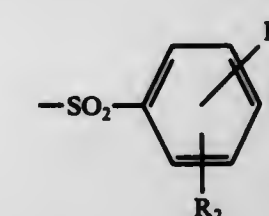
U.S. Cl. 96—91 R

7 Claims

1. A diazo photographic material having a support with a stabilized photosensitive emulsion layer thereon which provides blue images containing, together with a photosensitive diazonium compound, at least one compound which forms a blue dye upon reaction with said photosensitive diazonium compound, which compound is represented by the general formula



wherein R₁ represents (1)



wherein R₂ and R₃ each represents a hydrogen atom, a halogen atom, or an alkyl group having 1-4 carbon atoms; or (2) —COR₄ wherein R₄ represents an alkyl group or a substituted phenyl group or unsubstituted phenyl group wherein said substituted phenyl group is substituted with one or more members from the group consisting of hydroxy, halogen, nitro, alkyl having 1-4 carbon atoms, aryl or aralkyl where the alkyl moiety has 1-4 carbon atoms.

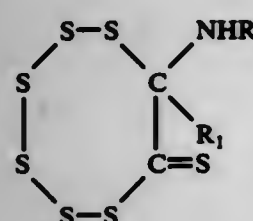
4,054,457
SILVER HALIDE EMULSIONS CONTAINING
HEXATHIOCANES AS SENSITIZERS

John Howard Bigelow, Rochester, N.Y., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.
 Filed Dec. 17, 1976, Ser. No. 751,585
 Int. Cl.² G03C 1/28

U.S. Cl. 96—107

7 Claims

1. A photographic element comprising a support coated with a light-sensitive silver halide emulsion containing a sensitizing amount of a hexathiothane thione sensitizer which has the basic structure



wherein R is a member of the group consisting of alkyl, unsaturated alkyl, and a saturated cyclic group, and R₁ is aryl or substituted aryl.

4,054,458
GELATINO SILVER HALIDE PHOTOSENSITIVE
MATERIAL

Kazuhiko Ohtani; Yosuke Nakajima; Reichi Ohi, all of Minami-ashigara; Tokiharu Kondo, deceased, late of Minami-ashigara, Japan, by Yoshiharu Kondo, legal representative, Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

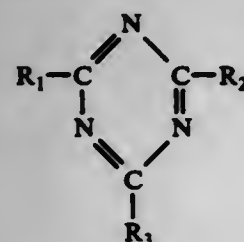
Continuation of Ser. No. 378,845, July 13, 1973, Pat. No. 3,905,821, which is a continuation-in-part of Ser. No. 74,520, Nov. 2, 1970, abandoned. This application Sept. 12, 1975, Ser. No. 612,986

Claims priority, application Japan, Sept. 22, 1969, 44-75467
 Int. Cl.² G03C 1/28

U.S. Cl. 96—107

12 Claims

1. A gelatino silver halide photo-sensitive emulsion which comprises, a silver halide emulsion sensitized to its maximum sensitivity by conventional chemical sensitization containing a sensitizing effective amount of a sensitizing compound represented by the following formula:



wherein R₁, R₂ and R₃ each represent a hydroxyl group, a hydroxylamino group, an amino group, an alkylamino group of from 1-6 carbon atoms, said alkyl group of said alkylamino group capable of being substituted by a member selected from the group consisting of a hydroxy group, a dialkylamino group of from 2 to 8 carbon atoms and an alkoxy group of from 1 to 4 carbon atoms, an arylamino group, said arylamino group capable of being substituted with a member selected from the group consisting of an alkyl group of from 1 to 4 carbon atoms, an alkoxy group of from 1 to 4 carbon atoms, a hydroxy group and a halogen atom, an alkoxy group of from 1 to 6 carbon atoms, an aryloxy group, said aryloxy group capable of being substituted with a member selected from the group consisting of an alkyl group of from 1 to 4 carbon atoms, an alkoxy group of from 1 to 4 carbon atoms, a hydroxy group, and a halogen atom, an alkyl group of from 1 to 6 carbon atoms, an aryl group, said aryl group capable of being substituted with a member selected from the group consisting of an alkyl group of from 1 to 4 carbon atoms, an alkoxy group of from 1 to 4 carbon

atoms, a hydroxy group, and a halogen atom, or a halogen atom, said compound represented by the above described formula containing no more than one group which is active to gelatin, with the proviso that if R₁, R₂ or R₃ is a halogen atom, no more than one of said R₁, R₂ and R₃ can be a halogen atom, and an organic hardening agent.

4,054,459
METHOD OF PREPARING GLASS BATCH

Garegin Sarkisovich Melkonian, ulitsa Berekamutiana, 26, kv. 11, Erevan, U.S.S.R.

Continuation of Ser. No. 426,241, Feb. 19, 1973, abandoned.

This application Nov. 19, 1975, Ser. No. 633,385

Int. Cl.² C03C 3/04

U.S. Cl. 106—52

3 Claims

1. A method for preparing a glass batch for colorless silicate glass comprising the steps of

- subjecting perlite to hydrothermal alkaline treatment and filtering to produce an aqueous solution of sodium trisilicate;
- mixing a part of the sodium trisilicate solution prepared in step (a) with a bivalent or trivalent metal oxide or hydroxide to form a precipitate of the silicate of said bivalent or trivalent metal and filtering to form a filtrate containing aqueous sodium hydroxide;
- mixing another part of the sodium trisilicate solution from step (a) with the metal silicate precipitate from step (b); and
- drying and simultaneously granulating the mixture from step (c) at a temperature of from 150° to 500° C. to form a cemented aggregate product, wherein the proportions of sodium trisilicate and bivalent or trivalent metal silicate used in step (c) are determined by the desired composition of the glass.

4,054,460
COMPOSITION AND METHOD FOR RETARDING THE
SETTING OF CEMENTS

Jean H. Buchet, Nice, France, and Fernand Peerts, Heverlee (Louvain), Belgium, assignors to Chemical Development Corporation, Nice, France and Tessenderlo Chemie S.A., Tessenderlo-B, Belgium

Filed Sept. 17, 1976, Ser. No. 724,451

Claims priority, application France, Sept. 18, 1975, 75.28546

Int. Cl.² C04B 7/35

U.S. Cl. 106—89

10 Claims

- A composition comprising:
 - a cement selected from the group consisting of Portland cement, slag cement and mixtures thereof;
 - a retarding agent in an amount relative to the cement contained in the final composition of 0.5-5% by weight, said retarding agent consisting essentially of, in percent by weight:

CaF ₂	50 - 65
Ca ₃ (PO ₄) ₂	7 - 12
CaSO ₄	5 - 7.5
SiO ₂	10 - 20
Fe ₂ O ₃	1 - 2
Al ₂ O ₃	1 - 5

said retarding agent being the insoluble residue by-product obtained by dissolving raw phosphate with hydrochloric, nitric or phosphoric acid.

4,054,461
METHOD OF CEMENTING

Robert C. Martin, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 670,331, March 25, 1976. This application

Jan. 28, 1977, Ser. No. 763,732

Int. Cl.² C04B 7/35

U.S. Cl. 106—89

14 Claims

1. A method of cementing the low temperature zone of an environment having a low temperature zone below about 80° F, which comprises providing a cement slurry, transporting said slurry to said low temperature zone, and permitting the slurry to set up in said low temperature zone, wherein the slurry comprises portland cement and the calcium sulfate hemihydrate form of gypsum in a weight ratio of from 3:1 to 1:3 and, based on the total weight of said portland cement and gypsum:

- from about 5 to about 25 percent alkali metal nitrate;
- from about 0.1 to about 2 percent of at least one retarder selected from the group consisting of
 - a low molecular weight polycarboxylic acid,
 - a sodium, potassium, or lithium salt of a low molecular weight polycarboxylic acid, and
 - an alkaline hexametaphosphate; and
- from about 25 to about 50 percent water.

4,054,462
METHOD OF CEMENTING

Duane L. Stude, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 662,666, March 1, 1976, Pat. No. 4,036,659.

This application Feb. 11, 1977, Ser. No. 768,005

Int. Cl.² C04B 7/35

U.S. Cl. 106—90

17 Claims

1. A method of cementing in the low temperature zone of an environment having a low temperature zone below about 80° F, which comprises:

- providing a slurry comprising portland cement and the calcium sulfate hemihydrate form of gypsum in a weight ratio of from 3:1 to 1:3 and, based on the total weight of said portland cement and gypsum,
- from about 5 to about 25 percent urea,
- from about 0.1 to about 2 percent of at least one retarder selected from the group consisting of
 - a water soluble salt of lignosulfonic acid,
 - a low molecular weight hydroxypolycarboxylic acid,
 - a sodium, potassium, or lithium salt of a low molecular weight hydroxypolycarboxylic acid, and
 - an alkaline hexametaphosphate, and
- from about 25 to about 50 percent water;
- transporting said slurry to said low temperature zone; and
- permitting the slurry to set up in said low temperature zone.

4,054,463
PROCESS FOR PRODUCING CEMENTITIOUS
PRODUCT FROM QUENCHED FLY ASH

Ping-Wah Lin, 506 S. Darling, Angola, Ind. 46703

Filed May 7, 1976, Ser. No. 684,188

Int. Cl.² C04B 7/02

U.S. Cl. 106—97

4 Claims

1. A process for producing a dry cementitious product comprising the steps of heating and thereafter rapidly quenching a quantity of fly ash to effect heat induced fractures of the outer surface thereof, and thereafter combining with said fly ash a second material selected from the group consisting of lime, lime derived from calcium oxide coated with cracked calcium sulphate particles, cement, and calcium oxide coated with cracked calcium carbonate particles.

4,054,464
METHOD FOR MAKING CEMENT USING ARAGONITE

Ernest B. Thorn, Jr.; Charles W. Grube; Walter W. Rowe, all of Dallas, and Johann A. Schueler, Richardson, all of Tex., assignors to General Portland, Inc., Dallas, Tex.

Filed July 20, 1976, Ser. No. 706,942

Int. Cl.² C04B 7/38

U.S. Cl. 106—100

12 Claims

1. An improved process for producing Portland cement clinker using aragonite as the calcium carbonate constituent comprising:

- forming a raw kiln feed consisting essentially of substantially dry, naturally recovered, unprocessed aragonite and an argillaceous material; chemically balanced to produce Portland cement clinker and
- burning said raw kiln feed within a rotary kiln to produce a Portland cement clinker having a free-lime content of less than about 2%.

4,054,465
LEAD CHROMATE PIGMENTS

Bernard George Ziobrowski, Glens Falls, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

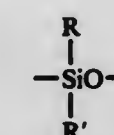
Filed Sept. 29, 1976, Ser. No. 727,926

Int. Cl.² C09C 1/20

U.S. Cl. 106—298

10 Claims

1. In a pigment consisting essentially of lead chromate-containing particles having on their surfaces a substantially continuous coating of dense amorphous silica, dense amorphous silica and alumina or a solid, glass-like alkali polysilicate, the improvement which comprises said pigment particles having absorbed on the coated surfaces thereof a liquid organopolysiloxane containing repeating units of the formula



where R and R' are hydrocarbyl groups in an amount from 1 to 15% of the weight of the coated particles, the improved pigment being free-flowing and having in thermoplastic systems improved dispersibility characteristics, heat stability and resistance to mechanical destruction by abrasion, shear or impact.

4,054,466
TANNIN TREATMENT OF ALUMINUM

Peter F. King, Farmington, and Gary A. Reghi, Sterling Heights, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 612,075, Sept. 10, 1975, abandoned, which is a continuation of Ser. No. 470,424, May 16, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,500

Int. Cl.² C23F 7/00

U.S. Cl. 148—6.27

20 Claims

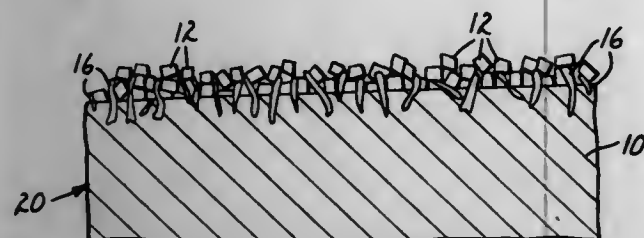
1. A process for the treatment of an aluminum surface to transform the surface to improve both the corrosion resistance of the surface and the adhesion of an organic finish to be subsequently applied to the treated surface comprising contacting the surface with an aqueous solution consisting essentially of at least 0.000025 weight percent of a vegetable tannin which solution exhibits a pH of from 3 to 9.

4,054,467

METHOD OF COATING ALUMINUM SUBSTRATES
Valdis Mikelsons, Mendota Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Division of Ser. No. 538,928, Jan. 6, 1975, Pat. No. 3,975,197.
This application June 2, 1976, Ser. No. 692,038
Int. Cl.² C23F 7/22

U.S. Cl. 148—6.3

9 Claims



1. A process for preparing a coated aluminum substrate comprising:

- applying particulate material to an aluminum substrate, said particulate material having an average particle size of about 0.05 to 3000 microns, a melting point above about 150° C., and a water solubility of less than about 0.1 part per 100 parts of water at 100° C., and
- exposing the aluminum substrate bearing the particulate material to an oxidizing environment containing water for a time, in an amount, and at a temperature sufficient to provide in situ formation of aluminum hydroxyoxide whereby the particulate material is firmly bound to the aluminum substrate.

4,054,468

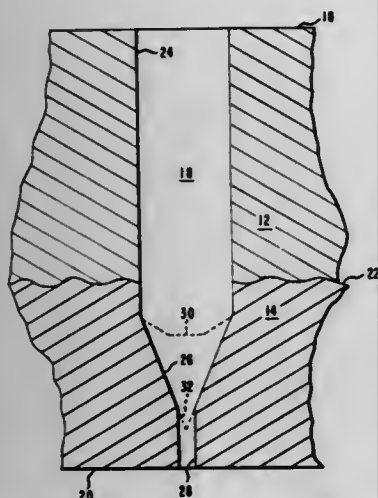
PROCESS OF MAKING A LAMINATED SPINNERET
Leland Robert Hoanaker, Wilmington, Del.; Gary Lee Jones, Midlothian, and Walter Ernest Wood, both of Ridgeway, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 7, 1976, Ser. No. 720,849

Int. Cl.² D01D 3/00

U.S. Cl. 148—11.5 Q

3 Claims



1. In the production of a corrosion-resistant spinneret suitable for spinning filaments of poly(p-phenylene terephthalamide) from a viscous solution of the polymer in 98 to 100 percent sulfuric acid, the process steps which comprise

- a machining a laminate, consisting of a plate of tantalum alloy or stainless steel clad on one face with a layer of commercially pure tantalum, to form a spinneret blank wherein the area of the blank which is to contain spinneret orifices has parallel flat faces, is of a thickness sufficient to prevent bulging of the spinneret face at spinning pressures, and has an exit face layer of tantalum about 0.025 to 0.04 inch thick,

- drilling a counterbore through the plate and partially into the tantalum layer at the location of each spinneret orifice,
- forming a conically tapering section at the bottom of each counterbore,
- wrapping the spinneret blank in tantalum metal foil and heat-treating the blank in vacuum at about 1,800° to 2,000° F to provide a soft-annealed tantalum layer,
- forming an axially aligned spinneret capillary, of about 3 to 12 square mills in cross-sectional area, from the tip of each conical taper through the tantalum layer to the exit face of the spinneret blank,
- polishing the exit face of the spinneret to remove protrusions formed by the capillary forming operations, and
- heat-treating the spinneret in nitrogen at about 1,600° to 1,700° F to harden the face.

4,054,469

DIRECTIONALLY SOLIDIFIED EUTECTIC $\gamma + \beta$ NICKEL-BASE SUPERALLOYS

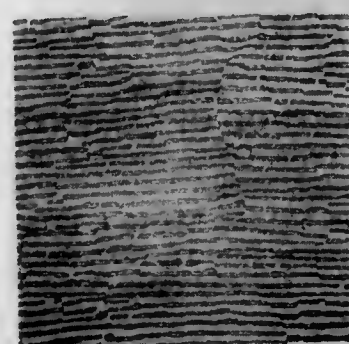
Melvin R. Jackson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 1, 1976, Ser. No. 691,935

Int. Cl.² C22C 30/00, 19/05

U.S. Cl. 148—31

11 Claims



1. An article of manufacture having improved high temperature strength and oxidation resistance properties comprising a directionally solidified multivariant eutectic $\gamma + \beta$ nickel-base superalloy casting containing a two phase eutectic structure consisting of a γ phase matrix of a face-centered-cubic solid solution crystal structure based on nickel having embedded in the γ phase an aligned reinforcing lamellar β phase consisting primarily of a nickel-iron-aluminum (Ni,Fe,Al) composition which is a body-centered-cubic (CsCl) ordered intermetallic based on (Ni,Fe)Al.

4,054,470

BORON AND COPPER BEARING SILICON STEEL AND PROCESSING THEREFORE

Frank A. Malagari, Jr., Freeport, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed June 17, 1976, Ser. No. 696,970

Int. Cl.² H01F 1/04

U.S. Cl. 148—111

8 Claims

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation, which process includes the steps of: preparing a melt of silicon steel containing from 0.02 to 0.06% carbon, from 0.015 to 0.15% manganese, from 0.01 to 0.05% of material from the group consisting of sulfur and selenium, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, no more than 0.008% aluminum and from 2.5 to 4.0% silicon; casting said steel; hot rolling said steel to an intermediate thickness of from about 0.050 to about 0.120 inch; cold rolling said steel from said intermediate thickness to a final gage no greater than 0.020 inch without an intermediate anneal between cold rolling passes; preparing several coils from said steel; decarburizing said steel; and final texture annealing said steel; the improvement comprising the step of incorporating between 0.3 and 1.0% copper in said melt, said copper improving the magnetic quality of said steel so that at least 25% of said

coils have a permeability of at least 1870 (G/O_e) at 10 oersteds and a core loss of no more than 0.700 watts per pound at 17 kilogauss, at both ends, said melt consisting essentially of, by weight, from 0.02 to 0.06% carbon, from 0.015 to 0.15% manganese, from 0.01 to 0.05% of material from the group consisting of sulfur and selenium, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, no more than 0.008% aluminum, from 2.5 to 4.0% silicon, between 0.3 and 1.0% copper, balance iron.

4,054,471

PROCESSING FOR CUBE-ON-EDGE ORIENTED SILICON STEEL

Amitava Datta, Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed June 17, 1976, Ser. No. 696,964

Int. Cl.² H01F 1/04

U.S. Cl. 148—112

20 Claims

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1870 (G/O_e) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel containing from 0.02 to 0.06% carbon, from 0.015 to 0.15% manganese, from 0.01 to 0.05% of material from the group consisting of sulfur and selenium, from 0.0006 to 0.0080% boron, up to 0.0100% nitrogen, up to 1.0% copper, no more than 0.008% aluminum and from 2.5 to 4.0% silicon; casting said steel; hot rolling said steel; cold rolling said steel to a final gage no greater than 0.020 inch; normalizing said steel; decarburizing said steel to a carbon level below 0.005%; applying a refractory oxide base coating to said steel; and final texture annealing said steel; the improvement comprising the step of normalizing said cold rolled steel of final gage at a temperature of from 1550° to 2000° F in a hydrogen-bearing atmosphere, so as to recrystallize the cold rolled steel; and subsequently applying said refractory oxide base coating to said steel; said processed steel having a permeability of at least 1870 (G/O_e) at 10 oersteds; said normalize at a temperature of from 1550° to 2000° F contributing to the high permeability of said steel.

4,054,472

ALKALI-RESISTANT COMPOSITIONS FOR FORMING GLASS FIBERS

Masahiro Kondo; Suguru Takehara; Tsutomu Mitsufuji; Moritosi Sasaki, and Tomoji Takura, all of Mouka, Japan, assignors to Fuji Fibre Glass Company, Ltd., Tokyo, Japan

Filed May 19, 1976, Ser. No. 687,746

Claims priority, application Japan, May 23, 1975, 50-61087

Int. Cl.² C03C 13/00, 3/04

U.S. Cl. 106—52

11 Claims

1. An alkali-resistant composition for forming glass fibers consisting essentially of, by molecular weight percentage, 58-77% of SiO₂, 4-11% of ZrO₂, 16-24% of at least one of alkali metal oxides and 0.5-3.5% of at least one oxide selected from the group consisting of an oxide of iron and an oxide of copper, with the proviso that the molecular weight percentages of the oxide of iron and oxide of copper are calculated in terms of the chemical formulas Fe₂O₃ and CuO, respectively.

4,054,473

METHOD FOR SEALING JOINTS IN PLASTIC LINED PIPES

Burl B. Ohnstad, Thousand Palms, Calif., assignor to Ameron, Inc., Monterey Park, Calif.

Filed Nov. 26, 1975, Ser. No. 635,704

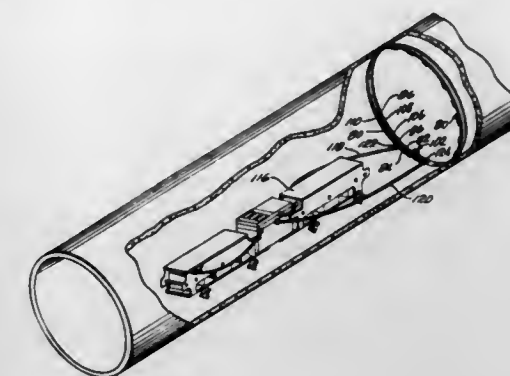
Int. Cl.² F04B 2/00; B29C 19/06

U.S. Cl. 156—71

3 Claims

1. A method of joining the thermoplastic lining at a joint between adjacent lined pipe sections comprising the steps of: forming an elongated flat strip of thermoplastic material, attaching a pair of elongated resistance heater elements in spaced parallel relation longitudinally along one surface of the strip, applying the strip around the inside of the joint with the width of the strip bridging the joint and with the heater elements in

contact with the liners respectively on either side of the joint, applying pressure radially outwardly against the strip to urge the strip against the adjoining liners, forming a plurality of



electrical connections to the respective heater elements at equally spaced intervals along the length of the strip, and applying a voltage between each pair of adjacent connections of each of the heater elements.

4,054,474

SHRINK WRAPPING

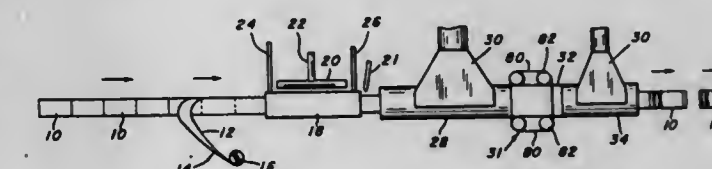
John W. Collins, III, Allegheny Township, Westmoreland County, and E. Scott Douds, Pittsburgh, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 18, 1976, Ser. No. 668,206

Int. Cl.² B29C 27/00

U.S. Cl. 156—86

10 Claims



1. Apparatus for decorating cylindrical bodies with a heat shrinkable plastic label comprising, means for spacing a continuous series of moving cylindrical bodies at regular intervals along a common central axis, means for forming a strip of heat shrinkable sheet plastic around the series of cylindrical bodies with the opposite edges of the strip adjacently disposed longitudinally of the cylindrical bodies, means for welding together the opposite edges of the plastic strip to form a tube around the series of cylindrical bodies, means for heating the plastic tube to shrink it against the cylindrical bodies, and means for severing the plastic tube between adjacent bodies.

4,054,475

METHOD FOR PRODUCING A CONTINUOUS BAND OF RUBBERIZED FABRIC HAVING TRANSVERSAL REINFORCING METAL ELEMENTS

Franco Bottasso, and Antonio Pacciarini, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Division of Ser. No. 485,007, July 1, 1974, Pat. No. 3,962,022.

This application Jan. 7, 1976, Ser. No. 647,157

Claims priority, application Italy, July 3, 1973, 26121/73

Int. Cl.² B65H 19/00

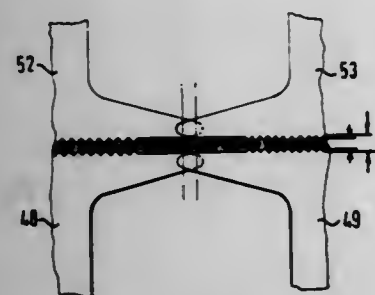
U.S. Cl. 156—157

5 Claims

1. In a method for manufacturing a continuous band of rubberized fabric provided with transversal reinforcing metal cords, by butt-splicing, without overlapping, two identical quadrangular pieces of said rubberized fabric along their facing splicing edges, parallel to said metal cords, said edges being respectively defined as "terminal end" and "initial end", the "terminal end" being the edge of the continuous band already

built up, and the "initial end" being the edge of the piece to be spliced to said band, said method comprising the steps of:

- arranging the terminal end of said continuous band between two corresponding parts of a first operating portion of a splicing apparatus,
- advancing the piece to be spliced towards said band so that at the end of said advancement said piece is coplanar with said band, arranged between two corresponding parts of a second operating portion of said splicing apparatus with its initial end facing the terminal end of said band,
- blocking said band and said piece, by pressing them between said two parts respectively, of said first operating portion and said second operating portion of the splicing apparatus,
- mutually approaching said ends for a first determined distance, in order to obtain the butt-splicing of said band with said piece,



releasing said band and said piece from the two parts of said respective first operating portion and said second operating portion of the splicing apparatus, and winding up the continuous band so built up, onto a collecting drum,

the improvement comprising the steps of applying said blocking pressure on the area of said band and said piece beginning from a pre-established distance from each of said respective terminal and initial ends, so that both said band and said strip of fabric are free from said blocking pressure along said pre-established distance and along the ends to be spliced, and

causing, by said mutual approaching of said ends, an increase of the density of the reinforcing cords in the zone astride the contact surface of said ends whose width depends on said pre-established distance and said first determined distance, and an accumulation of the rubber about the cords in said zone, causing the thickness of the fabric to be raised in this zone.

4,054,476

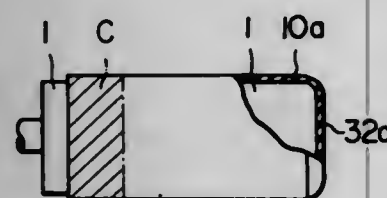
METHOD AND APPARATUS FOR FABRICATING NON-VULCANIZED PNEUMATIC RUBBER FENDERS
Yoshiaki Hara; Yusaku Waki; Yasuo Minai, all of Hiratsuka, and Katumi Nakamura, Ischawa, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1975, Ser. No. 643,132

Int. Cl.² B63B 59/02

U.S. Cl. 156—191

10 Claims



1. A process for fabricating a pneumatic rubber fender comprising:

- a first step of forming a main body of said non-vulcanized pneumatic rubber fender provided with a cylindrical body portion and a first end plate closing an end of said cylindrical body portion on a fabrication drum provided with a

cylindrical portion and an end plate portion closing one end of said cylindrical portion;

- a second step of disposing on the opened end portion of said cylindrical body portion, a cylindrical turn back case, which is closed at a longitudinal edge of one end and opened at the longitudinal edge of the other end, and is provided with an air supply opening thereafter, turning on and fixing the open edge portion of said cylindrical body portion on the circumference of said open edge of said turn back case in air tight condition, next, supplying air into said turn back case through said air supply opening so as to relatively retract said turn back case from said fabrication drum and turn back said open edge of said cylindrical body toward said first end plate;
- a third step of applying a second end plate having a valve attachment at a central portion thereof onto said end plate portion of said fabrication drum by way of said first end plate and bonding a peripheral edge portion of said second end plate with said turned back edge of said cylindrical body so that a non-vulcanized fender proper in partly turned back condition is formed on said fabrication drum;
- a fourth step of withdrawing said non-vulcanized fender proper in partly turned back condition from said fabrication drum;
- a fifth step of vulcanizing said non-vulcanized rubber fender proper.

4,054,477

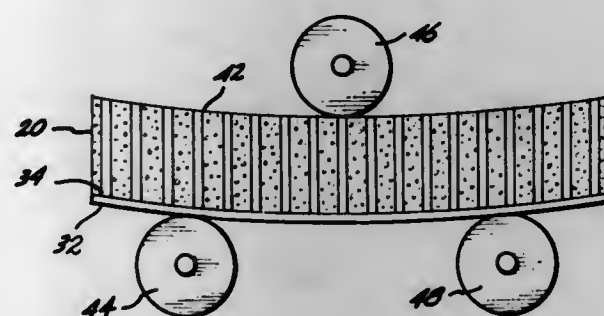
METHOD FOR FORMING A CONTOURED INSULATED HONEYCOMB CORE PANEL AND PANEL PRODUCED
Richard Norman Curran, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 7, 1975, Ser. No. 629,864

Int. Cl.² B31D 3/02

U.S. Cl. 156—197

4 Claims



- A process for preparing an insulated contoured honeycomb core structure having minimized distortion at the convex surface thereof comprising:

bonding a stabilizing adhesive layer including a relatively nonstretchable dimensionally stable peel ply on one cell end edge surface of a honeycomb core;

shaping said honeycomb core with said adhesive layer positioned on the resultant convex surface of said core whereby cell and edge structure remains undistorted on said convex side and cell end edge structure on the concave side is compressed;

bonding a second adhesive layer on said concave side; removing said peel ply; and

adhering a face sheet to each side of said honeycomb core without piercing of said stabilizing adhesive layer by said core whereby said stabilizing layer thermally isolates said face sheet from said honeycomb core to minimize the heat conductivity of said honeycomb core sandwich.

4,054,478

METHOD OF MANUFACTURING A THERMOELECTRIC DEVICE

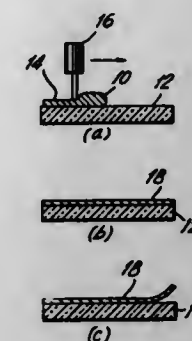
Robert C. Linnon, Livingston, N.J., assignor to Nu-Pak Corporation, Denville, N.J.

Filed May 25, 1976, Ser. No. 689,730

Int. Cl.² B01J 3/00; H01L 35/34; B29G 1/00

U.S. Cl. 156—242

10 Claims



- The method of manufacturing a thermoelectric device which includes a plurality of thin thermoelectric layers and insulative layers comprising the steps of:

forming a first suspension comprising a powdered P-type thermoelectric material, a binder and a liquid carrier; drawing the first suspension over a surface and allowing the liquid carrier to evaporate to form a first coherent film; forming a second suspension comprising a powdered N-type thermoelectric material, a binder and a liquid carrier; drawing the second suspension over a surface and allowing the liquid carrier to evaporate to form a second coherent film;

forming a third suspension comprising an insulative material, a binder and a liquid carrier; drawing the third suspension over a surface and allowing the liquid carrier to evaporate to form a third coherent film; stacking said first, second and third coherent films with said third coherent film interposed between and electrically insulating said first and second coherent films; compressing and heating said stack of films in an inert atmosphere to volatilize said binders converting said coherent films to first and second solid thermoelectric layers and a third solid insulative layer and to bond the third insulative layer to the adjacent thermoelectric layers to form a laminate.

4,054,479

ADDITIVE PROCESS FOR PRODUCING PRINTED CIRCUIT ELEMENTS USING A SELF-SUPPORTED PHOTOSENSITIVE SHEET

Robert William Peiffer, Jackson, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1976, Ser. No. 753,459

Int. Cl.² H05K 3/18

U.S. Cl. 156—280

12 Claims

- A process for the preparation of multilayered printed circuit boards with plated through-holes from a self-supported, adherent, photopolymerizable sheet having on each surface a removable cover film which comprises,

- exposing the self-supported, adherent, photopolymerizable sheet through the cover film imagewise to actinic radiation;
- removing the cover film;
- applying finely divided catalyst material to the surface to form a catalytic image;
- treating the catalytic image with an electroless plating solution to form a printed circuit substrate; then, using the printed circuit substrate,
- laminating the surface of an adherent, photohardenable layer of a photohardenable element comprising an adherent photohardenable layer and a strippable cover film thereon, to the printed circuit substrate; then, in either order,

- imagewise exposing the laminated element through the cover film to actinic radiation; and
- introducing through-holes into the laminated element; then
- removing the strippable cover film;
- applying divided catalyst material to the surface and the through-holes to form a catalytic image;
- treating the catalytic image and holes with an electroless plating solution to form a conductive printed circuit and holes; and
- curing the laminated element by baking.

4,054,480

ANAEROBIC ADHESIVE AND SEALANT COMPOSITIONS CONTAINING ALPHA-HYDROXYSULFONE

Martin M. Skoultschi, Somerset; Dilip K. Ray-Chaudhuri, Somerville, and William J. Catena, Passaic, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

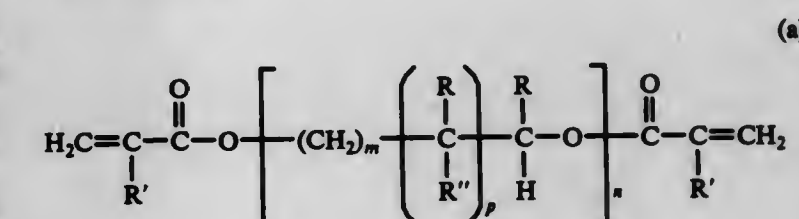
Filed May 22, 1975, Ser. No. 579,782

Int. Cl.² C09J 5/04; C08F 3/62, 18/00, 2/00

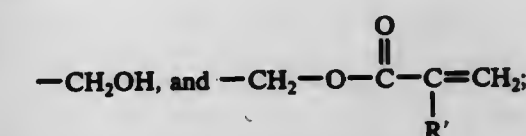
U.S. Cl. 156—331

13 Claims

- An anaerobic curing composition stable when exposed to air consisting essentially of a mixture of a polymerizable acrylic or substituted acrylic monomer selected from the group consisting of

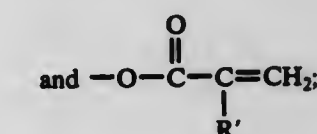


wherein R is selected from the group consisting of hydrogen, methyl, ethyl,

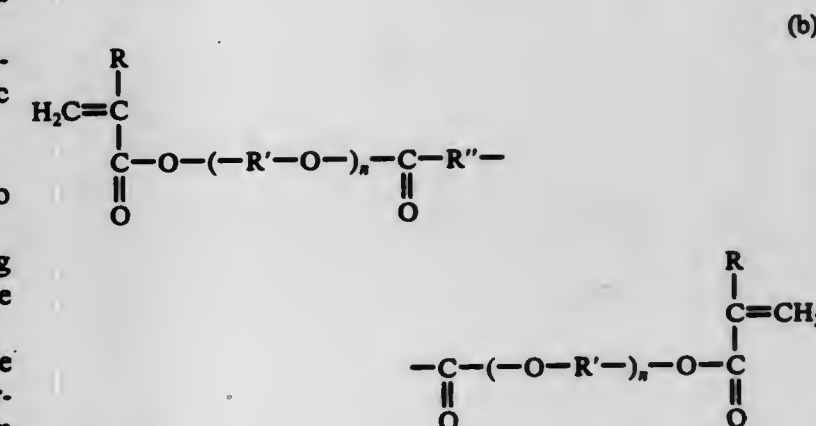


R' is selected from the group consisting of hydrogen, chlorine, methyl and ethyl;

R'' is selected from the group consisting of hydrogen, hydroxy,

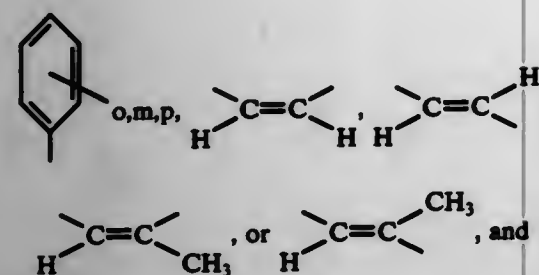


m is an integer from 1 to 8; and n is an integer from 1 to 20; and p is 0 or 1;

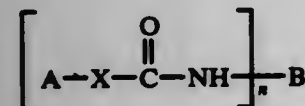


wherein

R represents hydrogen, chlorine, methyl or ethyl,
R' represents alkylene with 2-6 carbon atoms,
R'' represents $(CH_2)_m$ in which m is an integer of from 0 to 8.



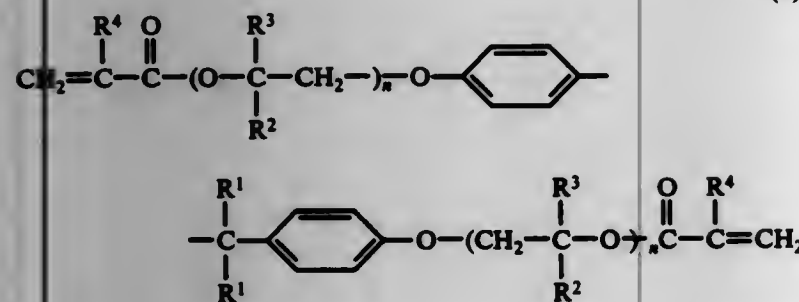
• represents an integer of from 1 to 4;



wherein X is selected from the group consisting of —O— and



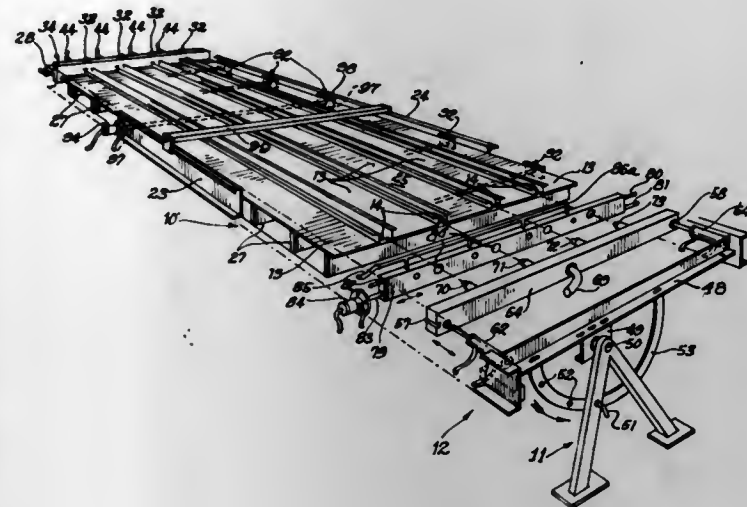
and R is a member selected from the group consisting of hydrogen and lower alkyl of 1 to 7 carbon atoms, A represents the organic residue of an active hydrogen containing acrylic ester wherein the active hydrogen has been removed, said ester being hydroxy or amino substituted on the alkyl portion thereof, and the methyl, ethyl and chlorine homologs thereof, *n* is an integer from 1 to 6, and B is a mono- or polyvalent organic radical selected from the group consisting of alkyl, allylene, alkenyl, cycloalkyl cycloalkylene, aryl, aralkyl, alkaryl, poly(oxyalkylene), poly-(carboalkoxyalkylene), and heterocyclic radicals both substituted and unsubstituted;



wherein R¹ is selected from the group consisting of methyl, ethyl, carboxyl and hydrogen, R² is selected from the group consisting of hydrogen, methyl and ethyl; R³ is selected from the group consisting of hydrogen, methyl and hydroxyl; R⁴ is selected from the group consisting of hydrogen, chlorine, methyl and ethyl and *n* represents an integer of from 0 to 8; and (e) monofunctional acrylate and methacrylate esters and the hydroxy, amide, cyano, chloro, and silane substituted derivatives thereof;

and from 0.05 to 5.0%, by weight of monomer, of an α -hydroxy sulfone, the latter compound present in amount sufficient to initiate polymerization of said acrylic monomer at room temperature in the absence of air or oxygen.

4,054,481
MECHANISM FOR ASSEMBLYING MULTI-STRATE
PANEL WITH PLASTIC KEYS
George Heffner, University City, Calif., assignor to Rohr Indus-
tries, Inc., Chula, V.I. STA Canada
Filed Apr. 21, 1976, Ser. No. 678,731
Int. Cl.² B32B 1/06



1. Mechanism for injecting flowable solidifying adhesive simultaneously into a plurality of key-forming passages in the joints of a panel comprising a plurality of assembled strakes joined together by interlocking joints, each of which joints has one such key-forming passage extending lengthwise there-through, said mechanism comprising:

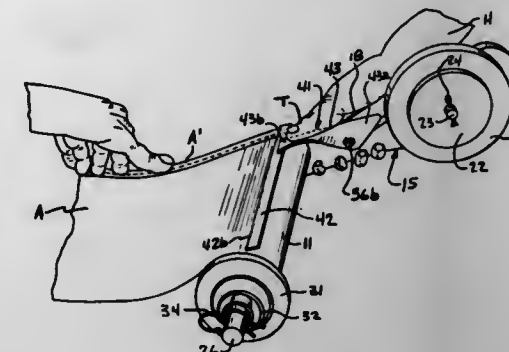
- a support for such panel;
- a nozzle manifold mounted endwise beyond a panel assembled on the support for reciprocation toward and away from a selected, upstream end of such panel;
- a plurality of nozzles mounted on said nozzle manifold and in open communication therewith, each of the nozzles being aligned with, and shaped and located for advance into sealed engagement with, one of the key-forming passages in such panel mounted on the support upon selected advance of the nozzle manifold toward such panel;
- controlled actuating means mounted for reciprocative actuation of the nozzle manifold;
- a flushing manifold having a plurality of nozzle seats thereon, each of the nozzle seats having an opening therein communicating with the flushing manifold, the flushing manifold being mounted for movement between retracted position, in which the flushing manifold is clear of the nozzles throughout the limits of reciprocative movement of the nozzle manifold, and actuated position, in which one of the nozzle seats is aligned with each of the nozzles for sealed communication of the nozzles with the flushing manifold upon selected advance of the nozzle manifold;

controlled actuating means mounted for actuation of the flushing manifold between its retracted and actuated positions;

- a supply of pressurized adhesive mounted for controlled communication with the nozzle manifold;
- first valve means for selectively controlling the flow of adhesive from the supply thereof through the nozzle manifold, the nozzles, and the key-forming passages with the nozzles in seated communication therewith;
- a supply of pressurized solvent mounted for controlled communication with the flushing manifold; and
- second valve means for selectively controlling the flow of flushing solvent through the flushing manifold and the nozzles when in sealed communication therewith.

OCTOBER 18, 1977

4,054,482
TAPE AND APRON DISPENSING APPARATUS
Stanley L. Wahlquist, 3203 S. Main St., Rockford, Ill. 61102
Filed Jan. 7, 1977, Ser. No. 757,649
Int. Cl.² B32B 31/00; B31F 5/00
U.S. Cl. 156-523 **10 Claims**



1. In a hand manipulable tape-apron dispensing apparatus for applying a strip of pressure sensitive tape to an edge of an apron strip and for dispensing the taped apron during application of the tape-apron to a surface to be masked, the dispensing apparatus including an elongated body member having inner and outer sides and upper and lower edges, tape roll support means on said body member adjacent one end for supporting a roll of pressure sensitive tape for rotation about an axis perpendicular to said inner side and with one end of the tape roll in a first plane adjacent said inner side of the body member, means extending laterally in cantilever fashion from said inner side of the body member adjacent the other end thereof for supporting a roll of apron material for rotation about a second axis parallel to the axis of the tape roll and with the periphery of the apron roll spaced a substantial distance from the periphery of the tape roll, apron roll guide means engaging one end of said apron roll for maintaining the same offset from said first plane a distance less than the width of the tape roll whereby a longitudinal portion of the tape strip from the tape roll will overlap and adhere to an edge portion of the apron strip on the apron roll when an end of the tape is withdrawn from its roll and passed over the apron roll at its upper side, said elongated body member having the portion thereof intermediate the tape roll and the apron roll adapted to be grasped in one hand to enable one hand positioning and movement of the dispensing apparatus during application of the taped apron to a surface being masked, the improvement comprising: a roll brake and cut-off device including a cutter bar adapted to extend lengthwise of the apron roll along the upper side thereof and an arm extending laterally of the cutter bar, means pivotally mounting one end of said arm on the body member at a location spaced from said other end of the body member to support the cutter bar for movement in a direction laterally of the upper side of the apron roll into and out of engagement therewith, said cut-off device having a portion providing an upwardly facing surface adjacent said body member at a location such that it can be engaged by the thumb of the same hand used to grasp the intermediate portion of the body member whereby the cutter bar can be selectively pressed by the thumb against the apron roll to facilitate tearing of taped apron along the cutter bar.

4,054,483

**ADDITIVES PROCESS FOR PRODUCING PLATED
HOLES IN PRINTED CIRCUIT ELEMENTS**

**Robert William Peiffer, Jackson, N.J., assignor to E. I. Du Pont
de Nemours and Company, Wilmington, Del.**

Filed Dec. 22, 1976, Ser. No. 753,458

Int. Cl.² C23F 1/02; H05K 1/00

U.S. Cl. 156—632

15 Claims

1. A process for preparing printed circuit boards having plated through-holes from a photosensitive element which comprises a substrate bearing, in order, a photosensitive layer and a strippable support capable of transmitting actinic radiation, wherein the photosensitive layer is imagewise exposed,

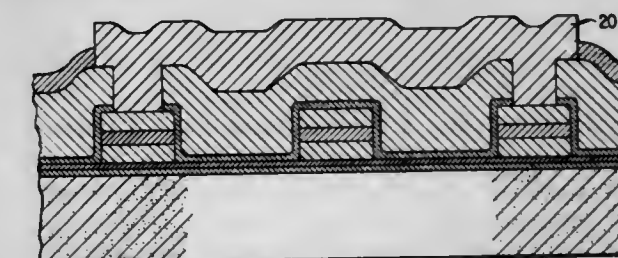
the strippable support is removed, the imaged photosensitive layer is developed, and the developed image is converted into a conductive printed circuit, which comprises, either prior to or after exposure, the steps of:

1. introducing through-holes into the element; and then
2. applying to the through-holes an adherent material which is catalytic to electroless plating or can be made catalytic by a development step;
3. removing the strippable support from the photosensitive layer; and
4. applying electroless plating solution to the catalyzed through-holes to produce an electrically conductive through-hole.

4,054,484

METHOD OF FORMING CROSSOVER CONNECTIONS

Nathan George Lesh, deceased, late of Bethlehem, Pa.; by William B. Ketterer, executor, Allentown, Pa.; Joseph Michael Morabito, Bethlehem, Pa., and John Henry Thomas, III, Pickerington, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.



11. A method of forming a conductive crossover connection between at least two conductors formed on an insulating substrate over an area separating said conductors, comprising the steps of:

- forming a layer of titanium over said substrate;
forming a first copper layer over said titanium layer;
forming on selected areas of said first copper layer at least two conductors comprising successively a second layer of copper, a first layer of nickel and a layer of gold;
plating a second layer of nickel over said first copper layer and said conductors to a thickness of at least 6,000 Å;
plating a third copper layer over said second nickel layer to a thickness in the range 1-2 mils before said nickel layer dries;
removing by a single etchant selected areas of said third copper layer and said second nickel layer over said conductors to be connected so as to expose said conductors in said areas;
plating over the conductors in said selected areas and over the remaining third copper layer in the space between conductors a conductive metal comprising gold to a thickness in the range 1-2 mils so as to form a conductive connection between said conductors;
removing said third copper layer with an etchant which does not significantly etch the said second nickel layer such that the first and second copper layers in the conductors are protected from the etchant;
removing said second nickel layer and the area of said first copper layer not covered by said conductors with a single etchant; and
removing said layer of titanium.

4,054,485

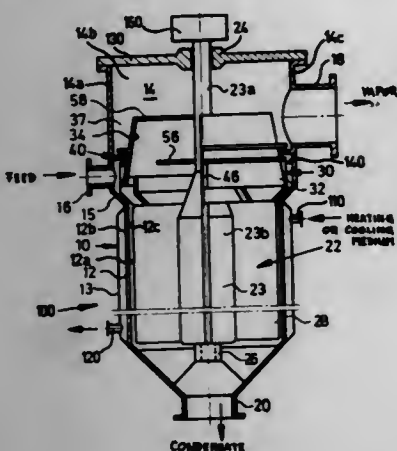
THIN FILM APPARATUS

Heinz Linder, Zofingen, and Hans Gruter, Zurich, both of Switzerland, assignors to Luwa AG, Zurich, Switzerland
 Filed Oct. 6, 1975, Ser. No. 620,155
 Claims priority, application Switzerland, Oct. 9, 1974, 13538/74

Int. Cl.² B01D 1/22

U.S. Cl. 159—6 W

13 Claims



1. A thin film apparatus for the treatment of a flowable material, comprising a substantially rotationally symmetrical housing member, rotor means rotatably mounted in said housing member, said housing member comprising a section defining a treatment portion containing a treatment compartment for the material to be treated and a section comprising a separator portion including a vapor outlet, said separator portion possessing an inner diameter greater than an inner diameter of said treatment portion, a transition member for interconnecting the separator portion with the treatment portion, said transition member possessing a substantially conical inner surface, inlet connection means for the infeed of the material to be treated opening into the interior of the housing member at a region of the substantially conical inner surface of the transition member which possesses a diameter which is larger than an inner diameter of the treatment compartment, said rotor means possessing vanes at least at the region of the treatment portion, said vanes extending approximately in axial direction of the housing member, collar means provided for said rotor means at the region of the substantially conical inner surface of the transition member, said collar means being provided with conveyor elements for displacing the material into the treatment compartment, a rotatable inner housing positioned above the transition member carrying a material distributor ring arrangement including distributor vanes for coaction with said inlet connection means to initially retard the downflow of the infeed materials prior to its being downwardly displaced by the conveyor elements on the collar means, said collar means being situated below said distributor ring arrangement and inwardly from the transition member for a distance sufficient to accommodate said conveyor elements.

4,054,486

NUCLEAR REACTOR FAIL-SAFE UNIT HAVING THE FUNCTION OF CONTROL RELAY AND CURRENT REGULATION

Claude Lefebvre, Les Lilas, and Jean-Paul Therond, Versailles, both of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Filed Dec. 3, 1975, Ser. No. 637,438

Claims priority, application France, Dec. 11, 1974, 74.40770; Dec. 11, 1974, 74.40771

Int. Cl.² G21C 7/00; H03K 17/02, 5/20

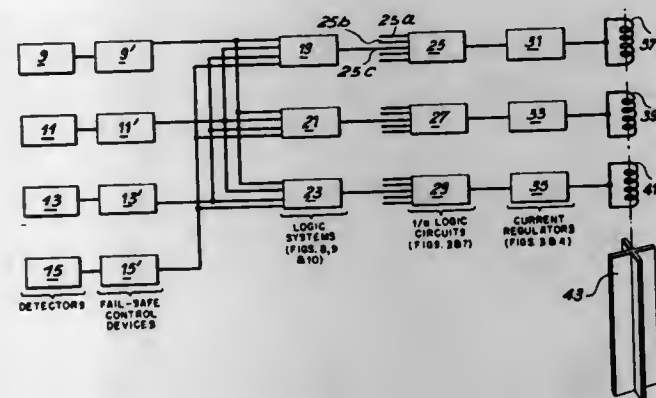
U.S. Cl. 176—20 R

11 Claims

1. In a fail-safe circuit for controlling the current in the coils of electromagnets for maintaining the safety absorbers of a nuclear reactor in a top position outside the reactor core under normal conditions and permitting the safety absorbers to drop

under gravity into the reactor core when certain monitored physical quantities deviate to an appreciable extent from predetermined reference values, the improvement comprising:

a self-supplied "AND₁" logic circuit of the positive safety type for performing logical multiplication of *m* input direct-current signals *a*, *b*, *c*, ..., *i*, ..., *m*, each of said input direct-current signals being capable of assuming one out of two distinct values including a 0 voltage value, said "AND₁" circuit comprising *m* series-connected dc/ac converter modules which are coupled to each other by means of electrical isolation transformers each of said *m* dc/c converter modules being supplied with a corresponding one of said direct-current input signals and with the alternating-current output voltage of the preceding module, an output isolation transformer having first and second secondary windings, and a rectifier and a self-oscillation dc/ac converter, the output of the last dc/ac converter module of the series being coupled on the one hand to the first dc/ac converter module through the first secondary winding of said isolation transformer, said rectifier followed by said



self-oscillation dc/ac converter to supply the first dc/ac converter module with an alternating-current voltage and coupled to the other hand through the second secondary winding of said isolation transformer to the output of the "AND₁" logic circuit, there being obtained at said output a square-wave signal whose amplitude value corresponds to the result of the logical multiplication of the different input direct-current signals *a*, *b*, *c*, ..., *i*, ..., *m*.

a static intensity regulator with negative current feedback, the input of which is coupled to the output of said "AND₁" logic circuit, said regulator modulating the width of the square-wave signal delivered by the output of said "AND₁" logic circuit, an output isolation transformer, the modulated square-wave signal from said static intensity regulator being coupled to the primary of said output isolation transformer, and a rectifier connected to the secondary winding of said output isolation transformer for delivering a constant current to a load constituted by one of the coils of said electromagnets, the output of said rectifier also being connected to said static intensity regulator to produce the negative current feedback.

4,054,487

NUCLEAR FUEL RODS

Toru Fujibayashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa and Nippon Genshiryoku Jigyo Kabushiki Kaisha, Tokyo, both of Japan

Filed May 28, 1975, Ser. No. 581,533

Claims priority, application Japan, June 4, 1974, 49-64071[U]

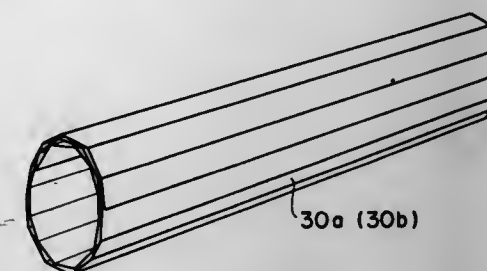
Int. Cl.² G21C 3/02

U.S. Cl. 176—68

5 Claims

1. In a nuclear fuel rod of the type comprising a sheath and a stack of a plurality of nuclear fuel pellets contained in said sheath, the improvement which comprises a wound leaf spring

member inserted in the gap between said sheath and the stack of said fuel pellets, said wound leaf spring member being made of a metal sheet having good heat conductivity and provided



with spaced parallel folds extending in the longitudinal direction, and said metal sheet being bent into a polygonal roll along said folds.



varying continuously in a predetermined manner throughout along the length of the zone.

4,054,488

PRESERVATION OF GLUCOSE IN BLOOD SAMPLES

Edward P. Marbach, 4607 Marwood Drive, Los Angeles, Calif. 90065

Continuation-in-part of Ser. No. 604,551, Aug. 14, 1975, abandoned. This application Feb. 26, 1976, Ser. No. 661,625

Int. Cl.² G01N 33/16

U.S. Cl. 195—1.8

10 Claims

1. A preserved sample including whole blood and a preservative to preserve the glucose content of said whole blood, said preservative being selected from a group consisting of Tris-Iodoacetate, a salt of Bromoacetic acid or a salt of Chloroacetic acid.

4,054,489

METHOD OF PREPARING L-GLUTAMIC ACID AND ITS SODIUM SALT

Nelli Isaakovna Zhdanova, Leningradskoe shosse, 112/1, korpus 3, kv. 748; Lev Mikhailovich Evstjugov-Babaev, ulitsa Pushkina, 22, kv. 36; Roza Mitrofanovna Balitskaya, ulitsa Vyborgskaya, 4, kv. 6; Albert Fedorovich Sholin, Teply Stan, 1a mikrorayon, korpus 18, kv. 100; Tatyana Borisovna Kasatkina, prospekt Mira, 120, kv. 226, and Natalya Nikolaevna Kuznetsova, ulitsa Dnepropetrovskaya, 23, korpus 3, kv. 130, all of Moscow, U.S.S.R.

Filed Sept. 26, 1975, Ser. No. 616,946

Int. Cl.² C12B 1/00

U.S. Cl. 195—47

4 Claims

1. A method of preparing L-glutamic acid and its sodium salt which comprises cultivating on a nutrient medium containing sources of carbon, nitrogen, and mineral salts *Micrococcus glutamicus* "VNIIGenetika" 3144, obtained from strain *Micrococcus glutamicus* "VNIIGenetika" 490 by multistep selection with mutagenic factors diethyl sulphate and ultra-violet radiation, precipitating the resulting biomass and recovering L-glutamic acid therefrom.

4,054,490

METHOD FOR INVESTIGATING MICROORGANISMS

Olof Alfred Yngve Vesterberg, Saltjö-Duvnas, Sweden, assignor to Orion-Yhtymä Oy-Orion Diagnostica, Helsinki, Finland

Filed Mar. 11, 1975, Ser. No. 557,287

Claims priority, application Sweden, Mar. 12, 1974, 7403259

Int. Cl.² C12K 1/00, 1/10

U.S. Cl. 195—103.5 K

7 Claims

1. A method in examining the effect of a biologically active substance on microorganisms, cultured in the presence of a continuous cultivating substance, the method comprising supplying the biologically active substance to the cultivating substance along an elongated zone in an amount continuously varying in a predetermined manner throughout the length of the zone, said biologically active substance being on a carrier

MICROORGANISM TESTING DEVICE AND METHOD

Sven E. Lindgren, Uppsala, Sweden, assignor to Kemanord AB, Stockholm, Sweden

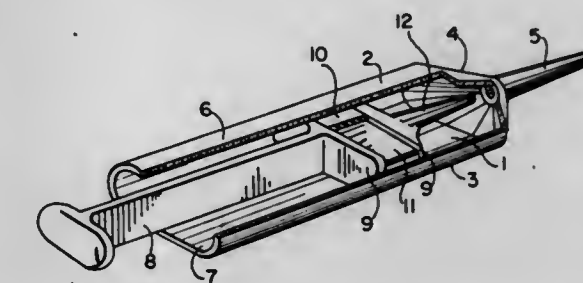
Filed Nov. 13, 1974, Ser. No. 523,376

Claims priority, application Sweden, Nov. 13, 1973, 7315344

Int. Cl.² C12K 1/04

U.S. Cl. 195—103.5 M

8 Claims



1. A method for determination of the presence of microorganisms in a sample wherein said sample and a growth medium for microorganisms are each individually sucked into a non-circular growth chamber having clear or transparent walls, said sucking being accomplished through one wall of said growth chamber which has an inlet passageway, said sucking being conducted by means of a displaceable opposite wall in the growth chamber, an upper wall and a lower wall of the growth chamber being spaced apart and disposed in a parallel relationship and connected to each other with side walls, the chamber having a cross section wherein the length of the cross section is more than two times greater than the width of the cross section, mixing said sample and growth medium in the growth chamber, incubating to permit growth of the microorganisms and examining the inoculated chamber through the clear or transparent walls of said growth chamber for the presence of growing colonies.

4,054,492

PROCESS FOR TREATING BITUMINOUS OR OIL-CONTAINING MATERIAL USING DRY DISTILLATION

Roland Rammner, Königstein, and Hans-Jürgen Weiss, Frankfurt am Main, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 20, 1976, Ser. No. 659,823

Claims priority, application Germany, Feb. 28, 1975, 2508707

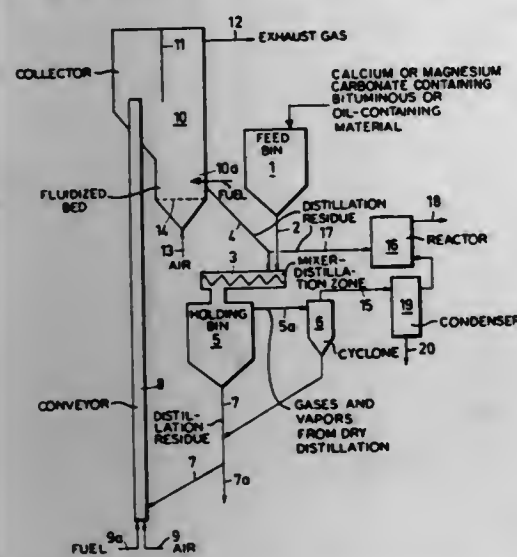
Int. Cl.² C10B 49/16, 55/02, 57/04

U.S. Cl. 201—12

9 Claims

1. A dry distillation process which comprises treating bituminous or oil-containing fine-grained material in a distillation zone with a heat carrier comprising fine-grained dry distillation residue which is heated in a pneumatic conveyor line by hot combustion gases and then fed to a collecting vessel to

remain in said collecting vessel for a residence time of 1-40 minutes at a temperature in the range of 750°-850° C, continuously withdrawing distillation residue from said collecting vessel and mixing same in the dry distillation zone with the bituminous or oil-containing fine-grained material, said material containing at least 0.2 percent by weight of magnesium



carbonate or calcium carbonate or a mixture of said carbonates, withdrawing distillation products from said distillation zone and feeding said withdrawn dry distillation residue to the inlet of the pneumatic conveyor line to be reheated therein and withdrawing exhaust gases from said collecting vessel, said exhaust gases having a small residual sulfur dioxide content.

4,054,493

METHOD AND APPARATUS FOR CONVERTING SALINE WATER TO FRESH WATER

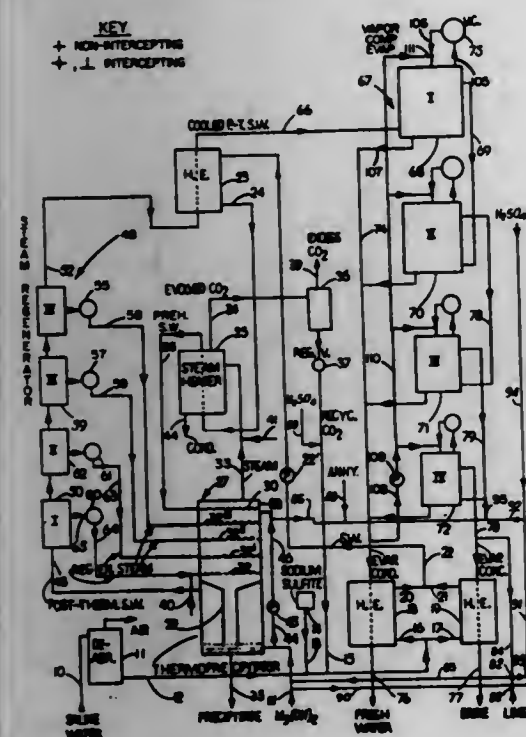
Paul S. Roller, 1440 N St., NW. (No. 208), Washington, D.C. 20045

Continuation-in-part of Ser. No. 531,278, March 15, 1966, abandoned, Ser. No. 834,203, June 3, 1969, abandoned, and Ser. No. 678,037, April 19, 1976, Ser. No. 387,585, Aug. 13, 1973, Pat. No. 3,951,752, and Ser. No. 444,789, Feb. 22, 1974, Pat. No. 3,951,753. This application July 1, 1976, Ser. No. 701,999

Int. Cl.² B01D 3/00, 3/02, 3/06, 3/10

U.S. Cl. 203-7

15 Claims



1. A process for the conversion of saline water containing scale-forming compounds to fresh water, which comprises indirectly preheating the saline water; to the preheated saline water, passing quanta of steam which are sequentially increasing temperatures and pressures and condensing the quanta of steam in the saline water at points which are at corresponding

lesser temperatures and pressures, thereby further heating the preheated saline water; as a result of the further heating, precipitating scale compounds in the saline water and decomposing scale-forming bicarbonates with the evolution of carbon dioxide; separating the precipitated scale compounds and carbon dioxide, forming post-thermal saline water; flash vaporizing the post-thermal saline water in stages of decreasing temperature and forming cooled, post-thermal saline water; compressing the flashed vapors of each said stage and passing the compressed vapors to the preheated saline water as said quanta of steam; and evaporating said cooled, post-thermal saline water to produce fresh water and saline water residuum.

4,054,494

COMPOSITIONS FOR USE IN CHROMIUM PLATING

Jeffrey Gyllenspetz, Knaresborough, and Stanley Renton, Penkridge, both of England, assignors to Albright & Wilson Ltd., Warley, England

Continuation-in-part of Ser. No. 530,158, Dec. 6, 1974, Pat. No. 3,954,574. This application Dec. 2, 1975, Ser. No. 636,853

Claims priority, application United Kingdom, June 17, 1974, 26665/74; Dec. 13, 1973, 57872/73

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.² C25D 3/06, 3/56

U.S. Cl. 204-43 T

32 Claims

1. An aqueous chromium electroplating solution consisting essentially of from 0.1 to 1.2 molar trivalent chromium; at least 0.1 molar bromide; formate in a proportion of from 3 to 0.5 moles per mole of the chromium; at least 0.1 molar ammonium and at least 0.1 molar borate.

32. An aqueous electroplating bath for electrodepositing chromium-iron alloys consisting essentially of water, from 0.2 to 0.6 molar trivalent chromium and iron cation in an amount up to saturation for the electrodeposition of chromium-iron alloys, from 0.05 to 0.3 molar bromide, from 2 to 1 moles formate per mole of trivalent chromium, from 0.2 to 3 molar ammonium, from 0.5 to 1 molar borate, from 2 to 4 molar total of anions selected from chloride and sulphate including at least 0.5 molar chloride and at least 0.5 molar sulphate and from 2 molar to saturation of alkali metal cations selected from the group consisting of sodium and potassium and having a pH of between 1 and 4.

4,054,495

ELECTRODEPOSITION OF NICKEL

Malcolm John Law, and Peter James Hutchinson, both of Perivale, England, assignors to Permalite Chemicals Limited, England

Filed Mar. 5, 1976, Ser. No. 664,086

Claims priority, application United Kingdom, Mar. 27, 1975, 12978/75

Int. Cl.² C25D 3/16

U.S. Cl. 204-49

4 Claims

1. An acidic aqueous solution for nickel electroplating comprising nickel sulphate, chloride and/or bromide, boric acid, at least 0.005 gms/liter of acetylenic alcohol, at least 0.005 gms/liter of separated mono and/or di-alkoxylated derivative of an acetylenic alcohol produced by reaction of acetylenic alcohol with ethylene oxide, propylene oxide or butylene oxide, and at least 0.0005 gms/liter of N-di-substituted aminopropylene or its hydrochloride derivative, the total concentration of acetylenic materials being 0.01 to 0.5 grams per liter.

4,054,496

PROCESS FOR THE PRODUCTION OF HIGH PURITY DEUTERIUM

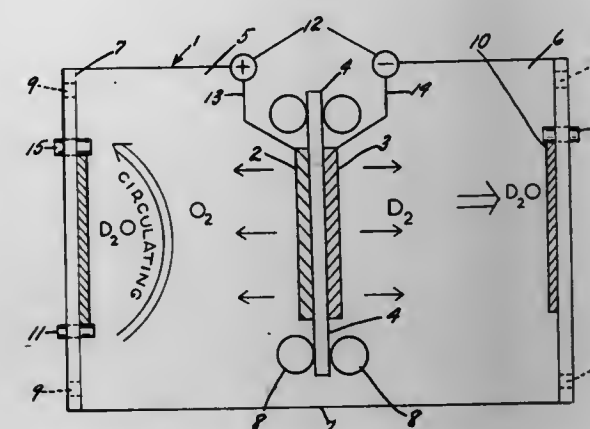
Raymond Arrathoon, c/o Solaris Ltd., Rte. 1, Box 210B, Troy, Idaho 83871

Filed Nov. 1, 1976, Ser. No. 737,222

Int. Cl.² C25B 1/10, 11/04, 13/08

U.S. Cl. 204-129

5 Claims



1. A process for the continuous production of high purity deuterium gas which comprises subjecting heavy water to electrolysis in an electrolytic cell containing a metallic anode and a metallic cathode separated by a cation-active permselective membrane which selectively permits hydrated deuterium ions to pass through said membrane to the cathode, applying a sufficient voltage across the membrane so that the heavy water is completely electrolyzed and deuterium gas is evolved at the cathode and oxygen gas is evolved at the anode, and recovering high purity deuterium from the cathode.

4,054,497

METHOD FOR ELECTROLYTICALLY ETCHING SEMICONDUCTOR MATERIAL

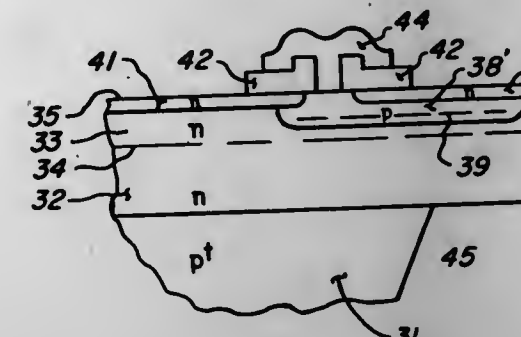
James F. Marshall, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 619,866, Oct. 6, 1975, abandoned. This application Sept. 29, 1976, Ser. No. 727,742

Int. Cl.² C25F 3/12

U.S. Cl. 204-129.65

1 Claim



1. An electrolytic etching method for semiconductor material structure having more than one type of semiconductor material conductivity therein, said method comprising: providing a semiconductor material structure having a first region of a first conductivity type, except in selected regions thereof, which is in a substantially crystalline relationship with a second region of a second conductivity type, said first region being in two strata of two different conductivities, a first strata of a lower conductivity which adjoins said second region and a second strata of a relatively higher conductivity which adjoins said first strata without adjoining said second region, said second strata having one or more said selected regions contained completely therein which are of said second conductivity type, providing a metal etching mask on said second region, and etching electrolytically said semiconductor material struc-

ture by electrically contacting said metal etching mask and placing said semiconductor material structure as masked and contacted in an electrolyte bath.

4,054,498

WHITE PHOTOPOLYMERIZABLE EPOXIDE COMPOSITIONS

Wesley Albion Tarwid, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Aug. 9, 1976, Ser. No. 712,963

Int. Cl.² C08F 8/18, 8/34

U.S. Cl. 204-159.11

14 Claims

1. A white photopolymerizable coating composition comprising (1) a blend of liquid epoxide materials polymerizable to higher molecular weights through the action of a cationic catalyst comprising an epoxidic ester having two epoxycycloalkyl groups, said ester constituting at least about 15% of the weight of the epoxide materials in the blend; (2) an aluminum oxide coated titanium dioxide pigment in an amount effective to color the composition to about 50% by weight of the composition and (3) as a radiation-sensitive catalyst effective to initiate polymerization of said epoxide materials upon exposure to irradiation, 2,5-diethoxy-4-(p-tolylthio) benzene diazonium hexafluorophosphate.

4,054,499

PROCESS FOR PRODUCING 2-CHLOROPYRIDINE

Masao Kawamura, Akashi; Tadaaki Nishi; Hiro Tsuchiya, both of Kakogawa, and Syuzi Takagi, Akashi, all of Japan, assignors to Seitetsu Kagaku Co., Ltd., Japan

Continuation of Ser. No. 530,478, Dec. 6, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,890

Int. Cl.² B01J 1/10

U.S. Cl. 204-158 HA

7 Claims

1. A process for producing 2-chloropyridine by reaction of pyridine with chlorine in a molar ratio of pyridine to chlorine of 0.5:1 - 10:1 under irradiation of photolytic light of 2,000 to 5,000 Å in the gaseous phase, which comprises:

- A. feeding and evaporating pyridine to provide gaseous pyridine in a reactor having therein a light source lamp means provided with a light source cooling means;
- B. feeding and evaporating 2 to 15 moles of water per mole of pyridine to provide steam in said reactor;
- C. feeding chlorine to said reactor; and
- D. providing photolytic light of 2,000 to 5,000 Å from said light source lamp to thereby effect photolytic reaction in the gaseous phase to provide said 2-chloropyridine, and wherein said light source lamp is cooled by means of said light source cooling means.

4,054,500

METHOD OF MAKING REFRACTORY METAL-CERAMIC CRUCIBLE

Edward D. Parent, Hamilton, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 28, 1975, Ser. No. 572,369

Int. Cl.² C25D 13/02, 13/12

U.S. Cl. 204-181

2 Claims



1. A method of making a refractory metal-ceramic crucible comprising the steps of winding refractory metal wire into the shape of a helical basket coil, electrophoretically coating the coil with a primer coat of alumina, firing the primer coat, and flame spraying or plasma spraying sufficient alumina on the

primer coated coil to form a crucible capable of containing molten metal.

4,054,501

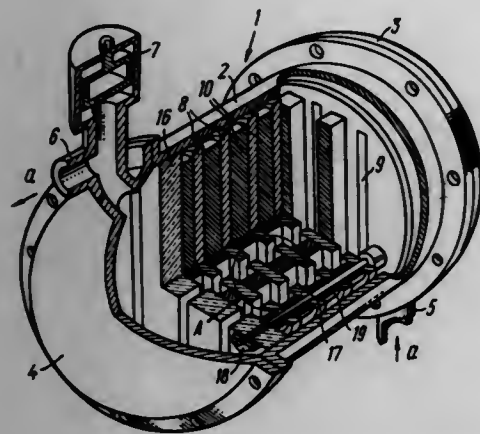
METHOD AND APPARATUS FOR REMOVAL OF MECHANICAL IMPURITIES FROM DIELECTRIC FLUIDS

Gennady Andreevich Nikitin, ulitsa Garmatnaya, 57, kv. 24; Konstantin Vasilievich Nikonov, ulitsa Zodchikh, 6, kv. 132, and Gennady Pavlovich Karabtsov, ulitsa Avtozavodskaya, 25, kv. 40, all of Kiev, U.S.S.R.

Filed Sept. 29, 1976, Ser. No. 727,715
Int. Cl.² B03C 5/00; B01D 13/02

U.S. Cl. 204—186

8 Claims



1. A method of removing mechanical impurities from dielectric fluids, residing in that the fluid being treated is caused to flow in an electric field along an unobstructed path defined in part by openings in a series of spaced flat electrodes and in part by spaces between said openings, said electrodes having collection surfaces extending laterally from edges of said openings thereof with the collection surface of one electrode facing the collection surface of the next electrode to define therewith a collection chamber for the mechanical impurities communicating with and extending laterally from the unobstructed path of fluid flow, the latter being in a direction substantially perpendicular to the collection surfaces of said electrodes which create said electric field.

4,054,502

QUICK START ELECTROLYSIS APPARATUS

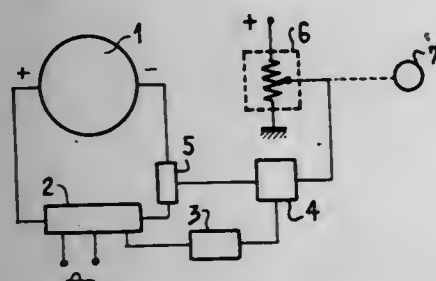
Louis Mas, Buc, France, assignor to Societe de Recherches Techniques et Industrielles, Buc, France

Filed Jan. 29, 1976, Ser. No. 653,522

Claims priority, application France, Feb. 3, 1975, 75.03250
Int. Cl.² C25B 15/02, 1/02

U.S. Cl. 204—228

3 Claims



1. Electrolysis apparatus made of a stack of cells, each of which is separated into two compartments by a diaphragm which is intended to separate electrolyte containing hydrogen bubbles from electrolyte containing oxygen bubbles; put into operation by an electrical supply circuit, said supply circuit comprising means for starting up said apparatus by maintaining constant, the ratio between the volume of gas and the volume of electrolyte, said means increasing the current intensity in an exponential fashion as a function of time.

4,054,503

PORTABLE METAL RECOVERY APPARATUS

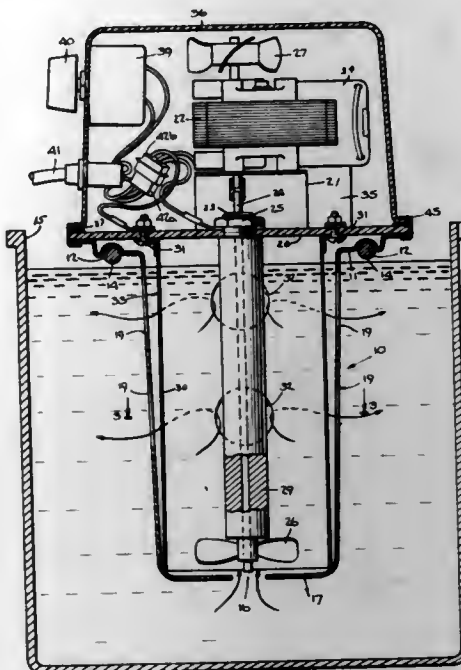
David L. Higgins, Palos Verdes Estates, Calif., assignor to Ag-MET, Inc., Frackville, Pa.

Filed Oct. 14, 1976, Ser. No. 732,407

Int. Cl.² C25C 1/20, 7/00

U.S. Cl. 204—271

20 Claims



1. Apparatus for recovering metal from metal bearing solutions comprising: an electrolysis chamber open at the top and having side wall means and a bottom wall, means normally securing the top of said chamber against access to the interior thereof, means defining an aperture in said bottom wall and at least one opening in said side wall means, a first electrode positioned in said chamber adjacent said side wall means, means defining at least one opening in said first electrode, a second electrode of opposite polarity than that of said electrode and positioned at or near the center of said chamber, an impeller, means for driving said impeller to draw fluid into said chamber and to expel same from said chamber via said aperture and said openings, said opening in said first electrode being disposed so as to be out of register with said opening in said chamber wall means, and means for passing an electric current between said electrodes and through the solution in said electrolysis chamber to deposit metal from said solution onto one of said electrodes.

4,054,504

CATALYTIC HYDROGENATION OF BLENDED COAL AND RESIDUAL OIL FEEDS

Michael C. Chervenak, Pennington, and Edwin S. Johanson, Princeton, both of N.J., assignors to Hydrocarbon Research, Inc., Morristown, N.J.

Filed Oct. 2, 1975, Ser. No. 618,911

Int. Cl.² C10G 1/08

U.S. Cl. 208—10

8 Claims

1. A continuous process for the hydro conversion of a fluid blend of solid and liquid fossil fuels comprising:
a. premixing a solid particulate stream consisting essentially of finely divided coal with a sufficient amount of a liquid stream consisting essentially of non-volatile hydrocarbon oil comprising a crude oil having at least about 20% by weight residuum oil boiling above about 975° F. to provide a flowable blend;
b. contacting the blend with hydrogen-rich gas at a temperature of from about 750° F. to about 900° F. and hydrogen partial pressure of from about 1000 to about 4000 p.s.i.g. in the presence of an ebullated bed of hydrogenation catalyst particles at space velocity between about 20 and 150 pounds of coal plus oil per hour per cubic foot reactor volume to convert the solid and liquid fossil fuels; and

c. recovering distillable liquid and gaseous hydrocarbon products.

4,054,505

METHOD OF REMOVING BITUMEN FROM TAR SAND FOR SUBSEQUENT RECOVERY OF THE BITUMEN

Louis I. Hart, Jr., Littleton; Josef J. Schmidt-Collierus, Denver, both of Colo., and Larry R. Burroughs, Calgary, Canada, assignors to Western Oil Sands Ltd., Denver, Colo.

Filed Apr. 28, 1976, Ser. No. 681,163

Int. Cl.² C10G 1/04

U.S. Cl. 208—11 LE

5 Claims

1. A method of removing bitumen from tar sand for subsequent recovery of the bitumen, the method comprising submerging tar sand in a sufficient amount of a circulating solvent in which the bitumen is soluble, and, while the tar sand is so submerged, stirring the circulating solvent and sonicating within the solvent with a sufficient amount of sonic energy to break apart any connection between sand granules and to remove bitumen from the sand granules so that the bitumen so removed can go into solution in the solvent for subsequent removal of the solvent-plus-bitumen and recovery of the bitumen therefrom.

4,054,506

METHOD OF REMOVING BITUMEN FROM TAR SAND UTILIZING ULTRASONIC ENERGY AND STIRRING

Louis I. Hart, Jr., Littleton; Josef J. Schmidt-Collierus, Denver, both of Colo., and Larry R. Burroughs, Calgary, Canada, assignors to Western Oil Sands Ltd., Denver, Colo.

Continuation-in-part of Ser. No. 681,163, April 28, 1976. This application Aug. 30, 1976, Ser. No. 718,923

Int. Cl.² C10G 1/04

U.S. Cl. 208—11 LE

5 Claims

1. A method of removing bitumen from tar sand for subsequent recovery of the bitumen, the method comprising contacting tar sand with an excess of solvent in which the bitumen is soluble, said contacting being performed within a column through which the tar sand falls from top to bottom while the bitumen is being removed from the tar sand wherein simultaneously the solvent is being stirred to enhance the circulation of the solvent relative to the tar sand to remove a bitumen film away from the surface of the tar sand and ultrasonic energy is being applied, the ultrasonic energy being of an intensity sufficient to break apart any connections between sand granules and to remove bitumen from the sand granules to thereby permit the bitumen so removed to go into solution in the solvent for subsequent removal of the solvent-plus-bitumen and recovery of the bitumen therefrom.

4,054,507

DEWATERING WATER-WET PARTICLES AND BLENDING THE PARTICLES IN A LIQUID CARRIER

George A. Pouska, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Apr. 9, 1976, Ser. No. 675,392

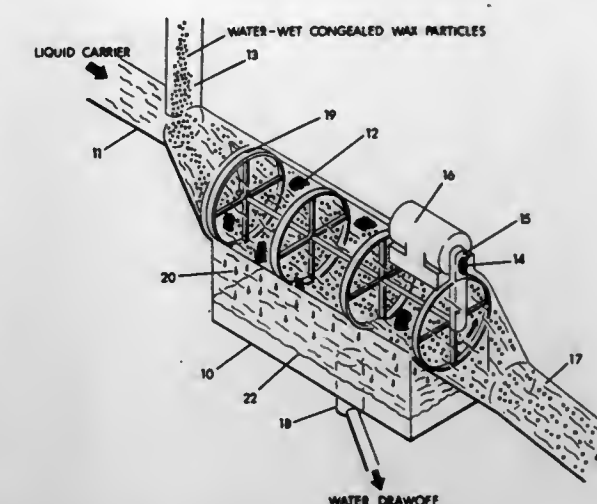
Int. Cl.² C10G 43/00

U.S. Cl. 208—24

12 Claims

1. In a process wherein wax particles are congealed in the presence of water and wherein the water containing congealed wax particles is slurried in a liquid, water-immiscible carrier having a density less than water to obtain a pumpable slurry, the improvement of minimizing water contamination in the slurry comprising passing said water containing congealed wax particles into a chamber having a rotating perforated cylinder mounted therein, the cylinder having an inlet and outlet means, through which the water-immiscible carrier flows; the cross-sectional area of the cylinder, the diameter and number of the perforations within the cylinder being sized, the flow rates of the water-immiscible carrier and the water containing the congealed particles, and the rotation of the cylinder being sufficiently fast to permit the water to pass through the perfo-

rations and form an interface with said liquid carrier below the cylinder, and a slurry containing substantially water-free con-



gealed wax particles and liquid carrier is withdrawn through the outlet of the cylinder to obtain the pumpable slurry.

4,054,508

DEMETALATION AND DESULFURIZATION OF RESIDUAL OIL UTILIZING HYDROGEN AND TRICKLE BEDS OF CATALYSTS IN THREE ZONES

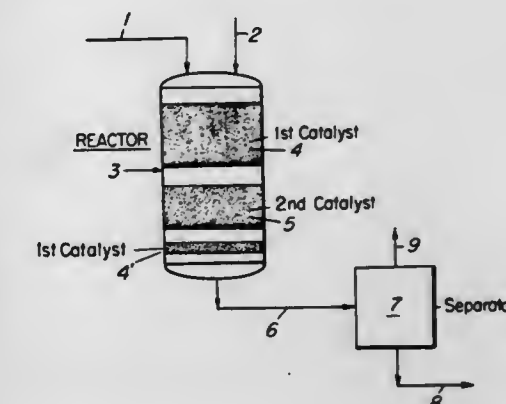
Donald Milstein, Cherry Hill, N.J., and Ronald H. Fischer, Oakton, Va., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 551,948, Feb. 21, 1975, Pat. No. 4,016,067. This application Dec. 27, 1976, Ser. No. 754,813

Int. Cl.² C10G 23/02

U.S. Cl. 208—89

6 Claims



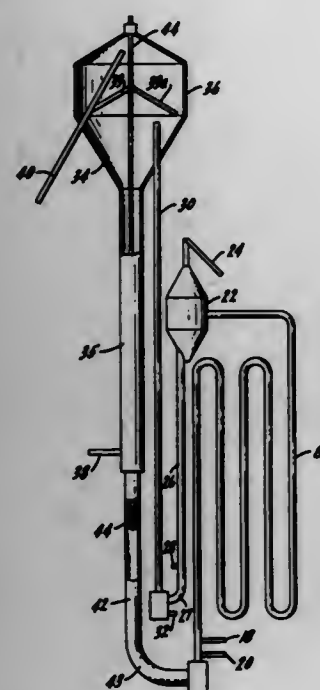
1. A method for demetalizing and desulfurizing a residual oil which comprises passing a mixture of hydrogen and said oil at a hydrogen pressure of 500 to 3000 psig, a temperature of about 600° to 850° F. and a space velocity of 0.1 to 5.0 LHSV, through trickle beds of catalysts disposed in three sequential reaction zones, the first zone containing a relatively larger bed of a said first catalyst, the third zone containing a relatively smaller bed of said first catalyst, and the second zone located between said first zone and said third zone containing a second catalyst, said first catalyst and said second catalyst comprising the oxides or sulfides of a Group VIB metal and an iron group metal on an alumina support, said first catalyst having at least 60 percent of its pore volume in pores with diameters of about 100 to 200 Å and at least about 5 percent of its pore volume in pores greater than 500 Å diameter, and said second catalyst having a surface area of at least 150 m²/g and at least 50 percent of its pore volume in pores with diameters of 30 to 100 Å.

4,054,509 PROCESS FOR CATALYTIC CONVERSION

George V. Lampadarios, Baltimore, Md., assignor to Atlantic Richfield Company, Philadelphia, Pa.
Division of Ser. No. 531,578, Dec. 11, 1974, Pat. No. 3,976,433.
This application Feb. 27, 1976, Ser. No. 662,189
Int. Cl.² C10G 11/18

U.S. Cl. 208—148

4 Claims



1. A catalytic hydrocarbon conversion process comprising:
 - a. passing a hydrocarbon feed fluid to be chemically converted and finely divided solid catalyst in a predominantly lean fluidized state through a reaction zone having a lower inlet and an upper outlet, provided that the cross-sectional area of the reaction zone is maintained substantially constant from the first point at which said feed fluid and said catalyst are contacted to said reaction zone outlet;
 - b. separating chemical reaction product from the catalyst;
 - c. passing a stripping gas through the separated catalyst in a dispersed state to remove products from the separated catalyst while maintaining a first portion of collected catalyst in a compact phase and a second portion of collected catalyst in a dense compact fluidized state;
 - d. withdrawing catalyst from said first portion and lifting the withdrawn catalyst in a dispersed fluid state to an elevated regeneration zone;
 - e. passing a regenerating gas through said catalyst in said regeneration zone while maintaining the catalyst in a dense fluidized state;
 - f. collecting regenerated catalyst below the inlet of the regenerating gas;
 - g. passing collected regenerated catalyst through a transfer means to said reaction zone while maintaining a lower portion of collected catalyst in a compact state;
 - h. introducing a fluidizing gas into said regenerated collected catalyst through a control means comprising a pipe passing through said regeneration zone to said transfer means and vertically moveable within said regeneration zone and said transfer means to vary the relative amount of fluidized and compact collected catalyst to control the rate at which regenerated catalyst is passed to said reaction zone.

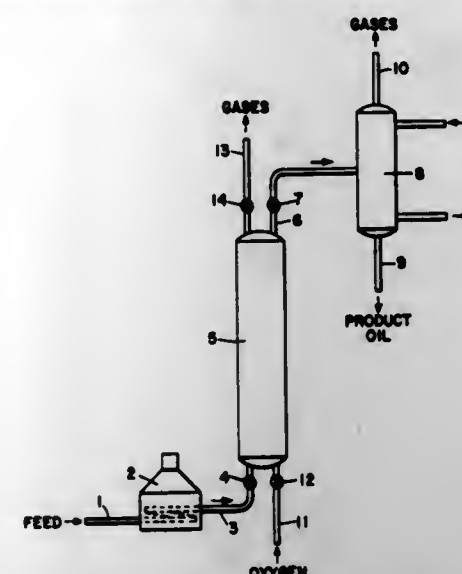
4,054,510
SELECTIVE CONVERSION OF NORMAL PARAFFINS
Paul Thomas Parker, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.
Filed June 13, 1958, Ser. No. 741,906
Int. Cl.² C10G 11/04

U.S. Cl. 208—120

26 Claims

1. An improved process for selectively converting normal paraffins in a hydrocarbon oil to olefins which comprises con-

tacting said oil in vapor phase at a temperature of from about 800° to 1000° F. with a crystalline metallic aluminosilicate having uniform pore spaces of about 5 Angstrom units in a



contacting zone and withdrawing from said zone an oil having a reduced normal paraffins content and an increased olefins content.

4,054,511 ACTIVATION OF FERRIERITE AND CONVERSION OF HYDROCARBONS THEREWITH

Joseph N. Miale, Trenton, and David H. Olson, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 482,286, June 24, 1974, Pat. No. 3,997,474.
This application July 22, 1976, Ser. No. 707,727
Int. Cl.² C10G 13/02; C01B 29/28; B01J 8/24

U.S. Cl. 208—120

8 Claims

1. A process for the catalytic conversion of a hydrocarbon charge comprising normal paraffins and isoparaffins, both having from 4 to 20 carbon atoms, which comprises contacting same under hydrocarbon conversion conditions with a catalyst comprising a ferrierite activated by steps comprising a first contact of said ferrierite with the ammonium ion or aqueous HF and a second contact wherein the ammonium ion-treated ferrierite is contacted with aqueous HF and the aqueous HF-treated ferrierite is contacted with the ammonium ion.

4,054,512
DEASPHALTING WITH LIQUID HYDROGEN SULFIDE
John J. Dugan, and Jackson Eng, both of Sarnia, Canada, assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 22, 1976, Ser. No. 734,744

Int. Cl.² C10G 21/06

U.S. Cl. 208—309

10 Claims

1. A process for deasphalting an asphalt-containing mineral oil which comprises contacting said oil with a liquid hydrogen sulfide deasphalting solvent to form two liquid-liquid immiscible phases, a solvent phase containing deasphalted oil and an asphalt phase.

4,054,513
MAGNETIC SEPARATION, METHOD AND APPARATUS
William Windle, St. Austell, England, assignor to English Clays Lovering Pochin & Company Limited, England
Continuation-in-part of Ser. No. 486,425, July 8, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,654
Claims priority, application United Kingdom, July 10, 1973, 32926/73

Int. Cl.² B03C 1/00

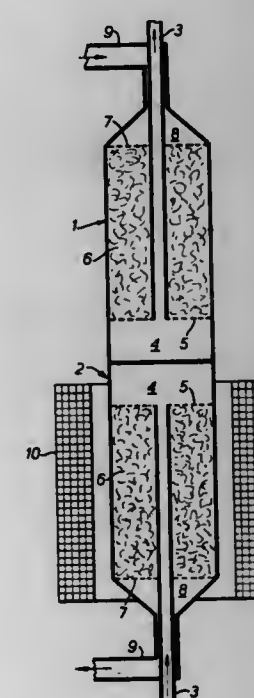
U.S. Cl. 209—214

24 Claims

1. Apparatus, suitable for separating magnetisable particles

from a fluid in which they are suspended, said apparatus comprising:

- a. superconductive electromagnet means for establishing a continuous high intensity magnetic field in a first zone,
- b. a plurality of elongate separating chambers coupled to each other with their axes aligned along a common axial direction,
- c. two openings provided in each of the said separating chambers for permitting fluid to enter and leave the separating chambers, the separating chambers being otherwise completely enclosed,
- d. a fluid permeable and magnetisable packing material provided in each of the separating chambers so that fluid flowing between the two openings passes through the packing material,
- e. means for moving said separating chambers reciprocatingly in the axial direction into and out of the first zone so



as to move one of the separating chambers into the first zone and the other or another separating chamber outside of the first zone,

- f. means for passing fluid having magnetisable particles suspended therein into one of the openings of the one separating chamber, when the one separating chamber is positioned within the first zone, wherein magnetisable particles are magnetised by the high intensity magnetic field and are attracted to the packing material within that separating chamber, as the fluid passes through the packing material and exits through the other opening in the separating chamber, and
- g. removal means for removing the magnetisable particles attracted to the packing material within a separating chamber which has been in the first zone, when that separating chamber has been moved into a second zone by said moving means.

4,054,514 SEDIMENTATION APPARATUS WITH FLOCCULATING FEED WELL

Hans Heinrich Oltmann, Danbury, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Continuation of Ser. No. 503,478, Sept. 5, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,401
Int. Cl.² B01D 21/16

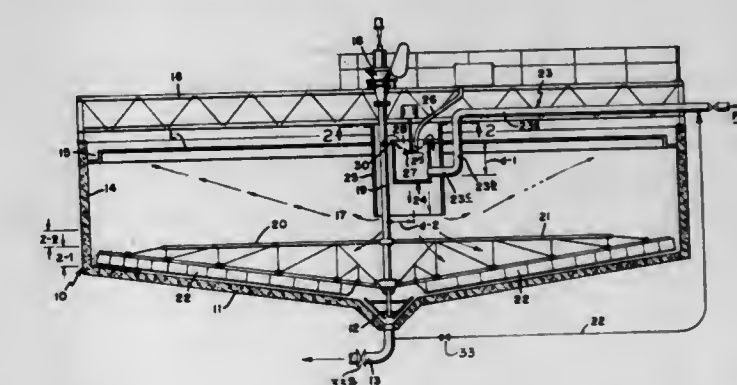
U.S. Cl. 210—20

21 Claims

1. A continuously operating settling tank which comprises in combination feed supply means for delivering an influent feed suspension to the tank, overflow means for supernatant liquid defining the overflow level of the tank, a tank bottom having a sludge collecting zone provided with sludge underflow discharge means, and operable to maintain in the tank a sludge bed comprising a bottom zone of final concentration and above

it a sludge blanket or compression zone wherein solids are still in a state of downward movement as distinguished from a condition of free settling,

- a bridge structure spanning the tank,
- a rotary sludge raking structure having a vertical rake shaft, drive mechanism mounted upon said bridge structure, for supporting and rotating the rake structure, whereby sludge is moved over the tank bottom to said sludge discharge means,
- a feed well located in a central area of the tank, and having a throughflow area such that the flow velocity therein is insufficient to disturb the sludge blanket, while providing a quiescent flow transfer zone for descending freshly formed flocs,
- a separate stationary mixing tank having a closed bottom, located and supported in said feed well, so as to be surrounded by a suspension of freshly formed flocs descending in said feed well, said mixing tank adapted for rapid and thorough mixing therein of the feed suspension in the presence of a flocculating agent, said tank having an overflow edge being located at a level such as to cause the resulting mixture to overflow from the mixing tank immediately into and down through said quiescent floc transfer zone in the feed well, the downflowing suspension thus carrying freshly formed flocs descending to settle into said sludge blanket, with the carrier liquid separating outwardly towards said overflow means of the settling tank,
- a feed supply conduit for the feed suspension leading to the mixing tank, and arranged so that there is an upflow of said feed suspension in said mixing tank,



flocculant feed means arranged for delivering said flocculating agent to said mixing tank, and mechanical mixing means cooperatively associated with said mixing tank, and operable so as to effect said rapid and thorough mixing of the flocculating agent with the feed suspension in said mixing tank, concurrent with the dispersal of the influent energy of said feed suspension in said mixing tank.

17. The method of continuously treating a stream of a solids suspension with flocculating chemicals to form said solids into settleable flocs, which method comprises, maintaining a body of liquid supplied by said stream undergoing continuous sedimentation and clarification, said body defined by a main overflow level for separated carrier liquid, and containing a sludge bed of controllable depth, comprising a bottom zone of final solids concentration and above it a sludge blanket or compression zone wherein solids are still in a state of downward movement as distinguished from a zone of free settling, maintaining in the central area of said body of liquid a self-contained mixing zone for receiving said suspension stream as well as a stream of flocculating chemicals, said zone being defined by a secondary overflow for delivery thereby of both said streams being combined in said mixing zone directly into a surrounding quiescent downflow transfer zone carrying freshly formed flocs, concurrent with the dispersal of the influent stream energy in said mixing zone, maintaining around said mixing zone a downflow transfer

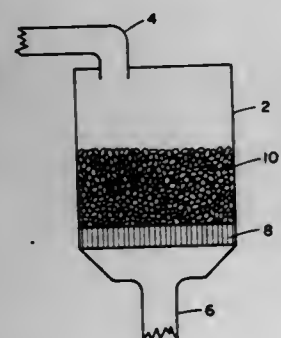
zone for receiving the mixture overflowing from said mixing zone for delivery of said flocs into said sludge blanket, while separated carrier liquid is delivered by said main overflow, feeding said suspension into said mixing zone, while supplying said stream of flocculating chemical to said mixing zone, rapidly mechanically mixing the combined streams in said mixing zone, in a manner to effect rapid and through distribution of the chemical in said suspension, while allowing the resulting mixture to overflow from said mixing zone immediately into and down through a surrounding quiescent zone, carrying said freshly formed flocs, said quiescent downflow zone being contained against the surrounding body of liquid, and maintaining in said quiescent zone a downflow rate low enough to avoid disturbance of the sludge blanket, while allowing the freshly formed descending flocs to settle into said sludge blanket, and the carrier liquid to separate outwardly towards said main overflow level of the settling tank.

4,054,515

WATER PURIFICATION METHODS

Edgar W. Sawyer, Jr., Hagerstown, Md., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Nov. 28, 1975, Ser. No. 636,263
Int. Cl.² C02B 1/14

U.S. Cl. 210—27



9. A method for purifying contaminated water containing heavy metal cations comprising the steps of: treating said water by adding a flocculating chemical to coagulate and settle at least part of said contaminants from said water; filtering said treated water to remove a further part of said contaminants; treating said filtered water with a germicide to kill bacteria; and adding a plurality of colloidal clay particles selected from the group of natural clays consisting of attapulgite and sepiolite to said germicide-treated water dispersing the clay particles in the water to form a plurality of of accicular-type needles to remove remaining contaminants and heavy metal cations from the water.

4,054,516

METHOD FOR SELECTIVELY CAPTURING METAL IONS

Gaku Izumi; Makoto Sato, both of Sendai, and Sakae Shoji, Tagajo, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan
Continuation-in-part of Ser. No. 447,913, March 4, 1974, abandoned. This application Oct. 23, 1975, Ser. No. 625,144
Int. Cl.² B03D 1/00

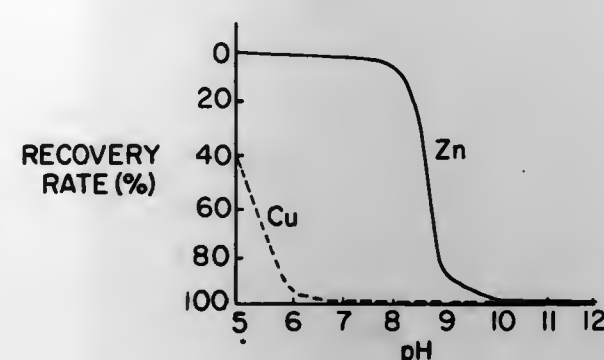
U.S. Cl. 210—44

4 Claims

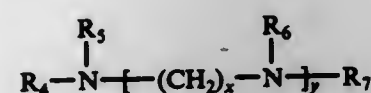
1. The method of eliminating at least one kind of metal ions selected from the group consisting of the following metals having the respective characteristic complexing pH ranges

cadmium (Cd ²⁺)	around 10 - around 12
mercury (Hg ₂ ²⁺)	around 7 - around 12
iron (Fe ²⁺)	around 7 - around 12
chromium (Cr ³⁺)	around 8 - around 12
copper (Cu ²⁺)	around 6 - around 12
nickel (Ni ²⁺)	around 7 - around 12
lead (Pb ²⁺)	around 8 - around 12
cobalt (Co ²⁺)	around 9 - around 12
zinc (Zn ²⁺)	around 10 - around 12
manganese (Mn ²⁺)	around 10 - around 12

from a solution containing at least said one kind of metal ions in solution by the steps comprising complexing said ions by adding to said solution an effective amount for complexing



with said metal ions of a condensation product of a fatty acid having at least about 8 carbon atoms or an ester or halide thereof with an excess molar amount of a polyamine having the general formula:



where R₄, each represent a hydrogen atom or a hydrophobic group selected from an alkyl group, and an arylalkyl group, and x is an integer from 1 to 5 and y is an integer from 1 to 4, adjusting the pH of the resultant complex-containing solution to a value within the above-specified characteristic range for the kind of metal ions to be separated, subjecting the pH adjusted solution containing said complex to foaming conditions, and separating from the solution the resultant foam containing the complex of said ions and said condensation product.

4,054,517

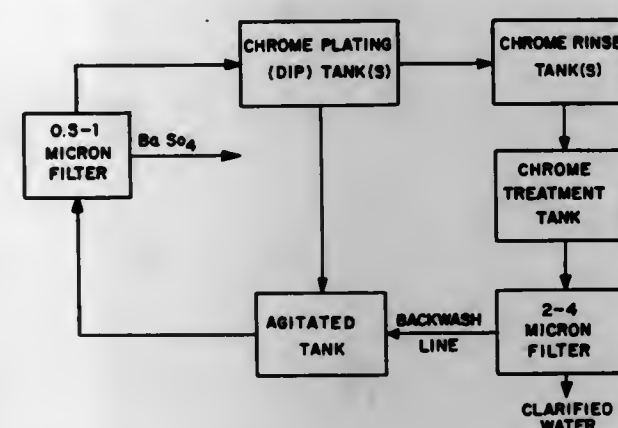
CHROME REMOVAL AND RECOVERY

Edward J. Feltz, Dayton, and Ross Cunningham, Mount Gilead, both of Ohio, assignors to John Cunningham, Portsmouth, Ohio
Continuation-in-part of Ser. No. 500,606, Aug. 6, 1974, Pat. No. 3,969,246. This application Feb. 13, 1976, Ser. No. 657,885
The portion of the term of this patent subsequent to July 13, 1993, has been disclaimed.

Int. Cl.² C02C 5/02

U.S. Cl. 210—45

9 Claims



1. A process for removing chromium from chromium-con-

taining water comprising contacting said chromium-containing water with barium carbonate and/or barium hydrate and a water-soluble acetate salt at a pH of 4-6 utilizing a weight concentration of barium carbonate and/or barium hydrate to chromium present ranging from about 1 to 6 and a weight ratio of barium carbonate and/or barium hydrate to water-soluble acetate salt ranging from about 3 to 15:1, thereafter filtering the resultant insoluble chromium material with a first acid-resistant filter media, recovering the filtered chromium and removing the barium present by contacting said chromium with sulfuric acid thereby converting said chromium to chromic acid and precipitating said barium as insoluble barium sulfate, passing said effluent from said sulfuric acid contact through a second acid-resistant filter material to remove insoluble barium sulfate therefrom, collecting the effluent from said second filter, and reusing its chromium content in a chromium plating process.

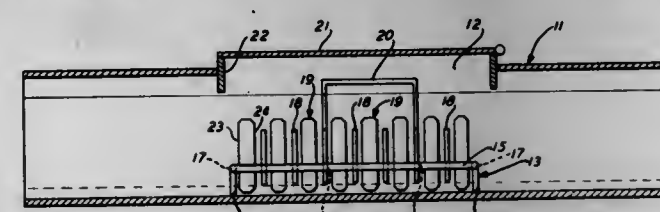
4,054,518

APPARATUS AND METHODS FOR SANITIZING SEWAGE EFFLUENT AND COMPOSITIONS FOR USE THEREIN

Lawrence P. Gould, 608 Cumberland Ave., Syracuse, N.Y. 13210
Filed Mar. 24, 1972, Ser. No. 237,862
Int. Cl.² C11D 7/54

U.S. Cl. 210—61

10 Claims



1. A flowing effluent sanitizer comprising:
 - a. a conduit having effluent flowing therethrough, the depth of effluent in the conduit being substantially a function of the mass-rate of effluent flow therethrough,
 - b. a plurality of solid members in the conduit in fluid flow intercepting relationship to effluent flowing therethrough,
 - c. means for supporting said solid members generally in a row extending along the path of effluent flow,
 - d. each solid member extending across a substantial portion of the varying depth of effluent flow in the conduit,
 - e. the said solid members being soluble in the effluent to release a bactericidal agent at a relatively constant rate at least in part as a function of the mass-rate of effluent flow in the conduit,
 - f. each said solid member consisting essentially of compacted trichloroisocyanuric acid and an additive selected from the group consisting of boric acid and a combination of boric acid and calcium stearate in relative ratios by weight of 1:4 to 4:1 the additive appearing in quantities relative to the trichloroisocyanuric acid just sufficient to achieve the desired rate of dissolution, the boric acid appearing in quantities no less than approximately 1% by weight of the trichloroisocyanuric acid.

4,054,519

HYDRAULIC ATTRITION UNIT FOR MARINE TOILET

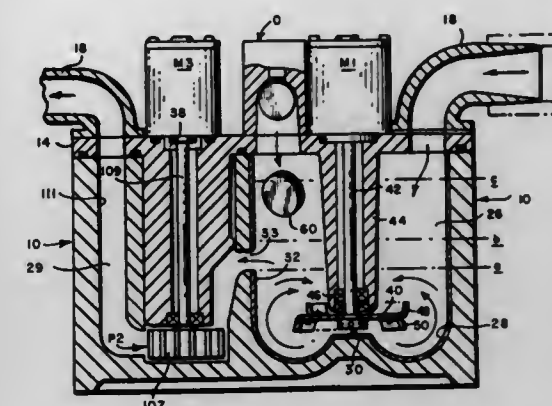
Wesley M. Tufts, Holliston, Mass., assignor to Nautron Corporation, Braintree, Mass.
Filed Sept. 4, 1975, Ser. No. 610,097
Int. Cl.² C02C 1/18

U.S. Cl. 210—104

5 Claims

1. A hydraulic attrition unit for rendering innocuous effluent comprising a treating chamber containing an opening for receiving a predetermined charge of effluent for treatment, an opening through which the treated effluent is discharged, said treating chamber being adapted to confine said predetermined charge of effluent during treatment and having a bottom, the interior surface of which is hemitoroidal, an impeller sup-

ported in the treating chamber for rotation about an axis perpendicular to the bottom and in a plane parallel thereto, said impeller having a plurality of flat deflector elements spaced at equal radial distances from the center of rotation of the impeller, at equal peripheral spacing and perpendicular to the plane of rotation, alternate ones of which project upwardly and intermediate ones of which project downwardly, each deflector element presenting an outwardly facing plane surface which diverges outwardly from the pitch circle and a leading end which slopes radially away from the plane of rotation, said impeller in conjunction with the hemitoroidal surface of the bottom operating to create excursive movement of said prede-



terminated charge of effluent within the chamber in planes perpendicular to the bottom and from the underside of the impeller downwardly, outwardly and upwardly along the hemitoroidal surface to the upper side of the impeller and simultaneously circular movement of the entire charge about the axis of rotation of the impeller so as to produce hydraulic attrition of the solid materials in the effluent, said opening through which the treated effluent is discharged being situated in the wall of the chamber above the level of a predetermined charge in said treating chamber so that said predetermined charge of effluent is subjected to repeated excursions before it is discharged.

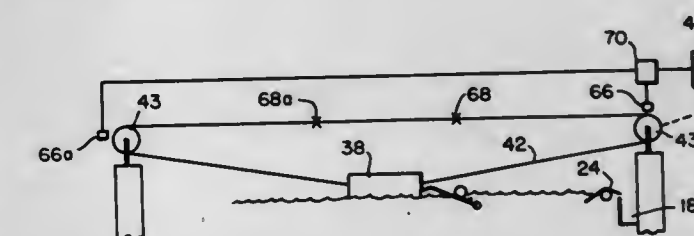
4,054,520

SCUM REMOVAL SYSTEM FOR A SEWAGE SETTLING TANK

Robert F. McGivern, Columbus, Ohio, assignor to Sybron Corporation, Rochester, N.Y.
Filed Feb. 2, 1976, Ser. No. 654,560
Int. Cl.² B01D 21/02

U.S. Cl. 210—122

5 Claims



1. A scum removal system for sewage settling tanks and the like comprising:

- a. a scum trough disposed within the settling tank along an end wall thereof, said trough being separated from the liquid in the settling tank by an upright scum trough wall having its upper edge located below the level of liquid in the settling tank;
- b. a floating beach extending substantially the full length of said scum trough, said beach being hinge connected to said upper edge and having a portion extending outwardly from said scum trough and into the liquid in the settling tank;
- c. a raised portion on said beach intermediate said hinge connection and said outwardly extending portion, said raised portion running generally the full length of said

beach parallel to said scum trough and being maintained above the level of liquid in the settling tank by the floating action of said beach to prevent flow into said scum trough;

d. a skimmer assembly operable back and forth across the settling tank for collecting and urging floating scum and the like towards said scum trough;

e. contact means on said skimmer assembly adapted to engaging and traveling a predetermined distance over said outwardly extending portion below the liquid level to pivot said beach downwardly about said hinge connection and submerge said beach and lower said raised portion below the level of liquid in the settling tank so as to permit flow of the floating scums and the like over said beach and into said scum trough; and

f. adjustable means for increasing or decreasing said predetermined distance to increase or decrease respectively the depth to which said raised portion is submerged below the level of liquid in the settling tank.

2. A scum removal system for sewage settling tanks and the like comprising:

- a. a scum trough disposed in the settling tank along one end wall thereof, said trough being separated from liquid in the settling tank by a scum trough wall having its upper edge located below the level of liquid in the settling tank;
- b. a beach connected by a hinge to said upper edge and extending outwardly therefrom and into the settling tank, said beach having a raised portion;
- c. float means pivoting said beach upwardly about said hinge for maintaining said raised portion above the level of liquid in the settling tank so as to prevent the flow of liquid over said beach and into said scum trough;
- d. a skimmer assembly operable back and forth across the settling tank for collecting and urging floating scums and the like towards said scum trough;
- e. a reversible motor for driving said skimmer assembly back and forth across the settling tank;
- f. contact means on said skimmer assembly which functions to engage and submerge said beach such as to lower said raised portion below the level of liquid in the settling tank and permit flow of the floating scums and the like over said beach and into said scum trough when the approach of said skimmer assembly to said beach reaches a predetermined distance; and
- g. time delay means for delaying the reversal of said motor when said skimmer assembly reaches said predetermined distance so as to maintain said raised portion submerged below the level of liquid in the settling tank for a predetermined time.

4,054,521

INDEXING MECHANISM

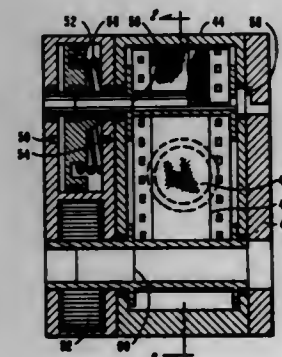
John P. Winzen, Palos Verdes Estates, Calif., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 252,103, May 10, 1972, Pat. No. 3,912,632. This application Sept. 22, 1975, Ser. No. 615,517

Int. Cl.² B01D 29/02

U.S. Cl. 210—137

1 Claim



1. In a filter device having a filter element, means defining a flow passage, and support means for supporting a portion of the filter element across the flow passage for filtering contaminants

from fluid passed therethrough, improved positioning means for sequentially moving the filter element transversely to the flow passage for selectively disposing different portions of the filter element across the flow passage, said positioning means comprising:

- a. an outer housing with said support means including a payoff spool and a take-up spool at opposite sides of the flow passage,
- b. the fluid pressure operated expansible means comprises a bellows mounted in the housing,
- c. indexing means operably associated with said support means for selectively positioning said different portions of the filter means across the flow passage means and including an escapement cam pivotally mounted on a rod slideably carried in the housing for movement by the bellows, means for biasing the cam, and a ratchet structure pivotally mounted within the housing and including a pawl coupled to the take-up spool, with the escapement cam operably associated therewith to cause indexed rotation of the take-up spool as a function of the pressure differential across said filter element portion, the ratchet includes a spring wound by the escapement as a function of the expansion of the bellows to rotate the ratchet a preselected maximum amount in tensioning the spring prior to disengagement of the escapement cam, the spring functioning to reverse the rotation of the pawl upon such disengagement, the bellows communicating with said flow passage at opposite sides of said filter element portion for operating said indexing means as a result of the pressure drop in said flow passage across said filter element portion reaching a preselected high value corresponding to a spent condition of the filter element portion to replace at least a preselected spent portion of the filter element with a fresh unspent portion for continued filtering of the fluid.

4,054,522

APPARATUS FOR EXPOSING A FLUID TO A NEGATIVE PRESSURE

Harry Pinkerton, Bridle Path Lane, Mill Neck, N.Y. 11765

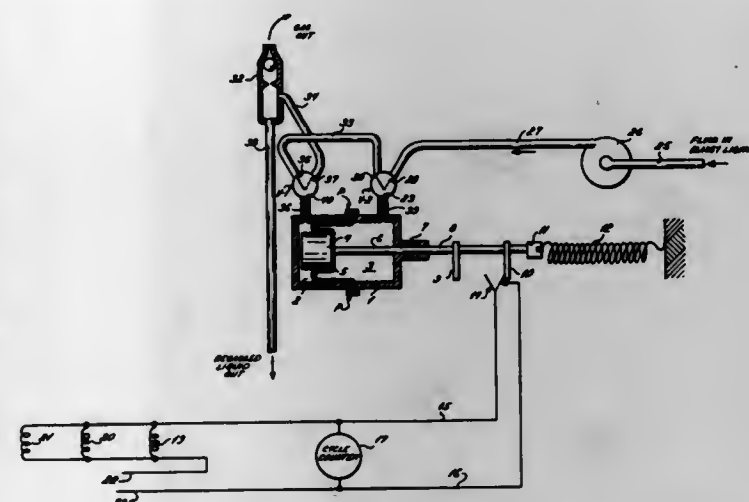
Continuation-in-part of Ser. No. 610,037, Sept. 3, 1975,

abandoned. This application May 17, 1976, Ser. No. 687,263

Int. Cl.² B01D 19/00

U.S. Cl. 210—188

23 Claims



15. A hemodialysis system comprising means for preparing a dialysate solution and apparatus for degassing that solution comprising a receptacle, a partition reciprocable in the receptacle and dividing the receptacle into two chambers, means reducing the effective volume swept by said partition, in one chamber to be lesser than that swept by said partition in the other chamber, an inlet to said one chamber for the admission of said solution, conduit means connecting said one chamber and said other chamber, an outlet from said other chamber and interconnected valve means cooperating with said inlet, said outlet and said conduit means to permit controlled reciproca-

tion of said partition within the receptacle, gas entrained in said solution passed from said one chamber to said other chamber forming bubbles to occupy the larger volume of said other chamber and means connecting said outlet to a device for separating said gas the liquid, a liquid outlet from said device being connectable to a dialysis cell.

4,054,523

CARDIOTOMY RESERVOIR WITH INTEGRAL FILTER

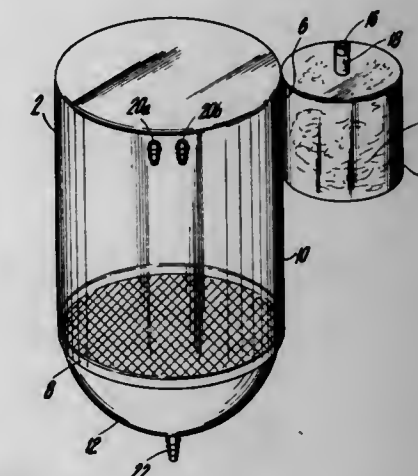
Donald R. Ingenito, Scotia, and Gunnar E. Walmet, Schenectady, both of N.Y., assignors to General Electric Company, Milwaukee, Wis.

Filed July 10, 1973, Ser. No. 377,923

Int. Cl.² B01D 35/02

U.S. Cl. 210—188

11 Claims



1. A reservoir for holding and reprocessing foamy shed blood prior to reintroduction to a patient, said reservoir comprising:

- a. a hollow holding and filtering chamber;
- b. an integral filter dividing said chamber into first and second sub-chambers;
- c. at least one blood inlet port in said first sub-chamber;
- d. a hollow foam killing chamber for collecting and collapsing blood foam in open communication with said first sub-chamber and removed from said integral filter, and positioned to permit the entrance of blood foam from said first sub-chamber and prevent the re-entrance or the entrance of the resultant collapsed blood into said first or second sub-chamber, said foam killing chamber including an air vent port; and
- e. at least one blood outlet port in said second sub-chamber.

4,054,524

APPARATUS FOR PURIFYING WASTE WATER CONTAINING ORGANIC CONTAMINANTS

Svatopluk Mackrle, Brno; Vladimir Mackrle, Prague, and Oldrich Dracka, Brno, all of Czechoslovakia, assignors to Agrotechnika, narodny podnik, Zvolen, Czechoslovakia

Filed Sept. 3, 1976, Ser. No. 720,509

Claims priority, application Czechoslovakia, Sept. 3, 1975, 5999/75; Mar. 11, 1976, 1593/76

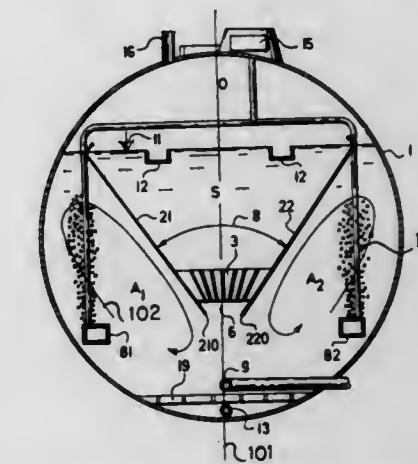
Int. Cl.² B01D 21/00; C02B 1/28; C02C 5/04

U.S. Cl. 210—195 S

14 Claims

1. In an apparatus for purifying waste water containing nitrogenous organic contaminants, said apparatus comprising the following elements: a cylindrical reaction vessel having a longitudinal axis extending from front to rear of the vessel, first and second transversely spaced, downwardly converging partition walls extending longitudinally in the vessel in spaced relation to the vessel wall to define a contamination separating zone means between the first and second walls and to independently define a first activating zone means and a second activating zone means between the respective first and second walls and the vessel walls below the separating zone means, the lower ends of the first and second walls defining therebetween a fluid transferring interface zone means above at least one of

said activating zone means for advancing fluid from such activating zone means into the separating zone means and for discharging contaminants in the form of sludge from the separating zone means to the bottom of the vessel, first conduit means terminating in communication with at least one of the activating zone means for admitting waste water into the vessel, means including first aerating means including first aerating means terminating in communication with the first activating zone means functioning to swirl said waste water in the



first and second activating zone means in respectively opposite senses, second conduit means associated with the upper end of the separating zone, means for discharging pumped water from the vessel, and means disposed at the bottom of the tank in communication with the first and second activating zone means for collecting sludge discharged through the interface zone means from the separating zone means; said elements cooperative to impart a gradient of aeration into the flow of said waste water sufficient to effectively convert said nitrogenous organic contaminants into gaseous nitrogen.

4,054,525

OIL SKIMMING APPARATUS

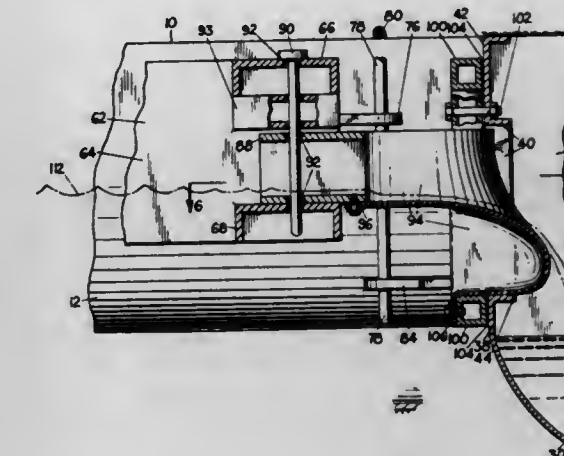
Carl F. Propp, Rte. 2, Box 97, Estacada, Oreg. 97023

Continuation-in-part of Ser. No. 286,606, Sept. 5, 1972, abandoned. This application Feb. 7, 1974, Ser. No. 440,320

Int. Cl.² E02B 15/04

U.S. Cl. 210—242 S

9 Claims



1. Apparatus for skimming pollutants and the like from the surface of water comprising a vessel having forward and rearward ends, means defining an opening leading rearwardly in the forward end of said vessel, a sump in said vessel having a bottom wall and peripheral defining side walls, one of said side walls having an inlet in communication with said opening, the lower end of said inlet being below the water level of the vessel, pump means communicating with said sump for removing water and pollutants therefrom, a float having forward and rearward ends disposed in said opening forward of said sump, said float having a pair of integrally connected elongated side buoyant portions defining a longitudinal opening therebetween

for the free flow of water and pollutants in said opening independent of the action of said pump, laterally extending insert means removably connected to said float, said insert having top and bottom walls defining a fluid flow opening therebetween, said bottom wall being disposed in a submerged position to allow said flow of water thereover, and a flexible apron having bottom and side walls connected between said insert means of said float and said sump in an arrangement allowing the float at both ends to have vertical buoyant movement independently of the buoyant movement of said vessel, said apron having sufficient slack in its connection between said support means and said sump wherein water thereunder billows it rearwardly to form a spillway portion directing the inflow of water from over said support means into said sump and at the same time allowing the individual vertical buoyant movement of said float relative to the vessel.

4,054,526

PRESSURIZED WATER TREATMENT BOTTLE

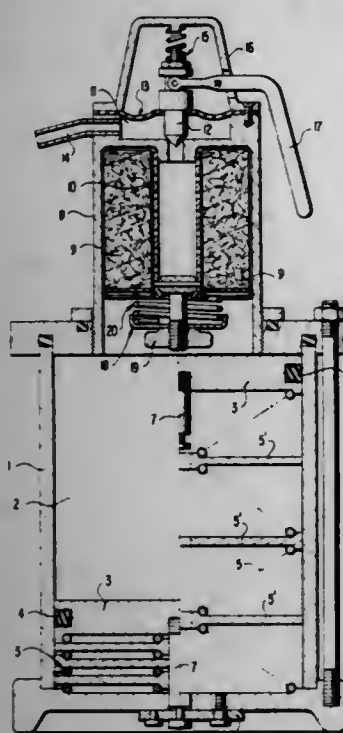
Jacques Muller, 127 bis Avenue du General de Gaulle, 92250 La Garenne, Colombes, France

Filed Mar. 14, 1975, Ser. No. 558,455

Claims priority, application France, Mar. 14, 1974, 74.08698; Oct. 22, 1974, 74.35420

Int. Cl.² B01D 27/08

U.S. Cl. 210—245



1. A bottle for dispensing treated water, comprising a container having in its upper portion a removable cover, a replaceable cartridge of material for treating water in said cover, screw-threaded means removably carried by said cover, a coil compression spring acting between said screw-threaded means and said cartridge to urge said cartridge into said cover, means defining a passageway for water through said material from the interior of the container to the exterior of the container, means for placing water within the container under positive pressure, valve means on said cover for regulating the flow rate of water out of the container, and manually operated means on said cover for controlling said valve means from outside the container.

4,054,527

COUNTERCURRENT CAPILLARY TRANSFER DEVICE

William G. Esmond, 800 Country Club Road, Havre de Grace, Md. 21078

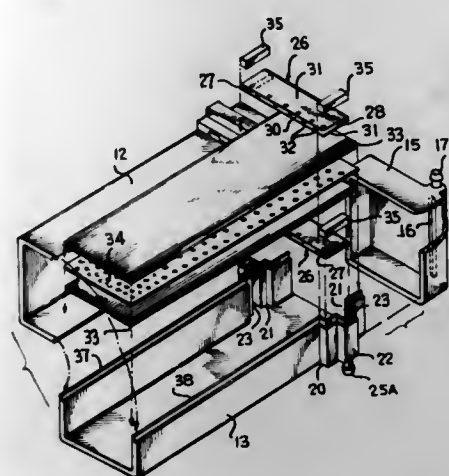
Filed June 25, 1976, Ser. No. 699,850

Int. Cl.² B01D 31/00

U.S. Cl. 210—321 B

1. A countercurrent capillary transfer device comprising a plurality of capillary tubes, first flow means connected to said

tubes for directing a first fluid through said tubes in a first direction, and second flow means associated with said tubes externally thereof for directing a second fluid externally surrounding said tubes in a second and opposite direction, and a sealed housing having flow means for said fluids forming portions of said first and second flow means, said housing including split identically formed halves arranged in mirror image



8 Claims

relation, said housing halves including outwardly directed ribs forming flow channels, which flow channels form parts of said first flow means, each of said ribs forming an outward extension of a wider rib defining a socket, said sockets being transversely aligned adjacent opposite ends of said housing halves, and said first flow means including distribution members extending transversely of said tubes and having end portions seated in said sockets.

4,054,528

SELF-CLEANING STRAINER OR FILTER

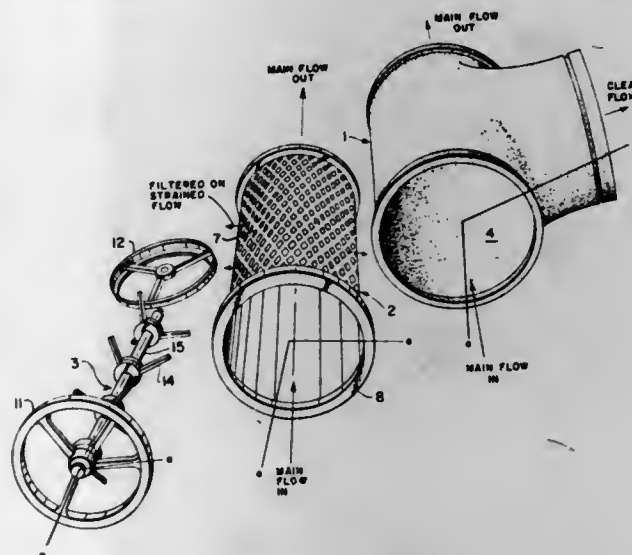
Kenneth L. Treiber, 1103 Villamay Blvd., Alexandria, Va. 22307

Filed Sept. 28, 1976, Ser. No. 727,492

Int. Cl.² B01D 35/16

U.S. Cl. 210—355

8 Claims



1. A self-cleaning strainer comprising a body member having an inner wall defining an axial main flow passage open at both ends and at least one lateral flow passage in communication with said main passage for the removal of strained fluid; annular straining means sealingly mounted within said main passage so as to define a chamber between the outer surface of said straining means and said inner wall of the body member; agitator means mounted within said main flow passage so as to be spaced from said straining means and freely rotatable about the longitudinal axis thereof, said agitator means progressively increasing in diameter from a first inlet end to a second outlet end of said main flow passage, and being configured with respect to said straining means such that the distance between said agitator means and said straining means progressively

decreases from said first end to said second end and such that fluid traveling through said straining means will cause it to rotate thereby creating a turbulent fluid flow which will prevent material adhering to said straining means without creating a shearing of said material between said agitator means and said straining means.

4,054,529

DEVICE FOR TREATING A SUSPENSION

Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pulkenrood-Vinitex B.V., Assendelft, Netherlands

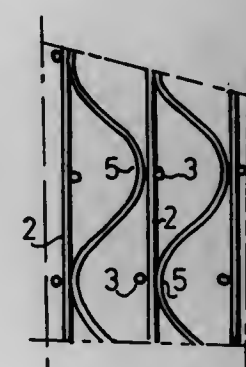
Filed Aug. 26, 1974, Ser. No. 500,581

Claims priority, application Netherlands, Sept. 7, 1973, 7312337

Int. Cl.² B01D 21/00

U.S. Cl. 210—521

17 Claims



1. In a device for promoting the separation of and for separable components suspended in a carrier liquid, wherein said device includes an assembly of substantially parallel similarly profiled plates within a housing surrounding this assembly, which assembly is provided with means for leading the liquid flow to be treated through the interspaces between said plates, and for subsequently discharging said flow therefrom, the improvement comprising means for enclosing each plate in a cage, said cage including at least one substantially plane grid consisting of a first set of parallel rods of a rigid material, said rods being interconnected by means of a second set of transversely directed rods to form a rigid unit, and said housing including a number of such grids positioned at definite mutual distances in said housing.

4,054,530

IRON-NICKEL-COBALT MAGNETIC POWDER AND TAPE PREPARED THEREFROM

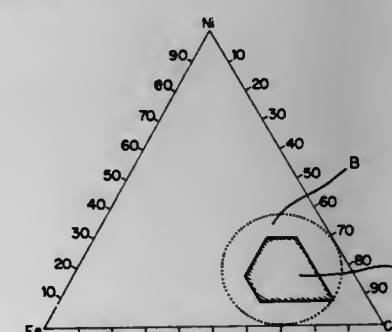
Robert J. Deffeyes, Arlington, Tex., assignor to Graham Magnetics, Inc., Graham, Tex.

Continuation of Ser. No. 411,670, Nov. 1, 1973, abandoned, and a continuation-in-part of Ser. No. 401,636, Sept. 28, 1973, Pat. No. 3,909,240. This application June 14, 1976, Ser. No. 695,656

Int. Cl.² H01F 1/02; C22C 1/04; C04B 35/04

U.S. Cl. 252—62.54

20 Claims



11. A magnetic recording medium of the type comprising a metallic powder dispersed in a polymeric binder wherein said powder is formed of an alloy consisting essentially of about 10 to 33 weight % iron, about 8 to 30 weight % nickel, and about 50 to 82 weight % cobalt;

and wherein said powder is characterized by

- a minimum squareness of about 0.5
- a minimum coercive force about 500 oersteds, a specific magnetic moment of 140 to 190, and a corrosion resistance characterized by the ability to maintain at least 50% of its specific magnetic moment when exposed to 50% relative humidity at 166° F. for 100 hours.

4,054,531

CERAMIC DIELECTRIC COMPOSITION

Koji Takahashi, Norishige Yamaguchi, Makoto Hori, and Masamichi Turuta, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1975, Ser. No. 628,229

Claims priority, application Japan, Nov. 7, 1974, 49-128452; Nov. 26, 1974, 49-136419; Feb. 4, 1975, 50-14723; Sept. 5, 1975, 50-107720; Sept. 5, 1975, 50-107721; Sept. 16, 1975, 50-111907

Int. Cl.² H01B 3/00, 3/02, 1/06; C04B 35/00

U.S. Cl. 252—63.2

9 Claims

1. A ceramic dielectric composition consisting essentially of (1) bismuth titanate with substituents, expressed by the formula:



where Me is at least one divalent metal selected from the group consisting of strontium, barium and lead, R is at least one pentavalent metal selected from the group consisting of tantalum, niobium and antimony, and both x and y are numbers falling within the range of 0.4 to 2.0 and the ratio of x/y is within the range of 0.9 to 1.1, and; (2) at least one metal oxide selected from the group consisting of tungsten oxide and molybdenum oxide in an amount of 0.01 to 2.0% by weight based on the weight of the aforesaid component (1) of the formula $\text{Bi}_{1-x}\text{Me}_x\text{Ti}_2\text{R}_y\text{O}_{12}$ and expressed in terms of the amount of tungsten trioxide (WO_3) and molybdenum trioxide (MoO_3), respectively.

4,054,532

CERAMIC DIELECTRIC MATERIAL

Leopold Hanke, Beyharting, Guenther Hoffmann, Munich, and Helmut Schmelz, Prien, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 23, 1976, Ser. No. 651,851

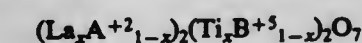
Claims priority, application Germany, Jan. 28, 1975, 2503438

Int. Cl.² C04B 35/50, 35/46; H01B 3/10, 3/12

U.S. Cl. 252—63.5

23 Claims

1. A ceramic dielectric material having a relatively low temperature coefficient of permittivity and consisting of a compound defined by the formula:



wherein

A⁺² is a positive divalent element selected from the group consisting of Ba, Ca, Cd, Mg, Sr and mixtures thereof; B⁺⁵ is a positive pentavalent element selected from the group consisting of Sb, Mo, Nb, Ta, W and mixtures thereof; and

x is a numeral ranging from 0.70 to 0.99.

4,054,533

HEAT TRANSFER FLUIDS HAVING LOW FREEZE POINTS

William David Watson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 24, 1976, Ser. No. 699,545

Int. Cl.² C09K 5/00

U.S. Cl. 252—73

5 Claims

1. A heat transfer fluid having a freeze point of about -18° C or less and consisting essentially of about, by weight:

- 20 to about 40 percent diphenyl ether;

- b. 40 to about 60 percent of a 2-biphenylphenyl ether (2-bippe) and 4-biphenylphenyl ether (4-bippe) mixture at a 2-bippe:4-bippe weight ratio of at least about 2:1; and
- c. 20 to about 25 percent of a di- and triphenylphenol mixture.

4,054,534

VOLATILE CLEANING SOLUTION FOR MIRRORS AND LENSES

Dominic J. Angelini, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 28, 1976, Ser. No. 691,056

The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.

Int. Cl.² C11D 7/06

U.S. Cl. 252—158

13 Claims

1. A method of cleaning lenses and mirrors of electrophotographic copiers comprising providing a filmed lens or mirror surface, applying a cleaning solution which consists essentially of lower alcohol, ultrapure water, ammonia solution and 3,5-dimethyl-1-hexyn-3-ol surfactant.

4,054,535

VARIABLE SENSITIVITY WATER WASHABLE DYE PENETRANT

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 444,432, Feb. 21, 1974, Pat. No. 3,915,885, Ser. No. 444,433, Feb. 21, 1974, Pat. No. 3,915,886, Ser. No. 535,262, Dec. 23, 1974, Pat. No. 3,981,185, and Ser. No. 521,730, Nov. 7, 1974, Pat. No. 3,939,092. This application June 25, 1975, Ser. No. 590,177

The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.

Int. Cl.² C09K 11/06; G01N 19/08, 21/16

U.S. Cl. 252—301.19

10 Claims

1. A process for producing variable sensitivity water washable dye penetrant compositions which comprises preparing a basic dye penetrant composition which comprises (1) a biodegradable nonionic surfactant selected from the group consisting of (a) straight chain, primary, aliphatic oxyalkylated alcohols, wherein said alcohols can contain from 8 to 20 carbon atoms and the oxyalkyl groups are a mixture of ethylene oxide and propylene oxide groups, and (b) ethoxylates of linear secondary aliphatic alcohols, with the hydroxyl groups randomly distributed, the linear aliphatic portion of said alcohols being a mixture of alkyl chains containing in the range from 10 to 17 carbon atoms, and containing an average of from 3 to 12 moles of ethylene oxide and (2) a small amount of a dye soluble in said surfactant;

and incorporating predetermined additional amounts of said nonionic surfactant into said basic dye penetrant composition sufficient to decrease the sensitivity of said basic composition, the resulting desensitized dye penetrant compositions having substantially the same washability as said basic composition.

4,054,536

PREPARATION OF AQUEOUS SILICA SOLS FREE OF ALKALI METAL OXIDES

David P. Schaefer, Hinsdale, Ill., and Linda Pluta Gamage, Jay, Maine, assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 535,760, Dec. 23, 1974, abandoned. This application July 2, 1976, Ser. No. 702,306

Int. Cl.² B01J 13/00

U.S. Cl. 252—313 S

7 Claims

1. A process for the preparation of an aqueous silica sol containing less than 400 ppm of an alkali metal, having a SiO₂ concentration of from 5-55% SiO₂ and a surface area of less than 800M²/gram said process comprising the steps of:

- A. providing a 0.1-3.0% aqueous solution of a lower alkanol amine;
- B. heating the aqueous solution of the lower alkanol amine to its boiling point;
- C. adding to the boiling aqueous solution of the lower alkanol amine a 2 to 10% by weight aqueous solution of silicic acid in a volume ratio of silicic acid solution to lower alkanol amine solution of from 3:1 to 7:1, the mole ratio of SiO₂ to lower alkanol amine being in the range of from 1:1 to 100:1;
- D. removing water by distillation so as to keep a constant volume as the silicic acid solution is added; and then,
- E. recovering an aqueous colloidal silica sol which contains 5-55% by weight SiO₂ having a pH of 8-10 and containing less than 400 ppm of an alkali metal.

4,054,537

PROCESS FOR SYNTHESIZING COMPOSITIONS CONTAINING SMECTITE-TYPE CLAYS AND GELLANTS PRODUCED THEREBY

Alan C. Wright, and Joseph Paul Rupert, both of Houston, Tex., assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 680,593, April 26, 1976, Pat. No. 4,040,974. This application Aug. 2, 1976, Ser. No. 710,793

The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.

Int. Cl.² B01J 13/00

U.S. Cl. 252—317

28 Claims

1. A process for synthesizing a composition containing a fluorine-containing trioctahedral smectite-type clay, said composition containing mole ratios of Li, Na, Mg and Si expressed as oxides, and F, of



where $0 \leq a < 1.2$, $0 \leq b < 0.60$, $4.75 \leq c < 7$, $0 < d < 4$, $0 \leq a + b < 1.4$, $5.5 < a + b + c < 8$, and where $c \geq 6$ when $a + b = 0$, said process comprising:

- a. forming an aqueous suspension containing from 12% to 35% solids by weight, the solids having the chemical composition represented by the formula above, by: (i) combining and mixing magnesium oxide, water, hydrofluoric acid, and a base selected from the group consisting of lithium hydroxide, sodium hydroxide, and mixtures thereof, until the base is dissolved; and (ii) adding a silica sol;
- b. agitating and heating the suspension until a viscous slurry is obtained from which no solids settle out;
- c. allowing the slurry to gel;
- d. hydrothermally reacting the gel under autogenous pressure at a temperature within the range from 85° C to about 250° C for a period of time sufficient to form said trioctahedral smectite-type clay; and
- e. drying the composition.

4,054,538

 π ALLYL CHROMIUM COMPLEX CATALYST AND PROCESS FOR PREPARING SAME

Robert N. Johnson, Basking Ridge, and Frederick J. Karol, Somerset, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 193,144, Oct. 27, 1971, Pat. No. 3,836,595, which is a continuation-in-part of Ser. No. 878,566, Nov. 20, 1969, abandoned, which is a continuation-in-part of Ser. No. 784,478, Dec. 17, 1968, abandoned. This application Aug. 3, 1973, Ser. No. 385,304

Int. Cl.² C08F 4/78

U.S. Cl. 252—428

8 Claims

1. A catalyst for the polymerization of ethylene which consists essentially of a π allyl chromium [III] complex wherein the ligands are only allyl ligands and at least a portion of the chromium is reduced to the chromium [II] valence state, said

complex being supported on an inorganic oxide of high surface area and selected from the group consisting of silica and silica-alumina.

4,054,539

CATALYST COMPRISING ULTRASTABLE ALUMINOSILICATES AND HYDROCARBON-CONVERSION PROCESSES EMPLOYING SAME

Albert L. Hensley, Jr., Munster, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 159,500, July 2, 1971, abandoned, which is a division of Ser. No. 204, Jan. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 788,832, Jan. 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 753,294, Aug. 16, 1968, abandoned, which is a continuation-in-part of Ser. No. 616,876, Feb. 17, 1967, abandoned, which is a continuation-in-part of Ser. No. 458,069, May 24, 1965, abandoned. This application Nov. 28, 1973, Ser. No. 419,886

Int. Cl.² B10J 29/06; C10G 13/02

U.S. Cl. 252—455 Z

7 Claims

1. A catalytic composition for use in a hydrocracking process, which catalytic composition comprises cobalt and molybdenum on a co-catalytic solid acidic support comprising ultrastable, large-pore crystalline aluminosilicate material and a silica-alumina cracking catalyst, a substantial amount of said ultrastable, large-pore crystalline aluminosilicate material being characterized by well-defined hydroxyl infrared bands near 3700 cm⁻¹ and near 3625 cm⁻¹, said ultrastable, large-pore crystalline aluminosilicate material being characterized further by a sodium content that is less than one percent, a maximum cubic unit cell dimension of 24.55 Å, and a superior ability to withstand repeated wetting-drying cycles.

4,054,540

PRESSURE SENSITIVE RESISTANCE AND PROCESS OF MAKING SAME

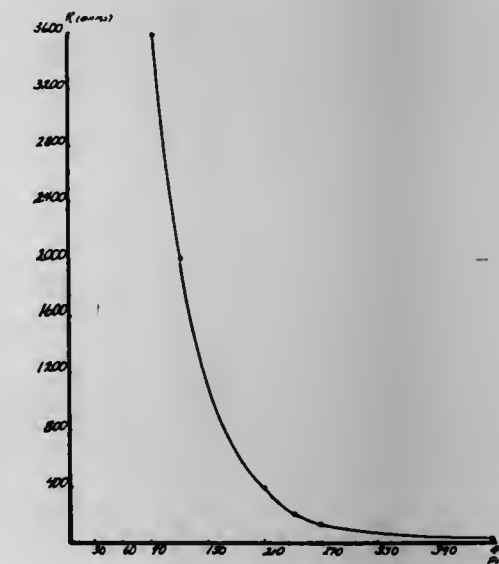
Michael Michalchik, Newport Beach, Calif., assignor to Dynacon Industries, Inc., West Milford, N.Y.

Continuation-in-part of Ser. No. 335,499, Feb. 26, 1973, abandoned. This application May 7, 1975, Ser. No. 575,184

Int. Cl.² H01B 1/02

U.S. Cl. 252—512

18 Claims



1. A process for manufacturing a pressure sensitive resistance element of the type comprising a discontinuous phase of conducting particles substantially uniformly distributed in a matrix of a cured polymerizable resin comprising
- providing a polymerizable, elastomeric resin composition of liquid to pasty consistency which is polymerizable with the aid of a polymerizing catalyst
 - providing finely divided metal conducting particles in a ratio of resin:metal conducting particles of about 100:75 to 100:110 by weight
 - coating the particles with a thin layer of a deformable,

- electrically semi-conducting compound and mixing the particles with the resin composition, and
- curing the resultant mix.

4,054,541

SPRAY DRIED ALCOHOL ETHER SULFATE DETERGENT COMPOSITIONS

Marvin L. Mausner, Teaneck, and Albert Benson, Fair Lawn, both of N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 520,588, Nov. 4, 1974, abandoned. This application Nov. 18, 1976, Ser. No. 742,942

Int. Cl.² A61K 7/50; C11D 1/29, 3/60, 17/06

U.S. Cl. 252—532

7 Claims

1. A spray dried hollow bead detergent composition comprising, by weight, about 5-12% of an alcohol ether sulfate; about 5-15% of magnesium sulfate; and 0.25-2.5% of a buffer selected from the group consisting of the salts of citric, maleic and phosphoric acid, and mixtures thereof; about 8-12% of sodium chloride and about 40-60% of a sodium or potassium sulfate filler, wherein an alkyl chain in the alcohol ether sulfate has from about 10 to 18 carbon atoms and wherein the alcohol ether sulfate has from about 3 to 7 ether groups.

7. A method for forming a hollow bead detergent composition comprising spray drying a composition comprising by weight, about 5-12% of an alcohol ether sulfate, about 5-15% of magnesium sulfate, and about 0.25-2.5% of a buffer selected from the group consisting of the salts of citric, maleic and phosphoric acid, and mixtures thereof; about 8-12% of sodium chloride, and about 40-60% of a sodium or potassium sulfate filler, wherein an alkyl chain in the alcohol ether sulfate has from about 10 to 18 carbon atoms and wherein the alcohol ether sulfate has from about 3 to 7 ether groups.

4,054,542

AMINE-EPICHLOROHYDRIN POLYMERIC COMPOSITIONS

John D. Buckman; Stanley J. Buckman; Gerald D. Mercer, and John D. Pera, all of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

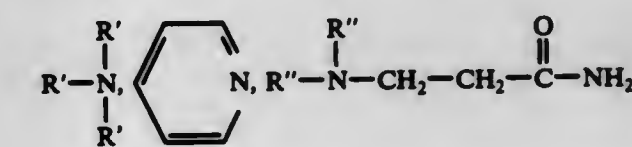
Continuation-in-part of Ser. No. 568,066, April 14, 1975, abandoned. This application Mar. 10, 1976, Ser. No. 665,664

Int. Cl.² C08G 65/26

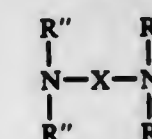
U.S. Cl. 260—2 BP

32 Claims

1. A cationic, water-soluble, amine-epichlorohydrin polymer prepared using a two-stage reaction process wherein about one mole of ammonia is reacted with about three moles of epichlorohydrin or about one mole of a primary amine having the formula RNH₂ is reacted with about two moles of epichlorohydrin in the presence of a polar solvent comprising an alkyl alcohol containing from 1 to 3 carbon atoms and water, thus forming a polymeric precursor and subsequently reacting said precursor with a tertiary amine having the formula:

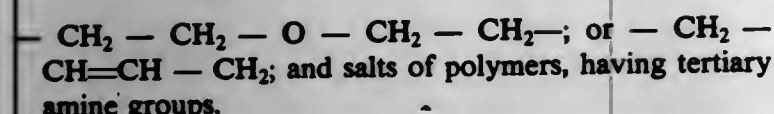
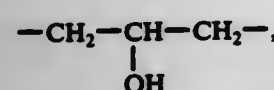


or



wherein R represents a straight or branched chain alkyl group containing 1 to 20 carbon atoms and 0 to 2 carbon to carbon double bonds, a straight or branched chain alkyl group containing 1 to 6 carbon atoms and one or more hydroxyl or chloro substituents, a saturated aryl group or a benzyl group;

and wherein each of the R' groups independently represents a straight or branched chain alkyl group containing 1 to 20 carbon atoms and 0 to 2 carbon to carbon double bonds, a straight or branched chain alkyl group containing 1 to 6 carbon atoms and one or more hydroxyl or chloro substituents, a saturated aryl group, or a benzyl group; R'' represents a straight chain alkyl group containing 1 to 6 carbon atoms; X represents a polymethylene group containing 1 to 12 carbon atoms,



4,054,543

PHOSPHORUS-CONTAINING POLYOLS AS FLAME RETARDANT AGENTS FOR POLYURETHANES

Wladim Batorewicz, New Haven, Conn., assignor to Uniroyal, Inc., New York, N.Y.

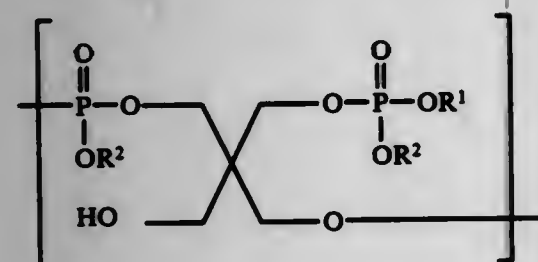
Division of Ser. No. 543,289, Jan. 23, 1975, Pat. No. 3,970,726. This application Mar. 2, 1976, Ser. No. 663,173

Int. Cl.² C08K 5/52

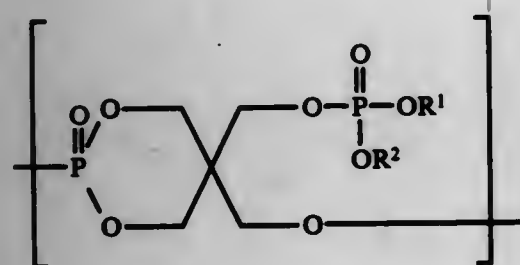
U.S. Cl. 260—2.5 AJ

6 Claims

1. A flame retardant composition comprising a polyurethane polymer and a flame retarding effective amount of a phosphate ester of the formula $\text{RO—[(A)}_m\text{—(B)}_n\text{—)]}_x\text{H}$ integrally part of the polymer wherein A has the structure



and B has the structure



wherein R, R¹ and R² are the same or different and are linear or branched primary radicals selected from alkyl having 1 to 6 carbon atoms, and chloroalkyl, bromoalkyl and hydroxy alkyl having 2 to 6 carbon atoms; m and n are integers from 1 to about 3 and the sum of m plus n is from 2 to about 4.

4,054,544

FLAME RETARDANT POLYURETHANE COMPOSITION CONTAINING BIS(HALOALKYL)-NITRILOTRIMETHYLENE PHOSPHONATES AND PHOSPHONATE COMPOUND

James A. Albright, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed May 5, 1976, Ser. No. 683,357

Int. Cl.² C08J 9/00; C07F 9/40

U.S. Cl. 260—2.5 AJ

10 Claims

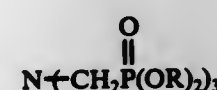
1. A flame-retardant polyurethane polymeric composition

comprising a polyurethane polymer and a flame retarding amount of a compound of the formula



wherein each R is independently selected from the group comprising halogenated alkyl radicals having from about two to about six carbon atoms and from one to about four halogen substituents.

6. A compound of the formula



wherein each R is independently selected from the group comprising halogenated alkyl radicals having from about two to about six carbon atoms and from one to about four halogen substituents.

4,054,545

PROCESS FOR THE PREPARATION OF FLEXIBLE POLYURETHANE FOAMS

Andre Guillaume, and Guy Poy, both of Lyon, France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 17, 1975, Ser. No. 623,406

Claims priority, application France, Oct. 21, 1974, 74.35312

Int. Cl.² C08G 18/14, 18/48; C07F 7/18

U.S. Cl. 260—2.5 AH

6 Claims

1. In a process for the manufacture of a "cold" flexible polyurethane foam which comprises pouring a foaming composition comprising a foam-forming polyether-polyol having an average of at least two hydroxyl groups per molecule, and a polyisocyanate into a mould allowing the foam to form and releasing the foam from the mould the improvement wherein the composition contains about 0.05% to 3% by weight, based on the weight of the polyether-polyol, of a triorganosilylated polyol of the general formula $(\text{A})_n\text{C}(\text{CH}_2\text{OSiR}_3)_{4-n}$ in which the symbols R, which may be identical or different, represent methyl, ethyl or vinyl radicals with the proviso that at least one radical R per SiR₃ group is a methyl radical, the symbol A represents a methyl or ethyl radical and the symbol n represents 0 or 1.

4,054,546

TRIAZINE COMPOSITIONS AND THEIR USE AS CATALYSTS

Thirumurti L. Narayan, Riverview, and Moses Cenker, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 534,436, Dec. 19, 1974, Pat. No. 3,988,337.

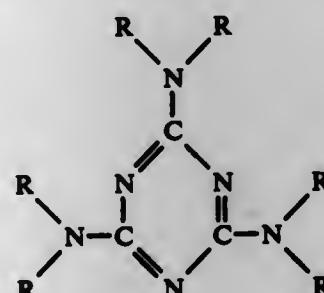
This application Apr. 19, 1976, Ser. No. 677,902

Int. Cl.² C08G 18/20, 18/14

U.S. Cl. 260—2.5 BF

7 Claims

1. A process for the preparation of a rigid cellular product characterized by carbodiimide linkages comprising: catalytically condensing an organic polyisocyanate in the presence of a catalytically sufficient amount of a triazine corresponding to the formula:



4,054,549

POLYMER COMPOSITION

Terence John Henman, Haslingfield, and Graham Williams, Hitchin, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 415,122, Nov. 12, 1973, Pat. No. 3,997,503.

This application Sept. 16, 1976, Ser. No. 723,898

Claims priority, application United Kingdom, Nov. 27, 1972, 54674/72

Int. Cl.² C08K 5/51

U.S. Cl. 260—42.15

11 Claims

1. A polymeric composition comprising a blend of (a) a graft copolymer obtained by grafting an unsaturated dicarboxylic acid or the anhydride thereof onto a propylene polymer, wherein the grafted acid or anhydride is present in an amount sufficient to give an acid moiety which is at least equivalent to that provided by 0.01 percent by weight of maleic anhydride and (b) at least one acid selected from the group consisting of phosphorus-containing acids of the formula



wherein 1-90% by weight of the acid moieties of the blend of (a) and (b) are present in the acid and/or anhydride component of the graft copolymer; and

R' is hydrogen or substituted or unsubstituted hydrocarbyl; and

R'' is OH or a group R'; except that R' is not hydrogen when R'' is OH.

4,054,550

PROCESS FOR PRODUCING CIGARETTE FILTERS

Frederick John Parker, Newport, and Durgacharan Sen, Cwmbran, both of Wales, assignors to Monsanto Limited, London, England

Filed Apr. 9, 1975, Ser. No. 566,508

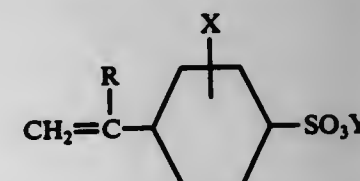
Claims priority, application United Kingdom, Apr. 11, 1974, 16198/74

Int. Cl.² B29D 27/00

U.S. Cl. 264—45.3

8 Claims

wherein R represents hydrogen or lower alkyl; X represents hydrogen, halogen, hydroxyl or lower alkyl; and Y represents hydrogen, an alkali metal or quaternary ammonium ion such that either (1) from 0.5 - 50 weight percent of the total amount of chloroprene or a mixture of chloroprene and a comonomer are polymerized in 10 - presence of said styrene sulfonic acid compound or (2) a portion of said chloroprene and styrene sulfonic acid compound is copolymerized to achieve a conversion of 10-70%, and after either (1) or (2) is completed, the residual chloroprene or monomer mixture is added to continue polymerization.



4,054,548

POTTERY-LIKE MENDING COMPOSITION

Laurence A. Malone, 2111 Jefferson Davis Highway, Arlington, Va. 22202

Continuation-in-part of Ser. No. 672,069, March 30, 1976, abandoned. This application Mar. 8, 1977, Ser. No. 775,525

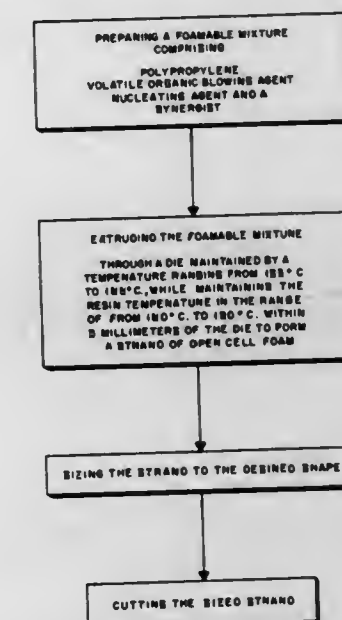
Int. Cl.² C08L 63/02

U.S. Cl. 260—37 EP

3 Claims

1. A mending composition capable of hardening into a hard, clay-like material and comprising a mixture of a first component which comprises:

- 12.5-18.3% by weight of an epoxy resin having a viscosity of 100-160 poise and an epoxide equivalent of 185-192;
- 1.1-3.0% by weight of bisphenol-A;
- 2.0-2.9% by weight of epichlorohydrin;
- 52.5-76.5% by weight of calcium carbonate; and
- 2.0-2.9% by weight of sodium sulphate; and a second component which comprises:
- 9.6-15.3% by weight of methylacetanilide;
- 57.0-80.5% by weight of calcium carbonate; and
- 1.7-4.2% by weight of talc.



1. In a process wherein a cigarette filter element comprised of a substantially open-cell foamed thermoplastic polypropylene resin is produced by the following steps taken in sequence:

- a. providing a foamable mixture comprised of a thermoplastic polypropylene resin, a volatile blowing agent and a nucleating agent;
- b. extruding said mixture through a die under controlled temperature conditions to produce a strand of foamed polypropylene resin wherein the melt temperature of the resin is maintained in the range of from 160° to 180° C and the temperature within 5 millimeters of the die is maintained in the range of from 155° to 165° C;

- c. passing said strand of foamed resin through sizing means to effect a cross-sectional diameter corresponding to that of a cigarette; and
- d. cutting the sized strand into individual filter elements; the improvement which comprises:
- employing a primary nucleating agent together with a synergist therefor in said foamable mixture, said primary nucleating agent being a particulate compound of a metal selected from Groups IIA, IIIA or IVA of the Mendeleef periodic table of elements and having a particle size in the range of from about 0.5 to 25 microns, and wherein said synergist is an organic compound having a hydrophilic group and a hydrophobic group wherein the hydrophilic group is ionic and the hydrophobic group is a hydrocarbon or a hydrocarbon having one or more hydrogen atoms substituted by a hydroxyl or halogen, said primary nucleating agent being present in said foamable mixture in an amount of from about 0.1 to 40 percent by weight, based on the weight of said polypropylene resin, and said synergist being present in an amount of from about 0.01 to 5.0 percent by weight, based on the weight of said primary nucleating agent; and
 - controlling the temperature of said extrusion such that the melt temperature of said polypropylene resin is maintained in the range of from about 155° to 180° C and the temperature within 5 millimeters of the die is maintained in the range of from about 150° to 180° C.

4,054,551

BENZOFURANYLPHENOL STABILIZERS

Robert W. Lauer, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

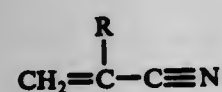
Filed May 2, 1975, Ser. No. 573,819

Int. Cl.² C08K 5/15

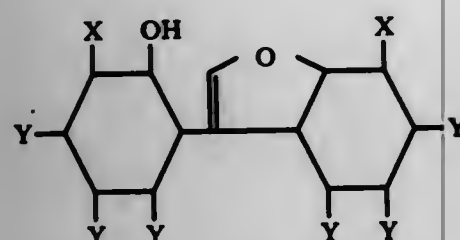
U.S. Cl. 260—45.8 A

21 Claims

1. A stabilized composition comprising (A) 100 parts by weight of at least one polymer selected from the group consisting of (1) diene polymers and (2) a polymer containing polymerized therein (a) from about 50% to about 90% by weight based upon total copolymer weight of styrene, or at least one alkyl styrene, alkoxy styrene or halostyrene, or a mixture thereof, wherein the alkyl or alkoxy group contains from 1 to 8 carbon atoms, (b) from about 10% to about 50% by weight based upon total copolymer weight of at least one vinyl nitrile having the formula



wherein R is hydrogen or an alkyl radical containing from 1 to 8 carbon atoms, and (c) from 0% to about 20% by weight of at least one monoolefin and (B) from about 0.1 part to about 10 parts by weight of at least one benzofuranyphenol having the formula



wherein each X and Y is hydrogen, or an alkyl, alkoxy or alkylthio group containing from 1 to 8 carbon atoms, but if any X is an alkyl, alkoxy or alkylthio group, then at least one Y must also be an alkyl, alkoxy or alkylthio group.

4,054,552

THERMAL OXIDATIVELY STABLE POLYCARBONATE

Thomas J. Hoogeboom, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

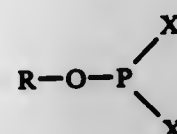
Continuation-in-part of Ser. No. 28,050, April 13, 1970, abandoned. This application July 17, 1972, Ser. No. 272,332

Int. Cl.² C08G 63/62; C08L 69/00

U.S. Cl. 260—47 XA

8 Claims

1. A thermal oxidatively stable polymer composition which is the residue of the condensation reaction of bisphenol-A, a carbonate precursor and a minor amount of an ester of a phosphorodihalidous acid having the following formula:



wherein X is a halogen atom independently selected from the group consisting of fluorine, chlorine, bromine and iodine and R is an organic radical selected from the group consisting of aryl, haloaryl, alkyl, cycloalkyl, aralkyl and alkaryl radicals of 1-115 carbon atoms, said minor amount of the ester of a phosphorodihalidous acid being sufficient to provide an elemental phosphorus content in the polymer of 0.0005 to about 1.0 weight percent based on the total weight of the polymer.

4,054,553

POLYPHENYLENE OXIDE PROCESS

Walter K. Olander, Saratoga, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 2, 1975, Ser. No. 582,910

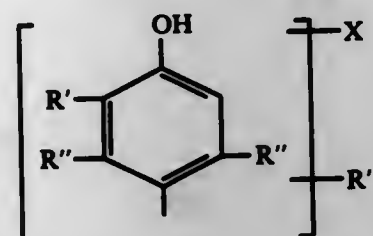
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.

Int. Cl.² C08G 65/44

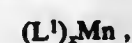
U.S. Cl. 260—47 ET

5 Claims

1. A process of forming self-condensation products of a phenol having the structural formula:

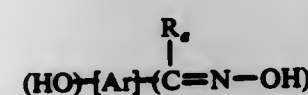


where X is a substituent selected from the group consisting of hydrogen, chlorine, bromine, and iodine; R' is a monovalent constituent selected from the group consisting of hydrogen, hydrocarbon radicals, halohydrocarbon radicals having at least two carbon atoms between the halogen atoms and phenol nucleus, hydrocarbonoxy radicals, and halohydrocarbonoxy radicals having at least two carbon atoms between the halogen atoms and phenol nucleus, R'' and R''' being the same as R' and, in addition, halogen under reaction conditions which comprise contacting said phenol with oxygen in the presence of a basic reaction medium, a secondary aliphatic amine, and a Type (A) or a mixture of Type (A) and Type (B) manganese chelate complexes selected from Type (A) complexes of the formulas:



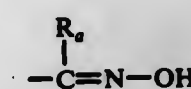
Type (A)

where L¹ is a ligand derived from an ortho-hydroxyareneoxime of the general formula

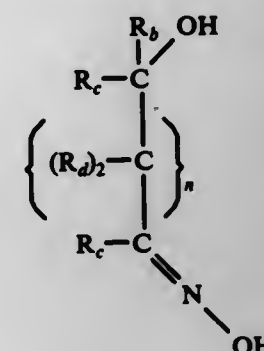


wherein R_a is independently selected from the group consisting

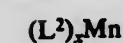
of hydrogen and lower alkyl radicals having from 1-5 carbon atoms, Ar is at least a divalent arene radical having at least one —OH radical and at least one



radical attached directly to ortho-positioned arene ring carbon atoms, and an ω-hydroxyoxime of the formula



wherein each R_b, R_c, R_d and R_e is independently selected from the group consisting of hydrogen, acyclic and cyclic organic radicals, and n is a positive integer equal to 0 or 1, Mn is the transition metal manganese, and x is a positive number at least equal to about 0.5, and selected from Type (B) complexes of the formula:



Type (B)

wherein L² is a ligand other than an L¹ ligand, Mn is the transition metal manganese, and x is a positive number at least equal to about 0.5.

4,054,554

DEHAZING COMPOSITIONS

Rudolf S. Buriks, St. Louis, and John H. Munch, Kirkwood, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 31, 1975, Ser. No. 563,650

Int. Cl.² C08G 8/10

U.S. Cl. 260—59 EP

25 Claims

1. The process which comprises reacting a phenolformaldehyde resin with an α-olefin epoxide having at least four carbon atoms and then reacting the product so obtained with a member of the group consisting of ethylene oxide, glycidol, propylene oxide and mixtures thereof, the reaction of said phenol-formaldehyde resin with said α-olefin epoxide and the reaction of the product so obtained with said member being carried out by heating the respective reaction mixtures.

4,054,555

PROCESS FOR THE PURIFICATION OF HALO-ALDEHYDES

Jacob Ackermann, Gorla Minore (Varese), and Pierino Radici, Turate (Como), both of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Continuation of Ser. No. 321,084, Jan. 4, 1973, abandoned. This application May 12, 1976, Ser. No. 685,603

Int. Cl.² C07D 47/14, 47/16

U.S. Cl. 260—601 H

13 Claims

1. A process for the purification of halo-aldehydes selected from the group consisting of monochloroacetaldehyde, dichloroacetaldehyde, trichloroacetaldehyde, monofluoroacetaldehyde, difluoroacetaldehyde, trifluoroacetaldehyde, bromoacetaldehyde and alpha-alpha-beta-trichloro-n-butylaldehyde, wherein in conducting a first stage of purification the said halo-aldehydes, in liquid form, are brought into contact with an absorbent solid consisting of an anionic exchange resin consisting of a polystyrene exchange resin having quaternary ammonium groups bonded thereto, said first stage

being carried out in the presence of a free alcohol selected from the group consisting of methanol and ethanol or water in quantities of 0.15 to 5.0% by weight with respect to the halo-aldehydes, and conducting a second stage of purification wherein said halo-aldehyde, thus treated and in liquid form, is brought into contact with an absorbent solid consisting of a cationic exchange resin consisting of a polystyrene exchange resin having sulfonic groups linked thereto and in the form of salts of alkali or alkaline earth metals, said process being carried out at a temperature from the melting temperature to the boiling temperature of said halo-aldehyde.

4,054,556

POLYURETHANES CURED WITH DERIVATIVES OF 2,4-DIAMINO-BENZOIC ACID

Norman Martin Van Gulick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

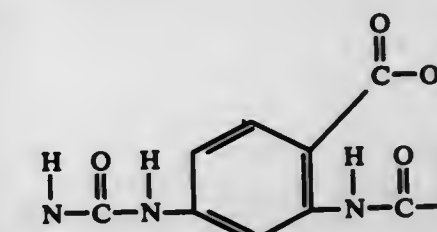
Filed Sept. 15, 1972, Ser. No. 289,460

Int. Cl.² C08G 18/32, 18/14

U.S. Cl. 260—75 NH

4 Claims

1. Polyurethane elastomers which contain structural units of the formula



and mixtures thereof in which R is a C₁—C₈ alkyl radical.

4,054,557

GROWTH PROMOTING POLYPEPTIDES AND PREPARATION METHOD

Hans Uno Sievertsson, Sollentuna; Linda Fryklund, Kungälv; and Knut Övind Uthne, Södertälje, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

Filed May 15, 1974, Ser. No. 470,040

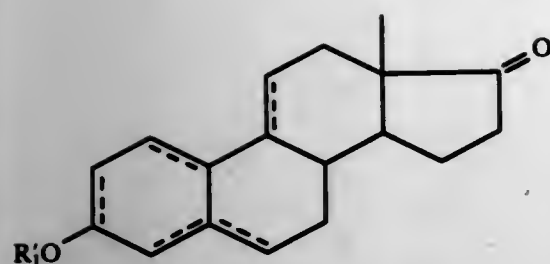
Int. Cl.² C08H 1/00

U.S. Cl. 260—112 R

16 Claims

1. A growth-promoting polypeptide derivable from mammalian blood plasma by a procedure which includes subjecting the plasma material to an acid, bond-splitting agent; and having (i) molecular weight in the range of from about 5,000 to about 7,000 determined by gel filtration enhanced by using insulin of its known molecular weight as a standard for comparison, (ii) chromatographic mobility under electrophoresis relative to lysine at pH 5 of from about 0.25 to about 0.37 and relative to aspartic acid at pH 7.5 of from about 0.17 to about 0.43, and (iii) the terminal amino acid at its amino end is asparagine or aspartic acid, and also having the respective constitution provided by one of the following groups (a), (b), and (c) of combined amino acids, with each said acid being in its respectively noted molar content:

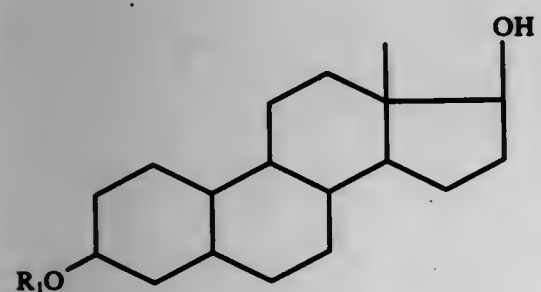
- aspartic acid 4.1, threonine 4.3, serine 7.8, glutamic acid 5.1, proline 8.2, glycine 10.2, alanine 4.9, valine 4.0, methionine 0.3, isoleucine 1.3, leucine 2.1, tyrosine 0.6, phenylalanine 1.1, histidine 1.5, lysine 2.8, arginine 4.0, tryptophan 1.0, and carboxymethyl cysteine 1.0, per mol of said polypeptide;
- aspartic acid 4.8, threonine 1.9, serine 3.5, glutamic acid 4.6, proline 7.3, glycine 7.1, alanine 7.0, valine 4.9, methionine 0.9, isoleucine 0.8, leucine 3.3, tyrosine 0.9, phenylalanine 2.2, histidine 3.8, lysine 2.5, arginine 4.6, tryptophan 1.0, and cysteine (determined as cysteic acid) 1.14, per mol of said polypeptide; and
- aspartic acid 5.2, threonine 4.0, serine 3.1, glutamic acid 8.1, proline 0.8, glycine 2.1, alanine 1.1, valine 1.8, leucine 1.0, tyrosine 2.9, phenylalanine 1.0, lysine 3.8, arginine 1.3,



wherein R_1 represents a hydrogen atom, a lower alkyl group or an acyl group, which contains a double bond in 5-position and a methyl group in 10-position, or three double bonds in the position 1,3 and 5(10), and which can contain an additional double bond in the 9(11)-position, with an organometallic compound of the formula



wherein M represents a grouping MgX , in which X represents a halogen atom or an alkali metal atom and R_2 represents a di-lower alkylamino group, converting, by treatment with a lower alkyl ester of a strong acid, the resultant 17 β -hydroxy-17 α -(γ -di-lower alkylaminopropyl) compound of the general formula



wherein R_1 and R_2 are as defined in formulae (I) and (III), respectively, and which contains a double bond in 5-position and a methyl group in 10-position, or three double bonds in the position 1,3 and 5(10), and which can contain an additional double bond in the 9(11)-position, into the corresponding quaternary tri-lower alkylammonium salt, liberating the corresponding quaternary base with a strong base and heating the latter up to the temperature of decomposition.

6. 2',3'- α -Tetrahydrofuran-2'-spiro-17[androst-5,9(11)-dien-3 α -ol].

4,054,564

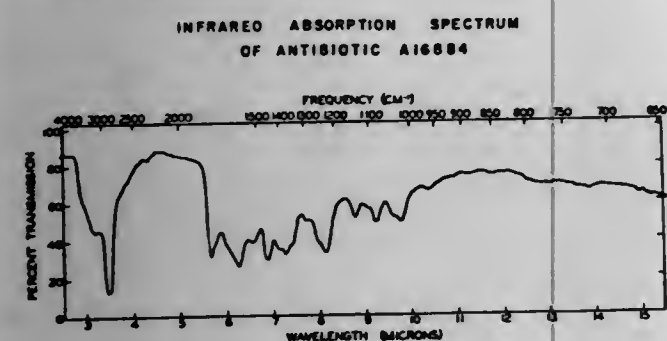
7-(5-AMINO-5-CARBOXYVALERAMIDO)-7-METHOXYCEPHALOSPORANIC ACID

Robert L. Hamill, New Ross; Calvin E. Higgins, and Marvin M. Hoeft, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

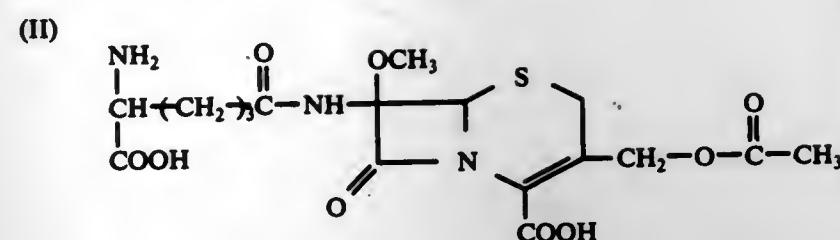
Division of Ser. No. 60,556, Aug. 3, 1970, Pat. No. 3,719,563, which is a continuation-in-part of Ser. No. 847,923, Aug. 6, 1969, abandoned. This application May 8, 1972, Ser. No. 251,619

Int. Cl.² C07D 501/28; A61K 31/545

U.S. Cl. 544—21

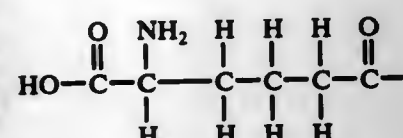


1. The compound of the formula

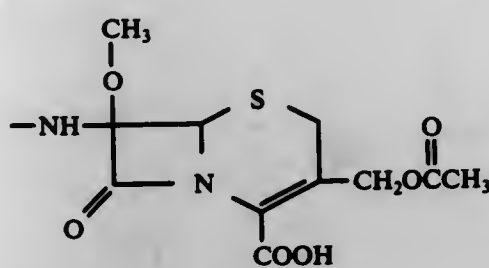


or a salt thereof.

2. A compound having the formula:



(III)



and pharmaceutically acceptable salts thereof.

(IV)

4,054,565

PROCESS FOR PREPARING N-MONO(ALKOXYMETHYL) PHENOBARBITALS

Julius A. Vida, New York, N.Y., and Carlos M. Samour, Wellesley, Mass., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 434,385, Jan. 18, 1974, Pat. No. 3,948,896, which is a continuation-in-part of Ser. No. 336,424, Feb. 28, 1973, abandoned. This application Sept. 24, 1975, Ser. No. 616,498

Int. Cl.² C07D 239/62

U.S. Cl. 260—257

6 Claims

1. A process for preparing N-mono(alkoxymethyl)phenobarbital which comprises reacting a dialkali metal salt of thiophenobarbital with chloromethyl alkyl ether wherein the alkyl group has from 1 to 4 carbon atoms in the presence of an inert solvent to provide an N,S-bis(alkoxymethyl) thiophenobarbital and then oxidizing said N,S-bis(alkoxymethyl)thiophenobarbital.

4,054,566

PROCESS FOR CONVERTING NEOPINONE TO CODEINONE

Henry Rapoport, and Randy B. Barber, both of Berkeley, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

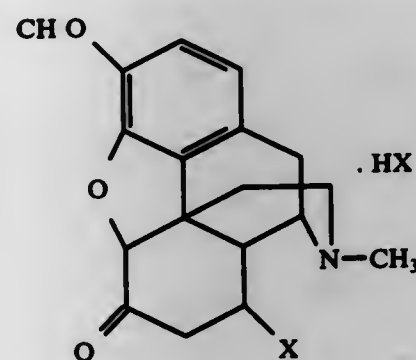
Filed Mar. 10, 1976, Ser. No. 665,602

Int. Cl.² C07D 489/00, 489/02

U.S. Cl. 260—285

14 Claims

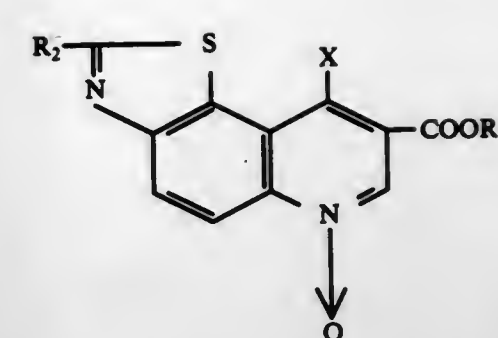
1. A compound represented by the following formula:



wherein X is a halogen selected from the group consisting of chlorine, bromine and iodine.

4. A process for preparing codeinone which involves

- reacting neopinone or a mixture containing neopinone and codeinone with a hydrohalic acid selected from the group consisting of hydrochloric, hydrobromic and hydroiodic under anhydrous conditions to form the corresponding 8-halodihydrocodeinone hydrohalide,
- treating the 8-halodihydrocodeinone hydrochloride with a basic agent to form codeinone.



wherein R_2 is a lower alkylsulfonyl group or a halogen atom, R_3 is a lower alkyl group and X is a halogen atom.

4,054,567

6-METHYL-8 β -HYDROXYMETHYL-8- γ -SUBSTITUTED-9-ERGOLINE COMPOUNDS

Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

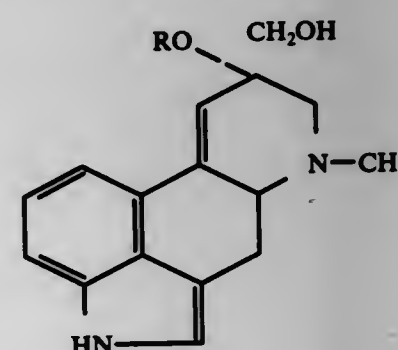
Continuation-in-part of Ser. No. 603,408, Aug. 11, 1975, Pat. No. 3,968,112, which is a division of Ser. No. 494,147, Aug. 2, 1974, Pat. No. 3,929,796. This application Feb. 17, 1976, Ser. No. 658,439

Int. Cl.² C07D 457/10

U.S. Cl. 260—285.5

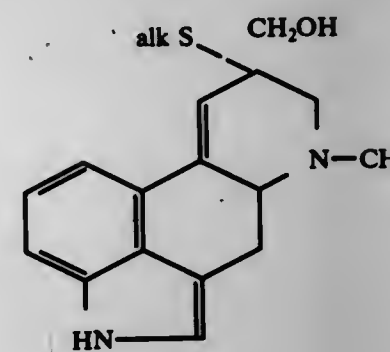
5 Claims

1. A compound of the formula



wherein alk is (C_1-C_3) alkyl and R is alk or CO-alk.

2. A compound of the formula



wherein alk is (C_1-C_3) alkyl.

4,054,568

THIAZOLO(5,4-F)QUINOLINE-8-CARBOXYLIC ACID DERIVATIVES

Hideo Agui, Toyonaka; Toru Mitani, Kyoto; Mitsuo Nakashita, Kobe; Eichi Murayama, Takarazuka; Kousaku Okamura, Toyonaka; Takenari Nakagome, Nishinomiya; Toshiaki Komatsu, Takarazuka; Akio Izawa, and Yasuko Eda, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 515,753, Oct. 17, 1974, Pat. No. 3,954,775.

This application Feb. 25, 1976, Ser. No. 661,455

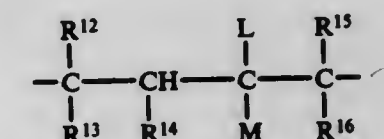
Claims priority, application Japan, Oct. 17, 1973, 48-117042

Int. Cl.² C07D 513/04

U.S. Cl. 260—287 CF

3 Claims

1. A compound of the formula (III)



in which R^1 is selected from the group which consists of hydrogen and lower alkyl containing from 1-6 carbon atoms in a straight chain and up to 4 carbon atoms in a branched chain, and Alk represents

in which R^{12} , R^{13} , R^{14} , R^{15} and R^{16} are each the same or different radicals selected from the group which consists of hydro-

gen and lower alkyl containing from 1-6 carbon atoms in a straight chain and up to 4 carbon atoms in a branched chain, with the proviso that the carbon atom to which R¹² and R¹³ are attached is bonded to the nitrogen atom of said compound; L represents hydroxyl or lower alkanoyloxy containing from 2-10 carbon atoms in a straight chain or from 4-6 carbon atoms in a branched chain; and M is selected from the group which consists of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl containing from three to six carbon atoms or cycloalkyl substituted with lower alkyl; phenyl or phenyl substituted with lower alkyl, lower alkoxy, halo, or trihalomethyl; benzyl, furyl, thienyl, or pyridyl; and their acid addition salts with pharmaceutically acceptable acids.

4,054,570

4-PIPERIDINOBUTYROPHENONES

Charles Ferdinand Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 407,737, Oct. 18, 1973, Pat. No. 3,992,546. This application Mar. 10, 1975, Ser. No. 556,599

Int. Cl.² C07D 211/22, 211/32

U.S. Cl. 260—293.8

3 Claims

1. The 4'-fluoro-4[4-(α-hydroxy-α-methylbenzyl)-piperidino]-butyrophenone, or a therapeutically acceptable acid addition salt thereof.

4,054,571

NITROGEN-CONTAINING POLYCYCLIC COMPOUNDS AND A PROCESS FOR THE PREPARATION THEREOF

Csaba Szántay; Lajos Szabó; György Kalász; Egon Kárpáti, and László Szporay, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Sept. 17, 1975, Ser. No. 614,151

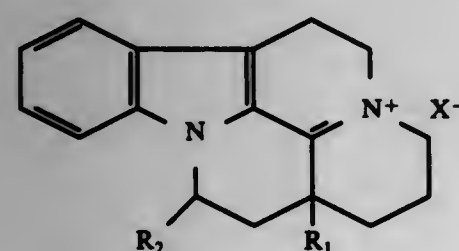
Claims priority, application Hungary, Sept. 27, 1974, RI-546

Int. Cl.² C07D 471/04

U.S. Cl. 260—293.55

7 Claims

1. A compound of the formula (I),



wherein

R₁ is a lower alkyl group with 1 to 6 carbonyl group having 1 to 6 carbon atoms in the alkoxy moiety, an aralkoxycarbonyl group having 7 to 20 carbon atoms in the aralkoxy moiety or a cyano group, and

X⁻ is an anion derived from an acid, and the corresponding free base.

4,054,572

HEXAHYDRO PYRIDINE [1,2D] DIBENZO [B,F] (1,4)-DIAZEPINES

Willem Jacob van der Burg, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 463,712, April 24, 1974, Pat. No. 3,966,723.

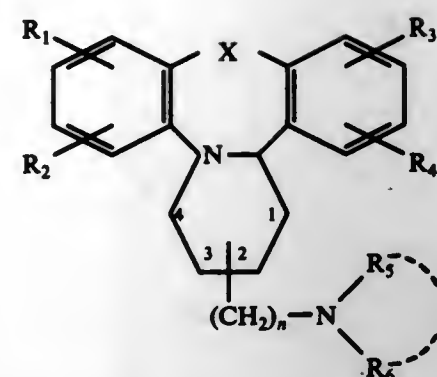
This application Jan. 15, 1976, Ser. No. 649,434

Claims priority, application Netherlands, Apr. 26, 1973, 7905811

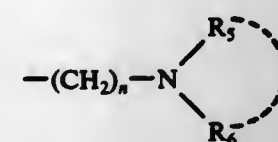
Int. Cl.² C07D 471/04

U.S. Cl. 260—293.55

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein the group



is present at position 2 or 3 in which:

X represents the group NR₇,

R₁, R₂, R₃ and R₄ represent hydrogen, hydroxy, halogen, alkyl containing 1 to 6 carbon atoms, alkoxy containing 1 to 6 carbon atoms, alkylthio containing 1 to 6 carbon atoms or trifluoromethyl,

R₅, R₆ represent hydrogen, alkyl containing 1 to 6 carbon atoms, phenylalkyl in which the alkyl group contains 1 to 4 carbon atoms, or R₅ together with R₆ and the nitrogen atom represent a heterocyclic 5 or 6 membered ring selected from the group consisting of pyrrolidine, pyrrolidino, piperidino, oxazolidino, morpholino, and piperazino,

R₇ represents hydrogen or alkyl containing 1 to 4 carbon atoms, and

n is the number 0, 1, 2 or 3.

4,054,573

CERTAIN ETHERS OF CERTAIN DI AND TRIHALO-1-HYDROXY-2-(FLUOROALKYL)IMIDAZO(4,5-b)PYRIDINE DERIVATIVES

George O. P. O'Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 613,387, Sept. 15, 1975, abandoned, and a continuation-in-part of Ser. No. 479,006, June 13, 1974,

abandoned, which is a continuation-in-part of Ser. No. 236,195, March 20, 1972, Pat. No. 3,818,022, said Ser. No. 236,195, is a

continuation-in-part of Ser. No. 181,638, Sept. 17, 1971, abandoned, said Ser. No. 181,638, is a continuation-in-part of

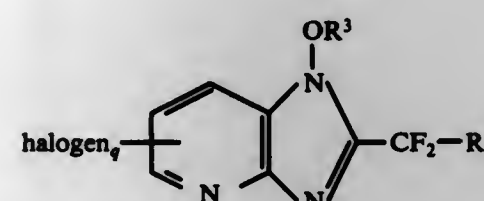
Ser. No. 100,410, Dec. 21, 1970, abandoned. This application Feb. 25, 1976, Ser. No. 661,186

Int. Cl.² C07D 471/04

U.S. Cl. 260—296 H

8 Claims

1.



wherein R¹ represents hydrogen, chlorine, fluorine, difluoromethyl, perfluoroalkyl of C₁-C₆, or radical of the formula

4,054,575

1,2,4-TRIAZOLYL-PHOSPHONIC ACID AND PHOSPHONIC ACID ESTERS

Beat Böhner, Binningen; Dag Dawes, Pratteln, and Willy Meyer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 5, 1973, Ser. No. 422,037

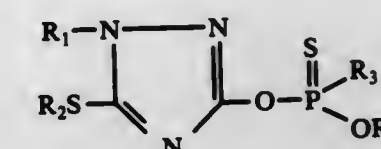
Claims priority, application Switzerland, Dec. 8, 1972, 17894/72; Nov. 2, 1973, 15457/73

Int. Cl.² A01N 9/36; C07F 9/65

U.S. Cl. 260—308 R

11 Claims

1. A compound of the formula



wherein

R₁ represents alkyl of from 1 to 6 carbon atoms or cycloalkyl of from 3 to 6 carbon atoms,

R₂ represents allyl, methallyl, 2-butenyl, 4-chloro-2-butenyl or propargyl,

R₃ represents methoxy, ethoxy or ethylamino, and

R₄ represents methyl or ethyl.

4,054,574

1-BENZOTHAZOLYL-5-AMINO-IMIDAZOLIDINONES

Chin Ching Wu, Libertyville, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

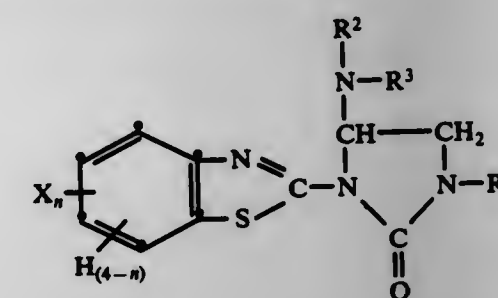
Filed May 24, 1976, Ser. No. 689,427

Int. Cl.² C07D 417/04

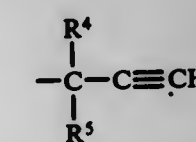
U.S. Cl. 260—306.8 D

9 Claims

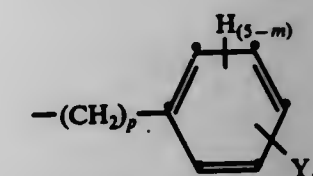
1. A compound of the formula



wherein X is selected from the group consisting of lower alkyl, chlorine, bromine, fluorine, lower chloroalkyl, lower bromoalkyl, trifluoromethyl, and lower alkoxy; n is an integer from 0 to 2; R¹ is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and



wherein R⁴ and R⁵ are each selected from the group consisting of hydrogen and alkyl of up to 3 carbon atoms; and R² and R³ are each selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower haloalkyl, lower hydroxyalkyl, lower alkoxyalkyl, cycloalkyl of from 3 to 7 carbon atoms and



where p is the integer 0 or 1; Y is selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio, halogen lower chloroalkyl, lower bromoalkyl, trifluoromethyl, nitro and cyano; and m is an integer from 0 to 3.

4,054,576

INSECT REPELLANT COMPOUNDS

Don R. Baker, Orinda; Francis H. Walker, Mill Valley, and Peter E. Letchworth, Cupertino, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 536,279, Dec. 24, 1974, abandoned, which is a division of Ser. No. 417,306, Nov. 19, 1973, abandoned. This

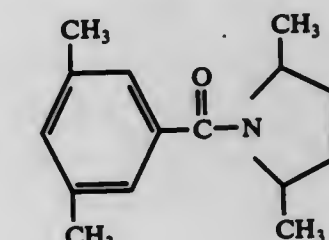
application Dec. 12, 1975, Ser. No. 640,112

Int. Cl.² C07D 207/20

U.S. Cl. 260—326.5 E

1 Claim

1. A compound having the formula



4,054,577

PREPARATION OF AROMATIC BISIMIDES

Howard M. Relles, Rexford, and Donald S. Johnson, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

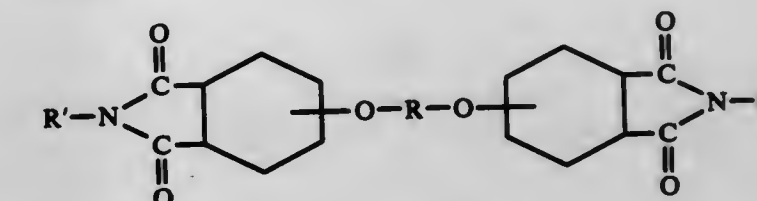
Filed May 6, 1976, Ser. No. 683,648

Int. Cl.² C07D 209/34

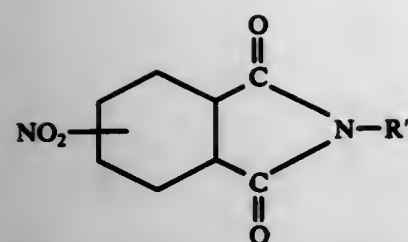
U.S. Cl. 260—326 N

11 Claims

1. The process for making aromatic imides of the general formula



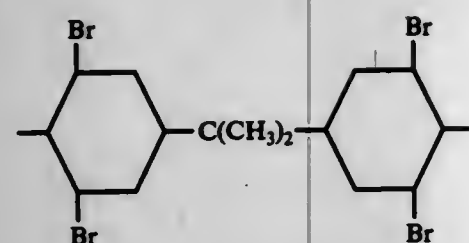
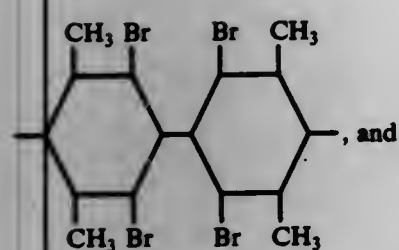
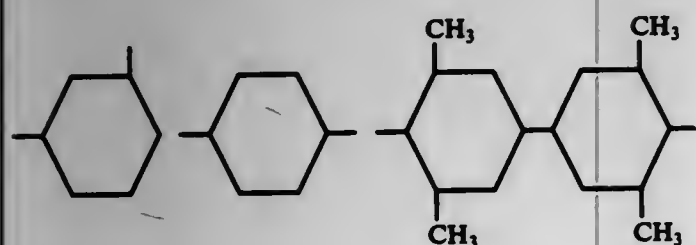
which comprises (1) simultaneously effecting reaction under substantially anhydrous conditions between a nitrophthalimide of the general formula



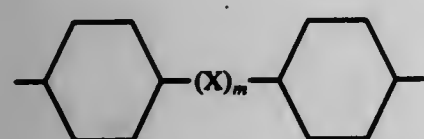
with a dihydroxy compound of the general formula



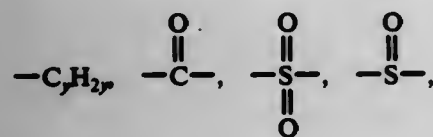
where R is a member selected from the class consisting of
a. divalent radicals of the formula



and (b) divalent organic radicals of the general formula



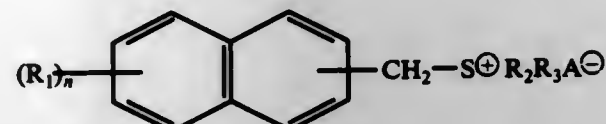
where X is a member selected from the class consisting of
divalent radicals of the formulas



—O— and —X—, where m is 0 or 1, y is a whole number from 1 to 5, and R' is a phenyl radical or an alkyl radical of from 1 to 2 carbon atoms, the said reaction being conducted in a solvent selected from the class consisting of N,N-dimethyl formamide, N,N-dimethyl acetamide, N-methylpyrrolidone, and mixtures of such solvents and in the further presence of a particulate potassium carbonate and a molecular sieve zeolite adsorbent, and (2) isolating the formed aromatic bisimide.

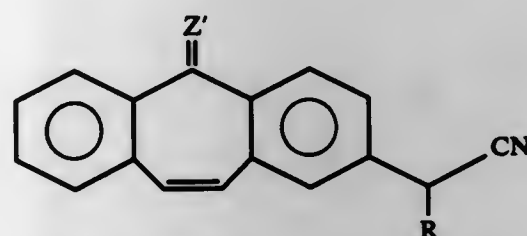
4,054,578
CERTAIN HETEROCYCLIC SULFONIUM COMPOUNDS
Wayne W. Frenier, and William J. Settineri, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 550,401, Feb. 18, 1975, Pat. No. 3,969,414, which is a continuation-in-part of Ser. No. 350,295, April 11, 1973, abandoned. This application Apr. 29, 1976, Ser. No. 681,645

Int. Cl.² C07D 333/46, 335/02
U.S. Cl. 260—327 R 6 Claims
1. A compound corresponding to the formula



wherein n is 1 or 2; each R₁ independently is hydrogen or a hydrocarbyl, hydrocarbyloxy or hydrocarbylthio group of from 1 to 24 carbon atoms, or a hydrocarbyl group of from 1 to 24 carbon atoms whose chain length is interrupted by an atom of oxygen or sulfur; R₂ and R₃ are joined to form, in combination with the sulfonium atom, a 5- or 6-membered heterocyclic ring selected from the group consisting of thiophenium, tetrahydrothiophenium, thiopyrylium and tetrahydrothiopyrylium, with the proviso that the total aggregate carbon content of R₁, R₂ and R₃ is from 10 to about 25 carbon atoms; and A⁻ is a neutralizing anion.

4,054,579
INTERMEDIATES IN THE PROCESS FOR THE
PREPARATION OF
2-(5H-DIBENZO[A,D]CYCLOHEPTEN-5-ON-2-YL)A-
CETIC, PROPIONIC AND BUTYRIC ACIDS
Peter H. Nelson; Karl G. Untch, both of Los Altos, and James P. Dunn, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Division of Ser. No. 611,057, Sept. 8, 1975, Pat. No. 3,979,430. This application June 21, 1976, Ser. No. 697,910
Int. Cl.² C07D 317/10
U.S. Cl. 260—340.9 R 3 Claims
1. A compound represented by the formula



wherein R is hydrogen, methyl or ethyl and Z' is an alkylene ketal having an alkylene group of from 2 to 4 carbon atoms which may be substituted with lower alkyl groups of from 1 to 4 carbon atoms.

4,054,580
PROCESS FOR PRODUCING
2,2,4-TRIMETHYL-6-HYDROXY-7-SUBSTITUTED
CHROMANS
Reitichi Ohi, Tokyo, Japan, assignor to Fujii Photo Film Co., Ltd., Minami-ashigara, Japan
Filed Dec. 10, 1975, Ser. No. 639,510
Claims priority, application Japan, Dec. 10, 1974, 49-142159
Int. Cl.² C07D 311/72
U.S. Cl. 260—345.5 8 Claims
1. A process for producing a 2,2,4-trimethyl-6-hydroxy-7-substituted chroman which comprises reacting a 2-substituted hydroquinone with 2-methyl-2,4-pentanediol in the presence of

a Friedel-Crafts catalyst, said substituent being selected from the group consisting of

- a long straight chain alkyl group having 6 to 18 carbon atoms,
- a branched chain alkyl group having 3 to 18 carbon atoms,
- a straight chain alkenyl group having 6 to 18 carbon atoms,
- a branched chain alkenyl group having 3 to 18 carbon atoms,
- a phenyl group,
- a naphthyl group,
- a phenyl group substituted with one or more members of the group consisting of an alkyl group having 1 to 12 carbon atoms, a nitro group, an amino group, an acyl group having 2 to 13 carbon atoms, a carboxyl group or a sulfo group, or
- a naphthyl group substituted with one or more members of the group consisting of an alkyl group having 1 to 12 carbon atoms, a nitro group, an amino group, an acyl group having 2 to 13 carbon atoms, a carboxyl group or a sulfo group.

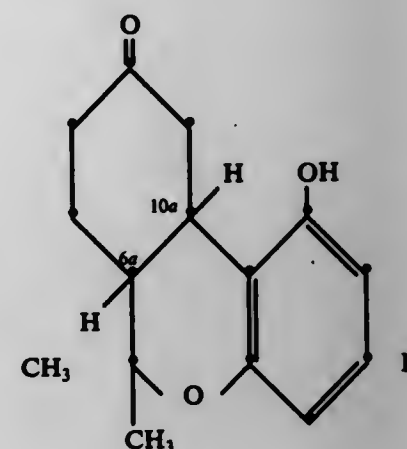


wherein: n is O or 1, R' and R'' independently are hydrogen, methyl or ethyl; in the presence of a catalyst selected from the group consisting of boron tribromide, boron trifluoride, and stannic chloride, in an organic solvent at a temperature in the range of from about -20° C. to about 100° C., for a period of time of from about 0.5 to about 8 hours.

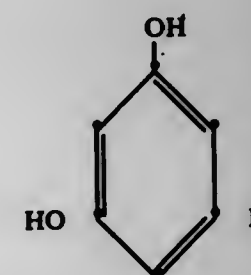
4,054,581
PREPARATION OF
CIS-1-HYDROXY-3-SUBSTITUTED-6,6-DIMETHYL-
6,6A,7,8,10,10A-HEXAHYDRO-9H-DIBENZO[B,D]PY-
RAN-9-ONES AND INTERMEDIATES THEREFOR
William B. Blanchard, and Charles W. Ryan, both of Indianap-
olis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed July 6, 1976, Ser. No. 702,804
Int. Cl.² C07D 311/78

U.S. Cl. 260—345.3 7 Claims
1. A process for preparing a hexyldrodibenzopyranone of the formula



wherein R is C₃-C₁₀ alkyl, C₃-C₁₀ alkenyl, C₃-C₈ cycloalkyl, or C₃-C₈ cycloalkenyl, and wherein the hydrogen atoms attached at the 6a and 10a positions are oriented cis to one another, comprising reacting a 5-substituted resorcinol of the formula

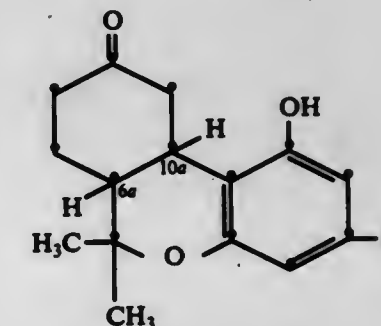


wherein R has the above-defining meaning, and a 4-(1-hydroxy-1-methylethyl)-3-cyclohexenone ketal of the formula

4,054,582
PROCESS FOR CONVERTING
CIS-HEXAHYDRODIBENZO[B,D]PYRAN-9-ONES TO
TRANS-HEXAHYDRODIBENZO[B,D]PYRAN-9-ONES
William B. Blanchard, and Charles W. Ryan, both of Indianap-
olis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed July 6, 1976, Ser. No. 702,807
Int. Cl.² C07D 311/78

U.S. Cl. 260—345.3 5 Claims
1. A process for preparing a 6a,10a-trans-hexahydrodiben-
zo[b,d]pyran-9-one of the general formula



wherein:
R is C₃-C₁₀ alkyl, C₃-C₁₀ alkenyl, C₃-C₈ cycloalkyl, or C₃-C₈ cycloalkenyl; and wherein the hydrogen atoms attached at the 6a and 10a positions are oriented trans to one another; comprising reacting the corresponding 6a,1-0a-cis-hexahydrodibenzo[b,d]pyran-9-one with an aluminum halide selected from the group consisting of aluminum chloride and aluminum bromide, in an unreactive organic solvent, at a temperature ranging from about -80° to about 100° C., for a period of time ranging from about 10 minutes to about 6 hours.

4,054,583

**PROCESS FOR CONVERTING
2,7-DIHYDROXY-5-ISOPROPYLIDENE-9-SUBSTITUTED-
2,6-METHANO-3,4,5,6-TETRAHYDRO-2H-1-BEN-
ZOXOCIN TO
TRANS-1-HYDROXY-3-SUBSTITUTED-6,6-DIMETHYL-
6,6A,7,8,10,10A-HEXAHYDRO-9H-DIBENZO(B,D)PY-
RAN-9-ONE**

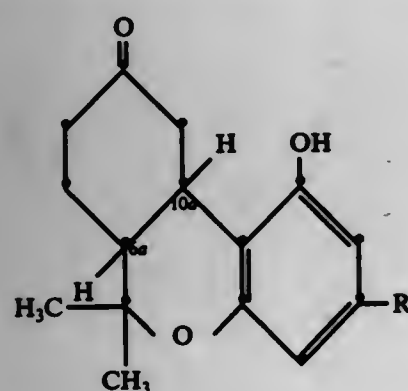
William B. Blanchard, and Charles W. Ryan, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed July 6, 1976, Ser. No. 702,808
Int. Cl.² C07D 311/78

U.S. Cl. 260—345.3

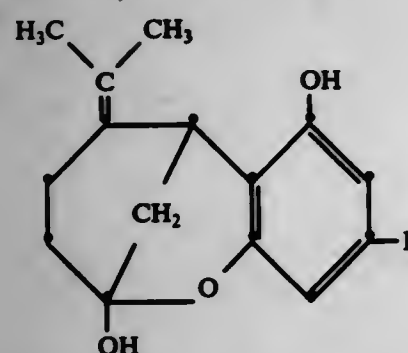
7 Claims

1. A process for preparing a compound of the formula



wherein:

R is C₅-C₁₀ alkyl, C₅-C₁₀ alkenyl, C₅-C₈ cycloalkyl, or C₅-C₈ cycloalkenyl; and wherein the hydrogen atoms attached at the 6a and 10a positions are oriented trans to one another; comprising reacting a 2,7-dihydroxy-5-isopropylidene-9-substituted-2,6-methano-3,4,5,6-tetrahydro-2H-1-benzoxocin of the formula



wherein R has the above-defined meaning, with from about 2 to about 6 molar equivalents of an aluminum halide selected from aluminum chloride and aluminum bromide, in a halogenated hydrocarbon or aromatic solvent, at a temperature ranging from about -20° C. to about 100° C.

4,054,584

**METHOD FOR MAKING BIS(THIOETHER
PHthalic ANHYDRIDES)**

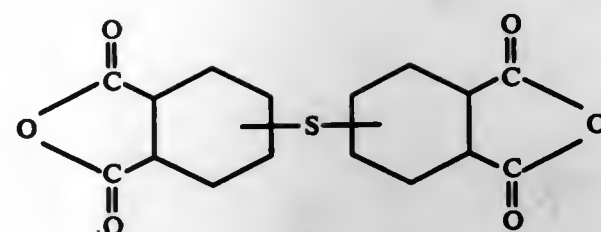
Frank J. Williams, III, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 346,470, March 30, 1973, Pat. No. 3,909,712. This application May 7, 1976, Ser. No. 684,015
Int. Cl.² C07D 307/89

U.S. Cl. 260—346.3

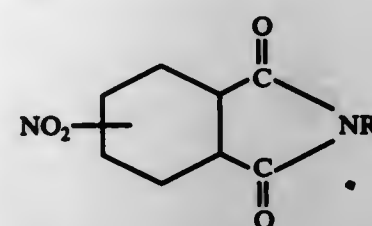
7 Claims

1. A method for making bis(thioether phthalic anhydride) of the formula



which comprises,

1. effecting reaction between an alkali metal sulfide M₂S, and an N-substituted phthalimide of the formula,



2. to produce an intermediate bis(thioether phthalimide),
3. hydrolyzing the bis(thioetherphthalimide) in the presence of base to produce the corresponding bis(thioetherphthalic acid salt),
4. acidifying the bis(thioetherphthalic acid salt) and recovering the corresponding bis(thioetherphthalic acid), and
5. thereafter dehydrating the bis(thioetherphthalic acid) to the bis(thioetherphthalic anhydride);

where R is a monovalent radical selected from the class consisting of C₍₁₋₈₎ alkyl radicals, C₍₆₋₂₀₎ aromatic radicals, and M is an ion derived from an alkali metal.

4,054,585

**FURAN-3-CARBOXAMIDE DERIVATIVES AND
METHOD OF PREPARING SAME**

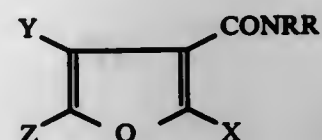
Ethel E. Felauer; Marshall Kulka, both of Guelph, Canada; Bogislav Von Schmeling, Hamden, and Robert A. Davis, Cheshire, both of Conn., assignors to Uniroyal, Inc., Naugatuck, Conn.

Continuation of Ser. No. 232,293, March 6, 1972, abandoned, which is a continuation of Ser. No. 799,109, Feb. 13, 1969, abandoned. This application June 9, 1976, Ser. No. 694,479
Int. Cl.² C07D 307/68

U.S. Cl. 260—347.3

21 Claims

1. A compound having the structural formula

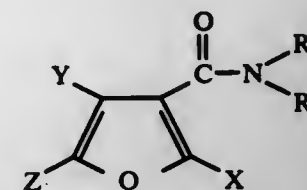


wherein R is hydrogen, alkyl of 1 to 2 carbon atoms, benzoyl, or trichloromethylsulfenyl; R₁ is phenyl, alkylphenyl, alkoxyphenyl, halophenyl, nitrophenyl, benzyl, biphenyl, alkyl having from 1 to 10 carbon atoms, allyl, cyclohexyl, naphthyl, pyridyl, thiazolyl, ethylene bis-, or furfuryl; or R and R₁ taken together are oxydiethylene; Y and Z are independently selected from the group consisting of hydrogen, halo, amino, alkyl having 1 to 17 carbon atoms, hydroxyalkyl of 1 to 17 carbon atoms, chloroalkyl of 1 to 17 carbon atoms, nitroalkyl of 1 to 17 carbon atoms, allyl, phenyl, alkylphenyl, alkoxyphenyl, halophenyl, or Y and Z together are, alkylene; and X is either alkyl having from 1 to 17 carbon atoms or phenyl; provided that if

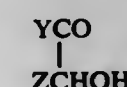
if (R is H, R₁ is phenyl, X is CH₃, Z is H) , then Y is not H or CH₃.

then Y is not H or CH₃.

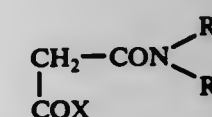
16. A method of making a compound of the formula:



wherein X, Y and Z are independently selected from the group consisting of hydrogen, alkyl containing 1 to 17 carbon atoms, lower hydroxyalkyl, allyl, phenyl, lower alkoxyphenyl, lower alkylphenyl, nitrophenyl and halophenyl, or Y and Z together are 1,4-butylene; R is selected from the group consisting of hydrogen, alkyl containing 1 to 10 carbon atoms, benzoyl and trichloromethyl sulfenyl; and R₁ is selected from the group consisting of phenyl, lower alkylphenyl, lower alkoxyphenyl, halophenyl, nitrophenyl, benzyl, biphenyl, alkyl containing 1 to 10 carbon atoms, allyl, cyclohexyl, naphthyl, pyridyl, thiazolyl, ethylene bis-, and furfuryl, or R and R₁ together with the nitrogen is morpholino, said method comprising reacting an aliphatic ketone or aldehyde of the formula



with an acetamide of the formula



where X, Y, Z, R and R₁ have the meanings set forth above in this claim, in an inert, non-hydroxylic solvent and in the presence of an active Friedel-Crafts reagent selected from the group consisting of AlCl₃, AlBr₃ and SnCl₄.

4,054,586

PROCESS FOR PREPARING

1-AMINOANTHRAQUINONE HAVING HIGH PURITY
Yutaka Hirai; Katsuharu Miyata, and Tagui Osawa, all of Ohmura, Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed Dec. 16, 1975, Ser. No. 641,284

Claims priority, application Japan, Dec. 20, 1974, 49-145612; Dec. 20, 1974, 49-145613

Int. Cl.² C09B 1/16

U.S. Cl. 260—378

14 Claims

1. A process for preparing 1-aminoanthraquinone of high purity, which comprises hydrogenating 1-nitroanthraquinone or crude 1-aminoanthraquinone in an aqueous medium in the presence of a base using a hydrogenating catalyst thereby forming an hydrogenation product which comprises a water soluble salt of 1-aminoanthraquinone and said base, and the oxidizing the hydrogenation product.

4,054,587

**PREPARATION OF CHLOROANTHRAQUINONES
FROM NITROANTHRAQUINONES**

Karl-Julius Reubke, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 26, 1976, Ser. No. 680,406

Claims priority, application Germany, May 17, 1975, 2522177
Int. Cl.² C09B 1/00, 1/10

U.S. Cl. 260—384

10 Claims

1. In the preparation of an α-chloroanthraquinone by reacting the corresponding α-nitro compound with a chlorinating agent in a solvent, the improvement which comprises employing an ionic chloride as said chlorinating agent and effecting the chlorination in the presence of an acid or of a compound

which eliminates an acid under the reaction conditions, the ionic chloride being selected from the group consisting of inorganic chlorides soluble in the solvent under the reaction conditions, hydrochlorides of tertiary amines, quaternary ammonium chlorides and anion exchangers in the chloride form, and the acid being selected from the group consisting of a mineral acid and a Lewis acid.

4,054,588

**PROCESS FOR THE PREPARATION IN A SINGLE
STAGE OF SATURATED OMEGA-AMINOACIDS FROM
OLEFINICALLY UNSATURATED
OMEGA-ALDEHYDOACIDS**

Francesco Siclari, Barlassina; Pietro Paolo Rossi, Garlasco, and Mario De Gaetano, Seregno, all of Italy, assignors to Snia Viscosa-Societa' Nazionale Industria Applicazioni Viscosa S.P.A., Italy

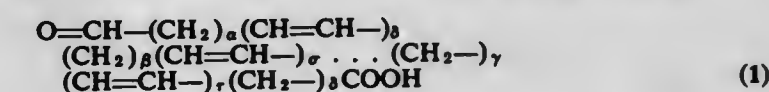
Filed Feb. 17, 1976, Ser. No. 658,589

Claims priority, application Italy, Feb. 25, 1975, 20590/75
Int. Cl.² C09F 5/00; C11C 3/00

U.S. Cl. 260—404

20 Claims

1. Process for the preparation of saturated omega-aminoacids having the general formula H₂N-(CH₂)_n-COOH wherein "n" is a whole number in the range from 4 to 16, from linear unsaturated omega-aldehydeacids comprising from 1 to 3 olefinic double bonds, and having the general formula



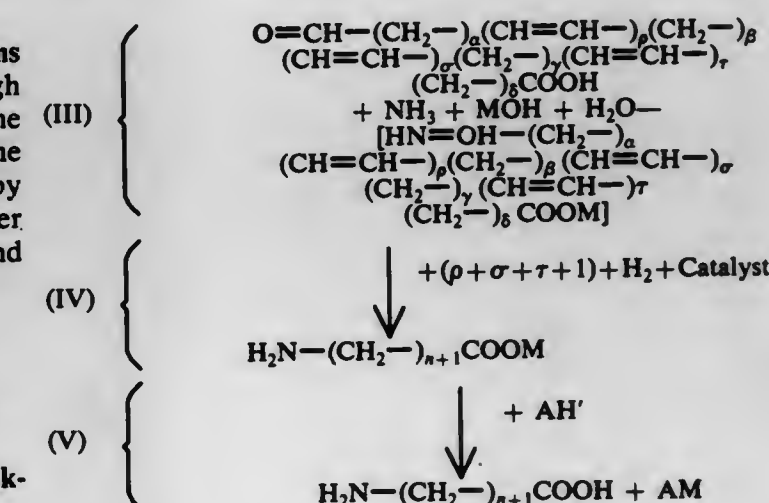
wherein α, β, γ, δ = whole numbers, equal or different from one another, chosen among 0, 1, 2 and 3;

ρ, σ, τ = whole numbers, equal or different from one another, chosen among 0 and 1;

and wherein the sum ρ + τ + τ = 1, 2 or 3;

and wherein the sum α + β + γ + δ + ρ + σ + τ = n,

characterized by the fact that an ω-aldehydeacid according to general formula (1) as set forth in the description, is reacted with ammonia and an alkali metal hydroxide in aqueous solution according to general reaction (III), whereby the alkali salt of the corresponding iminoacid is obtained, that this latter is reacted with hydrogen in the presence of an hydrogenation catalyst giving rise to general reaction (IV) and that the saturated ω-aminoacid is then obtained from its alkali salt by treatment with an acid compound according to reaction (V), all as follows:



wherein

M = an alkali metal;

H⁺ = an hydrogen atom of an acid compound;

A = residue of an acid compound;

α, β, γ, δ, ρ, σ, τ, n, have the meaning set forth hereinbefore; provided that:

the hydrogenation catalyst is a metal chosen from the group consisting of Fe, Ru, Os, Rh, V and Ir;

the hydrogenation temperature is from 70° to 140° C; the aqueous solution of the alkali salt of the iminoacid which forms when acid aldehyde, ammonia and metal alkali hydroxide are mixed, has an ammonia concentration from 10% to 50%, expressed as weight of NH₃ per weight of overall solution.

4,054,589

NOVEL 9-SUBSTITUTED PHENYL-3,7-DIMETHYL-NONA-2,4,6,8-TETRAENE ESTERS

Werner Bollag, Basel; Rudolf Rüegg, Böttmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sept. 15, 1975, Ser. No. 613,676

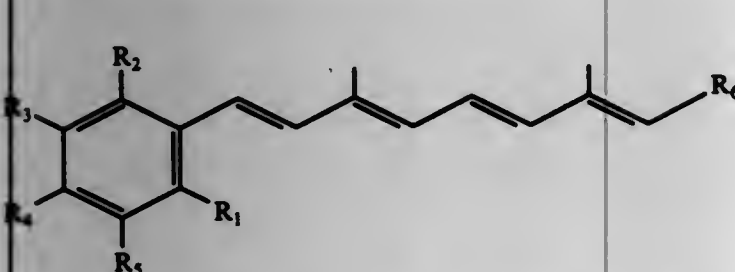
Claims priority, application Switzerland, Sept. 26, 1974, 13032/74; July 9, 1975, 8962/75

Int. Cl.² C09F 7/00; C11C 3/00

U.S. Cl. 260—408

6 Claims

1. A compound of the formula:



wherein R₁ and R₂ are halogen, lower alkyl or lower alkoxy, with the proviso that one of R₁ and R₂ is halogen; R₃ and R₄ are hydrogen, halogen or lower alkyl; with the proviso that one of R₃ and R₄ is other than halogen; R₅ is lower alkoxy; and R₆ is alkoxy carbonyl; and salts thereof.

2. The compound of claim 1 wherein said compound is 9-(6-chloro-4-methoxy-2,3-dimethyl-phenyl)-3,7-dimethyl-nona-2,4,6,8-tetraen-1-ol acid ethyl ester.

4,054,590

PRODUCTION OF FATTY ACIDS

Harold Robert Gerberich, Jr., Corpus Christi, Tex., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 586,761, June 13, 1975,

abandoned. This application Sept. 17, 1976, Ser. No. 724,034

Int. Cl.² C07C 51/20, 51/24, 51/26, 51/28

U.S. Cl. 260—413

10 Claims

1. In a process for the production of fatty acids from C₁₂ to C₃₅ normal alkanes wherein said C₁₂ to C₃₅ normal alkanes are oxidized in the liquid phase with molecular oxygen at elevated temperatures and pressures sufficient to maintain a liquid phase of said alkanes for a time whereby there is produced a crude primary oxidate liquid product containing fatty acids, unreacted alkanes and oxygenated hydrocarbon intermediates, and wherein a fatty acid product is recovered from said crude primary oxidate liquid product, the improvement which comprises: controlling said oxidation with molecular oxygens at a level such that said crude primary oxidate has a saponification number of about 50 to 95 and, in a secondary oxidation, oxidizing said crude primary oxidate liquid product prior to recovery of any fatty acids therefrom by nitric acid oxidation at elevated temperatures and pressures sufficient to maintain a liquid phase, and in the presence of a catalytic amount of a nitric acid oxidation catalyst, to produce a crude secondary oxidate liquid product comprising an aqueous phase containing most of the C₁₂ to C₃₅ fatty acids and a hydrocarbon phase containing most of the C₇ and higher fatty acids, followed by recovering a fatty acid product from said crude secondary oxidate liquid product.

2-CYANO-3-OR 4-(SUBSTITUTED AMINO)OXANILIC ACID DERIVATIVES

Dieter H. Klaubert, West Chester; John H. Sellstedt, Pottstown, and Charles J. Guinasso, King of Prussia, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 620,626, Oct. 3, 1975,

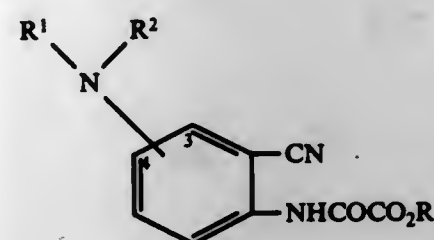
abandoned. This application Aug. 4, 1976, Ser. No. 710,481

Int. Cl.² C07C 121/78

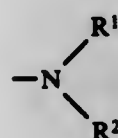
U.S. Cl. 260—465 D

11 Claims

1. A compound of the formula:



in which the group



is in the 3- or 4- ring position and

R is —H; an alkali metal; +NH₄; alkyl of 1 to 6 carbon atoms, inclusive; aralkyl of 7 or 8 carbon atoms; or cycloalkyl of 5 or 6 carbon atoms;

R¹ is hydrogen or normal alkyl of 1 to 6 carbon atoms and R² is hydrogen or alkyl of 1 to 6 carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

4,054,592

URETHANES CONTAINING TWO PERFLUOROALKYLTHIO GROUPS

Robert Ernest Arthur Dear, Mount Kisco, and Robert Allan Falk, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 439,497, Feb. 4, 1974, Pat. No. 3,935,277. This application Nov. 12, 1975, Ser. No. 631,004

Int. Cl.² C07C 125/06

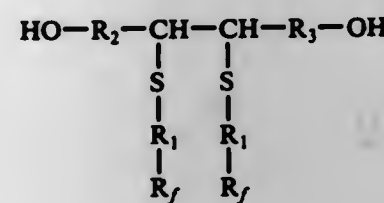
U.S. Cl. 560—25

9 Claims

1. A urethane derived from

a. an organic isocyanate which is an aromatic isocyanate or an alkyl isocyanate of 1 to 36 carbon atoms and

b. an R_f-glycol of formula



where

R_f is perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms;

R₁ is branched or straight chain alkylene of 1 to 12 carbon atoms, alkyleneethioalkylene of 2 to 12 carbon atoms, alkyleneoxyalkylene of 2 to 12 carbon atoms, or alkyleneiminoalkylene of 2 to 12 carbon atoms where the nitrogen atom contains as a third substituent, hydrogen or alkyl of 1 to 6 carbon atoms;

R₂ and R₃ independently are straight or branched chain alkylene of 1 to 12 carbon atoms, said alkylene substituted by 1 or 2 of phenyl or cyclohexyl; or R₂ and R₃ are a group of formula

C_mH_{2m}(OC_kH_{2k})_r

where

m is an integer from 1 to 12,

k is an integer from 2 to 6,

r is an integer from 1 to 40.

4,054,593

NITROGEN-CONTAINING COMPOUNDS

John Langshaw Brooks, and Richard Budziarek, both of Manchester, England, assignors to Imperial Chemical Industries Limited, Great Britain

Filed Feb. 9, 1976, Ser. No. 656,587

Claims priority, application United Kingdom, Mar. 10, 1975, 9844/75

Int. Cl.² C07C 79/46, 101/00

U.S. Cl. 560—12

7 Claims

1. Poly-sulphonyloxyurethanes of the formula:

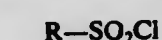


wherein A is a linking group to which the oxygen atoms are attached at alkyl, cycloalkyl or aryl carbon atoms, n is an integer of value at least 2, and each R which may be the same or different, is an optionally substituted alkyl or aryl group.

7. A process for manufacture of the poly-sulphonyloxyurethanes of claim 1 which comprises reacting a poly-(hydroxyurethane) of the formula:



with n moles of a sulphonyl chloride of the formula:



the symbols A, R and n having the meanings stated in claim 1, in the presence of an acid-binding agent which is added at a rate sufficient to neutralise the mineral acid formed whilst keeping the pH of the mixture below 7.

4,054,594

SEPARATION OF DIASTEREOMERS

Joseph Fried, Chicago, Ill., assignor to University of Chicago, Chicago, Ill.

Continuation-in-part of Ser. No. 400,297, Sept. 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 361,664,

May 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 53,663, July 9, 1970, abandoned. This application Oct. 29,

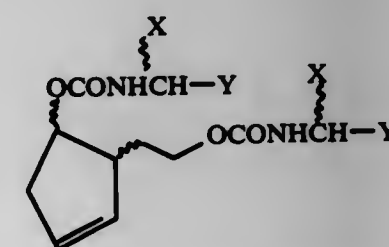
1975, Ser. No. 626,724

Int. Cl.² C07C 125/06

U.S. Cl. 560—32

5 Claims

1. A method of directly separating into its individual diastereomers, a diastereomeric mixture comprised of compounds of the formula



wherein X is methyl and Y is phenyl; which comprises subjecting said diastereomeric mixture to crystallization employing a aromatic hydrocarbon selected from the group consisting of benzene, toluene and xylene as crystallization solvent to obtain one diastereomer from said diastereomeric mixture and then subjecting the remainder of said diastereomeric mixture to crystallization with an acetone crystallization solvent to obtain the remaining diastereomer from said diastereomeric mixture.

963 O.G.—38

4,054,595

18 OR 19 HYDROXY PROSTAGLANDINS

Arthur Friedrich Marx, Delft, and Jean Doodewaard, Schipluiden, both of Netherlands, assignors to Gist-Brocades N.V., Netherlands

Filed Mar. 25, 1975, Ser. No. 561,895

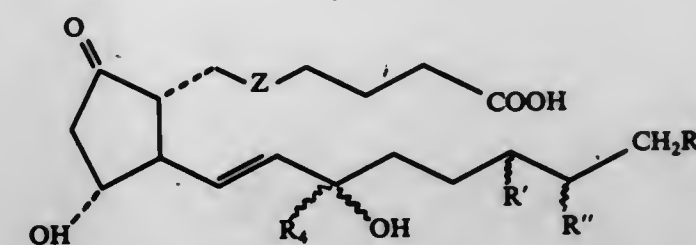
Claims priority, application United Kingdom, Mar. 26, 1974, 13399/74; Mar. 26, 1974, 13400/74

Int. Cl.² C07C 177/00

U.S. Cl. 560—121

7 Claims

1. The 18t- and 19t- hydroxy-prostaglandins, of the formula:



wherein the waved lines indicate that the substituents at the representative bonds are either in the α or β position; Z represents —CH₂CH₂— or cis —CH=CH—; R₁ represents H, CH₃— or C₂H₅—; R₄ is hydrogen or methyl and one of R' and R'' is hydroxy and the other is hydrogen and pharmaceutically acceptable salts or the aliphatic esters thereof containing 1 to 5 carbon atoms.

4,054,596

CARBOXY AND CARBOHYDROCARBYLOXY-SUBSTITUTED

1,1-BIS(PERFLUOROALKYLSULFONYL)PROPANES

Robert J. Kosher, Mahtomedi, and Loren L. Barber, Jr., Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

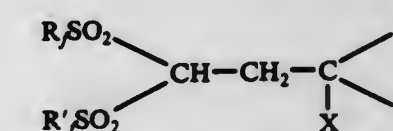
Filed Mar. 7, 1975, Ser. No. 556,494

Int. Cl.² C07C 147/02, 147/06

U.S. Cl. 560—150

3 Claims

1. A substituted 1,1-bis(perfluoroalkylsulfonyl)propane represented by the structure:



wherein

R_f and R_f' are perfluoroalkyl radicals having 1-18 carbon atoms,

X is hydrogen, chlorine, bromine or nitro, and

Y and Z are independently COOH or COOR where

R is alkyl, unsubstituted aryl or arylalkyl having 1 to 24 carbon atoms.

4,054,597

THIODIGLYCOL POLYCARBONATES

Heinrich Krimm, Hans-Josef Buysch, and Hermann Schnell, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 610,503, Sept. 4, 1975,

abandoned. This application May 17, 1976, Ser. No. 687,437

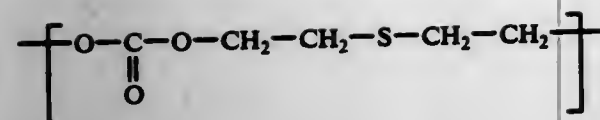
Claims priority, application Germany, Sept. 26, 1974, 2446107; Feb. 10, 1976, 2605024

Int. Cl.² C07C 149/14; C08G 63/62

U.S. Cl. 260—463

1 Claim

1. A polycarbonate containing terminal aliphatic hydroxyl groups, having a molecular weight of from about 400 to 20,000 and containing at least about 25 mol % of structural units corresponding to the formula:



prepared by reacting predominantly dihydric alcohols with phosgene or chlorocarbonic acid esters of predominantly dihydric alcohols and/or phenols by a phase interface process using concentrated, aqueous alkali solutions as hydrogen chloride binding agents and in the presence of inert solvents, said process characterized by the fact that thiodiglycol, optionally mixed with additional monohydric and polyhydric alcohols, is used as the dihydric alcohol in amounts of at least 25 mol %, based on the total mols of hydroxyl compounds used.

4,054,598

1-HYDROXY-3-AMINO-ALKANE-1,1-DIPHOSPHONIC ACIDS AND SALTS

Helmut Blum, and Karl-Heinz Worms, both of Dusseldorf, Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed July 16, 1976, Ser. No. 705,792

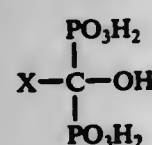
Claims priority, application Germany, Aug. 1, 1975, 2534391

Int. Cl.² C07F 9/38

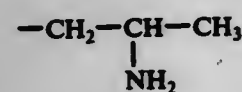
U.S. Cl. 260—502.5

4 Claims

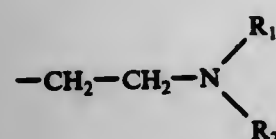
1. A 1-hydroxy-3-amino-alkane-1,1-diphosphonic acid compound of the formula



wherein X is a member selected from the group consisting of



and



wherein R₂ is alkyl having from 1 to 3 carbon atoms, and R₁ is a member selected from the group consisting of hydrogen and R₂, and a non-toxic, pharmaceutically-acceptable water-soluble salt thereof.

4,054,599

SULFOXIDATION PROCESS

Henry Shuttlesworth, and Wahid R. Ali, both of Pointe-a-Pierre, Trinidad and Tobago, assignors to Texaco Trinidad, Inc., Pointe-a-Pierre, Trinidad and Tobago

Continuation-in-part of Ser. No. 326,347, Jan. 24, 1973, abandoned. This application Aug. 27, 1975, Ser. No. 608,112

Int. Cl.² C07C 143/02

U.S. Cl. 260—513 R

7 Claims

1. In a sulfonation process wherein ferric hydroxide contamination due to iron alloys reactors is avoided comprising reacting, in a reaction zone, substantially straight chain saturated liquid hydrocarbons with oxygen and a sulfur dioxide under substantially anhydrous conditions in the presence of about 1 to about 4 percent by weight of a low molecular weight aliphatic acyl oxide having from 4 to about 8 carbon atoms at temperatures of about 25° to about 55° C. under a pressure ranging from about 0 to 100 psig, the improvement which comprises continuously removing the resulting heavy product

phase from the reactants to separate said phase as soon as it forms from unreacted hydrocarbons; cooling said phase to between above 0° C and 10° C and immediately degassing said phase free of sulfur dioxide; neutralizing the acid in said separated phase at a pH of 8-10; hydrolyzing unstable acid precursors present in said phase by boiling said phase at substantially constant volume at said pH, for about 10 to about 14 hours, filtering solid contaminants from said phase; and recovering color-stable sulphonates from the hydrolyzed phase.

4,054,600

METHOD FOR MAKING AROMATIC BIS(ETHER DICARBOXYLIC ACIDS)

Donald S. Johnson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 27, 1975, Ser. No. 590,877

Int. Cl.² C07C 51/06

U.S. Cl. 260—520 E

8 Claims

1. In a method for making aromatic bis(ether dicarboxylic acids) involving

1 hydrolyzing the corresponding aromatic bis(etherimide) with an alkali hydroxide to produce a tetraacid salt base hydrolysis mixture, 2 acidifying the tetraacid salt by pouring the base hydrolysis mixture into an aqueous solution of a mineral acid to produce a tetraacid acidification mixture, and 3 effecting the gravity separation of tetraacid from the resulting acidification mixture,

resulting in the build up of unrecovered aqueous mineral acid which method for making aromatic bis(ether dicarboxylic acid) involves the improvement comprising,

4 acidifying the aromatic bis(ether diacid) salt by directly adding a concentrated mineral acid to the base hydrolysis mixture at a temperature in the range of from about 15° C to 75° C until the pH of the resulting mixture is reduced to less than about 1, 5 heating the resultant mixture to a temperature in the range of between 80° C to reflux, and 6 effecting the separation of the tetraacid from the resulting mixture,

whereby the amount of unrecovered aqueous mineral acid in the acidification mixture is substantially reduced.

4,054,601

METHOD OF RECOVERING PURIFIED GLYCOLIC ACID FROM ITS CONTAMINATED AQUEOUS SOLUTIONS

Ulrich Metz, Seebruck, and Horst Michand, Trostberg, both of Germany, assignors to Sueddeutsche Kalkstickstoff-Werke Aktiengesellschaft, Trostberg, Germany

Filed June 22, 1976, Ser. No. 698,335

Claims priority, application Germany, July 1, 1975, 2529170

Int. Cl.² C07C 59/06

U.S. Cl. 260—535 R

7 Claims

1. A method of recovering purified glycolic acid from an aqueous solution thereof contaminated with ammonium and sulfate ions in respective amounts at least stoichiometrically equivalent to said glycolic acid which comprises:

a. contacting said contaminated solution with an extraction medium consisting essentially of a mixture of a trialkyl phosphate with a dialkyl ether until said glycolic acid is dissolved in said extraction medium, 1. alkyl in said trialkyl phosphate having up to six carbon atoms, 2. alkyl in said dialkyl ether having two to five carbon atoms, 3. each of said trialkyl phosphate and said dialkyl ether constituting at least 10% by weight of said medium; and b. separating said glycolic acid from said extraction medium.

4,054,602

REMOVAL OF BIS-CHLOROMETHYL ETHER FROM CHLOROACETYL CHLORIDE

Yog R. Dhinra, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

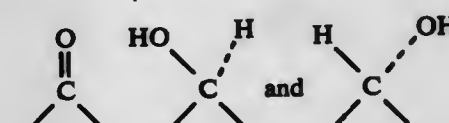
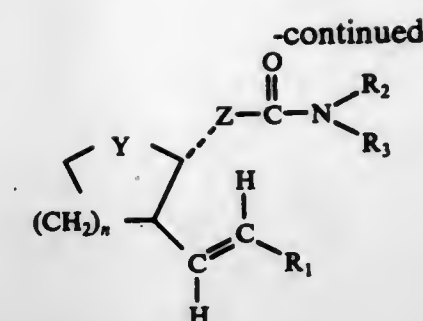
Filed Sept. 30, 1976, Ser. No. 728,103

Int. Cl.² C07C 51/42

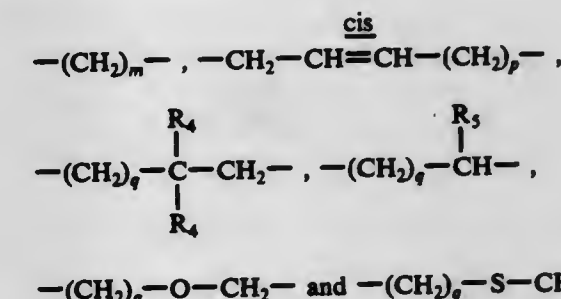
U.S. Cl. 260—544 Y

10 Claims

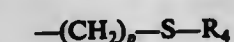
1. A process of removing bis-chloromethyl ether from a mixture comprising chloroacetyl chloride and bis-chloromethyl ether, the process comprising contacting the mixture with hydrochloric acid at a temperature between about 30° C and about 160° C, inclusive, in the presence of a catalytic amount of a Lewis acid or a strong protic acid.



Z is a divalent radical selected from the group consisting of those of the formulae:



wherein m is an integer from 1 to 8, inclusive, p is an integer from 2 to 4, inclusive, q is an integer from 3 to 6, inclusive, R₄ is an alkyl group having from 1 to 3 carbon atoms, and R₅ is a lower alkyl group, phenyl or fluoro; R₁ is selected from the group consisting of a straight chain alkyl group having from 3 to 10 carbon atoms, a straight chain alkyl group having from 3 to 6 carbon atoms and having one branched lower alkyl group, a straight chain alkenyl group having from 3 to 6 carbon atoms, a straight chain ω-haloalkyl group having from 3 to 6 carbon atoms, a straight ω-phenylalkyl group having from 1 to 4 carbon atoms in the chain, a straight chain ω-(cycloalkyl)alkyl group having from 1 to 4 carbon atoms in the chain and from 5 to 7 carbon atoms in cycloalkyl, and moieties of the formulae:



where p and R₄ are as hereinabove defined; R₂ is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cyclohexyl, phenyl lower alkyl and ω-hydroxy lower alkyl; R₃ is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, cyclohexyl, phenyl, trifluoromethylphenyl, di(lower alkyl)aminophenyl, chlorophenyl, lower alkylphenyl, phenyl lower alkyl, ω-hydroxy lower alkyl, ω-lower alkoxy lower alkyl, ω-di(lower alkyl)amino lower alkyl, amino, and di(lower alkyl)amino; and the pharmaceutically acceptable anionic salts thereof when R₃ contains a basic nitrogen atom.

4,054,605

UNSATURATED AMINO ALCOHOLS

Lewis William Watts, Jr., and Walter Howe Brader, Jr., both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

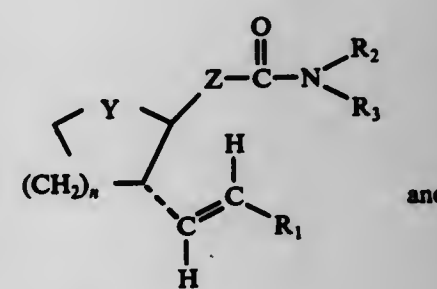
Filed Apr. 17, 1975, Ser. No. 568,924

Int. Cl.² C07C 91/06

U.S. Cl. 260—584 R

9 Claims

1. A compound having a formula:



wherein

R¹ is hydrogen, C₃-C₄ alkenyl or C₁-C₃ alkyl; when R¹ is hydrogen, R² is C₃-C₇ secondary alkyl; when R¹ is not hydrogen, R² is C₁-C₄ alkyl; and n is 0 or 1.

4,054,604

AMIDE DERIVATIVES OF 9-OXO-13-TRANS-PROSTENOIC ACID

Karel Francis Bernady, Middleton Brawner Floyd, Jr., both of Suffern; John Frank Poletto, Nannet, all of N.Y.; Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

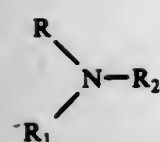
Division of Ser. No. 432,264, Jan. 10, 1974, Pat. No. 3,981,868, which is a continuation-in-part of Ser. No. 365,806, May 31, 1973, abandoned, which is a continuation of Ser. No. 162,712, July 14, 1971, abandoned. This application May 13, 1976, Ser. No. 685,943

Int. Cl.² C07C 103/19; A61K 31/16

U.S. Cl. 260—557 R

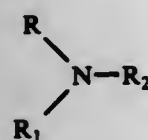
19 Claims

1. A racemic compound consisting of enantiomers of the formulae:



where R is hydrogen or alkanol, R₁ is alkanol and R₂ is octadienyl or decadienyl.

6. A process of preparing a compound having a formula



where R is hydrogen or alkanol, R₁ is alkanol and R₂ is octadienyl or decadienyl which comprises the step of reacting a compound having a formula



where R is hydrogen or alkanol and at least one occurrence of R is hydrogen and R₁ is alkanol with a diene compound selected from the group consisting of butadiene, 1,3-pentadiene, and isoprene in the presence of a palladium catalyst.

4,054,606

PROCESS FOR THE PREPARATION OF KETONE DERIVATIVES

Ferdinand Niff, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed May 23, 1975, Ser. No. 580,525

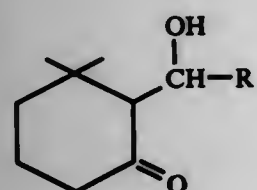
Claims priority, application Switzerland, May 31, 1974, 7476/74

Int. Cl.² C07C 45/00, 45/15

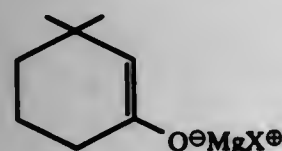
U.S. Cl. 260—586 C

9 Claims

1. A process for the preparation of α -substituted cyclic ketone compounds, of the formula



wherein R represents a saturated, a mono- or poly-unsaturated, linear or branched, substituted or unsubstituted univalent hydrocarbon radical; which comprises reacting an enolate of formula



wherein X represents a halogen, with an aldehyde of the formula



wherein R is as defined above; wherein the reaction is effected at a temperature of from about -15° to about 0° C, is carried out in an inert apolar

or weakly polar organic solvent, and wherein the condensation products are subject to acidification.

4,054,607

PROCESS FOR PREPARING ANISALDEHYDE

Manabu Matsuoka, Toyonaka, and Hiroyasu Seko, Nara, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed June 18, 1976, Ser. No. 697,473

Claims priority, application Japan, July 21, 1975, 50-89552

Int. Cl.² C07C 45/00

U.S. Cl. 260—600 R

6 Claims

1. In a process for preparing anisaldehyde by oxidizing p-methoxytoluene in the presence of a catalyst, the improvement which comprises bringing the vapor of p-methoxytoluene together with an oxidant into contact with a catalyst at a bath temperature of about 430° to about 520° C.; said catalyst consisting essentially of vanadium oxide, about 0.2 to about 0.8 mole of phosphorus oxide per mole of vanadium oxide, about 1.5 to about 2.5 moles of potassium sulfate per mole of vanadium oxide and 0 to about 0.1 moles of copper oxide per mole of vanadium oxide.

4,054,608

METHOD FOR THE PREPARATION OF 4-CHLORO-2-METHYL-CROTONALDEHYDE

Luciano Re; Giancarlo Eletti Bianchi, and Felice Centini, all of Rome, Italy, assignors to Anic S.p.A., Italy

Filed May 11, 1976, Ser. No. 685,317

Claims priority, application Italy, May 12, 1975, 23199/75

Int. Cl.² C07C 47/14

U.S. Cl. 260—601 H

7 Claims

1. The method of preparing 4-chloro-2-methyl-crotonaldehyde, which comprises subjecting 1: 2-epoxy-2-methyl-3-butene to chlorination reaction with a chlorinating agent consisting of cupric chloride in the liquid phase or tert-butyl hypochlorite in the vapor phase on a substrate selected from the group consisting of silica and alumina and combinations thereof.

4,054,609

PROCESS FOR THE PREPARATION FOR FORMALDEHYDE

Minoru Osugi, and Takako Uchiyama, both of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed June 17, 1976, Ser. No. 697,255

Claims priority, application Japan, June 20, 1975, 50-75397

Int. Cl.² C07C 47/04

U.S. Cl. 260—603 R

6 Claims

1. A process for the preparation of formaldehyde, comprising subjecting methanol in the vapor phase to dehydrogenation in the presence of a catalytically effective amount of a catalyst consisting of copper, zinc and selenium as catalyst components at a temperature of 500° to 750° C. wherein the atomic ratio of said catalyst components is 1:0.1-0.5 : 0.01-0.5 for Cu:Zn:Se.

(II)

4,054,610

1-PHENYL-BUT-3-ENE-OL

Günther Wilke, and Paul Heimbach, both of Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Division of Ser. No. 424,230, Dec. 12, 1973, Pat. No. 3,954,887, which is a division of Ser. No. 64,845, July 29, 1970, Pat. No. 3,832,371, which is a division of Ser. No. 678,172, Oct. 26, 1967, Pat. No. 3,544,604. This application Oct. 9, 1975, Ser. No. 621,185

Claims priority, application Germany, May 26, 1967, 26928

Int. Cl.² C07C 33/06

U.S. Cl. 260—618 R

1 Claim

1. 1-Phenyl-but-3-eneol.

4,054,611

METHOD FOR THE PREPARATION OF p-ISOPROPENYL PHENOL

Kosuke Mimaki; Tsutomu Takase, both of Nagoya; Mitsuhiro Iwasa, Tokai, and Tomitaka Yamamori, Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed July 30, 1974, Ser. No. 493,661

Claims priority, application Japan, Aug. 10, 1973, 48-89246

Int. Cl.² C07C 39/06

U.S. Cl. 260—626 R

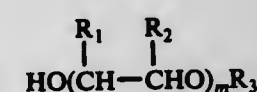
8 Claims

1. A method for the recovery of p-isopropenyl phenol in the form of a stable solution which comprises contacting p-isopropenyl phenol, in the form of a gas or of a liquid obtained immediately after condensation of said gas, said p-isopropenyl phenol gas being generated by thermal decomposition at a temperature of from 150° to 260° C. and at a pressure up to normal pressure of:

- bisphenol A in the presence of a catalytic amount of a base catalyst; or
- oligomers of p-isopropenyl phenol in the absence of catalyst or in the presence of a catalytic amount of a basic catalyst, directly with a solvent selected from the group consisting of: a monohydric alcohol expressed by the formula



wherein R is alkyl containing from 5 to 14 carbon atoms, cycloalkyl containing from 5 to 6 carbon atoms, or aralkyl containing from 7 to 10 carbon atoms; a dihydric alcohol or derivative thereof expressed by the formula



wherein R₁ and R₂ are independently hydrogen or alkyl containing from 1 to 4 carbon atoms, R₃ is hydrogen, alkyl containing from 1 to 4 carbon atoms or acetyl and m is an integer of from 1 to 4; a dihydric alcohol or derivative thereof expressed by the formula



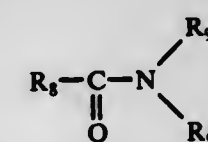
wherein R₄ is hydrogen, alkyl containing from 1 to 4 carbon atoms or acetyl, and n is an integer of from 3 to 6; and a trihydric alcohol or derivative thereof expressed by the formula



wherein R₅ is hydrogen, alkyl containing from 1 to 4 carbon atoms or acetyl; an ester expressed by the formula



wherein R₆ and R₇ are independently alkyl or cycloalkyl and the total number of carbon atoms in one molecule of the ester is within the range of from 6 to 20; and an acid amide expressed by the formula



wherein R₈, R₉ and R₉ are independently hydrogen or alkyl containing from 1 to 4 carbon atoms, and collecting said p-isopropenyl phenol in the form of a solution in said solvent.

4,054,612

PROCESS FOR PRODUCING LIQUID POLYMER

Yoshiharu Yagi, Toyonaka; Seimei Yasui, Ibaraki; Hiroshi Sato, Takatsuki; Takanobu Noguchi, and Michio Yamamoto, both of Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 425,701, Dec. 18, 1973, abandoned.

This application Nov. 24, 1975, Ser. No. 634,509

Claims priority, application Japan, Dec. 27, 1972, 48-3909; Mar. 9, 1973, 48-28142

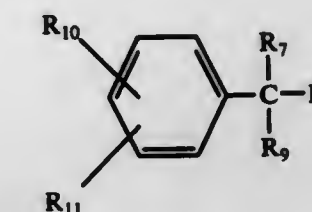
Int. Cl.² C07C 3/10

U.S. Cl. 260—669 P

7 Claims

1. A process for producing a liquid polymer of butadiene or a copolymer of butadiene and an aromatic vinyl compound having a molecular weight of at least 200 which comprises polymerizing butadiene or copolymerizing butadiene with an aromatic vinyl compound in the presence of 0.01 to 100 moles of ethylene, propylene or a mixture thereof, per mole of butadiene, in the presence of at least one phosphorus compound and in the presence of a catalyst system comprising:

- at least one nickel compound selected from the group consisting of a nickel salt of a carboxylic acid, nickel chloridepyridine complex, trisdipyritylnickel chloride, bisethylenediaminenickel sulfate, bisacetylacetonatonicel, bis(ethyl ethyl acetoacetate)(nickel, bisdimethylglyoximatonickel, bis(π -allyl)nickel, bis(π -methylallyl)nickel, bis(π -crotyl)nickel, bis(π -cyclooctenyl)nickel, bis(π -cyclopentenyl)nickel and tetracarbonyl nickel, and
- an organometallic compound consisting of a combination of (b₁) at least one compound selected from the group consisting of (i) an organoaluminum compound of the formula AlR₁R₂R₃, wherein R₁ is hydrogen, fluorine, alkyl, cycloalkyl, aryl or aralkyl and R₂ and R₃ are each alkyl, cycloalkyl, aryl or aralkyl; (ii) an organomagnesium or organozinc compound of the formula (R₄)₂M, wherein M is magnesium or zinc and R₄ is alkyl, cycloalkyl, aryl or aralkyl; and (iii) an organolithium compound of the formula R₅Li, wherein R₅ is alkyl, cycloalkyl, aryl or aralkyl, and (b₂) at least one halogen compound selected from the group consisting of (i) a chloride, bromide or iodide of a metal belonging to Group III, IV, V or VI in the Periodic Table, or an ether complex, ester complex or aldehyde complex thereof; (ii) a hydrogen halide of the formula HX, wherein X is chlorine, bromine or iodine; (iii) an alkylmetal halide of the formula (R₆)_nMX_{3-n}, wherein M is a metal of Group III or IV in the Periodic Table R₆ is alkyl, X is chlorine, bromine or iodine and n is 1 or 2; (iv) a halide of an aliphatic or alicyclic hydrocarbon; (v) a compound of the formula;



wherein R₇ is chlorine, bromine or iodine, R₈ and R₉ are each hydrogen, chlorine, bromine, iodine, lower alkyl or phenyl and R₁₀ and R₁₁ are each hydrogen, chlorine, lower alkyl or halogen-substituted lower alkyl; (vi) an alkynyl halide; (vii) a ketone containing chlorine or bromine; and (viii) a halogen-containing allyl compound of the formula R₁₂CH=CHCH₂X, wherein R₁₂ is hydrogen or an aliphatic hydrocarbon having 1 to 6 carbon atoms and X is chlorine, bromine or iodine.

4,054,613

BUTADIENE PRODUCTION AND PURIFICATION

Donald M. Haskell; Edward E. Hopper, and Bradley L. Munro, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

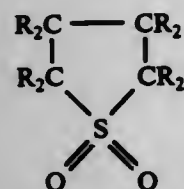
Filed Oct. 20, 1975, Ser. No. 624,096

Int. Cl.² C07C 11/12

U.S. Cl. 260—680 R

1 Claim

1. A process for producing a polymerization grade butadiene stream comprising
 - a. dehydrogenating a C₄-hydrocarbon stream containing at least one of the members selected from the group consisting of butane and butylenes in the presence of a dehydrogenation catalyst consisting essentially of phosphorus, tin, and a Group Ia or IIa metal compound under dehydrogenation conditions to produce a dehydrogenation effluent stream,
 - b. separating from this dehydrogenation effluent stream a feed stream consisting essentially of butadiene, butylenes, n-butane, propylene and vinylacetylene,
 - c. extractively distilling said feed stream utilizing as an extractant a mixture of about 15 to 30 weight percent of acetone and about 85 to 70 weight percent of a sulfolane having the formula



wherein the radicals R, which can be the same or different, are individually selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, which radicals in turn can be unsubstituted or substituted by alkyl, cycloalkyl, and aryl radicals, each hydrocarbon radical R having up to 10 carbon atoms and the sulfolane having 4 to 14 carbon atoms per molecule, to produce a first overhead stream consisting essentially of propylene, n-butane and butylenes, and a first bottom stream consisting essentially of butadiene, vinylacetylene, butylenes and said extractant,

- d. stripping said first bottom stream to produce a first stripper bottom stream consisting essentially of said extractant and a first stripper overhead stream consisting essentially of butadiene, butylenes and vinylacetylene and being essentially free of said extractant,
- e. extractively distilling said first stripper overhead stream utilizing the same extractant as defined in step c to form a second bottom stream consisting essentially of said extractant, butadiene, and vinylacetylene and a second overhead stream consisting essentially of butadiene and butylenes,
- f. fractionating said second stripper overhead stream to produce a third overhead stream consisting essentially of said polymerization grade butadiene as the product of the process, and a third bottom stream consisting essentially of butylenes and some butadiene,
- g. stripping said second bottom stream to form a second stripper bottom stream consisting essentially of said extractant and a second stripper overhead stream,
- h. combining said first and said second stripper bottom stream to form one extractant stream,
- i. recycling a first portion of said extractant stream as said extractant in step (c),
- j. recycling a second portion of said extractant stream as said extractant in step (e), and
- k. recycling said first overhead stream and said third bottom stream to step a as part of the C₄-hydrocarbon feed.

4,054,614

WATER SOLUBLE POLYESTER COATING COMPOSITIONS

William A. Hoffman, III, N. Bergen, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,737

Int. Cl.² C08L 67/02; C08G 63/46

U.S. Cl. 260—850

12 Claims

1. In the production of polyester resins adapted for use in baked coatings comprising reacting at least one polybasic acid with a molar excess of at least one polyol to provide a hydroxy terminated polyester the improvement which comprises incorporating pentaerythritol as an essential element of the polyol component and reacting available hydroxyl groups in the preformed polyester with phthalic anhydride, whereby said polyester is rendered water soluble upon neutralization, and is convertible upon cross-linking to a baked coating characterized by chemical resistance, hardness and flexibility.
8. A polyester resin comprising adipic acid isophthalic acid, neopentyl glycol and pentaerythritol in the approximate molar ratio 3:4:7:2.

4,054,615

HIGH IMPACT TERNARY BLEND PVC MOULDING COMPOSITIONS

Dietrich Hardt, Cologne; Gert Humme, Odenthal; Karl-Heinz Ott, Leverkusen, and Hans-Eberhard Braese, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 31, 1976, Ser. No. 719,247

Claims priority, application Germany, Sept. 6, 1975, 2539719 Int. Cl.² C08L 51/04

U.S. Cl. 260—876 R

16 Claims

1. A thermoplastic moulding composition comprising:
 - a. 65 to 95% by weight of polyvinyl chloride or a vinyl chloride copolymer having a K-value of 50 to 80;
 - b. 2 to 25% by weight of a chlorinated polyolefin or of a chlorinated olefin copolymer with a chlorine content of 20 to 80% by weight; and
 - c. 3 to 30% by weight of a graft polymer produced by grafting onto an EPDM rubber as graft base a member selected from the group consisting of styrene, α-methyl styrene, a mixture of styrene and α-methyl styrene, a mixture of styrene and acrylonitrile, a mixture of α-methyl styrene and acrylonitrile, and a mixture of styrene, α-methyl styrene and acrylonitrile.

4,054,616

PROCESS FOR PRODUCING TRANSPARENT BLOCK COPOLYMER RESINS

Tamotsu Miki; Shizuo Narisawa; Ichiro Ichikawa, and Hideaki Horiike, all of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 508,743, Sept. 24, 1974, abandoned.

This application May 10, 1976, Ser. No. 685,129

Claims priority, application Japan, Sept. 29, 1973, 48-109946; Oct. 5, 1973, 48-112593

Int. Cl.² C08L 9/06

U.S. Cl. 260—880 B

25 Claims

1. A process for producing a transparent block copolymer resin which comprises subjecting 90 to 65 parts by weight of a vinyl aromatic compound monomer and 10 to 35 parts by weight of a conjugated diene monomer to 3-stage block copolymerization in an inert hydrocarbon solvent using an organomonolithium compound as an initiator, characterized in that at the first stage of polymerization, a mixture of S₁ parts by weight of the vinyl aromatic compound monomer and B₁ parts by weight of the conjugated diene monomer is added and substantially all of the monomer mixture is polymerized; at the second stage of polymerization, S₂ parts by weight of the vinyl

aromatic compound monomer is added and the polymerization is continued to polymerize substantially all of the monomers; and at the third stage of polymerization, a mixture of S₃ parts by weight of the vinyl aromatic compound monomer and B₃ parts by weight of the conjugated diene monomer is added and the polymerization is continued to polymerize substantially all of the monomers, wherein the feed weight ratios of the individual monomers are controlled to values within the ranges of:

$$S_1 + S_2 + S_3 = 90 \text{ to } 65 \text{ (parts by weight)}$$

$$B_1 + B_2 = 10 \text{ to } 35 \text{ (parts by weight)}$$

$$S_1/B_1 = 0.2 \text{ to } 3.0$$

$$S_2/B_2 = 0.2 \text{ to } 3.0$$

$$S_2/(S_1 + S_2 + S_3) = 0.35 \text{ to } 0.90$$

and the polymerization is effected in the presence of 0.01 to 5 mole % of a Lewis base compound based on the total monomer, to produce a block copolymer resin having an average molecular weight in the range from 0.5 to 1.8 dl/g in terms of intrinsic viscosity as measured in toluene at 30° C.

4,054,617

PHENOL-ALKYLPHENOL PHOSPHATES

John G. Papalos, Ledgewood, and James M. Kelly, Belford, both of N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 405,113, Oct. 10, 1973, Pat. No. 3,934,975, which is a continuation of Ser. No. 206,969, Dec. 10, 1971, abandoned, which is a division of Ser. No. 93,839, Nov. 30, 1970, abandoned. This application Jan. 23, 1976, Ser. No. 651,959

Int. Cl.² C07F 9/09

U.S. Cl. 260—930

1 Claim

1. The product formed by the process of condensing a phenol and an alkylphenol with an aldehyde in the presence of an acid catalyst to form a condensate, which is then alkoxylated and phosphated, comprising the steps of:
 - a. maintaining a mixture of the phenol, the alkylphenol, and acid catalyst at a temperature from about 50° to about 150° C while slowly adding the aldehyde to the mixture;
 - b. maintaining said mixture at a temperature of about 60° to about 150° C for an additional period of from about 1 to 5 hours, to form the condensate;
 - c. adjusting the mixture to a pH higher than 7;
 - d. alkoxylating the condensate at a temperature from about 100° to about 200° C in an inert atmosphere at a pressure from about 10 to 30 p.s.i.g. with an alkoxylating agent;
 - e. removing substantially all the water, then adding non-aqueous solvent to form an intermediate-polymer solution;
 - f. maintaining said intermediate-polymer solution at a temperature from about 60° to about 150° C while adding a phosphating agent, then maintaining the reaction mixture at said temperature for an additional period of from about 1½ to 2½ hours; wherein
 - i. the phenol is selected from at least one of a group consisting of hydroxybenzene, cresoles, ethyl hydroxybenzenes, and fused ring-, polyaryl-, and polyalkyl-phenols having from 2 to 15 benzene rings per molecule, including phenols and polyphenols substituted with at least one member of the group consisting of halogen atoms, nitro radicals, and additional hydroxyl radicals.
 - ii. the alkyl phenol is selected from at least one of a group consisting of saturated or unsaturated linear or branched chain C₆ to C₂₀ alkyl substituted phenols.
 - iii. the phenol moiety of the alkyl phenol is selected from at least one of a group consisting of phenols, thiophenols, and phenols substituted with at least one member of the group consisting of hydroxyl radicals, halogen atoms, nitro radicals, methyl radicals, ethyl radicals, propyl radicals and phenol radicals.
 - iv. the ratio of phenol to alkylphenol in said condensate

being from about 3:1 to about 1:3, and are joined by bridging alkylene radicals.

- v. the alkoxylating agent being selected from at least one of a group consisting of ethylene oxide, propylene oxide, butylene oxide and isobutylene oxide.
- vi. the phosphating agent being selected from at least one of a group consisting of polyphosphoric acid, phosphoric acid, phosphorous pentoxide, pyrophosphoric acid, phosphorous acid, and phosphorous oxychloride, and
- vii. further characterized in that the total number of benzene rings contained in one molecule of the condensate is between 3 and 16.

4,054,618

PROCESS FOR PREPARING NINE-MEMBER RING PHOSPHONATES

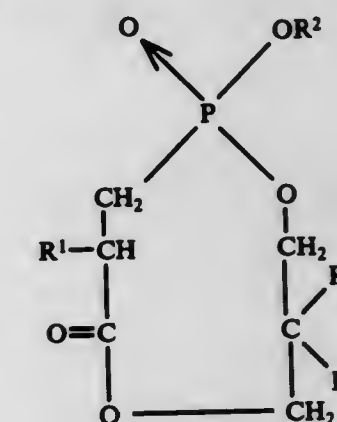
James S. Clovis, Warminster, Pa., and Francis R. Sullivan, La Crosse, Wis., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 354,730, April 26, 1973, Pat. No. 4,001,176, which is a division of Ser. No. 139,949, May 9, 1971, Pat. No. 3,812,219. This application Oct. 6, 1976, Ser. No. 730,043 Int. Cl.² C07F 9/38

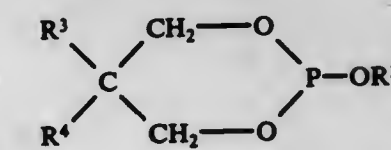
U.S. Cl. 260—968

3 Claims

1. A process for preparing a nine-membered ring phosphonate having the general formula:



wherein R¹ is selected from the group consisting of hydrogen and methyl, R² is phenyl or substituted phenyl wherein the substitution is one or more of halogen, nitro, lower alkyl, cyclohexyl, alkoxy, naphthoxy or phenoxy and R³ and R⁴ are the same or different and are lower alkyl of up to eight carbon atoms, comprising reacting a compound selected from the group consisting of acrylic acid of methacrylic acid with a compound having the general formula:



wherein R², R³ and R⁴ are as defined hereinabove.

4,054,619

ATOMIZING AND MIXING APPARATUS

George C. Coverston, 76 S. Russell, Fallon, Nev. 89406

Filed Feb. 22, 1974, Ser. No. 444,913

Int. Cl.² B01F 3/04

U.S. Cl. 261—24

1 Claim

1. A device for intermixing a carrier gas and a first substance to be carried thereby so as to impregnate one with the other, and for introducing a second substance into said carrier gas and first substance mixture, comprising: A elongated hollow tubular member in which said hollow tubular member is constricted intermediate its ends; means adjacent the first end of said tubular member so adapted to admit gas into said tubular member; control means adjustably fastened within said first end so as to

HEMA monomer, of HQ inhibitor; from about 50 to 250 ppm, based on the weight of HEMA monomer, of MEHQ inhibitor and from 0.005% to about 0.2% of a low temperature free radical polymerization initiator operable between the temperatures of from about 23° C. to about 80° C., into the polyester-lined mold of (A);

C. De-gassing the homogeneous blend of (B) while in the mold to remove substantially all oxygen present;

D. Closing the mold of (C) with a cap plug to prevent contamination with atmospheric oxygen;

E. Subjecting the homogeneous blend of (D) to a three stage polymerization process wherein the initial polymerization reaction is conducted at a temperature of from about 23° C to about 30° C for from about 16 hours to about 36 hours in a medium capable of continuously absorbing the heat of the reaction to control the reaction exotherm;

F. Removing the mold from the heat absorbing medium of (E) and conducting a second-stage polymerization reaction by heating the mold to a temperature of from about 40° C to about 80° C in the absence of any additional polymerization initiator, for from about two hours to about six hours to form a solid, self-supporting, partially polymerized rod;

G. Removing the cap plugs from the mold of (F) and gently forcing the solid rod, encased in the polyester film, from the mold;

H. Conducting the third-stage polymerization reaction by heating the solid rod of (G) encased in the polyester film, to a temperature of from 110° C to 115° C for from about 24 hours to about 36 hours to substantially complete polymerization of the rod;

I. Removing the polyester film casing from the polymerized rod of (H); and subjecting the rod to cutting, machining and polishing to form a corrective contact lens or a shaped eye bandage; and

J. Hydrating the contact lens or shaped eye bandage of (I) in a saline solution buffered to maintain a pH of from about 7.0 to about 7.1 until from about 45% to about 65% water has been absorbed.

4,054,625

PROCESS FOR MAKING FIBERS

John H. Kozlowski, Vancouver; Paul C. Litzinger, and Frank J. Steffen, both of Camas, all of Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 285,386, Aug. 30, 1972, abandoned. This application Aug. 27, 1973, Ser. No. 391,709

Int. Cl.² B22D 23/08; D21F 11/00

U.S. Cl. 264—13

24 Claims

1. A process of making discrete fibers comprising:
 - A. forming a mixture comprising:
 1. a polymer capable of forming fibers and of being swollen or dissolved by a solvent,
 2. an organic solvent, in an amount at least greater by weight than said polymer, which is a solvent for said polymer at elevated temperatures and which is capable of forming therewith a phase which is substantially water immiscible and
 3. water in an amount capable of forming a dispersed and non-continuous phase in said mixture in which the water is present as a dispersed phase and not as a continuous phase in the mixture;
 - B. at a temperature sufficiently high that the polymer is present in at least a swollen state but below the critical temperature of the solvent and below the temperature at which the polymer decomposes and at autogeneous or higher pressure;
 - C. agitating the mixture sufficiently to maintain the water as a dispersed and non-continuous phase therein; and
 - D. passing the mixture through a nozzle into a zone of lower pressure which is at a temperature and pressure enabling said solvent to vaporize, thereby causing the formation of a fibrous product of discrete fibers.

4,054,626
METHOD FOR FORMING BODIES OF FOAMED PLASTISOL RESIN

Gerald D. Sjostrand, 4734 E. Home, Fresno, Calif. 93703

Filed Apr. 2, 1976, Ser. No. 673,299

Int. Cl.² B29D 27/00

U.S. Cl. 264—45.4

8 Claims

1. An improved method for forming a unitary body of foamed plastisol resin comprising the steps of:
 - A. heating a fluid plastisol containing a chemical blowing agent to form a solidified body;
 - B. grinding the solidified body to form aggregate;
 - C. depositing the aggregate in a mold cavity for a closed mold; and
 - D. heating the aggregate within said mold cavity to a temperature above the temperature at which said blowing agent decomposes for thus causing the plastisol aggregate to expand and fuse into a unitary foamed body of substantially uniform density.
7. The method of claim 1 further comprising the step of inserting within the mold cavity a support member for supporting and bonding to the resulting foamed body.

4,054,627

DENSE CHROMIUM SESQUIOXIDE

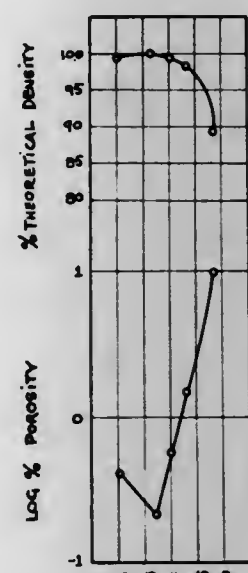
Paul Darrell Ownby, 1 Woodland Drive, Rolla, Mo. 65401

Filed May 14, 1973, Ser. No. 359,661

Int. Cl.² F27B 9/04; C04B 35/12

U.S. Cl. 264—65

2 Claims



1. A process for producing a sintered body consisting substantially of Cr₂O₃ up to within about 1% of theoretical density, which comprises, sintering a Cr₂O₃ body at essentially the equilibrium oxygen partial pressure for the formation of Cr₂O₃ from its elements at the sintering temperature.

4,054,628

METHOD OF MAKING BIAXIALLY ORIENTED NONWOVEN FABRICS

Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 506,843, Sept. 17, 1974, Pat. No. 3,969,561.

This application Dec. 22, 1975, Ser. No. 643,552

Int. Cl.² B01D 47/16; D01G 25/00

U.S. Cl. 264—89

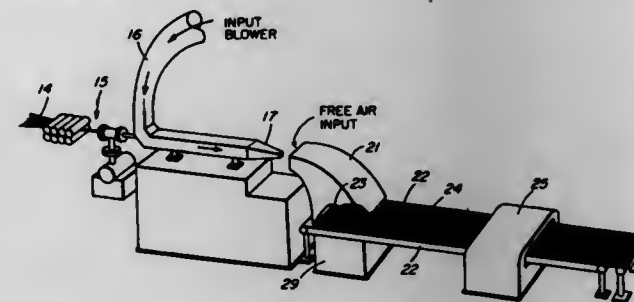
7 Claims

1. A method of producing a biaxially oriented nonwoven fabric having alternating stripes of low fiber density and high fiber density, wherein a majority of the fibers in said low fiber density stripes are oriented in a direction substantially normal to the axis of the fibers in the high fiber density stripes and a majority of the fibers in said high fiber density stripes are

oriented in a substantially lengthwise direction parallel to the axis of said stripe comprising:

passing a fluid-borne stream of discretely separated textile-length fibers onto a moving conveyor screen;

causing a majority of said fibers in said stream to locate outside approximately equidistantly spaced-apart finger-like striping bar resist areas disposed on and over said moving conveyor screen, said majority of said fibers locating outside said striping bars orienting themselves in a direction substantially parallel with the contours of said striping bars;



simultaneously causing a majority of said fibers in said stream to locate across said striping bars disposed on and over said moving conveyor screen with the aid of said vacuum means disposed under said screen, said minority of fibers orienting themselves in a substantially cross direction normal to the axis of said striping bars;

securing said thusly oriented nonwoven fabric in said biaxial orientation;

carrying said biaxially oriented nonwoven fabric on said moving conveyor toward a pick-up means for collecting the thusly formed fabric; and,

collecting said fabric on said pick-up means.

4,054,629

TRANSFER BLOW MOLDING TECHNIQUE

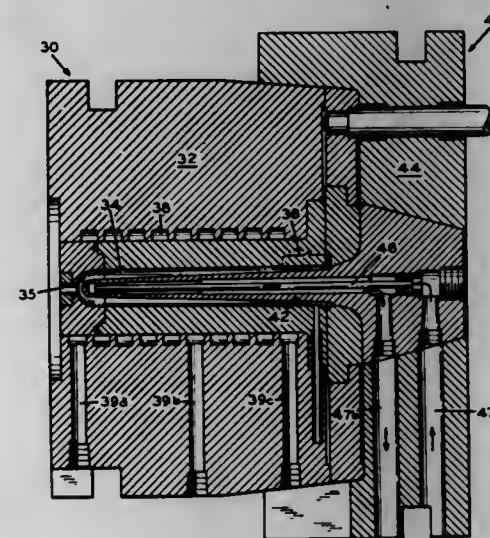
James Chi-Hwi Wang, Kendall Park, N.J.; Ilie Milla Belivakici, Nicholson, Pa., and Robert Richard Young, Trenton, N.J., assignors to American Can Company, Greenwich, Conn.

Filed Jan. 22, 1976, Ser. No. 651,300

Int. Cl.² B29C 17/07

U.S. Cl. 264—97

4 Claims



1. A method for making a highly molecularly oriented blow molded container substantially free of stress whitening, crazing, or cracks from polymeric material comprising the steps of forming a seamless, closed ended, tubular parison from the polymeric material in an injection mold comprising a die maintained below the glass transition temperature of the polymeric material and having a cavity surrounding a coaxial core pin by maintaining the core pin at a temperature, above the glass transition temperature, at which the polymeric material in contact with the pin will remain in a state of at least semi-fluidity throughout injecting of

pressurized polymeric material into the die cavity and at which residual stress in the vicinity of the inner surface of the parison is minimized in the polymeric material and injecting pressurized molten polymeric material into the die cavity,

removing the parison from the injection mold core pin and promptly transferring the hot parison to a temperature controlled conditioning pin in contact with the inner surface of the parison and a temperature controlled cavity in contact with the outside surface of the parison and temperature conditioning the injection molded parison to within the orientation temperature range for the polymeric material,

transferring the parison while on the temperature conditioning pin to the blow mold cavity, and inflating the temperature conditioned parison in the blow mold cavity having the configuration of the container to molecularly orient the polymeric material to at least 500 p.s.i. orientation release stress in the circumferential direction and to form the material into the configuration of the container.

4,054,630

HOT PIN PARISON INJECTION MOLDING TECHNIQUE

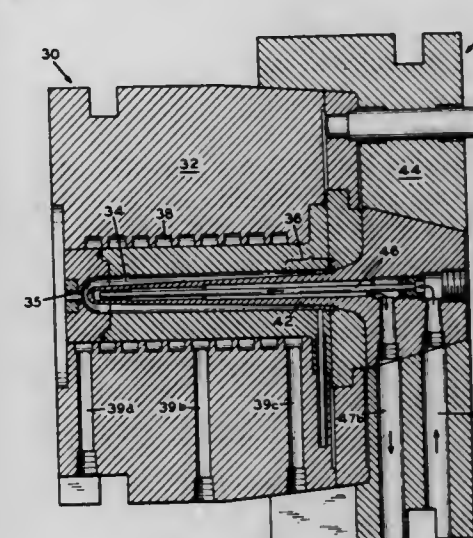
James Chi-Hwi Wang, Kendall Park, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Jan. 22, 1976, Ser. No. 651,272

Int. Cl.² B29C 17/07

U.S. Cl. 264—97

3 Claims



1. A method for making a highly molecularly oriented blow molded container substantially free of stress whitening, crazing, or cracks from polymer material comprising the steps of forming a seamless, closed ended, tubular parison from the polymeric material in an injection mold comprising a die having a cavity cooled below the glass transition temperature surrounding a coaxial core pin by maintaining the core pin at a temperature, above the glass transition temperature, at which the polymeric material in contact with the pin will remain in a state of at least semi-fluidity throughout injecting of pressurized polymeric material into the die cavity and at which residual stress in the vicinity of the inner surface of the parison is minimized in the polymeric material and injecting pressurized molten polymeric material into the die cavity,
- temperature conditioning the injection molded parison to within the orientation temperature range for the polymeric material, and
- inflating the temperature conditioned parison in a blow mold cavity having the configuration of the container to molecularly orient the polymeric material to at least 500 p.s.i. orientation release stress in the circumferential direction and to form the material into the configuration of the container.

4,054,631

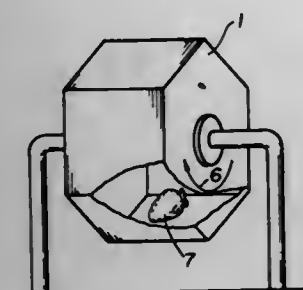
METHOD FOR AGGLOMERATING HYGROSCOPIC DUST AND MOISTURE-CONTAINING COARSER PARTICLES

Toshikazu Mori, Yokohama, and Mitsuru Wakui, Fujisawa, both of Japan, assignors to Nippon Electric Glass Company, Limited, Otsu, Japan

Continuation-in-part of Ser. No. 498,368, Aug. 19, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,685
Claims priority, application Japan, Aug. 21, 1973, 48-92950
Int. Cl.² B01J 2/12

U.S. Cl. 264-117

5 Claims



1. A method of agglomerating hygroscopic dust and a water-insoluble material, comprising
 - a. placing within a sealable bag hygroscopic dust recovered from waste gas of a glass melting furnace and water-insoluble particulates selected from the group consisting of silica sand, calcium carbonate and dolomite, said particulates being coarser particles than said dust and having a moisture content of 5-20% by weight, an amount to adhere said dust particles to said coarser particles in forming agglomerates,
 - b. sealing said bag,
 - c. placing said sealed bag within a movable container,
 - d. moving said container to tumble said bag therein to intimately mix and cause said dust particles to adhere to the surfaces of said particulates and form agglomerates thereby, and
 - e. terminating the movement of said container, removing said bag therefrom, and recovering said formed agglomerates from said bag.

4,054,632

METHOD FOR FORMING HOT MELT ADHESIVES INTO A READILY PACKAGEABLE FORM

Willard A. Franke, St. Paul, Minn., assignor to H. B. Fuller Company, Saint Paul, Minn.

Division of Ser. No. 85,158, Oct. 29, 1970, Pat. No. 3,723,035, which is a continuation-in-part of Ser. No. 824,244, May 13, 1969, abandoned. This application July 26, 1972, Ser. No. 301,574

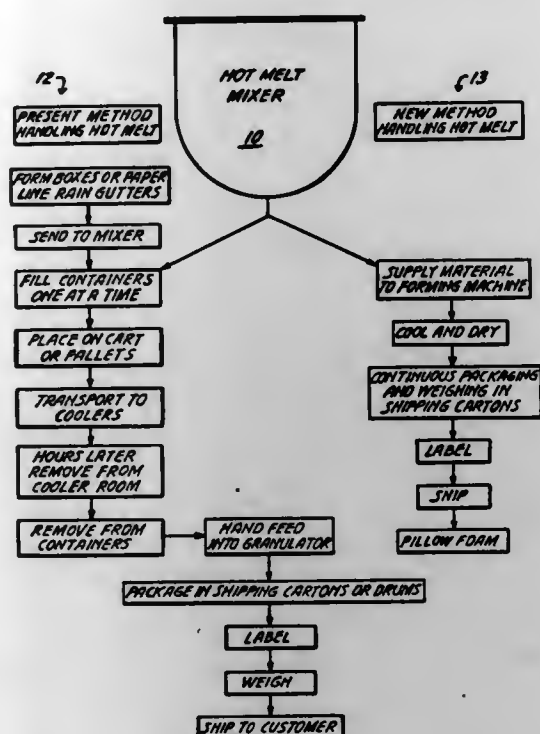
Int. Cl.² B29F 3/08; B29E 17/10

U.S. Cl. 264-145

13 Claims

1. The method of packaging a hot melt adhesive material having normally solid characteristics which becomes liquid at elevated temperatures, comprising the steps of:
 - a. conveying said hot melt adhesive material in the form of a molten liquid stream through a cooling medium, said hot melt adhesive having a solidification temperature in the range of 125 to 450° F. and comprising a thermoplastic synthetic resin and a substantial amount of wax, whereby said hot melt adhesive material in said form is capable of forming a semi-hard, flexible outer surface while cooling down from the molten state; said conveying through said cooling medium being continued until the outer surface of said stream is solidified by the action of said cooling medium to form a partially solidified stream comprising a solidified, semi-hard, flexible outer surface, serving as a sealing coating, enveloping the still-liquid interior; said cooling medium having a density greater than said liquid or partially solidified stream of material thus causing said

- liquid or partially solidified stream of material to be supported by said cooling medium;
- b. severing said partially solidified stream into segments by pinching said partially solidified stream between a rotary cutting means and a cushioning means, so as to form a



- solid envelope or casing enclosing the liquid interior of each resulting segment;
- c. circulating said cooling medium so as to move the resulting segments further through the cooling medium until said segments are sufficiently further solidified to be resistant to breakage of the solid envelopes thereof.

4,054,633

PROCESS FOR CONTINUOUSLY PREPARING SHAPED ARTICLES OF AROMATIC OXADIAZOLE OR AROMATIC OXADIAZOLE/N-ALKYLHYDRAZIDE POLYMERS FROM MONOMER SOLUTIONS

John C. Richardson, Cantonment, Fla., assignor to Monsanto Company, St. Louis, Mo.

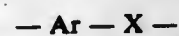
Filed May 13, 1976, Ser. No. 686,206

Int. Cl.² D01F 6/00

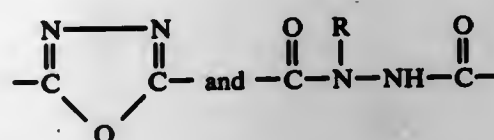
U.S. Cl. 264-184

10 Claims

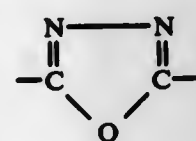
1. A process for preparing a shaped article of a polymer consisting essentially of recurring units of the formula



wherein Ar is a divalent aromatic radical and X is a radical selected from the group consisting of



where R is a C₁ to C₄ alkyl, with the proviso that in at least 20% of said recurring units X is



comprising:

- a. continuously introducing into a continuous reactor an acid solution consisting essentially of monomers from which an oxadiazole polymer is prepared and an acid selected from the group consisting of oleum, chlorosulfonic acid, poly-

phosphoric acid, and mixtures thereof, said reactor being maintained at a temperature between about 100° C. and 225° C. and at a pressure sufficient to keep the contents thereof in the liquid phase, whereby said monomers polymerize to provide a dope having a Brookfield viscosity ranging from about 8,000 to 80,000 and comprising a polymer having an inherent viscosity of from about 1 to 10, and

- b. continuously extruding said dope into an aqueous coagulating medium to obtain a shaped article of said polymer, wherein the residence time of said monomers in the reactor is from about 2 to about 60 minutes.

4,054,634

PRODUCTION OF POLYESTER TIRE YARN

Robert Moore Marshall, Chester, and Kimon Constantine Dardoufas, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 29, 1975, Ser. No. 617,547

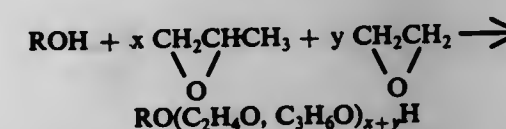
Int. Cl.² B05D 1/38, 3/12

U.S. Cl. 264-210 F

6 Claims

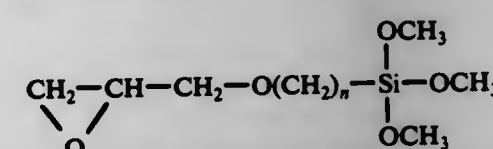
1. In a process for producing polyethylene terephthalate yarn, particularly for tire cords, wherein a liquid finish is applied to the yarn, said process involving spinning and drawing steps, the improvement comprising:

- a. first applying to the yarn prior to said drawing step from about 0.2 to about 0.6 weight percent, based on the weight of the yarn, of a liquid finish composition consisting essentially of a polyalkylene glycol compound which is a mixed polyoxyethylated-polyoxypropylated monoether prepared in accordance with the equation:



where R is an alkyl group having 1 to 8 carbon atoms, x and y are the number of moles of propylene oxide and ethylene oxide respectively and wherein ethylene oxide comprises 40 to 60 percent by weight of the combined total of ethylene oxide and propylene oxide and x+y has a value to produce a molecular weight of from 500 to 850; and then

- b. applying to said yarn after said drawing step from about 0.3 to about 1.3 weight percent, based on the weight of the yarn, of a liquid finish composition consisting essentially of an aqueous solution of about 70 to 95 parts by weight of said mixed polyoxyethylated-polyoxypropylated monoether, about 5 to 30 parts by weight of a silane having the structural formula:



wherein n = 2 to 5, and a sufficient amount of a water-soluble alkaline catalyst to adjust the pH of the finish composition to 8-10.

4,054,635

COPOLYMER OF GLYCIDYL METHACRYLATE AND ALLYL GLYCIDYL ETHER

Sheldon I. Schlesinger, E. Windsor Township, Mercer County, N.J., and Veronica Cochran, Armonk, N.Y., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 509,672, Sept. 26, 1974, abandoned, which is a division of Ser. No. 297,829, Oct. 16, 1972, abandoned. This application June 17, 1976, Ser. No. 697,010

Int. Cl.² B29C 1/02; G03C 5/00

U.S. Cl. 264-219

9 Claims

1. A method for direct application of information from a

photoresist image which comprises admixing (a) a copolymer of glycidyl methacrylate and allyl glycidyl ether having an inherent viscosity of at least about 0.25, an epoxide equivalent of at least about 0.65 epoxide equivalent per 100 grams of polymer derived from reaction of a mixture consisting essentially of the monomers containing from about a 4 to 5 molar excess of glycidyl methacrylate in the presence of a free-radical polymerization catalyst and a solvent at a temperature below about 100° C, with (b) a photosensitive aromatic diazonium salt of a complex halogenide which decomposes upon exposure to radiation to release a halide Lewis Acid effective to initiate polymerization of said copolymer selected from compounds having the general formula (ArN₂)_m (MX_{n+m})_{-m} wherein Ar is an aryl or substituted aryl group, X is chlorine or fluorine, M is P, n is the oxidation state of M, and m is the number of diazonium groups as determined by the net charge on the anion (MX_{n+m}); applying said mixture to a substrate, screening predetermined portions of said substrate, exposing the substrate to electron beam or electromagnetic irradiation to effect polymerization of said copolymer, removing said screening means, applying a solvent to remove unpolymerized portions on said substrate to obtain a photoresist image, contacting said photoresist image with a thermoplastic material at a temperature below the softening point of said substrate and of said photoresist image and exerting sufficient pressure to obtain replicated impressions of said photoresist image on said thermoplastic material.

4,054,636

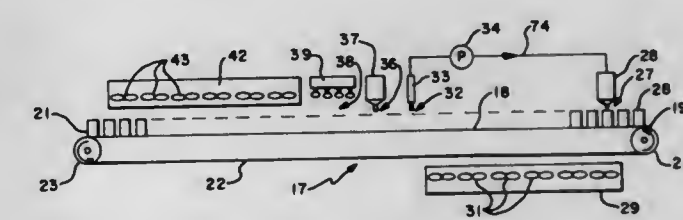
METHOD OF MAKING A COMPOSITE CANDLE WITH POWDERED WAX CORE

John B. Menig, 283 Hart, Ben Lomond, Calif. 95005

Division of Ser. No. 516,203, Oct. 21, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 619,573
Int. Cl.² B29C 3/00, 5/00, 6/00; B29F 5/00

U.S. Cl. 264-250

7 Claims



1. A method of forming a wax pillar candle comprising the steps of
 - securing a candle wick centrally disposed in a pillar candle mold,
 - melting an amount of candle wax to assume a liquid phase, pouring a predetermined volume of the liquid phase wax into the mold,
 - cooling the wax at the surface of the mold thereby forming a solidified shell in the mold having an open end,
 - removing the remaining liquid phase wax from the mold, depositing a volume of wax in powdered form in the shell sufficient to substantially fill the solidified shell, forming a seal at the open end, on top of the powdered wax and about said wick, with liquid candle wax, said liquid wax being allowed to solidify to retain the powdered wax within the candle shell, releasing the wick from the mold, and removing the candle from the mold,
 - whereby a wax pillar candle having the smooth exterior appearance of a solid molded candle is produced which assumes a flowering shell form as the candle burns.

4,054,644

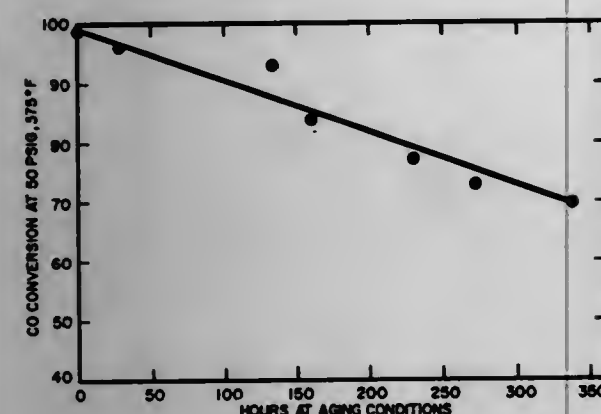
WATER GAS SHIFT PROCESS

Marnell A. Segura; Clyde L. Aldridge; Kenneth L. Riley, all of Baton Rouge, and Lloyd A. Pine, Greenwell Springs, all of La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 235,178, March 16, 1972, abandoned. This application Nov. 25, 1974, Ser. No. 526,675 Int. Cl.² C01B 1/03, 2/06

U.S. Cl. 423—655

17 Claims



1. In a process for the preparation of hydrogen which comprises contacting a gas mixture comprising carbon monoxide and steam with minor amounts of hydrocarbon under shift reaction conditions with a catalyst comprising: (i) an alkali metal compound derived from an acid having an ionization constant less than about 1×10^{-3} , (ii) a hydrogenation-dehydrogenation component selected from the group consisting of (a) a non-noble metal composition comprising the oxides or sulfides of vanadium, molybdenum, tungsten, cobalt, tantalum or niobium or mixtures thereof or (b) mixtures of non-noble metal compounds comprising the oxides or sulfides of vanadium, molybdenum, tungsten, cobalt, tantalum or niobium or mixtures thereof with oxides or sulfides of nickel, iron or chromium or mixtures thereof, the weight ratio of said hydrogenation-dehydrogenation component to said alkali metal compound, each calculated on the basis of the oxides thereof, being less than about 5:1, the oxides or sulfides of nickel, iron or chromium or mixtures thereof making up less than about 80 mole % of the total hydrogenation-dehydrogenation component, the improvement which comprises incorporating at least 0.01 weight % of a halogen component into said catalyst, thereby improving the activity maintenance characteristics of said catalyst.

4,054,645

RADIOLOGIC COMPLEXES EMPLOYING FLUORINE-CONTAINING TIN REDUCING AGENTS

Brian K. Hill, Cottage Grove, Minn., and Verna M. Kubik, Somerset, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 24, 1976, Ser. No. 717,173
Int. Cl.² A61K 29/00, 43/00

U.S. Cl. 424—1

14 Claims

1. An intravenously injectable diagnostic solution for use in mammalian bodies which is an aqueous solution comprising a target-specific radiocomplex, said radiocomplex comprising the reaction product of an aqueous mixture of (a) Tc99m-per-technetate ion, (b) a target-specific diagnostic ligand, and (c) a tin (II) reducing agent for said pertechnetate ion selected from the group consisting of SnF_2 , MSnF_3 and MSn_2F_3 , and mixtures thereof, wherein M is NH_4 , Na, K, Li, Rb or Cs.

4,054,646

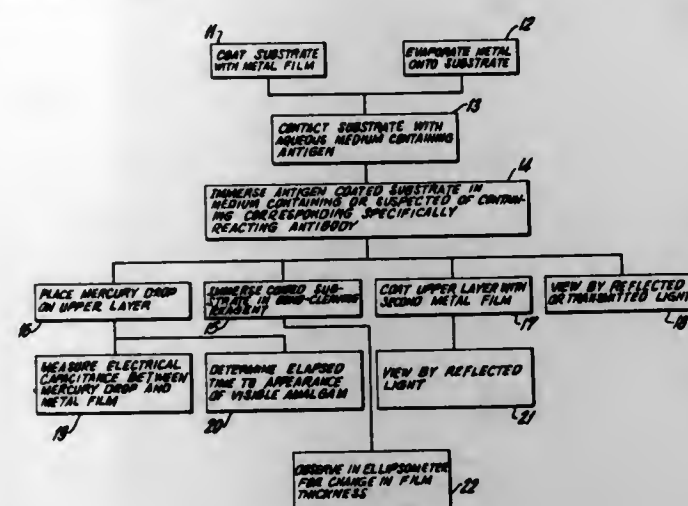
METHOD AND APPARATUS FOR DETECTION OF ANTIBODIES AND ANTIGENS

Ivar Giaever, Schenectady, N.Y., assignor to General Electric, Milwaukee, Wis.

Continuation-in-part of Ser. No. 384,113, July 30, 1973, abandoned. This application Aug. 27, 1975, Ser. No. 608,255 Int. Cl.² G01N 21/06, 33/16

U.S. Cl. 424—12

60 Claims



1. A diagnostic method for determining the presence or absence of a specific antibody or antigen in a biological sample comprising the steps of:

- depositing a metal onto a substrate material;
- contacting said substrate material with an aqueous medium containing either a corresponding specifically reacting antigen to said specific antibody or a corresponding specifically reacting antibody to said specific antigen, to coat all or part of said substrate material with a monomolecular layer of said specifically reacting antigen or antibody;
- immersing said coated substrate material in said sample; and
- examining said coated substrate material to determine whether said substrate has a bimolecular or monomolecular layer adhering thereto.

4,054,647

METHOD AND COMPOSITION FOR REMOVING UNDESIRABLE ODORS FROM AIR

Jakob Harich, and Franz P. Harich, both of Orlando, Fla., assignors to Rush-Hampton, Inc., Longwood, Fla.

Division of Ser. No. 126,251, March 19, 1971, Pat. No. 3,890,212, which is a continuation-in-part of Ser. No. 27,080, April 9, 1970, abandoned. This application May 8, 1975, Ser. No. 575,982

Int. Cl.² A61L 9/04, 13/00; A61K 35/78

U.S. Cl. 424—45

11 Claims

1. A method for removing undesirable odors from air, which comprises contacting the air being treated with an effective amount of an organic reaction product obtained by contacting the pulps of grapefruit with a non-toxic polyhydric alcohol to form said reaction product and separating the resultant organic reaction product from the pulp residue.

10. An aerosol spray air deodorizer composition which comprises a pressurized mixture of an effective amount of an organic reaction product obtained by contacting the pulps of grapefruit with a non-toxic polyhydric alcohol, to form a reaction product, and separating the resultant organic reaction product from the pulp residue with a propellant gas which is nonreactive with said reaction product.

4,054,648

PROCESS FOR PREPARING A THERAPEUTIC AGENT

Taro Nagasawa; Morio Kuboyama, both of Tokyo; Joji Ono, Chiba; Minoru Saito, Komae; Tsutomu Kudo, Kawasaki; Eiji Takahashi, Narashino; Kazuyoshi Doi, Tokyo, and Kazuhiro Nagata, Yokohama, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1974, Ser. No. 496,814

Claims priority, application Japan, Aug. 30, 1973, 48-96689

Int. Cl.² A61K 35/50

U.S. Cl. 424—105

3 Claims

1. A process for preparing a therapeutic agent which comprises:

- A. 1. mincing and grinding placenta with water or diluted physiological saline solution to form an emulsion and
- A. 2. acidifying the emulsion with a mixture of aqueous acetic and hydrochloric acid to 0.5 - 2.0 N;
- B. heating the acidified emulsion to 75° - 90° C for 30 - 60 minutes so as to insolubilize a portion of the placental proteins;
- C. 1. after cooling, centrifuging the acidified emulsion of (B) to remove the insolubilized portion and to produce a supernatant,
- C. 2. neutralizing the supernatant with an alkaline solution and
- C. 3. centrifuging the neutralized supernatant so as to form a supernatant fluid and an insoluble precipitant;
- D. 1. concentrating the supernatant fluid of (C) 3 to 1/10-1/30 that of its volume under reduced pressure,
- D. 2. dialysing the concentrated fluid with cellulose tubing so as to obtain a dialysate or filtering the concentrated fluid through a membrane filter so as to obtain a filtrate and
- D. 3. concentrating the dialysate or filtrate to 1/100 to 1/200 or 1/5 to 1/10 respectively of its original volume under reduced pressure;
- E. 1. chromatographically absorbing the concentrated dialysate or filtrate on a column of a cross-linked dextran having an exclusion limit of 5000 molecular weight, of 1500 molecular weight or of 700 molecular weight and
- E. 2. eluting the chromatographically absorbed dialysate or filtrate so as to obtain the fraction of distribution coefficient 0.95 to 1.82 in the case of cross-linked dextran of exclusion limit 5000 molecular weight, of distribution coefficient 0.35 to 1.24 in the case of cross-linked dextran of exclusion limit 1500 molecular weight and of distribution coefficient 0.35 to 1.25 in the case of cross-linked dextran of 700 molecular weight; and
- F. lyophilizing said fraction.

4,054,650

O,O-DIETHYL-O-[N-METHOXY-2-NITROBENZIMIDOYL]-THIONO-PHOSPHORIC ACID ESTERS
Walter Lorenz, deceased, late of Wuppertal, Germany, by Erika Lorenz, heiress; Ingeborg Hammann, Cologne, Germany; Wolfgang Behrenz, Overath, Germany, and Bernhard Homeyer, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 24, 1976, Ser. No. 726,362

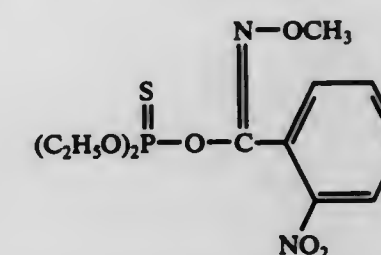
Claims priority, application Germany, Oct. 7, 1975, 2544776

Int. Cl.² A01N 9/36; C07F 9/165

U.S. Cl. 424—211

3 Claims

1. O,O-Diethyl-O-(N-methoxy-2-nitrobenzimidoyl)-thiono-phosphoric acid ester of the formula



3. A method of combating insect or acarid pests which comprises applying to the pests or a habitat thereof an insecticidally or acaricidally effective amount of a compound according to claim 1.

4,054,651

METHOD OF CONTRACEPTION

Harvey D. Benson, Cincinnati; Joyce Francis Grunwell, Hamilton; John O'Neal Johnston, Cincinnati, all of Ohio, and Vladimir Petrow, Chapel Hill, N.C., assignors to Richardson-Merrell Inc., Wilton, Conn.

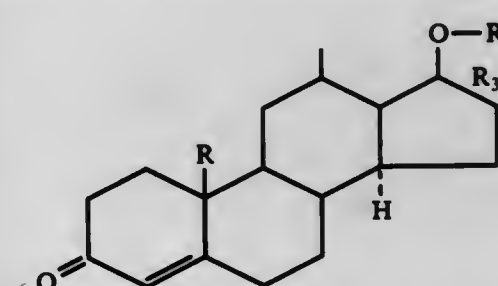
Filed May 10, 1976, Ser. No. 684,943

Int. Cl.² C07J 1/00; A61K 31/56

U.S. Cl. 424—239

28 Claims

1. A method of contraception in a patient in need thereof which comprises administering to said patient a contraceptive effective amount of a compound of the formula:



wherein R is —CHO or —CH₂OR₁; each of R₁ and R₂ is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 20 carbon atoms and is straight or branched, benzoyl, phenylalkylcarbonyl wherein the alkyl moiety has from 1 to 6 carbon atoms and is straight or branched or cycloalkylcarbonyl wherein the cycloalkyl moiety has from 5 to 10 carbon atoms; R₃ is hydrogen; or R₂ and R₃ together form a double bond between the 17- position carbon atom and the oxygen atom.

4,054,652

DIHYDRO- AND TETRAHYDRO- IMINOTHIAZINES
Clarence S. Rooney, Beaconsfield; Joshua Rokach, Chomedey, both of Canada, and Edward J. Cragoe, Jr., Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 15, 1976, Ser. No. 696,448

Int. Cl.² C07D 279/06, 279/12; A61K 31/54

U.S. Cl. 424—246

5 Claims

1. A compound of structural formula:

4,054,649

THERAPEUTIC COMPOSITIONS AND THE TREATMENT OF LESIONS OF CONNECTIVE TISSUE

Leon Cariel, 85, rue de Sevres, 75006 Paris, France

Filed Jan. 27, 1976, Ser. No. 652,860

Claims priority, application France, Nov. 24, 1975, 75.35851

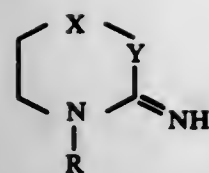
Int. Cl.² A61K 35/78

U.S. Cl. 424—195

6 Claims

1. A therapeutic method for the treatment of stretched and discolored conjunctive tissue lesions or stretch marks associated with pregnancy comprising applying topically to the affected area of a woman exhibiting such lesions a therapeutic amount of a pharmaceutical composition containing, as active ingredients in weight percent:

- Alchemilla extract — 30-80%
 - Equisetum extract — 50-10%
 - Hedera Helix extract — 20-10%
- the total of said extracts being 100 weight percent, and continuing such treatment for a period of time until said lesions have been at least partially improved.

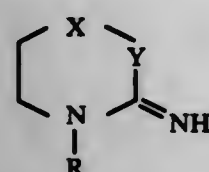


or pharmaceutically acceptable salt thereof, wherein the dotted line is unsaturation or saturation;

X—Y is —CH₂—S— or —S—CH₂—; and

R is C₁₋₂ alkyl, with the proviso that if X—Y represents —CH₂—S— in a saturated ring, then R is methyl.

3. A method of inhibiting indoleamine-N-methyl transferase which comprises the administration to a patient in need of such treatment an effective amount of a compound of formula:



or pharmaceutically acceptable salt thereof, wherein the dotted line is saturation or unsaturation;

X—Y is —CH₂—S— or —S—CH₂—; and

R is C₁₋₂ alkyl.

4,054,653

SUBSTITUTED PYRIDO[3,4-E]OXAZINE DIONES AND THEIR THERAPEUTIC USE

Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

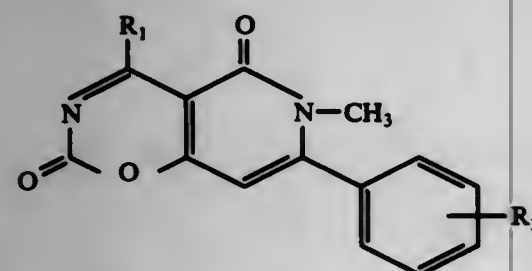
Filed June 1, 1976, Ser. No. 691,529

Int. Cl.² A01N 9/00, 9/22; C07D 265/00, 273/00

U.S. Cl. 424—248.57

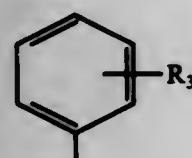
10 Claims

1. A compound of the formula



where

R₁ represents straight chain lower alkyl or



where

R₃ represents hydrogen or halo having an atomic weight of about 19 to 36, and

R₂ represents hydrogen or halo.

10. A pharmaceutical composition for use in the treatment of insomnia, muscle tension or anxiety which comprises a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier therefor.

4,054,654

ISOINDOLIN-1-ONE DERIVATIVES

Claude Cotrel, Choisy-le-Roi; Claude Jeanmart, Brunoy, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Division of Ser. No. 527,031, Nov. 25, 1974, Pat. No. 3,987,174, which is a continuation of Ser. No. 341,307, March 14, 1973, Pat. No. 3,898,232. This application Mar. 23, 1976, Ser. No. 669,730

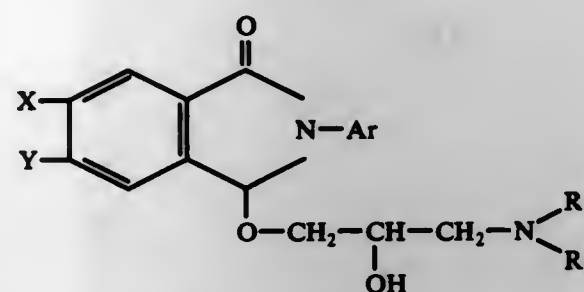
Claims priority, application France, Mar. 16, 1972, 72.09207; Feb. 1, 1973, 73.03728

Int. Cl.² A61K 31/50; C07D 403/12

U.S. Cl. 424—250

5 Claims

1. An isindoline of the formula:



wherein Ar is pyridazinyl, unsubstituted or substituted by methyl, X and Y when taken singly represent hydrogen or alkoxy of 1 through 4 carbon atoms, or X and Y when taken together represent methylenedioxy, and R₁ and R₂ represent hydrogen or alkyl of 1 through 4 carbon atoms, and non-toxic pharmaceutically acceptable acid addition salts thereof.

5. A pharmaceutical composition useful as an anti-arrhythmic which comprises, as active ingredient, an effective amount of an isindoline of claim 1 or a non-toxic pharmaceutically acceptable acid addition salt thereof, in association with a significant amount of a pharmaceutically acceptable carrier.

4,054,655

AMINODICYANOPYRAZINES FOR CONTROLLING PLANT DISEASE

Dennis Scott Donald, Mendenhall, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 6, 1976, Ser. No. 655,954

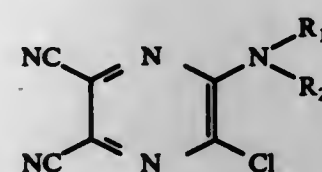
Int. Cl.² A01N 9/22

U.S. Cl. 424—250

34 Claims

1. A composition suitable for use in controlling plant diseases caused by fungi comprising:

a. a fungicidally effective amount of a compound of the formula:



where

R₁ is alkyl of 2-8 carbon atoms, alkenyl of 3-8 carbon atoms, alkynyl of 3-8 carbon atoms, cycloalkylalkyl of 4-7 carbon atoms, phenyl, benzyl, α-methylbenzyl, or —NH—CO₂R₃,

where R₃ is alkyl of 1-3 carbon atoms;

R₂ is hydrogen, methyl, or ethyl; and

R₁ and R₂ together can be —(CH₂)_n—, where n is 4-6; and b. at least one of the following: a surfactant, or a solid or liquid diluent.

4,054,656

THIENO[2,3-D]PYRIMIDINE ANTIALLERGIC AGENTS

Davis L. Temple, Jr., Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

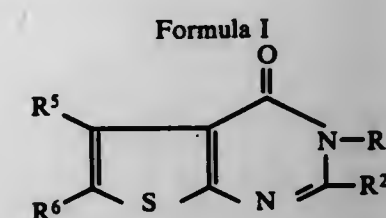
Filed Sept. 10, 1975, Ser. No. 611,955

Int. Cl.² A61K 31/505; C07D 241/50

U.S. Cl. 424—251

34 Claims

1. The compound having Formula I

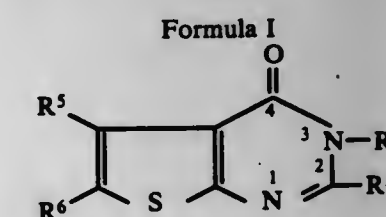


wherein:

R² is —CO₂R³, wherein R³ is selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, and M wherein M is a non-toxic pharmacologically inert metal cation, and

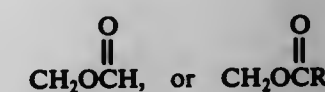
R⁵ and R⁶ are independently selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, and amino.

23. The compound having Formula I



wherein

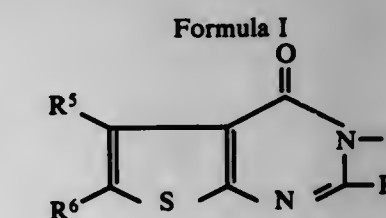
R² is selected from the group consisting of CH₂OH,



wherein

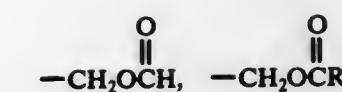
R is lower alkyl having 1 to 8 carbon atoms, R³ is selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, and M wherein M is a non-toxic pharmacologically inert metal cation, and R⁵ and R⁶ are independently selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, lower alkenyl having 3 to 6 carbon atoms, lower alkoxy having 1 to 6 carbon atoms, hydroxy, nitro, amino, halo, phenyl, alkanoyl having 2 to 6 carbon atoms, or together they constitute a cycloalkene ring or an R-substituted cycloalkene ring wherein R is as defined above and said cycloalkene ring contains 5 to 7 annular atoms.

30. A method of inhibiting the immediate hypersensitivity reaction in a sensitive mammal which comprises administering to said mammal an effective hypersensitivity reaction inhibiting dose of a compound having Formula I



wherein

R² is selected from the group consisting of —CO₂R³, —CH=CHCO₂R³, —CH₂OH,



and —CHO wherein

R is lower alkyl having 1 to 8 carbon atoms, R³ is selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, and M wherein M is a non-toxic pharmacologically inert metal cation, and R⁵ and R⁶ are independently selected from the group consisting of hydrogen, lower alkyl having 1 to 8 carbon atoms, lower alkenyl having 3 to 6 carbon atoms, lower alkoxy having 1 to 6 carbon atoms, hydroxy, nitro, amino, halo, phenyl, alkanoyl having 2 to 6 carbon atoms, or together they constitute a cycloalkene ring or an R-substituted cycloalkene ring wherein R is as defined above and said cycloalkene ring contains 5 to 7 annular atoms.

4,054,657

PYRIMIDINYL OXAMIC ACIDS AND ESTERS, AND COMPOSITIONS AND METHODS FOR THE SUPPRESSION OF ALLERGIC MANIFESTATIONS

John H. Sellstedt, Pottstown; Charles J. Guinasso, King of Prussia, and Albert J. Begany, Perkiomenville, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

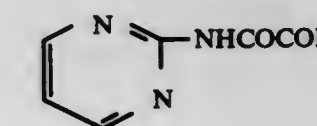
Division of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, March 23, 1973, abandoned. This application Mar. 23, 1976, Ser. No. 669,571

Int. Cl.² A61K 31/505; C07D 239/00

U.S. Cl. 424—251

5 Claims

1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivitis, food allergy, and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:



in which B is a member selected from the group consisting of —OH, lower alkoxy, —NH₂, —NHOH, cyclohexyloxy, and phenoxy.

4,054,658

THERAPEUTIC COMPOSITIONS CONTAINING METHAQUALONE

John D. Buehler, 02, Fort Washington; Pramod B. Chemburkar, Willow Grove, and Robert S. Joslin, Fort Washington, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 440,053, Feb. 6, 1974, abandoned, which is a continuation of Ser. No. 43,976, June 5, 1970, abandoned. This application Jan. 21, 1976, Ser. No. 651,132

Int. Cl.² A61K 31/505

U.S. Cl. 424—251

9 Claims

1. An orally administrable, rapidly soluble, and readily absorbable, sedative hypnotic composition comprising between 25 mg. to 300 mg. per dosage unit of 2-methyl-3-(o-tolyl)-4(3H)-quinazolinone and its pharmaceutically acceptable acid addition salts, and at least two adjuncts selected from the group consisting of:

a surfactant effective for wetting and dissolving said quinazolinone present in an amount of 0.5% to 300% by weight of said quinazolinone and selected from the group

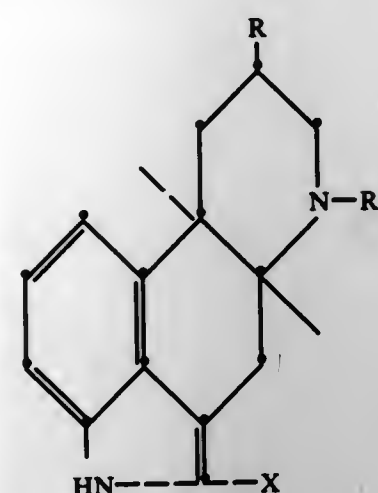
consisting of a polyoxypropylene-polyoxyethylene non-ionic compound, a polyoxyethylene glycol ester of a higher fatty acid, an alkyl phenoxy poly(ethyleneoxy)ethanol, an alkyl poly(ethyleneoxy)ethanol, a complex organic phosphoric acid, a complex organic phosphoric acid ester, a polyoxyethylene derivative of a sorbitan fatty acid ester, and lecithin;

an acidifier present in an amount between 10% and 1000% by weight of said quinazolinone and selected from the group consisting of hydrochlorides of glycine, glutamic acid and lysine;

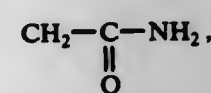
an aggregation preventing carrier present in an amount between 100% and 2000% by weight of said quinazolinone and selected from the group consisting of mannitol, sorbitol, starch, lactose, sucrose, polyethylene glycol of a molecular weight between 1000 and 6000, and microcrystalline cellulose; and

a dispersant present in an amount between 0.5% and 50% by weight of said quinazolinone and selected from the group consisting of finely divided silica and finely divided silicate;

said quinazolinone compound being present in said composition in the form of finely divided, discrete, substantially non-aggregated particles, wherein the particle size does not exceed 20μ , at least the majority of said particles being and remaining separate from each other, and the adjuncts being present in intimate contact with the discrete particles of said quinazolinone.



wherein X is Cl, Br or I, R is $\text{CH}_2\text{-CN}$ or



and R' is $\text{C}_1\text{-C}_3$ primary alkyl.

4,054,659

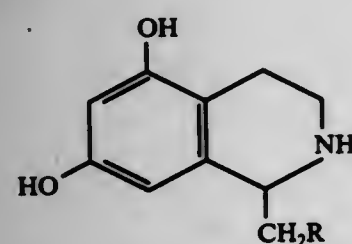
5,7-DIHYDROXY-1-(TRIMETHOXYBENZYL)-1,2,3,4-TETRAHYDROISOQUINOLINES AND USE THEREOF
Muneyoshi Ikezaki, Ageo; Kunihiro Irie; Norihide Umino, both of Omiya; Katsuo Ikezawa, Urawa, and Masanori Sato, Kuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Oct. 30, 1975, Ser. No. 627,259

Claims priority, application Japan, Nov. 20, 1974, 49-134734
Int. Cl.² A61K 31/47; C07D 213/65

U.S. Cl. 424-258

1. A compound of the formula:



wherein R is trimethoxyphenyl, or a pharmaceutically acceptable acid addition salt thereof.

2. A pharmaceutical composition consisting essentially of a bronchodilating effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

4,054,660

METHOD OF INHIBITING PROLACTIN

James A. Clemens; Edmund C. Kornfeld, and Nicholas J. Bach, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 568,072, April 14, 1975, abandoned, which is a division of Ser. No. 419,566, Nov. 28, 1973, Pat. No. 3,920,664, which is a continuation-in-part of Ser. No. 273,902, July 21, 1972, abandoned. This application Aug. 19, 1976, Ser. No. 715,774

Int. Cl.² A61K 31/48

U.S. Cl. 424-261

2 Claims

1. A process for inhibiting the secretion of prolactin in mammals which comprises administering from 0.01 to 10 mg/kg/day of mammalian weight of a compound of Formula II or a salt thereof formed with a pharmaceutically-acceptable

acid, to a mammal having a condition in which there is an excess of prolactin being secreted:

II

4,054,661 PYRIDYL OXAMIC ACID DERIVATIVES AND USE IN THE PREVENTION OF ALLERGIC REACTIONS

John H. Sellstedt, Pottstown; Charles J. Guinasso, King of Prussia, and Albert J. Begany, Perkiomenville, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

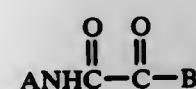
Continuation-in-part of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, March 23, 1973, abandoned. This application Mar. 23, 1976, Ser. No. 669,569

Int. Cl.² A61K 31/44; C07D 213/36

U.S. Cl. 424-263

16 Claims

1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivitis, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:



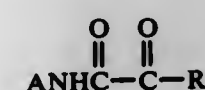
in which

A is a member selected from the group consisting of 2-pyridyl, 2-pyridyl-N-oxide, 6-(lower)alkyl-2-pyridyl, 3-pyridyl, 4-pyridyl;

and

B is a member selected from the group consisting of —OH, lower alkoxy, —NH₂, —NHOH, lower alkylamino, cyclohexyloxy and phenoxy.

4. A compound of the formula:



in which

A is a member selected from the group consisting of 2-pyridyl-N-oxide, 6-methyl-2-pyridyl, 3-pyridyl and 4-pyridyl and

R is lower alkoxy.

4,054,662

PHENOXYALKYLAMINE CONTAINING PYRIDINES HAVING BLOOD PRESSURE REDUCING PROPERTIES

Rudolf Theodor Petersen, Wohltorf, and Wolfgang Fleck, Hamburg, both of Germany, assignors to Belersdorf Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 532,673, Dec. 13, 1974, Pat. No. 3,960,878.

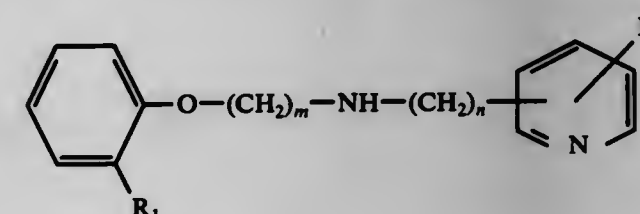
This application Mar. 23, 1976, Ser. No. 669,620

Claims priority, application Germany, Dec. 27, 1973, 2364685
Int. Cl.² A61K 31/44

U.S. Cl. 424-263

2 Claims

1. A pharmaceutical composition which comprises a blood pressure reducing quantity of the compound of formula I



wherein

R₁ represents a chlorine atom or a methoxy or cyano group;

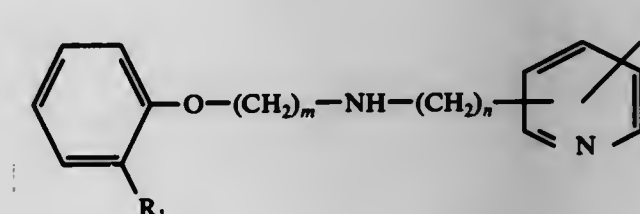
R₂ represents a hydrogen atom or a methyl or hydroxy group;

m is 2, 3 or 4; and

n is 1 or 2

or a physiologically acceptable acid addition salt thereof together with a pharmacologically acceptable carrier or diluent.

2. A method for reducing blood pressure in a patient comprising administering an effective amount to said patient of a compound of formula I



wherein

R₁ represents a chlorine atom or a methoxy or cyano group;

R₂ represents a hydrogen atom or a methyl or hydroxy group;

m is 2, 3 or 4; and

n is 1 or 2

or a physiologically acceptable acid addition salt thereof.

4,054,663

PYRIDINE DERIVATIVES AND THEIR USE AS ANTICOCIDIAL AGENTS

Yasuhiro Morisawa; Mitsuru Kataoka; Noritoshi Kitano, and Toshiaki Matsuzawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Dec. 11, 1975, Ser. No. 639,697

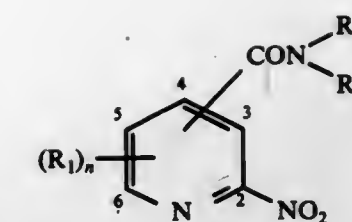
Claims priority, application Japan, Dec. 23, 1974, 49-147908; Mar. 18, 1975, 50-32739; May 21, 1975, 50-60519; Sept. 5, 1975, 50-107822

Int. Cl.² C07D 213/56; A61K 31/44

U.S. Cl. 424-266

31 Claims

1. A compound having the formula



wherein

R₁ is an alkyl group having 1 to 3 carbon atoms;

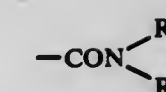
R₂ is hydrogen atom or an alkyl group having 1 to 3 carbon atoms;

R₃ is hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 3 to 4 carbon atoms, or an alkyl group having 1 or 2 carbon atoms and hydroxy as a substituent;

n is an integer of 0 to 2 inclusive; and

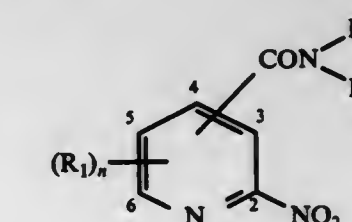
when n is 2, R₁'s may be the same or different;

provided that when R₂ is said alkyl group having 1 to 3 carbon atoms, R₃ is said alkyl group having 1 to 4 carbon atoms, and the group



is attached to the pyridine ring at the 4- or 5-position thereof.

25. A poultry feed having dispersed therein for control of poultry coccidiosis at least 0.005% by weight of a compound having the formula



wherein

R₁ is an alkyl group having 1 to 3 carbon atoms;

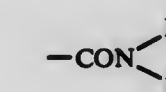
R₂ is hydrogen atom or an alkyl group having 1 to 3 carbon atoms;

R₃ is hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 3 or 4 carbon atoms, or an alkyl group having 1 or 2 carbon atoms and hydroxy as a substituent;

n is an integer of 0 to 2 inclusive; and,

when n is 2, R₁'s may be the same or different; provided that

when R₂ is said alkyl group having 1 to 3 carbon atoms, R₃ is said alkyl group having 1 to 4 carbon atoms, and the group



is attached to the pyridine ring at the 4- or 5-position thereof.

4,054,664

TRIAZOLE INSECTICIDES

Thomas I. Watkins, and David M. Weighton, both of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

Filed July 8, 1975, Ser. No. 594,372

Claims priority, application United Kingdom, July 8, 1974, 30169/74

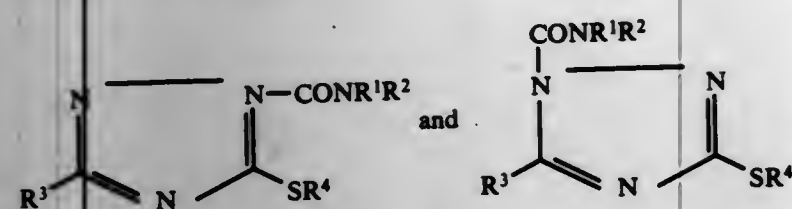
Int. Cl.² A01N 9/22

U.S. Cl. 424-269

6 Claims

1. A method of controlling insect larvae which comprises applying to the locus of the larvae a larvicidally effective

amount of a compound selected from the group consisting of triazoles of the formulae



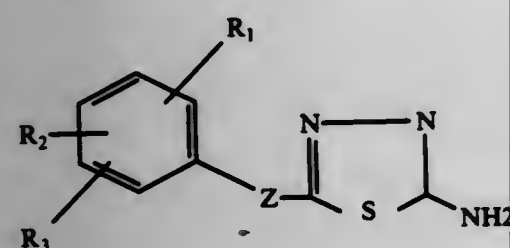
in which R¹ and R² are methyl, R₃ is selected from the group consisting of isopropyl, s-butyl, and t-butyl and R⁴ is selected from the group consisting of methyl, ethyl, propyl, vinyl prop-2-ynyl, and but-2-enyl, provided that when R⁴ is propyl R³ is selected from the group consisting of isopropyl and s-butyl and when R⁴ is but-2-enyl R³ is t-butyl.

4,054,665

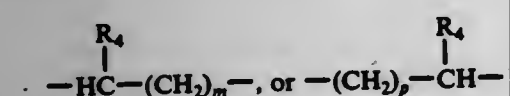
2-AMINO-5-(TRIFLUOROMETHYLPHENYLALKYL)-1,3,4-THIADIAZOLES USED IN THE TREATMENT OF INSOMNIA AND ANXIETY

Marcel K. Eberle, Madison, and Robert E. Manning, Mountain Lakes, both of N.J., assignors to Sandoz, Inc., Hanover, N.J. Division of Ser. No. 528,477, Nov. 29, 1974, Pat. No. 3,965,110, which is a continuation-in-part of Ser. No. 485,991, July 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 452,678, March 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 218,559, Jan. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 124,489, March 15, 1971, abandoned. This application Mar. 10, 1976, Ser. No. 665,776 Int. Cl.² A61K 31/425

U.S. Cl. 424-270 3 Claims
1. A pharmaceutical composition for use in treating insomnia or anxiety comprising a therapeutically effective amount of a compound of the formula



where R₁, R₂, and R₃ each independently represent hydrogen, fluoro, chloro, or trifluoromethyl, and Z is —(CH₂)_n—,



where R₄ is lower alkyl, and n is 1, 2, 3, or 4, and m is 0, 1, 2, or 3, and p is 1, 2, or 3,

provided that (a) at least one of R₁, R₂, and R₃ is trifluoromethyl, and (b) that when more than one of R₁, R₂, and R₃ is trifluoromethyl, they are bonded to other than adjacent carbon atoms and (c) where two of the substituents are trifluoromethyl, the remaining substituent is hydrogen, in association with a pharmaceutically acceptable carrier therefor.

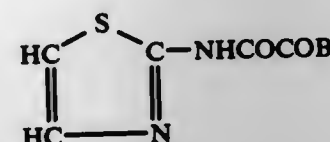
4,054,666 COMPOSITIONS AND METHODS OF TREATING IMMEDIATE HYPERSENSITIVITY REACTIONS WITH THIAZOLYL OXAMIC ACID DERIVATIVES

John H. Sellstedt, Pottstown; Charles J. Guinasso, King of Prussia, and Albert J. Begany, Perkiomenville, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, March 23, 1974, abandoned. This application Mar. 23, 1976, Ser. No. 669,572

Int. Cl.² A61K 31/425

U.S. Cl. 424-270 4 Claims
1. A process for preventing the release of pharmacological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivitis, food allergy, and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:



in which B is a member selected from the group consisting of —OH, lower alkoxy, —NH₂, —NHOH, lower alkylamino, cyclohexyloxy and phenoxy.

4,054,667

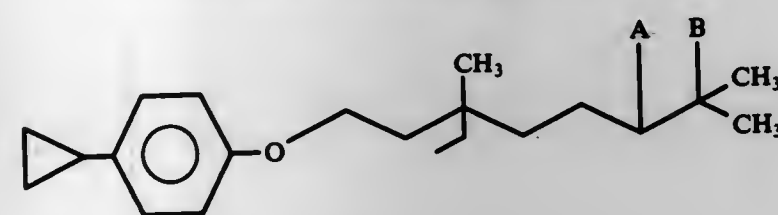
CERTAIN 4-CYCLOPROPYLPHENYL GERANYL ETHERS AND THEIR USE IN CONTROLLING INSECTS

Raymond A. Felix, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 17, 1976, Ser. No. 658,782

Int. Cl.² A01N 9/28; C07D 303/00

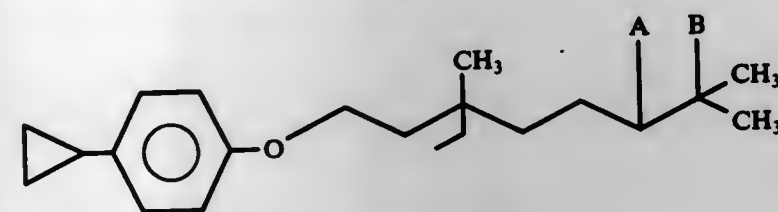
U.S. Cl. 424-278 8 Claims
1. A compound having the general structural formula



wherein i. A and B together form a bond, ii. A and B together form an epoxide link, or

iii. A is hydrogen and B is C₁-C₄ alkoxy.

5. A method of controlling insects selected from the group consisting of *Tenebrio molitor* and *Culex pipiens* comprising applying thereto at the larval or pupal stage an insecticidally effective amount of a compound having the formula



where i. A and B together form a bond, ii. A and B together form an epoxide link, or iii. A is hydrogen and B is C₁-C₄ alkoxy.

4,054,668

N-SUBSTITUTED AMINO ACID DERIVATIVES

Osamu Kirino, Ashiya; Tadashi Oishi; Nobuyuki Kameda, both of Takarazuka; Toshiro Kato, Ibaraki; Akira Fujinami, Takarazuka, and Toshiaki Ozaki, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

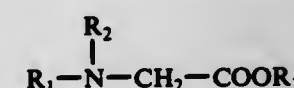
Filed Oct. 2, 1975, Ser. No. 619,125

Claims priority, application Japan, Oct. 2, 1974, 49-114062; Oct. 2, 1974, 49-114063; Oct. 3, 1974, 49-114425; Apr. 4, 1975, 50-41453

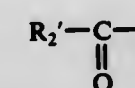
Int. Cl.² C07C 101/28, 103/48; A01N 9/24, 9/30

U.S. Cl. 424-314 10 Claims

1. An N-substituted amino acid derivative of the formula:



wherein R₁ is selected from the group consisting of an allyl, chloroallyl, propargyl or crotyl group; R₂ is selected from the group consisting of a methyl or



group in which R₂' is selected from the group consisting of a methyl, ethyl, n-propyl, monochloropropyl or dichloropropyl group and R₃ is selected from the group consisting of a hydrogen atom, an alkyl having 1 to 18 carbon atoms, cyclohexyl, benzyl, hydroxyethyl or methoxyethyl group, and the hydrochlorides, sulfates, acetates or oxalates thereof.

10. A soil fungicidal composition consisting essentially of an inert carrier or diluent and at least one N-substituted amino acid compound of formula (I) as defined in claim 1 as an active ingredient in a fungicidally effective amount.

4,054,669

PHENOLIC MENTHENE DERIVATIVES, THERAPEUTIC COMPOSITION CONTAINING SAME AND THEIR USE AS THERAPEUTIC COMPOSITIONS

Bernard Lahourcade, Vielle-Saint-Girons; Christiane Hirigoyen, Saint-Vincent-de-Tyrosse; Maurice Joulle, St-Germain-en-Laye; Gabriel Maillard, Paris; Lucien Lakah, Paris, and Christian Warolin, Paris, all of France, assignors to Les Derives Resiniques et Terpeniques, Dax and S.A. Joulle International, Neuilly-sur-Seine, both of France

Filed Jan. 2, 1976, Ser. No. 646,200

Claims priority, application France, Jan. 15, 1975, 75.01139

Int. Cl.² A01N 9/00, 9/12, 9/24, 9/26

U.S. Cl. 424-315 5 Claims

1. A compound selected from the group consisting of 1-hydroxy-4-(3'-m.menthen-4'-yl)-benzene, 1-hydroxy-3-methyl-4-(3'-m.menthen-4'-yl)-6-isopropyl-benzene and their sulfonates.

4. Therapeutic composition having antiviral activity against influenza virus and antibacterial activity against gram-positive bacteria comprising a therapeutically effective amount of a compound as claimed in claim 1, together with a therapeutically administrable carrier.

4,054,670

SKIN-TREATING COMPOSITION CONTAINING POLYSILOXANE FLUIDS

Allen C. Buhler, Racine, Wis., assignor to Growth Products, Inc., Racine, Wis.

Continuation-in-part of Ser. No. 223,711, Feb. 4, 1972, abandoned. This application June 5, 1975, Ser. No. 584,139

Int. Cl.² A61K 47/00

U.S. Cl. 424-358 1 Claim

1. In a cosmetic composition for application to the skin to form an air-permeable, invisible, protective barrier thereon,

containing one or more emollients, an emulsifying agent and a major portion by weight of water, the improvement which comprises incorporating in said composition the combination of dimethyl/trimethyl polysiloxane fluid, said fluid being present in a quantity of not less than 2% and not more than 10% by weight, and at least one part dimethyl polysiloxane fluid, present for each four parts of said dimethyl/trimethyl polysiloxane fluid.

4,054,671

METHOD FOR MANUFACTURING BEER

Robert F. Eslick, and Kenneth J. Goering, both of Bozeman, Mont., assignors to The Research Corporation, New York, N.Y.

Filed Jan. 8, 1976, Ser. No. 647,567

Int. Cl.² C12C 9/00, 11/04

U.S. Cl. 426-16 5 Claims

1. In a method for brewing beer by forming a malted barley grain, mixing said malted grain with a starch source, yeast and other beer brewing ingredients to form a brewery liquor and allowing said mixture to ferment until a wort is obtained having an ethyl alcohol content characteristic of beer, the improvement which comprises:

mixing said malted grain with a cross-bred barley variety having a pedigree of 'Waxy Oderbrucker'/'7* 'Compana'/'2/'Sermo'/'7* 'Compana', F₄ and designated as Washonupana and containing starch granules which are self-liquefying in that the starch granules contain a high amount of α-amylase which is tenaciously bound to the starch granules such that said α-amylase degrades the starch in said granules to maltose, glucose and small fractions of α-limit dextrins wherein said self-liquefying starch granules are present in amounts ranging from 10 to 75% in said brewing liquor.

4,054,672

PREPARATION OF FROZEN AND DEFROSTED FOODS

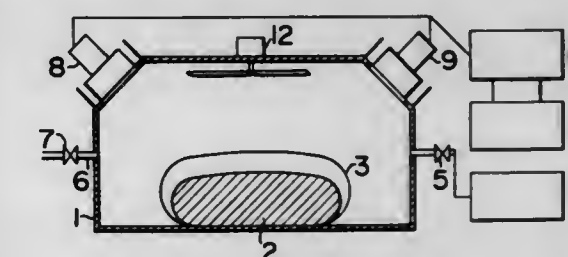
Kiyoshi Inoue, Tokyo, and Yoshinori Shima, Kanagawa, both of Japan, assignors to Inoue-Japax Research (IJR) Inc., Yokohama, Japan

Filed Sept. 11, 1972, Ser. No. 288,092

Claims priority, application Japan, Sept. 10, 1971, 46-69757

Int. Cl.² A23B 4/00

U.S. Cl. 426-244 6 Claims



1. A method of preserving food comprising the steps of: a. applying a superatmospheric pressure of substantially 2 to 8 atmospheres as a fluid medium to said food and cooling same to a temperature sufficient to freeze the food; b. maintaining the food in a frozen state under a superatmospheric pressure of 2 to 8 atmospheres; and c. defrosting said food by heating it while maintaining it under a superatmospheric pressure of 2 to 8 atmospheres until the food is substantially defrosted.

4,054,673

PROCESS FOR DEEP FRYING OF CHICKEN

Harvey R. Kaufman, 1310 Echo Park Ave., Los Angeles, Calif. 90026

Continuation-in-part of Ser. No. 31, Jan. 2, 1970, abandoned.

This application Apr. 5, 1972, Ser. No. 241,451

The portion of the term of this patent subsequent to Mar. 18, 1991, has been disclaimed.

Int. Cl.² A23L 1/315

U.S. Cl. 426—302

5 Claims

1. A single continuous process of frying chicken comprising the steps of:
 - a. cutting raw chicken into several serving pieces;
 - b. segregating said serving pieces into groups having the same parts therein;
 - c. preparing a dry formula mix consisting of about 5-20 weight percent salt, about 1-8 weight percent spices and seasonings, about 0.2-4 weight percent baking powder, about 58-93 weight percent flour, about 0.1-5 weight percent egg yolk, and about 0.2-5 weight percent milk solids;
 - d. preparing a batter mix by combining said dry formula mix with water in a weight ratio of about 5 to 8 with said water being between about 70 and about 75° F;
 - e. whipping said batter mix for about five minutes and adjusting the temperature thereof to a range of about 70-75° F to produce a smooth mix which is free of air bubbles and having a viscosity sufficient to completely drain a G4 cup having an orifice of 0.168 inches in 25 seconds based upon a Zahn Viscosimeter, said whipped batter mix being applied to said chicken parts within two hours after preparation of said mix so that the viscosity thereof remains essentially constant;
 - f. immersing said serving pieces into said about 70°-75° F whipped batter mix for approximately 5 to 10 seconds to cover the exterior surface of each serving piece;
 - g. removing said covered serving pieces from said whipped batter mix;
 - h. removing from said covered serving pieces any whipped batter mix which is in excess of an amount of said mix necessary to cover the exterior of said pieces;
 - i. heating a hydrogenated cooking fluid to a temperature of about 330° F;
 - j. wholly immersing said covered serving pieces into said 330° F cooking fluid for a period of about 6½ minutes to produce partially cooked pieces without causing said pieces to become saturated;
 - k. removing said pieces from said cooking fluid for about 30 seconds thereby suddenly exposing the exterior portions of said partially cooked chicken to a sudden reduction in temperature whereby the interior portions thereof remain at a temperature only slightly less than 330° F so that interior portions of said pieces do not undergo substantial temperature changes during the entire cooking process while the exterior surface portions thereof do experience a sudden temperature change to become crisp and flaky while said interior portions remain tender and juicy;
 - l. separating said partially cooked pieces from contact with each other while said pieces are removed from said fluid to insure a thorough cooking of each piece;
 - m. reimmersing said pieces in said 330° F cooking fluid for a time sufficient to produce a total cooking time of about 9 to 12 minutes, which time includes the time said partially cooked pieces are removed from said cooking fluid to suddenly reduce the temperature of the exterior portions of said pieces, to complete the cooking of said pieces and produce cooked pieces;
 - n. removing said cooked pieces from said cooking fluid;
 - o. draining any cooking fluid remaining on said cooked pieces from said cooked pieces; and
 - p. storing said cooked pieces at a temperature of at least about 120° F.

4,054,674

SEMI-MOIST ANIMAL FOOD

David Barker, Melton Mowbray; Ian Edward Burrows, Gaddesby, and Keith Buckley, Melton Mowbray, all of England, assignors to Pedigree Petfoods Limited, Melton Mowbray, England

Filed Apr. 23, 1974, Ser. No. 463,425

Claims priority, application United Kingdom, Apr. 25, 1973, 19703/73

Int. Cl.² A23L 3/34

U.S. Cl. 426—326

12 Claims

1. A packaged moist food composition comprising:
 - a. edible proteinaceous material;
 - b. moisture at a concentration of from 15 to 45% by weight of the composition;
 - c. and sufficient edible water-soluble material to confer bacteriological stability on said composition,
 said water-soluble material including from 5 to 30% polypeptide solids by weight of said composition, said material being such as confers on a 50% aqueous solution thereof a water activity of less than 0.95, the molecular weight of said polypeptide solids being low enough for water solubility at ambient temperature, thereby to reduce the vapor pressure of the moistening component.

4,054,675

SELECTIVE PEACH PITTING

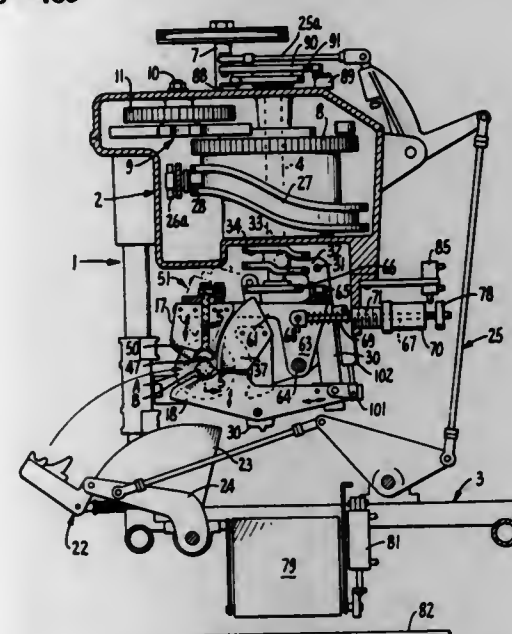
Henry Lewis Spence, Pleasanton, Calif., assignor to Filper Corporation, Reno, Nev.

Division of Ser. No. 609,874, Sept. 2, 1975. This application Apr. 7, 1976, Ser. No. 674,709

Int. Cl.² A23P 1/00

U.S. Cl. 426—485

5 Claims



1. A method of pitting clingstone peaches at a single pitting station, some having sound pits and some having split pits, and presented randomly in succession to said station, comprising:
 - a. supporting each whole peach at said station with its suture substantially in a predetermined plane;
 - b. substantially bisecting the body of said peach in said plane and at the same time;
 - c. moving opposed pit-gripping means and a coring spoon through the body of said peach in said plane toward the edges of the pit;
 - d. upon said pit-gripping means engaging and gripping the edges of a sound pit, holding the same against rotation, and maintaining said coring spoon inoperative in said plane;
 - e. upon either of said pit-gripping means passing between the halves of a split pit, moving said coring spoon into an operative position extending transversely of said plane into said body on opposite sides of said pit; and thereafter,
 - f. rotating the halves of said bodies relative to said pit-gripping means and said coring spoon about and axis extending transversely to said plane and extending through said

pit for either shearing said halves from a held sound pit or cutting a core including said split pit from said halves.

4,054,676

EDIBLE WITH POLYMERIC HYDROQUINONE ANTIOXIDANT

Ned M. Weinshenker, Palo Alto, and James A. Dale, Redwood City, both of Calif., assignors to Dynapol, Palo Alto, Calif.

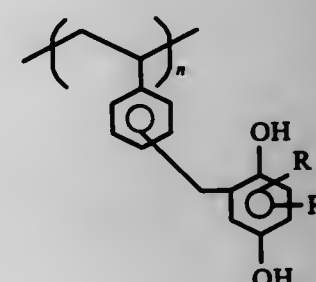
Filed Dec. 4, 1974, Ser. No. 529,325

Int. Cl.² A23D 5/04

U.S. Cl. 426—546

5 Claims

1. An oxidizable composition stabilized against the oxidative edible degradation comprising an oxidizable material having admixed therewith a stabilizing amount in the range of from 2 ppm to 50,000 ppm by weight of the polymeric hydroquinone represented by the structural formula



wherein R and R' are independently selected from the members of the group consisting of hydrogen and lower saturated alkyls of from 1 to 5 carbon atoms inclusive and n has a value of from 3 to 10,000 inclusive.

4,054,677

PROCESS FOR PREPARING VEGETAL PROTEINIC CONCENTRATES, PRODUCTS THEREBY OBTAINED, AND MILK SUBSTITUTING FEEDS CONTAINING SAID CONCENTRATES

Stefano Orban, Bagni di Tivoli, Rome, Italy

Filed July 30, 1975, Ser. No. 600,379

Claims priority, application Italy, July 30, 1974, 5235/74

Int. Cl.² A23J 3/00; A23K 1/14

U.S. Cl. 426—602

7 Claims

1. A process for preparing a vegetal proteinic feed to be used as base material for replacing natural milk for nutrition of young mammals, said process comprising the steps of: submitting to a bland acid hydrolysis at a temperature of 80°-120° C at least one vegetal flour with a proteinic content of 20-75% by an acid in solution of 0.2 to 10% acid and controlling the hydrolysis to solubilize at least 50% of the proteins and transform 5-30% of the proteins into free amino acids, submitting to a bland alkaline hydrolysis at least one vegetal flour with a proteinic content of 20-75% by an alkali in solution of 0.1 to 5% alkali and controlling the hydrolysis to solubilize at least 50% of the proteins and transform 5-30% of the proteins into free amino acids, and mixing the acid hydrolysate and alkaline hydrolysate and adjusting said mixture to a pH value of 6.7 to 7.1, and wherein fats in nutritional amounts are intimately incorporated into said neutralized hydrolysate mixture to form a stable emulsion, whereby in the process the proteinic fraction is resolved into easily digestible derivatives, a great part of the polysaccharides is resolved in simpler sugars, the enzymes are destroyed and the oligosaccharides which are harmful for the digestion are removed.

4,054,678

SODIUM ALUMINUM PHOSPHATE

Robert E. Benjamin; James C. Anglea; Thomas E. Edging, all of Nashville; Jerry D. Griffith, Franklin; A. J. Patterson, Nashville, and Thelton A. Webster, Madison, all of Tenn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 30, 1976, Ser. No. 671,769

Int. Cl.² A21D 2/02

U.S. Cl. 426—653

9 Claims

1. A process for the preparation of an improved potassium modified 1:3:8 sodium aluminum phosphate which comprises:
 - a. contacting, at a temperature above 40° C., a food grade phosphoric acid having a concentration of about 85.0 to about 88.0 weight percent H₃PO₄ with a sufficient amount of potassium ion to provide an analysis of about 0.5 to about 1.2 weight percent K₂O in the final product, and a sufficient amount of sodium ion to provide an analysis of about 2.4 to about 3.2 weight percent of Na₂O in the final product;
 - b. contacting the sodium-potassium treated phosphoric acid with a sufficient amount of alumina to provide a concentration of about 15 to about 17% by weight Al₂O₃ in the final product;
 - c. cooling the slurry of potassium modified sodium aluminum phosphate thereby formed to a temperature varying from about 60 to about 75° C;
 - d. drying and granulating the potassium modified sodium aluminum phosphate;
 - e. milling and classifying the potassium modified sodium aluminum phosphate to obtain the following particle size distribution:
 - from about 0.1 to about 5% retained on 60 mesh;
 - from about 3 to about 20% through 60 on 100 mesh;
 - from about 9 to about 50% through 100 on 140 mesh.

4,054,679

STEAM INJECTION AND FLASH HEAT TREATMENT OF ISOELECTRIC SOY SLURRIES

Irving Melcer, Park Forest, and Louis Sair, Evergreen Park, both of Ill., assignors to The Griffith Laboratories, Inc., Alsip, Ill.

Filed Oct. 15, 1975, Ser. No. 622,538

The portion of the term of this patent subsequent to June 13, 1989, has been disclaimed.

Int. Cl.² A23J 1/14

U.S. Cl. 426—656

18 Claims

1. In the method of treating a soybean material to provide a soy product, said method including the steps of forming an aqueous slurry of soybean material and processing said slurry under controlled conditions of time, temperature and pH to destroy bacteria, to modify the physical and the chemical properties of the slurry and to improve the flavor properties thereof, the improvement wherein the processing of said slurry comprises the steps of:
 - a. adjusting the pH of an aqueous slurry of soybean material to an isoelectric pH value characteristic of the protein being treated, said value being in the range of from about pH 3.5 to about pH 5.5,
 - b. injecting pressurized steam into said slurry to provide a rapid rise in temperature of from about 225° to about 400° F while said slurry is contained in a confining vessel,
 - c. maintaining a short dwell time of contact of said slurry with said pressurized steam in said vessel, said time being preferable of from about 3 seconds to about 3 minutes, duration,
 - d. and, while the steam-treated slurry is at a temperature of at least 160° F; promptly elevating the pH of the slurry to a value in the range of from about 6 to about 10.5 to minimize denaturation of proteins contained in the slurry, and recovering a homogeneous, readily dispersible water miscible fluid product containing both solubilized carbohydrates and soluble protein,

said fluid product being further characterized by absence of bacterial activity, substantial freedom from objectionable beany flavor and odor, particular suitability for use in food products for human consumption, and enhanced palatability.

4,054,680

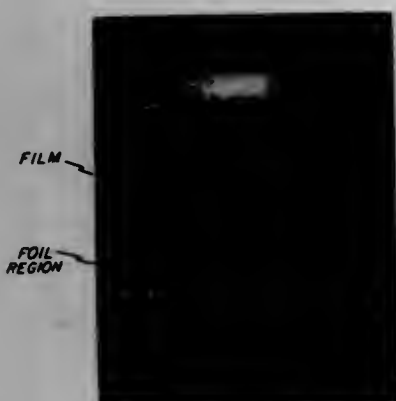
METHOD OF FABRICATING IMPROVED CAPACITORS AND TRANSFORMERS

Amundus H. Sharbaugh, Clifton Park, and David G. Shaw, Glens Falls, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 28, 1976, Ser. No. 700,298
Int. Cl.² B05D 3/06, 5/12

U.S. Cl. 427-13

7 Claims



1. A process for increasing corona-start voltage and operating voltage of a device to be fluid-impregnated, said device including a layer of insulating material between two layers of conductor, said process comprising:
maintaining said device in an atmosphere of unsaturated monomeric gas; and
converting said unsaturated monomeric gas to solid polymer at regions of high electric stress in said device when a voltage is applied across said two layers of conductor.

4,054,681

COATING POWDERS ON THE BASIS OF THERMOPLASTIC POLYESTERS

Klaus Brüning, Bergisch-Gladbach; Karl-Günter Sturm, St. Augustin, and Siegfried Hahn, Siegburg-Kaldauen, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 499,250, Aug. 21, 1975, Pat. No. 4,012,363.
This application Nov. 20, 1975; Ser. No. 633,996
Claims priority, application Germany, Sept. 15, 1973, 2346559
Int. Cl.² B05D 1/04, 1/06; B05B 5/00

U.S. Cl. 427-27

15 Claims

1. In a process for coating a substrate by a powder coating process wherein a polyester powder is applied to said substrate, the improvement which comprises using as the polyester powder a powder consisting essentially of a partially crystalline powder of an acid component comprising an acid or ester of at least 60 mole percent of which is terephthalic acid and a diol component of at least 50 mole percent of which is 1,4-butanediol, said polyester having a glass transition temperature of between +20° and +50° C, as measured at the attenuation maximum in accordance with Deutsche Industrie Norm 53,445, a reduced η_{red} viscosity of 0.7 to 1.0, as determined in a one weight percent solution in a mixture of 60 parts by weight phenol and 40 parts by weight 1,1,2,2-tetrachloroethane at 25° C and melting maximum as determined by differential thermal analysis of 170 to 190° C, said powder having a grain size of 10-300 microns and being in admixture with a leveling agent.

PHOTOPOLYMERIZABLE COMPOSITION CONTAINING A THIOETHER SENSITIZER

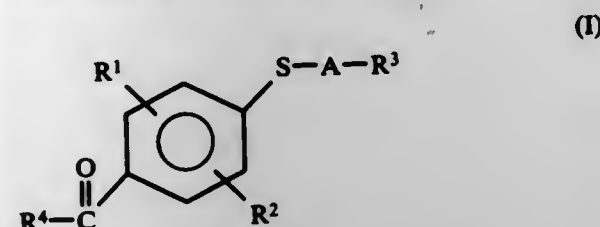
Werner Kuesters; Rolf Osterloh, both of Ludwigshafen, and Manfred Jacobi, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany
Filed Jan. 6, 1977, Ser. No. 757,382

Claims priority, application Germany, Jan. 23, 1976, 2602419
Int. Cl.² C08F 2/46, 4/00

U.S. Cl. 427-54

15 Claims

1. A photopolymerizable composition containing olefinically unsaturated compounds and 0.2 to 20% by weight, based on the unsaturated compounds, of a photoinitiator, wherein the photoinitiator is a mixture of
A. a thioether of the general formula (I):



where

R¹ is phenyl, naphthyl, thienyl, furyl or styryl which may be substituted by one or more identical or different R⁵'s,
R² is phenyl, benzoyl, halogen, alkyl of 1 to 5 carbon atoms, alkyl having an —O—group and 1 to 5 carbon atoms, alkyl having an —S—group and 1 to 5 carbon atoms, alkoxyalkyl of 2 to 5 carbon atoms, alkaryl of 7 to 11 carbon atoms, aralkyl of 7 to 11 carbon atoms, NO₂, CN, COOH or COOR⁶, R⁶ being an alkyl of 1 to 5 carbon atoms,
A is the alkylene group C_nH_{2n} (n = an integer of 1 to 5) which may be substituted by one or more R⁴'s and/or R⁵'s, and R¹, R² and R³ may be identical or different and are each H, an R⁴ or an R⁵,

and
B. an organic amine.

4,054,683

PIGMENTED ACTINIC LIGHT POLYMERIZABLE COATING COMPOSITIONS CONTAINING PHENANTHRENEQUINONE

Gerald W. Gruber, Sewickley, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 2, 1976, Ser. No. 654,507
Int. Cl.² B05D 3/06

U.S. Cl. 427-53

3 Claims

1. An actinic light polymerizable coating composition consisting essentially of:
a. phenanthrenequinone, said phenanthrenequinone being present in an amount in the range of from about 0.01 percent to about 10 percent by weight based on the weight of the binder of said coating composition;
b. organic polymerizable material containing a plurality of sites of ethylenic unsaturation and capable of being free radically addition polymerized by interaction with said phenanthrenequinone upon exposure to actinic light, said organic polymerizable material comprising polymer having a plurality of sites of acrylic unsaturation, monomer having a plurality of sites of acrylic unsaturation or mixture thereof, said organic polymerizable material being present in an amount in the range of from about 20 percent to about 100 percent by weight of the binder of said coating composition; and
c. rutile, said rutile being present in an amount in the range of from about 5 percent to about 70 percent by weight of said coating composition.

4,054,684

COMPOSITION FOR FORMING COLORED IMAGES, NEW RECORDING MATERIAL AND PROCESS USING SAME

Claude Ceintrey, and Herve Nicolle, both of Dieppe, France, assignors to La Cellophane, Paris, France

Filed Dec. 2, 1975, Ser. No. 637,087

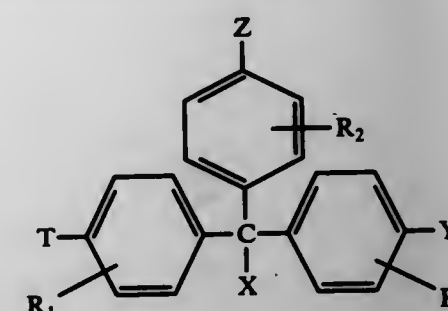
Claims priority, application France, Dec. 3, 1974, 74.39454
Int. Cl.² C09D 11/00; B05D 3/06, 3/12

U.S. Cl. 427-54

23 Claims

1. A composition for use in the production of colored images by the application of heat or pressure comprising an intimate mixture of:

a. triphenylmethane paraamino leuco salt of the formula:



wherein X is halogen, CN or HSO₃; Y, Z and T which may be the same or different are hydrogen or a substituted or unsubstituted amino group, with the proviso that at least one of Y, Z and T is an amino group; and R₁, R₂ and R₃ which may be the same or different are hydrogen, halogen or alkyl of 1 to 3 carbon atoms; and

b. a metallic oxide or metallic sulfide selected from the group consisting of zinc sulfide, zinc oxide, tin oxide, titanium oxide, alumina and silica

wherein the ratio of (a) to (b) is from 0.001:1 to 0.005:1 by weight.

4,054,685

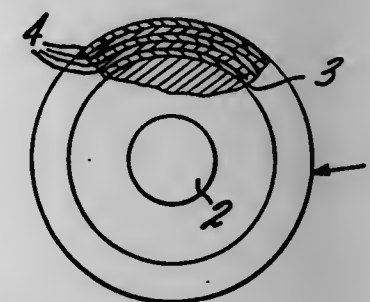
METHOD AND APPARATUS FOR MAKING WIPING CYLINDER OF STEEL ENGRAVING PRINTING PRESS

Gualtiero Giori, Lausanne, Switzerland, assignor to De la Rue Giori S.A., Switzerland
Continuation-in-part of Ser. No. 409,265, Oct. 24, 1973, Pat. No. 3,900,595, which is a division of Ser. No. 175,924, Aug. 26, 1971, Pat. No. 3,785,286, which is a continuation-in-part of Ser. No. 833,672, June 16, 1969, abandoned, and Ser. No. 462,355, June 8, 1965, abandoned. This application May 2, 1975, Ser. No. 573,971

Claims priority, application Italy, June 18, 1964, 48397/64
Int. Cl.² B32B 31/22; B41F 9/08

U.S. Cl. 427-55

13 Claims



1. A method of making a wiping cylinder of a steel engraving press which comprises the steps of
a. providing a metal base cylinder, covering said cylinder with a layer of rubber of uniform thickness,
b. mounting said cylinder for rotation about its longitudinal axis with said axis horizontal,
c. mounting a straight doctor blade horizontally at one side of said cylinder for micrometric movement toward and

away from said cylinder, said blade extending parallel to the cylinder the full length of said cylinder,
d. bringing said blade into engagement with the periphery of said covered cylinder,
e. retracting said blade micrometrically while keeping it parallel to the cylinder to provide a predetermined small uniform space between said blade and cylinder, said space extending the full length of said cylinder,
f. supplying heat-hardenable plastic composition to the upper side of said blade while rotating said cylinder slowly in a direction to cause its periphery to move downwardly past said blade to thereby apply to said cylinder a thin uniform layer of said composition having a thickness determined by said space between said blade and said cylinder,
g. discontinuing the supply of said composition to said blade and continuing rotation of said cylinder with said blade in said position to smooth said layer without applying additional plastic composition,
h. removing said blade from said cylinder, and rotating said coated cylinder while applying to said cylinder simultaneously throughout its length radiant heat to effect predetermined hardening of said layer.

4,054,686

METHOD FOR PREPARING HIGH TRANSITION TEMPERATURE Nb₃Ge SUPERCONDUCTORS

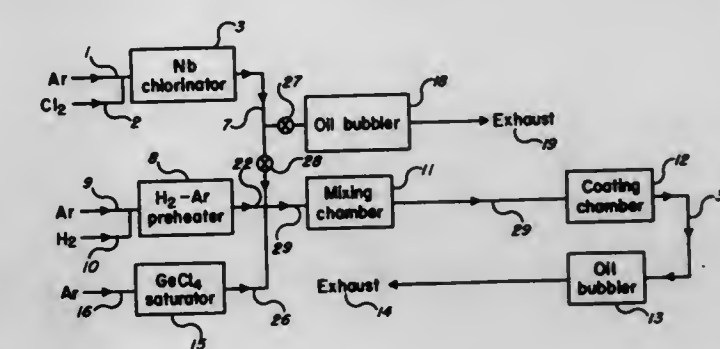
Lawrence R. Newkirk, Los Alamos, and Flavio A. Valencia, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 26, 1975, Ser. No. 590,757

Int. Cl.² H01L 39/12

U.S. Cl. 427-62

2 Claims



1. In a method of forming bulk coatings of high transition temperature Nb₃Ge superconductors by the coreduction of flowing Nb and Ge chlorides in the presence of flowing hydrogen, the improvement comprising quantitatively forming NbCl₅ vapor at a desired rate by flowing Cl₂ gas at a desired rate over an excess of Nb metal at a temperature in the range of about 250° to about 260° C, the partial pressure of said NbCl₅ vapor in the presence of said Nb metal being maintained at about 0.1 atm or less, and using said NbCl₅ vapor as the source of the Nb chloride used in said coreduction.

4,054,687

METHOD FOR MAKING A FUEL CELL ELECTRODE

Harold Russell Kunz, Vernon, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Division of Ser. No. 691,921, June 1, 1976, Pat. No. 4,028,274.
This application Dec. 17, 1976, Ser. No. 751,509
Int. Cl.² B01J 21/18, 23/42

U.S. Cl. 427-115

7 Claims

1. In the process of making a fuel cell electrode the steps of:
depositing metal oxidizing catalyst crystallites on the surfaces of support particles consisting of carbon which is at least partially graphitized;
oxidizing the surface of the support particles only at the metal oxidizing catalyst crystallite sites;

removing the metal oxidizing catalyst crystallites; depositing platinum on the oxidized support particles to form a supported platinum catalyst; forming an admixture of the supported platinum catalyst and a fluorocarbon polymer binder; and depositing said admixture onto a substrate to form a fuel cell electrode.

4,054,688

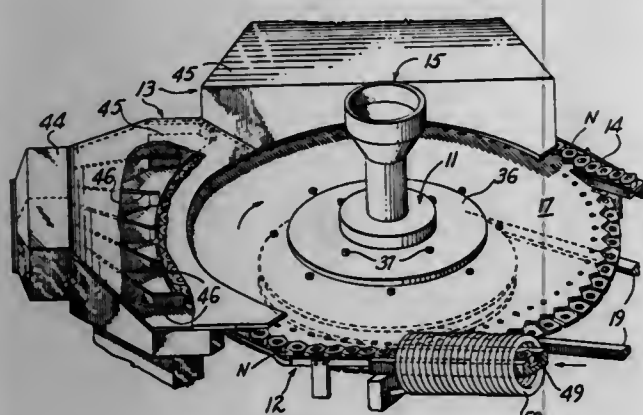
METHOD OF MAKING LOCKING NUTS

Richard J. Duffy, Salem, and Phillip J. Rodden, Beverly, both of Mass., assignors to USM Corporation, Boston, Mass. Continuation-in-part of Ser. No. 572,199, April 28, 1975, Pat. No. 3,995,074, which is a division of Ser. No. 396,094, Sept. 10, 1973, Pat. No. 3,894,509. This application July 12, 1976, Ser. No. 704,294

Int. Cl.² B29F 5/00

U.S. Cl. 427-183

3 Claims



1. Process for applying locking patches of resilient resin to internally threaded articles having openings at both ends of the threaded portions comprising: conveying said articles in a path for treatment with the axes of their threaded portions in an up and down position and with the openings at the upper and lower ends of the threaded portions substantially uncovered, heating said threaded portions of said articles to a temperature above the softening point of resin to be applied, directing particles of heat fusible resin upwardly through said openings at the lower ends of said articles against a first area of each of said threaded portions during movement in a first portion of said path to cause said resin particles to be softened by heat from said threaded portions and to build up a deposit on said area, sequentially turning each of said articles about the axis of its threaded portion through a predetermined angle, less than 360°, at an intermediate location along said path to dispose a further area of said threaded portion to receive particles, directing particles of heat fusible resin against said further area of each of said threaded portions to build up a deposit on said further area during movement along the remaining portion of said path, coalescing the deposited resin particles, and cooling the resin from fused state to a solid resilient condition effective to provide locking action.

4,054,689

METHOD OF PREPARING HYDROPHOBIC SILICA

Donald William Calvin, Zachary, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 7, 1976, Ser. No. 730,541

Int. Cl.² C01B 33/18; C09C 3/00

U.S. Cl. 427-215

7 Claims

1. A method of causing fine-particle silica to be hydrophobic, said method comprising providing a supply of substantially dry, fine-particle silica which is not hydrophobic and a supply of gaseous anhydrous HF or a gaseous HF stream containing water vapor, contacting the silica, in the substantial absence of liquid

water, with the gaseous anhydrous HF or gaseous HF stream containing water vapor at a temperature above the dew point of the HF and the water vapor, when water vapor is present continuing said contacting until the amount of fluorine values sorbed by the silica is in the range of about 0.06 to about 2% by weight, discontinuing the supply of HF vapor being supplied to the silica, and recovering the so-formed hydrophobic silica.

4,054,690

ACRYLIC MODIFIED URETHANE BOBBIN FINISH

Walter C. Webster, III, Beebe River, N.H., and Frank L. Allen, Jr., Hopedale, Mass., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 2, 1975, Ser. No. 573,863

Int. Cl.² B05D 3/12

U.S. Cl. 427-240

3 Claims

1. A process for producing an improved wood textile bobbin comprising: a. providing a bobbin body which has been dried to less than about 9% moisture; b. applying a first protective coating to said bobbin body, which coating consists essentially of from about 20 parts by weight ricinoleate diphenyl methane diisocyanate prepolymer 7-14 parts by weight trifunctional polyether polyol, 20-40 parts by weight xylene and 20-40 parts by weight ethylene glycol monoethyl ether acetate; c. applying a second protective coating directly to said first protective coating before said first protective coating has cured, said second protective coating consisting essentially of from about 20 parts by weight ricinoleate diphenyl methane diisocyanate prepolymer and 7 to 14 parts by weight trifunctional polyether polyol, 12-27 parts by weight thermoplastic acrylic copolymer, balance substantially all xylene and ethylene glycol monoethyl ether acetate.

4,054,691

PROCESS FOR PROMOTING THE ADHESION OF CEMENTITIOUS MATERIAL TO CLOSED CELL GENERALLY SMOOTH SKINNED FOAM MATERIALS

William J. McMillan, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 24, 1975, Ser. No. 617,333

Int. Cl.² B05D 1/36, 3/12, 7/02

U.S. Cl. 427-290

5 Claims

1. A process for promoting the adhesion of a portland cement protective covering to the surface of closed cell, generally smooth skinned styrene polymer foam material which process comprises the sequential steps of (1) providing in said foam surface a plurality of indentations therein, (2) applying to said surface a substantially continuous first coating of a thermoplastic styrene-butadiene copolymer latex consisting essentially of a styrene-butadiene-1,3 copolymer having a styrene to butadiene weight ratio of about 30:70 to 70:30, and based on the weight of said copolymer, (a) from about 2 to about 10 percent of non-ionic surfactant, (b) from about 0.75 to 7.5 percent of anionic surfactant, at least about 15 percent of which is sodium alkyl sulfate in which the alkyl groups contain 9 to 17 carbon atoms, the sum of (a) and (b) not exceeding about 11 percent by weight of said copolymer and the weight ratio of (a) to (b) being within the range of about 0.7:1 to 10:1, then (3) applying a portland cement protective covering to the coated surface prior to substantial dehydration of said first coating, and (4) allowing said portland cement protective covering to harden.

4,054,692

METHOD OF IMPREGNATING AND DRYING MATERIALS AND INSTALLATIONS FOR CARRYING OUT THIS METHOD

Jean Monmarson, Vitry-sur-Seine, France, assignor to Mecalix S.A., Vitry-sur-Seine, France

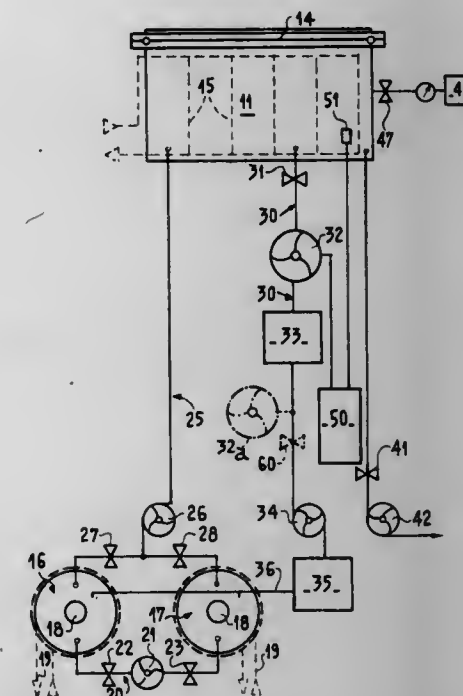
Filed Dec. 18, 1975, Ser. No. 641,873

Claims priority, application France, Dec. 19, 1974, 74.42052

Int. Cl.² B05D 3/00, 1/18

U.S. Cl. 427-296

6 Claims



1. A method of impregnating and drying cardboard for packaging purpose with impregnating liquid which is formed by an impregnating substance and solvent, said method comprising the steps of isolating the material in a sealed treatment container; introducing and maintaining during the treatment period, said impregnating liquid into said treatment container; evacuating said impregnating liquid, after said treatment; creating a vacuum in said treatment container to extract all traces of solvent by pumping; recycling said solvent after pumping; said method further comprising the step of removing substantially all traces of oxygen from said treatment container before the step of introducing impregnating liquid; and the step of controlling the rate of evaporation and of recovery of the solvent to prevent bubbles from forming locally in the cardboard.

4,054,693

PROCESSES FOR THE PREPARATION OF RESINOUS BODIES FOR ADHERENT METALLIZATION COMPRISING TREATMENT WITH MANGANATE/PERMANGANATE COMPOSITION

Edward J. Leech, Oyster Bay; Joseph Polichette, South Farmingdale, and John G. Branigan, Smithtown, all of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Division of Ser. No. 521,891, Nov. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 314,748, Dec. 13, 1972, abandoned. This application July 9, 1975, Ser. No. 594,505

Int. Cl.² C23C 3/02; C09K 13/00, 13/02

U.S. Cl. 427-304

11 Claims

1. In a process for producing a securely bonded layer of metal on a resinous surface by electroless metal deposition the improvement which comprises contacting the resinous surface, prior to electroless metal deposition, with a composition comprising water, permanganate ion and manganate ion in the molar ratio of manganate ion to permanganate ion of up to 1.2, said composition having a pH in the range of 11 to 13, followed by removal of substantially all oxidation by-products of said contacting from the resinous surface prior to electroless metal deposition.

4,054,694

METHOD FOR APPLYING FATIGUE-RESISTANT SURFACE COATING

Henry Raich, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,727

Int. Cl.² B05D 3/00, 3/02

U.S. Cl. 427-352

8 Claims

1. A method for forming an adherent, wear and fatigue resistant, protective film on a surface of a metal object, prior to contact of the object with another metal surface, which comprises:

- coating and reacting the surface of the object with a solution of dinonylphenyl hydrogen phosphonate in a non-reactive solvent;
- thereafter removing the non-reactive solvent with a solvent in which the non-reactive solvent is soluble; and,
- drying the metal object after removal of the non-reactive solvent from the surface thereof.

4,054,695

TEXTILE FIBER HAVING IMPROVED FLAME RETARDANCY PROPERTIES

Gordon Carlton Johnson, Armonk, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

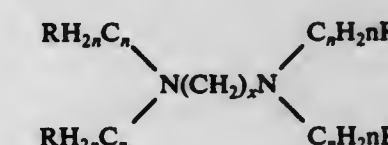
Filed Mar. 19, 1976, Ser. No. 668,800

Int. Cl.² C09K 3/28; C09D 5/18

U.S. Cl. 427-390 D

28 Claims

1. The process of improving the flammability retardancy of a silicone treated synthetic organic fiber material comprising applying on the said surface of material a flammability retarding amount treated of a flammability retarder of the formula:



wherein x has a value of from 2 to 4; n has a value of from 1 to 5; R is carboxyl or hydroxyl or a salt, ether or ester thereof.

4,054,696

ARTIFICIAL AND MECHANICAL TREE

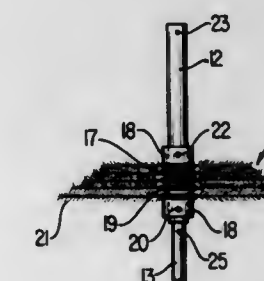
Frederick Scott Crownover, Rte. 1, Box 27, Columbiana, Ala. 35051

Filed Feb. 22, 1977, Ser. No. 770,434

Int. Cl.² A47G 33/06

U.S. Cl. 428-9

5 Claims



1. An artificial and mechanical tree, comprising: a base member; a pole member secured to said base member, said pole member having attachment means located at intervals along the length thereof; and at least one accordion-type tree limb section, said tree limb section including a tubular member having at least a portion thereof constructed of a vertically collapsible and expandable accordion-type material, said tubular member having a diameter slightly larger than that of the pole member to allow the tubular member to fit over the pole member, said tubular member being concentric with said pole member and having attachment means at the upper and lower

end thereof which is engageable with said attachment means of said pole member to retain the accordion-type portion of said tubular member in an expanded condition; said accordion-type portion having attached thereto a plurality of tree limbs which extend radially outwardly from said tubular member.

4,054,697

DECORATIVE SHEET MATERIAL

David Robert Reed, Mottram, and Thomas Whitehead Stafford, Hyde, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 28, 1975, Ser. No. 626,562

Claims priority, application United Kingdom, Dec. 16, 1974, 54172/74

Int. Cl.² E04F 13/00

U.S. Cl. 428—40

5 Claims

1. A sheet material having a decorative surface and a working surface, the working surface being provided with a continuous coating of a tacky, pressure-sensitive, adhesive, the improvement comprising providing on the adhesive coating a discontinuous layer of resilient, non-adhesive, solid particles of a material selected from a foamed organic polymeric material, a natural or synthetic rubber or blends thereof.
3. A sheet material as claimed in claim 1 in which the discontinuous layer of resilient particles is covered with a release paper.

4,054,698

CARPET BINDING TAPE

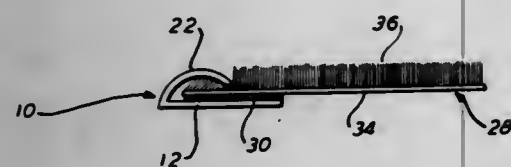
Joseph J. Hamrah, 5 Longview Road, Edison, N.J. 08817

Filed Dec. 10, 1975, Ser. No. 639,265

Int. Cl.² A47G 27/04

U.S. Cl. 428—40

1 Claim



1. Carpet binding tape for floor covering, comprising: a longitudinally extending strip-like body of predetermined material, said body having two longitudinally extending edges and having a top and a bottom; a curved flange portion of said predetermined material extending co-incidentally with and longitudinally of said body and formed integrally with one of said longitudinally extending edges of said body, said curved flange portion over-hanging the top of said body and providing in combination with said top of said body a channel for receiving and partially surrounding the edge portion of said floor covering;
- a strip of pressure sensitive adhesive material formed on said top of said body and extending co-incidentally with and longitudinally of said top of said body;
- a strip of release material provided on top of said strip of pressure sensitive adhesive material and extending co-incidentally with and longitudinally of said adhesive material, said release material for covering said adhesive material and for preventing unwanted adhesion between said carpet binding tape and objects other than said floor covering;
- upon said release strip being removed from said adhesive material and upon said edge portion of said floor covering being received within and partially surrounded by said channel, and upon said adhesive material being pressed into engagement with the underside of said edge portion of said floor covering, said adhesive material securing said carpet binding tape to said edge portion of said floor covering and said one longitudinally extending edge of said body providing said floor covering with a uniform

edge and preventing unraveling and fraying of the floor covering; and said longitudinally extending strip-like body of predetermined material being sufficiently flexible to permit said carpet binding tape to be rolled up with said floor covering thereby eliminating any requirement of removing said carpet binding tape before said carpet can be rolled up.

4,054,699

CHIP TILE PATTERN AND FLOOR CONTAINING SAME

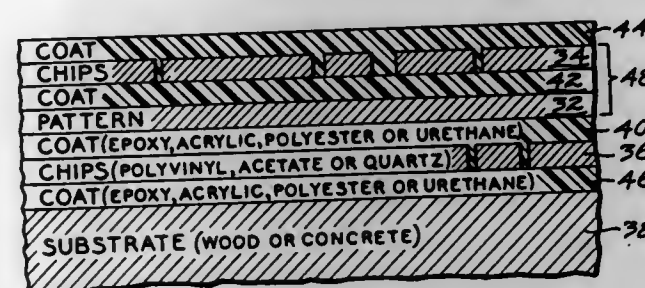
Jerry A. Brinkley, 1416 First Ave., Winchester, Tenn. 37398

Filed Aug. 25, 1976, Ser. No. 717,619

Int. Cl.² E04C 1/24

U.S. Cl. 428—48

4 Claims



1. A method of preparing a tile pattern surface which comprises applying resin selected from the group consisting of epoxy, urethane, acrylic and polyester to a concrete, wood or Masonite surface, sprinkling polyvinyl acetate or quartz chips over the coated surface, drying the surface, vacuuming off loose chips from said surface, topping the coated, chipped surface with said resin, sanding or buffing the resulting coated, chipped and topped surface, tiling by adhering to said coated, chipped and topped surface a plurality of resin coated and chipped sheets of material each of a particular design so as to form a pattern, applying another coat of said resin and drying it, thereby sandwiching the pattern between two layers of said resin, to embed it as a part of a pattern tile surface, drying the surface, sanding said surface again and then applying and drying at least one other coat of said resin without further sanding.

4,054,700

CARPET FITTINGS

Michael Francis Anthony Cooper, Kidderminster, England, assignor to Cobra Metals Limited, England

Filed Aug. 6, 1975, Ser. No. 602,390

Claims priority, application United Kingdom, Aug. 9, 1974, 35157/74; Mar. 27, 1975, 13119/75

Int. Cl.² A47G 27/04

U.S. Cl. 428—90

1 Claim

1. A carpet fitting comprising a body in the form of an aluminum alloy extrusion having a surface which is exposed to view when said fitting is in use, a conversion layer of amorphous oxyphosphate on said exposed surface of said body, a coating on at least said conversion layer of said exposed surface, and said coating comprising an electrostatically deposited flock of fiber strands and a hardenable epoxy resin directly bonding said strands to said coated body to form a pile thereon.

4,054,701

PLASTIC SHEET WITH A SURFACE TREATED TO ENHANCE ADHESION AND METHOD OF MAKING SUCH SHEETS

Alvin J. Hahn, Ladoga, Ind., assignor to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Mar. 1, 1976, Ser. No. 662,862

Int. Cl.² B32B 3/00; B42D 3/02; B29C 3/00

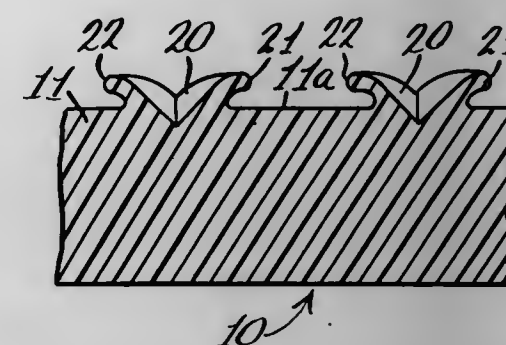
U.S. Cl. 428—156

10 Claims

1. A sheet of thermoplastic material which has had a planar

surface treated to enhance adherence of paper thereto by means of an adhesive of the class consisting of animal glues and water base adhesives, said surface being characterized by a continuous pattern of small, shallow recesses separated by inter-recess planar areas of said surface, and a raised rim of the thermoplastic material bordering each of said recesses and projecting above the planar areas, a large percentage of said rims having at least a part of their outer periphery overhanging a portion of the adjacent inter-recess planar area.

6. A method of treating a planar surface of a sheet of thermoplastic material to enhance adherence of paper thereto by an adhesive of the class consisting of animal glues and water base



adhesives, said method comprising the step of subjecting said planar surface to contact under pressure from a heated member which has a continuous pattern of small, closely adjacent protuberances that displace the thermoplastic material to form in the planar surface a continuous pattern of small recesses, and controlling the temperature of said member, the pressure, and the time of contact so that said recesses are shallow and separated by small inter-recess planar areas, and so that the thermoplastic material displaced to form each recess remains as a raised rim which borders said recess and has at least a part of its outer periphery overhanging a portion of the adjacent inter-recess planar area.

4,054,702

MONOLITH DESIGN

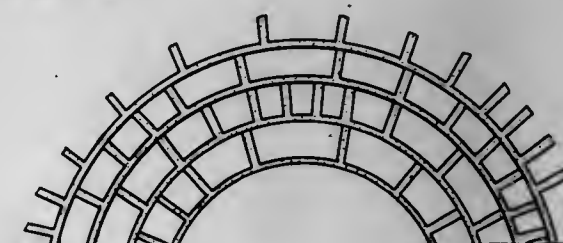
Christian Bent Lundsager, Ashton, and Edwin M. Glocker, Glenelg, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 5, 1976, Ser. No. 664,333

Int. Cl.² B32B 3/30, 3/22

U.S. Cl. 428—167

2 Claims



UNEQUAL SPACING OF RIBS NECESSARY.

1. In an improved ceramic monolith structure prepared by winding successive layers of a rib embossed sheet to provide a structure having channels along the length thereof, said channels having essentially the same dimension in a direction perpendicular to the axis of winding, and subsequently treating said sheet to form a ceramic structure, the improvement comprising

embossing said sheet with a repeating pattern in which the dimension from rib to adjacent rib is unequal and which has a repeating length which is greater than 2π times the thickness of the layers of the embossed sheet.

4,054,703

DRAPERY HEADING

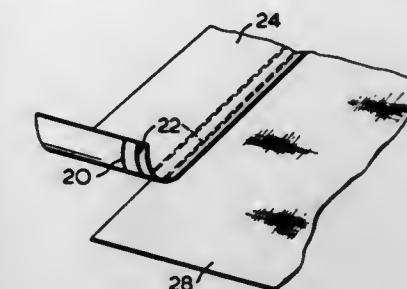
Joseph Boehm, 400 Highway 33 West, Kelowna, British Columbia, Canada (V1X 1Y1)

Filed Apr. 30, 1976, Ser. No. 681,965

Int. Cl.² B32B 7/14; A47H 23/08; B32B 3/06

U.S. Cl. 428—194

2 Claims



1. A drapery support heading for attachment to a drapery crinoline to provide stiffness and support thereto, comprising a flexible, planar, elongated material having a pair of fine lines of adhesive thereon positioned adjacent one longitudinal side of said heading material, said lines of adhesive having a low melting point to seal the heading to said crinoline when heat is applied thereto when the crinoline is laid on the adhesive.
2. A method of heading a drapery crinoline using a heading material having a pair of fine lines of adhesive applied parallel and adjacent to a terminal side edge of the heading, comprising the steps of (a) placing the drapery material in overlapping relation in a straight line over the edge of the heading and one adhesive line (b) applying heat to said crinoline to melt said adhesive and seal the fabric and heading together (c) turning the heading material 360° within the crinoline and applying heat over the second line of adhesive to melt the same and seal the heading to and within the crinoline.

4,054,704

PROCESS FOR DECORATING COATINGS PRODUCED BY HEAT-STABLE POLYMER COMPOSITIONS

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 509,936, Sept. 27, 1974, abandoned, and a continuation-in-part of Ser. No. 552,872, Feb. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,936. This application Aug. 22, 1975, Ser. No. 606,296

Int. Cl.² B32B 3/10, 27/00; B05D 3/02

U.S. Cl. 428—201

16 Claims

1. A process for preparing a decorative coating on a substrate, comprising the following steps, with (a) and (b) performed in any order:
 - a. applying to a substrate a composition comprising
 1. a heat-stable polymer;
 2. a colorant;
 3. optionally, an antioxidant; and
 4. a liquid carrier; and
 - b. applying to a substrate, in a decorative pattern, a composition comprising
 1. an antioxidant;
 2. a liquid carrier; and
 3. optionally, one or more of a heat-unstable organic compound which decomposes to produce a colorant;
- and then heating the resulting coating to the heat-stable polymer fusion temperature wherein the heat stable polymer composition is stable at temperatures above 300° C and the heat-stable polymer is a silicone, polysulfide, polymerized p-hydroxybenzoic acid, a polysulfone, a polyimide, a polyamide, a polysulfonate, a polysulfonamide, a fluorocarbon polymer, or a mixture thereof.

4,054,705

PROCESS FOR DECORATING COATINGS PRODUCED BY HEAT-STABLE POLYMER COMPOSITIONS

Emstathios Vassilion, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 606,296, Aug. 22, 1975, abandoned, Ser. No. 606,297, Aug. 22, 1975, abandoned, Ser. No. 606,298, Aug. 22, 1975, abandoned, and Ser. No. 606,299, Aug. 22, 1975, said Ser. No. 606,296, is a continuation-in-part of Ser. No. 552,872, Feb. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,936, Sept. 27, 1974, abandoned, said Ser. No. 606,297, is a continuation-in-part of Ser. No. 552,871, Feb. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,939, Sept. 27, 1974, abandoned, said Ser. No. 606,298, is a continuation-in-part of Ser. No. 552,870, Feb. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,938, Sept. 27, 1974, abandoned, said Ser. No. 606,299, is a continuation-in-part of Ser. No. 552,873, Feb. 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,937, Sept. 27, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 677,988

Int. Cl.² B32B 3/10, 27/00; B05D 3/02

U.S. Cl. 428-201

17 Claims

1. A process for decorating a heat-stable polymer coating on a substrate, the process consisting essentially of applying a heat-stable polymer composition which is stable at temperatures above 300° C either as a subsequent coat over or directly under or between an antioxidant composition and an oxidation catalyst composition which are both arranged in decorative patterns on a substrate and then baking the coating wherein the antioxidant or its decomposition product and the oxidation catalyst or its decomposition products diffuse into the coating and either by reacting with components of the coating, by catalyzing or hindering reactions within the coating or by themselves render, upon baking, the decorative pattern visible within the heat-stable polymer coatings wherein the heat-stable polymer composition comprising:

a. a heat-stable polymer, said polymer being silicone, polysulfide, polymerized parahydroxy benzoic acid, polysulfone, polyimide, polyamide, polysulfonate, polysulfonamide, fluorocarbons, or mixtures of the above;

b. a liquid carrier;

c. optionally a colorant;

wherein the oxidation catalyst is a compound or mixture of compounds produced by reaction of a metal from list (1) with an acid to form a salt compound of list (2):

(1) Metals

Cobalt
Cerium
Manganese
Iron

Bismuth
Nickel
Lead

(2) Salts

Acetate
Caprate
Caprylate
Isodecanoate
Linoleate
Naphthenate
Nitrate

Octoate
Oleate
Palmintate
Ricinoleate
Soyate
Stearate
Tallate

17. An article bearing a decorative pattern coating produced by the process of claim 1.

4,054,706

LINING MATERIAL FOR FOOT WEAR AND A METHOD FOR MANUFACTURING SAME

Mervin Shapiro, Brooklyn, N.Y., assignor to Continental Combining Corporation, Brooklyn, N.Y.

Filed May 28, 1975, Ser. No. 581,535

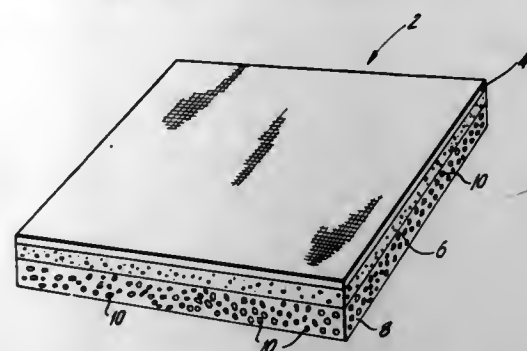
Int. Cl.² B32B 3/26

U.S. Cl. 428-213

10 Claims

10. A multilayer material including a first layer having a first and a second surfaces of a foam material chosen from a group

consisting of polyether and polyurethane, said first layer being between 1/32 and 1/4 inch in thickness;
a second layer of an absorbent fabric material adherent to said first surface of said first layer; and
a third layer of a reprocessed foam material having a density within the range of 8 to 11 pounds per cubic foot, said



third layer comprising flakes of a material chosen from a group consisting of polyether and polyurethane within a linking agent chosen from a group consisting of polyether and polyurethane, adherent to said second surface of said first layer, and said third layer being between 1/32 and 1/4 inch in thickness.

4,054,707

SULPHONATED POLYARYL-ETHER-SULPHONES AND MEMBRANES THEREOF

Jean-Pierre Quentin, Lyon, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Dec. 23, 1975, Ser. No. 643,910

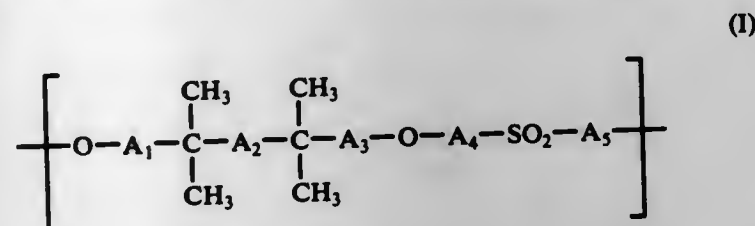
Claims priority, application France, Dec. 26, 1974, 74.42874

Int. Cl.² C08G 75/23

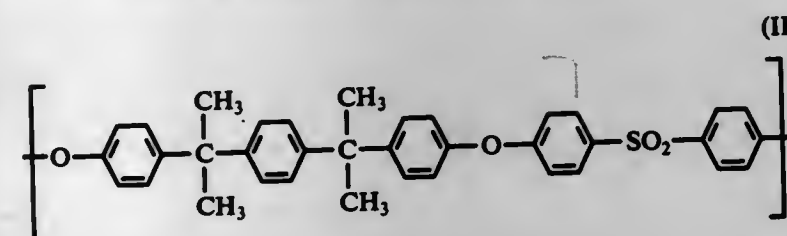
U.S. Cl. 428-213

8 Claims

1. A sulphonated polyaryl-ether-sulphone resin which consists essentially of a plurality of units of the formula:



and, optionally, a plurality of units of the formula:



in which A₁, A₂, A₃, A₄ and A₅ each represents a phenylene radical at least one of which is substituted by a sulphonyl (—SO₂H) or sulfated sulphonyl radical, the relative proportions of units of formula (I) and (II) and the degree of substitution by sulphonyl radicals being such that the number of sulphonyl groups is from about 0.1 to about 5 milliequivalents per gram of dry resin.

4,054,708

FILM OF PYROLYTIC GRAPHITE HAVING BI-DIRECTIONAL REINFORCING PROPERTIES

William A. Robba, Boulder, Colo., and Robert W. Froberg, Easton, Pa., assignors to Pfizer Inc., New York, N.Y.

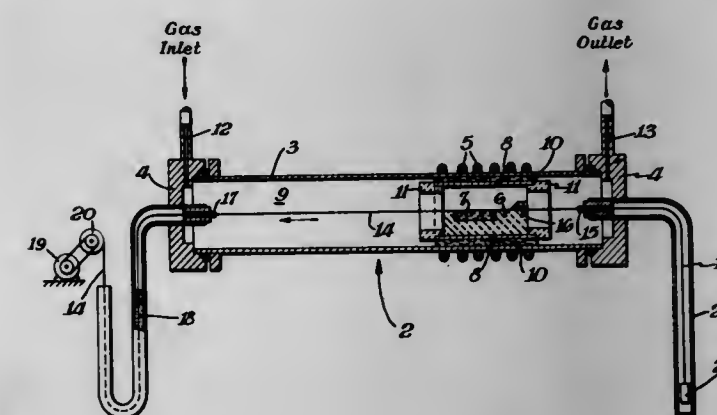
Division of Ser. No. 448,651, March 6, 1974, Pat. No. 3,900,540, which is a continuation of Ser. No. 202,385, Nov. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 154,228, June 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 43,430, June 4, 1970, abandoned. This application May 21, 1975, Ser. No. 579,667

The portion of the term of this patent subsequent to Aug. 19, 1992, has been disclaimed.

Int. Cl.² C01B 31/04; C03B 18/02; B29J 1/00

U.S. Cl. 428-220

2 Claims



1. An unsupported film of pyrolytic graphite having a thickness of from about 1 to 25 microns made by the process which comprises: maintaining the temperature of an inert liquid substrate selected from the group consisting of copper, gold, tin, silver, palladium, lead, antimony, platinum and glass below the melting point of graphite; introducing a premixed source gas comprising a mixture of a hydrocarbon gas and a diluent gas selected from the group consisting of helium, neon, argon, krypton, xenon, radon, hydrogen and nitrogen at a distance above the surface of said liquid substrate, said surface being substantially smooth and stress-free, whereby said hydrocarbon gas decomposes upon contacting said surface to form a pyrolytic graphite film thereon; and separating said film from said surface.

4,054,709

MAN-MADE FIBRE, YARN AND TEXTILE PRODUCED THEREFROM

Mikhail Nikolaevich Belitsin, 2 Donskoi proezd, 6, kv. 9, Moscow; Alexandr Gamsheevich Borik, Borodinsky proezd, 7, kv. 7, Klin Moskovskoi oblasti; Galina Akimovna Kudryashova, ulitsa Mira, 16, kv. 33, Klin Moskovskoi oblasti; Sergei Alexandrovich Kudryashov, ulitsa Mira, 16, kv. 33, Klin Moskovskoi oblasti; Eleonora Viktorovna Goncharova, Lomonosovskiy prospekt, 34a, kv. 51, Moscow; Natalia Alexandrovna Sadkova, Oskaya ulitsa, 22/2, kv. 13, Moscow; Serafim Alexandrovich Pavlov, Leninsky prospekt, 34/1, kv. 293, Moscow; Valentin Vladimirovich Kulikov, Leningradskoe shosse, 44, kv. 58, Klin Moskovskoi oblasti; Galina Petrovna Tolpygina, Maidanovo, 1, kv. 2, Klin Moskovskoi oblasti; Tatyana Nikolaevna Gotie, ulitsa Krasnaya, 1/27, kv. 24, Klin Moskovskoi oblasti; Elena Grigorievna Toropova, ulitsa Gagarina, 47, kv. 23, Klin Moskovskoi oblasti; Nina Ivanovna Ermolina, Borodinsky proezd, 7, kv. 7, Klin Moskovskoi oblasti, and Ivan Vasilievich Puchnin, Nakhimovskiy prospekt, 23, korpus 5, kv. 34, Moscow, all of U.S.S.R.

Filed July 17, 1975, Ser. No. 596,833

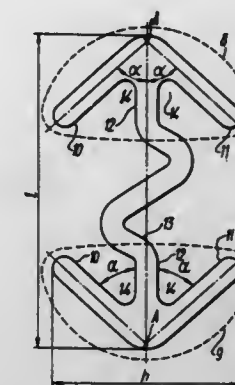
Int. Cl.² D02G 3/00, 3/02

U.S. Cl. 428-224

6 Claims

1. A man-made fibre of a material selected from the group consisting of polycapromide and polyethylene terephthalate and displaying a complex cross-sectional shape formed of at least two elements each comprising three rays namely two outer rays and one middle ray situated between said outer rays,

said rays of each element all intersecting each other at and emanating from a single point, with the rays of each element extending from said point thereof generally toward the rays of the other element, and said middle ray of each element forming with each outer ray thereof an angle within 10° to 70°, said



middle and outer rays of each element defining between themselves open capillary canals adding to mechanical cohesion between individual fibres, and a flexible bridge extending between, forming an extension of, and interconnecting the middle rays of both elements, said bridge being formed of the same material as the elements.

4,054,710

LAMINATED INSULATION BLANKET

Christos J. Botsolas, New Brunswick, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

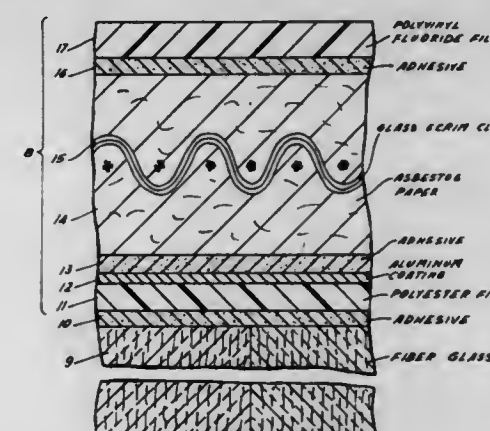
Continuation of Ser. No. 379,643, July 16, 1973, abandoned.

This application Mar. 4, 1976, Ser. No. 670,016

Int. Cl.² B32B 17/02; D03D 15/12

U.S. Cl. 428-228

16 Claims



1. A flexible jacketed thermal insulation blanket which consists essentially of:

a. a flexible thermal insulation element comprising at least one layer of mass type thermal insulation of low thermal conductivity and which is flexible in at least one direction; and adhered thereto in a laminar relationship;

b. a flexible jacket element consisting essentially of;

i. a vapor barrier layer consisting essentially of a first polymeric film having deposited on the interior face thereof a thin coating of a reflective metal, said polymeric film being selected from the group consisting of polyester and halocarbon polymeric film;

ii. a fibrous insulating layer consisting essentially of asbestos fiber reinforced with an open mesh scrim cloth; and

iii. an exterior layer consisting essentially of a second polymeric film selected from the group consisting of halocarbon and acrylic polymeric films; the uncoated face of said first polymeric film being adhered to said thermal insulation element, the metal coated face of said first polymeric film being adhered to one face of said fibrous insulating layer, and the other

face of said fibrous insulating layer being adhered to said second polymeric film.

4,054,711

COMPOSITE INSULATION JACKET

Christos J. Botsolas, New Brunswick, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

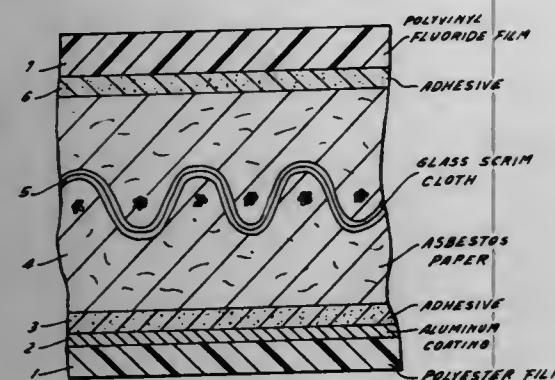
Continuation of Ser. No. 379,342, July 16, 1973, abandoned.

This application Mar. 4, 1976, Ser. No. 670,017

Int. Cl.² B32B 17/02; D03D 15/12

U.S. Cl. 428-228

12 Claims



1. A flexible composite laminated insulation jacket, which consists essentially of:

- a vapor barrier layer consisting essentially of a first polymeric film having deposited on the interior face thereof a thin coating of a reflective metal, said polymeric film being selected from the group consisting of polyester and halocarbon polymeric film;
 - a fibrous insulating layer consisting essentially of asbestos fiber reinforced with an open mesh scrim cloth; and
 - an exterior layer consisting essentially of a second polymeric film selected from the group consisting of halocarbon and acrylic polymeric films;
- the metal coated face of said first polymeric film being adhered to one face of said fibrous insulating layer, and the other face of said fibrous insulating layer being adhered to said second polymeric film.

4,054,712

TONER IMAGE RECEIVING SHEET WITH COLOR FORMING AGENTS

Shinichi Nagashima, Tokyo; Kaichi Tsuchiya, Fuchu; Yoshihiro Sakamoto; Hiroshi Yamakami, both of Tokyo, and Seiji Tomari, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 305,672, Nov. 13, 1972, Pat. No. 3,879,196.

This application Mar. 20, 1975, Ser. No. 560,508

Claims priority, application Japan, Nov. 15, 1971, 46-91246; June 5, 1972, 47-55780; July 10, 1972, 47-68786

Int. Cl.² B32B 7/00

U.S. Cl. 428-262

13 Claims



1. A toner image receiving sheet for producing a low-temperature, heat fixed color image from a colorless or light colored toner image containing a color forming agent (A), said receiving sheet consisting essentially of:

- a color forming agent (B) selected from the group consisting of diarylphthalides, leuco auramines, acryl auramines, α,β -unsaturated arylketones, basic monoazo dyestuff, rhodamine B lactone, polyaryl carbinols, benzoinolono spiropyrans, phthalans and spiropthalans;
- a material having a melting point ranging from 40°-130° C selected from the group consisting of fatty acid, fatty acid

metal salt, fatty acid esters, fatty acid amide, fatty acid anilide and solid plasticizer; and

a paper sheet or web support associated with said color forming agent (B) and said material having a melting point ranging from 40°-130° C;

wherein said receiving sheet contains between 25-130 parts of said material having a melting point ranging from 40°-130° C per 50 parts of said coloring forming agent; and

wherein said color forming agent (B) is adapted to react with said color forming agent (A) in said toner image upon heating to produce said low-temperature, heat-fixed colored image.

4,054,713

PROCESS FOR PREPARING GLASS FIBER MATS

Kahei Sakaguchi; Masaaki Minakata, both of Wakayama; Shigeru Takamori, Osaka; Jun-ichi Furukawa, and Yoshinao Kono, both of Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 536,902, Dec. 27, 1974, abandoned.

This application May 28, 1976, Ser. No. 691,016

Claims priority, application Japan, Dec. 28, 1973, 49-7474

Int. Cl.² B05D 5/00; B32B 17/04

U.S. Cl. 428-285

8 Claims

7. A resin-bonded glass fiber mat having a low solubility in vinyl monomers, which comprises:

- a glass fiber mat having adhered thereto and substantially uniformly distributed thereon from 2.5 to 10 percent by weight, based on the weight of the glass fibers, of unsaturated polyester resin having a melting point of from 80° to 130° C and a molecular weight of from 2500 to 7000, obtained by reacting (A) a dicarboxylic acid component consisting essentially of from 10 to 100 molar percent of at least one α,β -ethylenically unsaturated dicarboxylic acid, or anhydride thereof, and the balance is at least one aliphatic or aromatic dicarboxylic acid, or anhydride thereof, and (B) a polyol component consisting of from 50 to 100 molar percent of bis(β -hydroxyethyl) terephthalate and the balance is one or more polyester-forming polyols, the molar ratio of A:B being 1:0.9 to 1:1.

4,054,714

ELECTRICALLY CONDUCTIVE ADHESIVE COMPOSITION

Sebastian Vito Rocco Mastrangelo, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 7, 1976, Ser. No. 693,560

Int. Cl.² B32B 5/16; H01B 1/02

U.S. Cl. 428-328

15 Claims

1. Nonrigid electrically conductive adhesive composition consisting essentially of polymeric binder, conductive particles having at least their surfaces constituted by a noble metal and a normally liquid polyhydric alcohol.

4,054,715

SEWING THREAD CONTAINING A FLAME RETARDANT LUBRICANT

Jefferson Lyle Claiborne, Hexson, Tenn., assignor to Dixie Yarns, Inc., Chattanooga, Tenn.

Continuation-in-part of Ser. No. 612,546, Sept. 11, 1975, abandoned, which is a continuation of Ser. No. 455,362, March 27, 1974, abandoned. This application Feb. 11, 1976, Ser. No. 657,058

Int. Cl.² D02G 3/00

U.S. Cl. 428-375

11 Claims



1. A flame-retardant yarn or thread, comprising a yarn or thread having applied thereto a flame-retardant lubricant selected from the group consisting of mono- and di-bromo alkanes having from 10 to about 30 carbon atoms.

4,054,716

PREPARATIONS OF REACTION PRODUCTS OBTAINED FROM EPOXIDES, FATTY AMINES AND REACTION PRODUCTS WHICH CONTAIN CARBOXYL GROUPS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Rosemarie Töpfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 27, 1976, Ser. No. 680,639

Claims priority, application Switzerland, May 6, 1975, 5820/75

Int. Cl.² C08L 63/00, 61/20

U.S. Cl. 428-413

27 Claims

1. Preparations of reaction products obtained from epoxides, fatty amines and reaction products which contain carboxyl groups, said preparations being in the form of solutions in organic solvents, or aqueous dispersions or emulsions, and containing

- reaction products of
 - an epoxide which contains in each molecule at least two epoxide groups and which is a polyglycidyl ether of 2,2-bis-(4'-hydroxyphenyl)-propane,
 - a fatty amine containing 12 to 24 carbon atoms,
 - a reaction product which contains carboxyl groups and is obtained from
 - a trihydric to hexahydric aliphatic alcohol,
 - 1,2-propylene oxide, and
 - an aliphatic saturated dicarboxylic acid of 2 to 14 carbon atoms, an ethylenically unsaturated aliphatic dicarboxylic acid of 4 to 10 carbon atoms, a monocyclic or bicyclic aromatic dicarboxylic acid of 8 to 12 carbon atoms; or anhydrides thereof,
 and wherein the mole ratio of (c₁), (c₂) and (c₃) in (c) in 1:2 to 110:2 to 6; and optionally,
 - an epihalohydrin, glycerol dichlorohydrin, acrylic acid, methylolacrylic acid, butylacrylate or acrylonitrile; wherein the reaction products (1) contain, per epoxide group equivalent of component (a), 0.1 to 0.7 amino group equivalent of component (b), 0.2 to 1.5 acid equivalents of component (c), and optionally 0.1 to 0.7 moles of component (d); and
- an alkyl ether of a methylolaminotriazine aminoplast precondensate, and wherein said preparations contain 5 to 70 percent by weight of component (2), relative to reaction products (1), and wherein (1) and (2) are present as a mixture, reaction product of (1) and (2), or both.

4,054,717

MINERAL PAPER COATING COMPOSITIONS CONTAINING LATEX AND AMPHOTERIC POLYMER

Robert A. Gill, Abington; Joseph J. Latimer, Perkiomenville, and Arthur D. Jordan, Jr., Philadelphia, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 19, 1975, Ser. No. 633,301

Int. Cl.² B32B 9/06; C08F 45/06, 45/18

U.S. Cl. 428-452

10 Claims

1. In a coating composition adapted to coat papers consisting essentially of an aqueous dispersion of (1) a finely divided pigmentary material comprising a major amount of clay therein and (2) a binder, in an amount of 5 weight percent to 50 weight percent based on pigment weight, comprising (a) a negatively-charged latex polymer free of amine groups with or without another binder material the improvement wherein the binder additionally comprises (b) a water-soluble polymer of 20% to 100% by weight of units containing a monoethylenically unsaturated monomer having a primary, secondary, or tertiary amine group, the amount of (b) being from 0.1% to 10% by weight of the pigment, but not over 18% by weight of binder component (a), the molecular weight of (b) being from about 5000 number average to about 900,000 viscosity average.

10. A mineral-coated paper product in which a paper sheet carries on a surface thereof a dried deposit of a coating composition as defined in claim 1.

4,054,718

HEAT-SENSITIVE RECORDING MATERIAL CONTAINING A MALACHITE GREEN COLOR FORMER

Robert Garner, Bury, England, and Jean Claude Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 21, 1976, Ser. No. 651,108

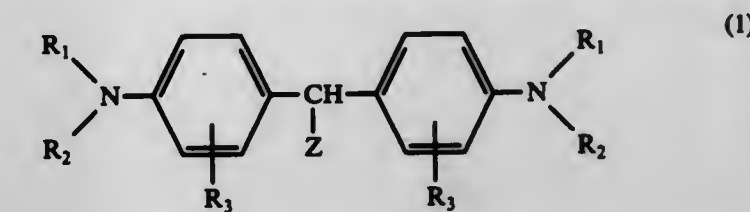
Claims priority, application Switzerland, Jan. 27, 1975, 951/75

Int. Cl.² B32B 29/04, 9/06

U.S. Cl. 428-454

14 Claims

1. A heat sensitive recording material containing at least one color former and at least one electron acceptor in at least one binder layer on paper, said color former having the formula



wherein

R₁ and R₂, which can be the same or different, represent hydrogen, alkyl of at most 12 carbon atoms which is unsubstituted or substituted by cyano or halogen, alkoxy-alkyl of 2 to 8 carbon atoms, benzyl or phenyl, R₃ represents hydrogen, halogen, nitro, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and Z represents alkenyl of at most 12 carbon atoms, unsubstituted or ring-substituted aralkyl or aralkenyl, or represents the radical of a reactive organic methylene compound or of a heterocyclic compound which does not contain active methylene groups.

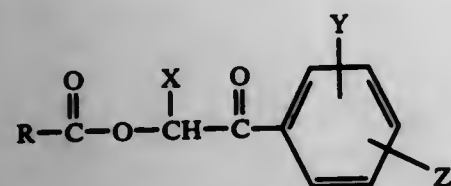
14. A heat-sensitive recording material according to claim 1 which contains attapulgite clay, siltan clay, acid phenolic compounds, acid phenolic resins or a solid organic acid as electron acceptor.

4,054,719
PHENACYL ESTER PHOTSENSITIZERS FOR
RADIATION-CURABLE COATINGS

William Frederick Cordes, III, East Brunswick, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Nov. 23, 1976, Ser. No. 744,367
Int. Cl.² C08F 2/46, 4/00

U.S. Cl. 428—461

1. A liquid coating composition curable by ultraviolet radiation comprising a photopolymerizable polyethylenically unsaturated ester of an α , β -ethylenically unsaturated acid and a polyhydric alcohol and effective photopolymerizing amounts of (1) a tertiary aliphatic amine and (2) a phenacyl acetate represented by the formula:



wherein R is an alkyl radical of 1 to 7 carbon atoms, X is selected from hydrogen or alkyl of 1 to 8 carbon atoms, and Y and Z are each selected from hydrogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms, halogen or phenyl.

4,054,720
FLAME RETARDANT POLYESTER ARTICLE, METHOD
FOR THE PRODUCTION OF THE SAME AND
COMPOSITIONS FOR RETARDING THE
FLAMMABILITY OF POLYESTER ARTICLE

Mikio Tomita, Shiga; Masahito Jimura, Tokyo, and Atsumi Ueno, Kyoto, all of Japan, assignors to Meisel Chemical Works, Ltd., Kyoto, Japan

Filed May 30, 1975, Ser. No. 582,194

Claims priority, application Japan, Feb. 7, 1975, 50-16560
Int. Cl.² C09K 3/28; B01F 17/14; B32B 27/36, 27/18

U.S. Cl. 428—480

1. A flame retardant composition useful in making stable aqueous emulsions for treatment of polyester consisting essentially of a halogenated phosphoric ester and 5 percent to 20 percent by weight of said halogenated phosphoric ester of a nonionic surfactant emulsifier obtained by esterification of a polyethylene glycol ether of a higher alcohol, a polypropylene glycol ether of a higher alcohol, or an alkyl phenol with a phosphoric esterifying agent.

9. A method for the flame retarding treatment of polyester consisting essentially of treating a polyester article with a composition including a halogenated phosphoric ester and 5 percent to 20 percent by weight of said halogenated phosphoric ester of a nonionic surfactant emulsifier derived by esterification of a polyethylene glycol ether of a higher alcohol, a polypropylene glycol ether of a higher alcohol, or an alkyl phenol with a phosphoric esterifying agent, said halogenated phosphoric ester and surfactant emulsifier being admixed with an amount of water sufficient to form a stable aqueous emulsion.

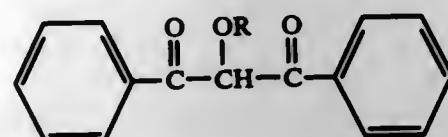
18. A flame retardant polyester article obtained by treating a polyester article with a flame retardant composition consisting essentially of an aqueous emulsion of a halogenated phosphoric ester present in said emulsion in an amount by weight thereof at 7 percent to 20 percent by weight; and 5 percent to 20 percent by weight of said halogenated phosphoric ester of a nonionic surfactant emulsifier derived from the esterification of a polyethylene glycol ether of a higher alcohol, a polypropylene glycol ether of a higher alcohol or an alkyl phenol with a phosphoric esterifying agent.

4,054,721
PHOTOSENSITIZERS FOR RADIATION-CURABLE
COATINGS

William Frederick Cordes, III, East Brunswick, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Nov. 23, 1976, Ser. No. 744,366
Int. Cl.² B05D 3/06

U.S. Cl. 428—500

1. A liquid composition curable by ultraviolet radiation comprising a photopolymerizable polyethylenically unsaturated ester of a polyhydric alcohol and an effective amount of a photosensitizer compound represented by the formula:



wherein R is an alkyl radical of 1 to 8 carbon atoms.

4,054,722
ACYLOXY SUBSTITUTED ACRYLATE TIMING LAYERS
FOR COLOR DIFFUSION TRANSFER

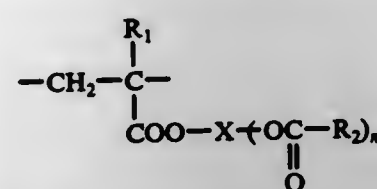
Takashi Yoshida, and Shinji Sakaguchi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 23, 1976, Ser. No. 699,138

Claims priority, application Japan, June 23, 1975, 50-77946
Int. Cl.² G03C 7/00, 1/40, 5/54; B44N 1/09

U.S. Cl. 428—522

1. A material for a color diffusion transfer photographic process, which comprises a support and which possesses neutralizing means thereon comprising the combination of a timing layer containing a polymer having a repeating unit represented by the following general formula (I):



where R₁ represents a hydrogen atom or a methyl group, R₂ represents a hydrogen atom, an aliphatic hydrocarbon residue having 1 to 6 carbon atoms or an aryl group, and X represents an n+1 valent aliphatic hydrocarbon residue having 2 to 8 carbon atoms or an n+1 valent residue of the formula -A-O_nA, wherein A represents an aliphatic hydrocarbon residue having 2 to 4 carbon atoms, and m and n each represents an integer of 1 to 5, and an acidic polymer layer between said support and said timing layer.

4,054,723
COMPOSITE ARTICLES

Gordon John Spencer Higginbotham, Darley Abbey, and John Wolverson, Hilton, both of England, assignors to Rolls-Royce Limited, London, England

Continuation of Ser. No. 412,803, Nov. 5, 1973, abandoned. This application Aug. 13, 1975, Ser. No. 604,117

Claims priority, application United Kingdom, Nov. 8, 1972, 51405/72

Int. Cl.² B32B 15/00

U.S. Cl. 428—678

1. A nickel-base or cobalt-base superalloy having an alloy coating thereon consisting essentially of, in weight percent, about 12.5% to about 20% Chromium, about 4% to about 6% Silicon, about 2% to about 8% Aluminium, about 3% to about 6% Titanium, optionally up to about 0.25% from the group consisting of Yttrium and the other rare earth metals, optionally up to about 20% Iron, optionally up to about 4% Niobium,

optionally up to about 4% Molybdenum, optionally up to about 5% Manganese, the Iron, Niobium, Molybdenum or Manganese being present singly or in combinations such as to produce little or no deleterious effect on the corrosion resistance, the balance of said coating alloy being essentially Cobalt or Nickel, or a combination of these two, together with small amounts of impurities and incidental elements which do not detrimentally affect the basic characteristics of the coating alloy.

4,054,724
ISOTOPE HEATED DEFERRED ACTION THERMAL
BATTERIES

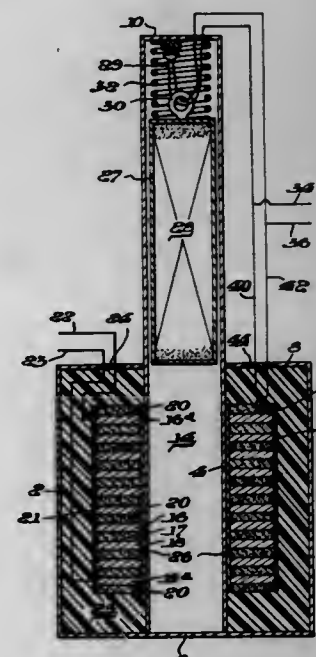
Henry J. Goldsmith, Baltimore, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Filed Aug. 17, 1965, Ser. No. 481,445

Int. Cl.² H01M 6/36

U.S. Cl. 429—5

7 Claims



1. A deferred action battery comprising:

a thermal battery comprising a plurality of cells having a metallic positive electrode and a metallic negative electrode spaced by a normally inactive electrolyte that becomes electrically active when heated and a combustible composition for supplying heat to the electrolyte when ignited;

a body containing radioactive isotope associated with thermal battery so that a major portion of the thermal energy generated by said isotope is not received by said thermal battery;

first means for igniting said combustible composition to render said thermal battery functionally active; and second means movable to permit the said thermal battery to receive a major portion of the thermal energy generated by said isotope.

4,054,725
CELL UTILIZING ATMOSPHERIC OXYGEN AS
DEPOLARIZER

Yoshitane Tuburaya, Ibaraki, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 18,089, March 10, 1970, abandoned. This application May 29, 1973, Ser. No. 364,296

Claims priority, application Japan, Mar. 10, 1969, 44-21279; Mar. 10, 1969, 44-21280

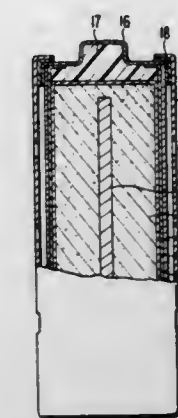
Int. Cl.² H01M 8/06

U.S. Cl. 429—29

6 Claims

1. In an electrochemical cell using an aqueous solution of alkali metal hydroxide as the electrolyte and atmospheric oxygen activated by a catalytic cathode as the depolarizer wherein atmospheric air contacts said catalytic cathode, said cell comprising an anode in addition to said catalytic cathode

and alkali metal hydroxide electrolyte retained in a housing having air inlet means for permitting atmospheric air contact with said catalytic cathode, the improvement wherein scrubber means for removing carbon dioxide from the atmospheric air are constructed and arranged between said air inlet means to said cell and said catalytic cathode whereby atmospheric air contacts are scrubber means before contacting said catalytic



cathode; said scrubber means including a material which reacts with carbon dioxide to release water, and an element for retaining said material, said scrubber means being so constructed or arranged within said cell to preclude wetting out of said catalytic cathode with said water of reaction without exertion of an external pressure on the air fed to said cell or on the electrolyte of said cell.

4,054,726
GALVANIC PRIMARY ELEMENT WITH AIR
ELECTRODE

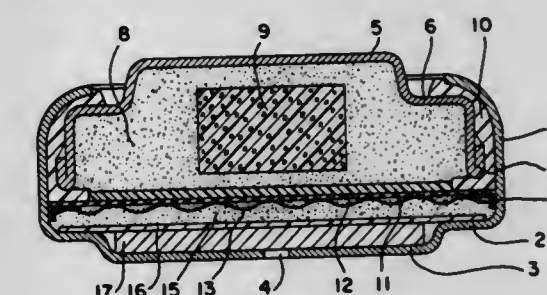
Hans Sauer, 6271 Idstein-Waldorf, and Dieter Spahr, 6239 Fischbach, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Germany

Filed Aug. 3, 1976, Ser. No. 711,360

Claims priority, application Germany, Aug. 7, 1975, 2535269
Int. Cl.² H01M 4/02, 4/06

U.S. Cl. 429—66

16 Claims



1. A primary element with alkaline electrolyte and a hydrophobic air electrode which is electrolytically connected via a separator system to an electrolyte-containing negative electrode that includes zinc powder, the negative electrode being positioned in a metal cell cover and the positive electrode being positioned in a metal cell cup provided with an air inlet opening, and the cover and cup being sealed electrolyte-tight to each other, the element being characterized by a compressible expansion-absorbing body positioned within the negative electrode and surrounded by zinc in direct contact with the metal cell cover, and a hydrophobic air permeable layer attached to the air electrode.

4,054,727

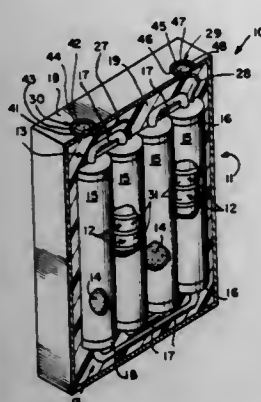
BATTERY WITH AN AGENT FOR CONVERTING HYDROGEN TO WATER AND A SECOND AGENT FOR RETAINING FORMED WATER

Thomas Charles O'Nan, White Plains, and Frank L. Ciliberti, Ossining, both of N.Y., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 607,152, Aug. 25, 1975, abandoned. This application Oct. 14, 1976, Ser. No. 732,253 Int. Cl.² H01M 2/12

U.S. Cl. 429—86

5 Claims



1. A battery comprising a plurality of electrically interconnected electrochemical cells each of said cells having an electrode subject to hydrogen gas evolution; retaining means exterior to and separated from said cells and having retained therein an oxygen containing compound for reaction with said evolved hydrogen and which converts said evolved hydrogen to water; passage means between said electrically interconnected electrochemical cells and said retaining means for enabling said evolved hydrogen to pass from said cells and into contact with said oxygen containing compound; a water retaining agent not reactive with said hydrogen in proximity with said oxygen containing compound and with said formed water and insulatively separated from said cells thereby preventing retained water from contacting said cells; and an outer housing having contained therein said cells, said oxygen containing compound and said water retaining agent.

4,054,728

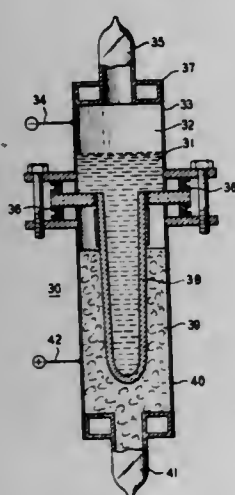
SODIUM-SULFUR BATTERIES

John Broadhead, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1977, Ser. No. 766,969 Int. Cl.² H01M 10/39

U.S. Cl. 429—104

9 Claims



1. A sodium-sulfur battery comprising a sodium negative electrode, a sulfur positive electrode, and a solid electrolyte CHARACTERIZED IN THAT an additive is present in the battery which consists essentially of at least one compound selected from the group consisting of imidazole, aliphatic and

aromatic substituents of imidazole with up to six carbon atoms on all substituents on the compound.

4,054,729

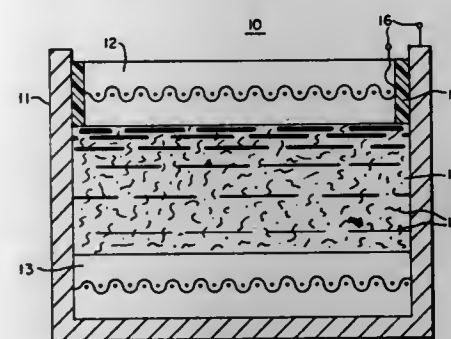
RECHARGEABLE HIGH TEMPERATURE ELECTROCHEMICAL BATTERY

Arnold O. Isenberg, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 27, 1976, Ser. No. 735,922 Int. Cl.² H01M 6/36

U.S. Cl. 429—112

11 Claims



1. A rechargeable, high temperature, electrochemical cell, comprising an anode containing a battery active material selected from the group consisting of intermetallic compounds of magnesium with silicon and magnesium with boron, a cathode containing a metal sulfide, and a contacting fused halide salt electrolyte containing magnesium ions therebetween, said anode and cathode having attached electrical connections.

4,054,730

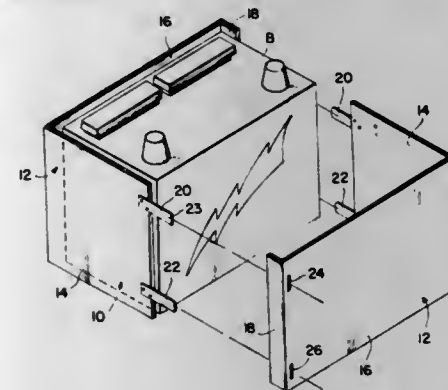
WINTER POWER SAVER

Salvatore Crifasi, 245 Ridgewood Ave., Brooklyn, N.Y. 11208

Filed July 19, 1976, Ser. No. 706,240 Int. Cl.² H01M 2/02

U.S. Cl. 429—120

5 Claims



1. A battery cover comprising: a pair of insulated, substantially L-shaped plates which are the mirror image of each other, and means on said plates for locking said plates to each other around a storage battery, said locking means including at least one bendable tab on the shorter leg of each of said plates for inserting through a slot on the longer leg of each of said other plates and bending to lock the cover to the battery.

4,054,731

PROCESS FOR CURING LIQUID CHLOROPRENE POLYMER CONTAINING XANTHATE ACTIVE TERMINAL GROUPS USING POLYFUNCTIONAL AMINES

Kiyonobu Marubashi; Hideji Oshima, and Yasuaki Sakano, all of Omi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 470,490, May 16, 1974, Pat. No. 3,919,281. This application July 17, 1975, Ser. No. 596,783

Claims priority, application Japan, May 17, 1973, 48-55090; June 20, 1974, 49-470490

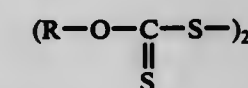
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.² C08F 2/00, 14/02, 34/00, 4/00

U.S. Cl. 526—75

10 Claims

1. A process for preparing an elastomer which comprises: a. preparing a liquid polymer having xanthate active terminal groups by polymerizing chloroprene alone or in combination with one or more monomers copolymerizable with chloroprene in the presence of a xanthogen disulfide compound represented by the formula:



wherein R can contain 1 to 12 carbon atoms and is an alkyl group, an aryl group, an aralkyl group or a cycloaliphatic group, in an organic solvent selected from the group consisting of (1) a solvent selected from the group consisting of an aromatic hydrocarbon, an aliphatic halogenated hydrocarbon and a cyclic ether having a boiling point of about 160° C or less at atmospheric pressure, and (2) carbon disulfide, said organic solvent being present in an amount of about 20 to 200 parts by weight per 100 parts by weight of total monomer, and said xanthogen disulfide compound being present in an amount substantially equal to a ratio of about 2.5 to 20 parts by weight of diethyl xanthogen disulfide to 100 parts by weight of total monomer,

b. purifying said liquid polymer by extracting and removing any unreacted xanthogen disulfide with an alcohol having the formula R₁OH, wherein R₁ is alkyl group containing 1 to 5 carbon atoms to remove any unreacted xanthogen disulfide compound, and

c. curing the purified liquid polymer with a polyfunctional amine.

4,054,732

DRY PHOTOPOLYMER IMAGING PROCESS

Sheldon Irwin Schlesinger, East Windsor Township, County of Mercer, and Ronald J. Boszak, Trenton, both of N.J., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 486,169, July 5, 1974, Pat. No. 3,997,344. This application May 26, 1976, Ser. No. 690,308

Int. Cl.² C08F 216/14, 220/32

U.S. Cl. 526—273

3 Claims

1. A polymer, polymerizable to higher molecular weights through the action of a cationic polymerization catalyst, selected from the group consisting of copolymers of glycidyl acrylate and allyl glycidyl ether and terpolymers of glycidyl acrylate, glycidyl methacrylate and allyl glycidyl ether containing up to about 0.25 mole of glycidyl methacrylate per mole of glycidyl acrylate, said polymer having pendant epoxy groups, an epoxide equivalent of at least about 0.64 per 100g. of polymer and an inherent viscosity of from about 0.09 to 0.28 as measured in butyronitrile at 25° C; said polymer being substantially non-tacky at room temperature, tacky at an elevated temperature and convertible to a non-tacky condition upon exposure to irradiation in the presence of a radiation-sensitive catalyst which releases a Lewis Acid effective to initiate further polymerization of said polymer.

4,054,733

AR-HALO-AR(T-ALKYL)STYRENES POLYMERS

Richard H. Hall, Midland; Daniel H. Haigh, Sanford; Junior J. Lamson, Bay City, and Larry D. Yats, Clare, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 534,391, Dec. 19, 1974, abandoned, which is a division of Ser. No. 94,578, Dec. 2, 1970, abandoned. This application June 16, 1976, Ser. No. 696,599

Int. Cl.² C08F 12/16, 112/16, 212/16, 4/20

U.S. Cl. 526—293

7 Claims

1. A normally solid polymer of an ar-halo-ar-(t-alkyl)styrene wherein halo is chloro, bromo or fluoro and tertiary alkyl has from 4 to 8 carbon atoms and is in a ring position para or meta to the ethylenically unsaturated group of the ar-halo-ar-(t-alkyl)styrene, said polymer capable of being fabricated into useful articles according to known techniques for fabricating conventional styrene polymers.

4,054,734

AMPHOTERICIN COMPLEXES CONTAINING CITRIC ACID AND CALCIUM

Julio Metzger, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 555,015, March 3, 1975, which is a continuation-in-part of Ser. No. 338,122, March 5, 1973, abandoned, which is a division of Ser. No. 203,037, Nov. 29, 1971, abandoned. This application Mar. 8, 1976, Ser. No. 664,838

Int. Cl.² C07H 17/08

U.S. Cl. 536—17

3 Claims

1. A crystalline amphotericin B complex comprising about 1 mol of amphotericin B, from about 0.5 to about 20 mols of an anion of citric acid, and from about 0.2 to about 0.8 mol calcium ion, the complex having a solubility in water at pH 2 of 2.24 g/l, infrared absorption bands at 6.35 and 7.2 microns, and an E₁¹ U.V. absorption value of 1597 at 405 millimicrons.

4,054,735

STABILIZED

N²,2'-O-DIBUTYRYLGUANOSINE-3,5-CYCLIC PHOSPHATE AND SALTS THEREOF

Goro Motoki; Kazuo Uchida, and Hiroshi Yoshino, all of Choshi, Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Japan

Filed Apr. 30, 1975, Ser. No. 573,157

Claims priority, application Japan, May 14, 1974, 49-52866

Int. Cl.² C07H 19/20

U.S. Cl. 536—28

4 Claims

1. A method for producing a stabilized dibutyrylguanosine cyclic phosphate compound selected from the group consisting of N²,2'-O-dibutyrylguanosine-3',5'-cyclic phosphate and salts thereof which has a moisture content of not more than 3 percent by weight, which method consists essentially of subjecting a dibutyrylguanosine cyclic phosphate compound selected from the group consisting of N²,2'-O-dibutyrylguanosine-3',5'-cyclic phosphate and salts thereof selected from the group consisting of alkali metal salts, alkaline earth metal salts and ammonium salts, having a moisture content of more than 3 percent by weight to desiccation for a time sufficient to reduce the moisture content to not more than 3 percent by weight.

4,054,736

CLATHRATE COMPOUNDS OF PROSTAGLANDINS OR THEIR ANALOGUES WITH CYCLODEXTRIN

Masaki Hayashi, Takatsuki, and Atsunobu Ishihara, Ibaraki, both of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

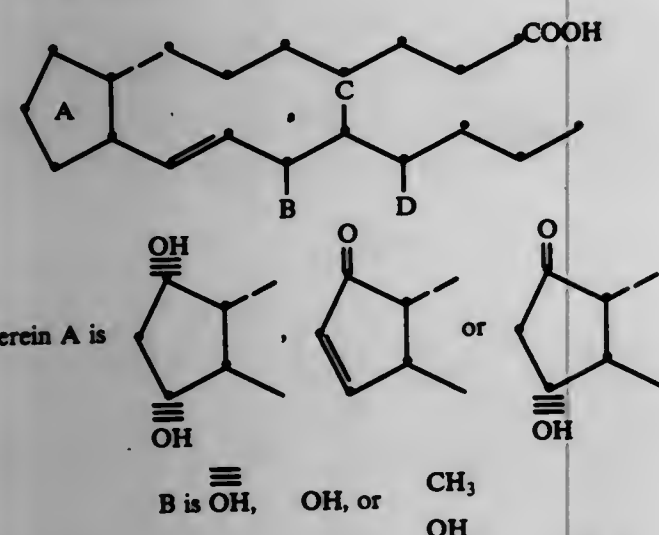
Continuation-in-part of Ser. No. 286,731, Sept. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 147,255, May 26, 1971, Pat. No. 3,816,393. This application Dec. 5, 1973, Ser. No. 421,795

Claims priority, application Japan, June 10, 1970, 45-50119 Int. Cl.² C08B 37/16

U.S. Cl. 536-103

21 Claims

1. A cyclodextrin clathrate compound of a prostaglandin having the structure:

and C and D are each hydrogen or —CH₃.

4,054,737

THROMBOXANE B ANALOGS

Robert C. Kelly, Kalamazoo, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

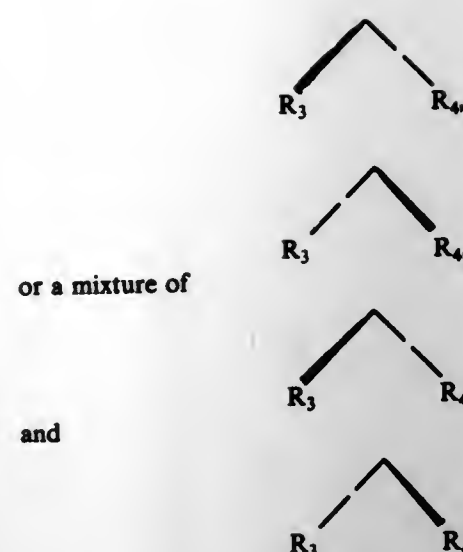
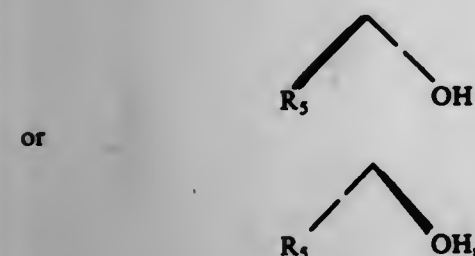
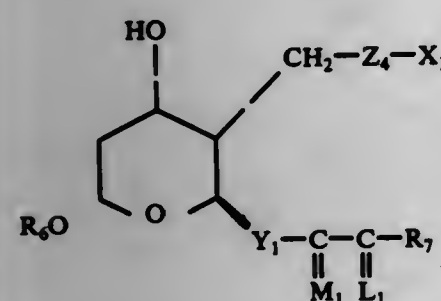
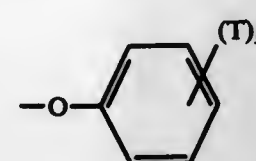
Filed Aug. 20, 1976, Ser. No. 716,449

Int. Cl.² C07D 309/36, 309/38

U.S. Cl. 542-413

54 Claims

1. A thromboxane analog of the formula.

wherein R₃ and R₄ are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R₃ and R₄ is methyl only when the other is hydrogen or methyl; wherein Y₁ is trans —CH=CH— or —CH₂CH₂—; wherein R₇ iswherein 1 is zero, one, two, or three; wherein m is one to 5, inclusive, T is alkyl of one to 3 carbon atoms, inclusive, alkoxy of one to 3 carbon atoms, inclusive, chloro, fluoro, or trifluoroethyl, and s is one, two, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R₇ isonly when R₃ and R₄ are hydrogen or methyl, being the same or different; wherein Z₄ is

- (1) cis—CH=CH—CH₂—(CH₂)_g—CH₂—,
- (2) cis—CH=CH—CH₂—(CH₂)_g—CF₂—,
- (3) cis—CH=CH—CH₂—(CH₂)_g—CH₂—,
- (4) —(CH₂)₃—(CH₂)_g—CH₂—,
- (5) —(CH₂)₃—(CH₂)_g—CF₂—,
- (6) —CH₂—O—CH₂—(CH₂)_g—CH₂—,

wherein g is one, or 3; and wherein X₁ is

- (1) —CH₂OH, or
- (2) —COOR₁, wherein R₁ is alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one or two chloro, fluoro, or alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation,
- with the overall proviso that Z₄ is cis—CH=CH—(CH₂)—

3—Y₁ is trans—CH=CH—, R₃, R₄, and R₅ are all hydrogen, and R₇ is n-butyl, only when X₁ is —CH₂OH.

4,054,738

SODIUM CEFAMANDOLE CRYSTALLINE FORMS

Kuo S. Yang, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 22, 1975, Ser. No. 642,922

Int. Cl.² C07D 501/36

U.S. Cl. 544-26

3 Claims

1. The crystalline anhydrate of sodium 7-(D-2-hydroxy-2-phenylacetamido)-3-(1-methyl-1H-tetrazole-5-ylthiomethyl)-3-cephem-4-carboxylate which has the following X-ray powder diffraction pattern obtained with nickel filtered copper radiation of λ1.5405Å wherein d represents the interplanar spacing and I/I₁ the relative intensity.

Spacing d	Relative Intensity I/I ₁
14.24	.61
12.70	.22
8.14	.15
7.92	.23
7.25	.71
6.60	.15
6.43	.30
5.33	.13
5.06	.12
4.83	.55
4.29	.29
4.17	.15
4.02	.26
3.64	.12
3.60	.13
3.58	.12
3.50	.05
3.42	.06
3.28	.07
3.20	.08
3.14	.06
2.96	.09
2.87	.21
2.80	.06
2.72	.15
2.67	.08
2.57	.07
2.52	.04
2.41	.12
2.29	.15

2. The crystalline methanol solvate of sodium 7-(D-2-hydroxy-2-phenylacetamido)-3-(1-methyl-1H-tetrazole-5-ylthiomethyl)-3-cephem-4-carboxylate which consists of approximately 6 percent by weight of methanol and which has the following X-ray powder diffraction pattern obtained with nickel filtered copper radiation of λ1.5405Å wherein d represents the interplanar spacing and I/I₁ the relative intensity.

Spacing d	Relative Intensity I/I ₁
15.22	.06
14.24	1.00
12.99	.25
8.75	.18
7.92	.19
7.65	.45
7.16	.46
6.93	.25
6.62	.18
5.48	.15
5.30	.07
5.11	.26
4.98	.47
4.79	.40
4.64	.19
4.22	.08
4.15	.07
3.76	.11
3.89	.28
3.70	.18
3.58	.19
3.49	.22

-continued

Spacing d	Relative Intensity I/I ₁
3.35	.13
3.12	.09
2.93	.06
2.89	.17
2.79	.10
2.76	.08
2.66	.09
2.56	.07

3. The crystalline monohydrate of sodium 7-(D-2-hydroxy-2-phenylacetamido)-3-(1-methyl-1H-tetrazole-5-ylthiomethyl)-3-cephem-4-carboxylate which consists of approximately 4 percent by weight of water and which has the following X-ray powder diffraction pattern obtained with nickel filtered copper radiation of λ1.5405Å wherein d represents the interplanar spacing and I/I₁ the relative intensity.

Spacing d	Relative Intensity I/I ₁
13.79	.57
12.23	.40
8.23	.12
7.52	.09
7.21	.40
7.02	.60
6.67	.15
6.19	.25
5.09	.10
4.84	.42
4.70	.33
4.15	.37
3.99	.26
3.84	.08
3.76	.09
3.65	.12
3.55	.10
3.40	.08
3.25	.10
3.07	.11
2.92	.06
2.76	.16
2.65	.11
2.62	.05
2.49	.15
2.41	.05
2.36	.07
2.23	.11

4,054,739

PROCESS FOR THE SUBSTITUTION OF CHLORINE ATOMS OF CYANURIC CHLORIDE

Heinz Haschke, Weissenstein ob der Drau, Austria; Gerd Schreyer, Hanau, Germany; Werner Schwarze, Frankfurt, Germany, and Helmut Suchsland, Rodenbach, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

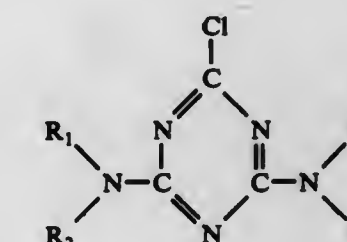
Filed Feb. 10, 1976, Ser. No. 656,845

Claims priority, application Germany, Feb. 12, 1975, 2505703 Int. Cl.² C07D 251/50

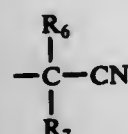
U.S. Cl. 544-208

13 Claims

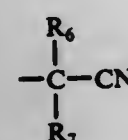
1. A process for the successive substitution of two chlorine atoms of cyanuric chloride comprising reacting the cyanuric chloride with two amines in the presence of an acid binding agent and an organic solvent to produce a triazine of the formula



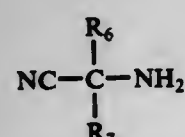
where R_1 and R_2 are lower alkyl, lower alkenyl, cyclo lower alkyl or methylcyclopropyl or such groups substituted by $-\text{OH}$, $-\text{OR}$, $-\text{SR}$, or CN where R_3 is lower alkyl with the proviso that one of R_1 and R_2 can be hydrogen, R_3 is as defined for R_1 or



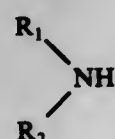
and R_4 is



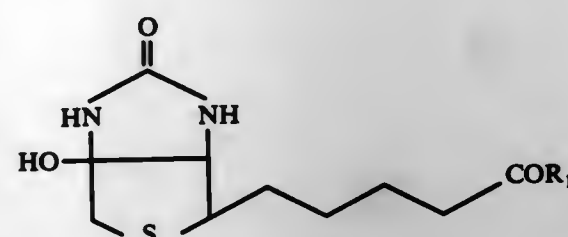
wherein R_6 and R_7 are alkyl or alkenyl of 1 to 8 carbon atoms, or together with the adjoining carbon atom form a 5 to 7 membered cycloalkyl ring or are cycloalkyl with the proviso that one of R_6 and R_7 can be hydrogen, said process comprising adding a first amine of the formula



to a 4 to 60 weight % solution or suspension of cyanuric chloride in a mixture of (a) 65 to 85 weight % of a hydrocarbon solvent selected from the group consisting of an aliphatic hydrocarbon having 5 to 10 carbon atoms, a cycloaliphatic hydrocarbon having 5 to 10 carbon atoms or an aromatic hydrocarbon, and (b) 35 to 15 weight % of a ketone having 3 to 8 carbon atoms and then adding a different amine having the formula

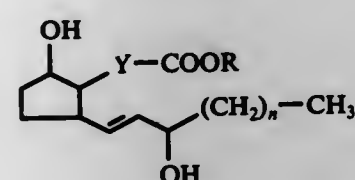


4,054,740
HYDROXYBIOTIN
George Francis Field, West Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.
Continuation-in-part of Ser. No. 536,139, Dec. 24, 1974, abandoned. This application Sept. 5, 1975, Ser. No. 610,707
Int. Cl.² C07D 495/04
U.S. Cl. 548-303
1. A compound of the formula:



wherein R_1 is lower alkoxy, hydroxy, lower alkyl substituted or unsubstituted amino; the racemates and optical antipodes thereof.

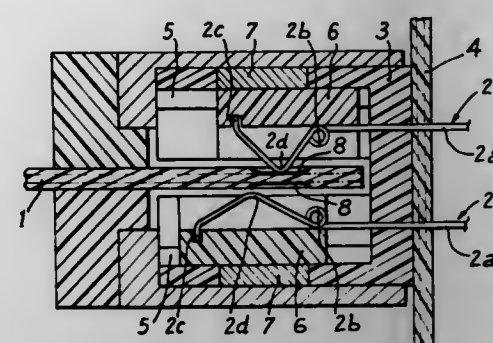
4,054,741
DERIVATIVES OF PROSTANOIC ACID
Jehan F. Bagli, Valois Gardens, and Tibor Bogri, Montreal, both of Canada, assignors to Ayerst McKenna & Harrison Ltd., Montreal, Canada
Division of Ser. No. 591,231, June 27, 1975, abandoned, which is a division of Ser. No. 377,973, July 5, 1973, Pat. No. 3,907,998, which is a continuation of Ser. No. 259,876, June 5, 1972, Pat. No. 3,773,795, which is a continuation-in-part of Ser. No. 157,704, June 28, 1971, abandoned. This application June 21, 1976, Ser. No. 697,901
Int. Cl.² C07C 177/00
U.S. Cl. 560-121
1. A compound of the formula VIIIa



in which R is hydrogen or lower alkyl, n is an integer from 1 to 6 and Y is $\text{CH}_2-(a)-(\text{CH}_2)_m$ wherein (a) is $\text{C}=\text{C}$ and m is an integer from 2 to 4.

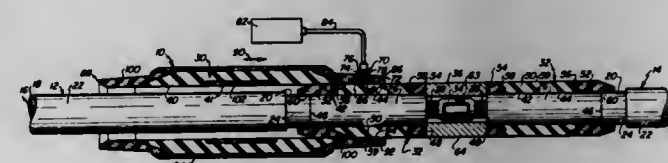
ELECTRICAL

4,054,742
PRINTED CIRCUIT BOARDS
Francois Robert Bonhomme, 6, Parc de Bearn, Saint Cloud, France (92210)
Filed Mar. 29, 1976, Ser. No. 671,165
Claims priority, application France, Apr. 11, 1975, 75.11314
Int. Cl.² H02B 1/02
U.S. Cl. 174-68.5
2 Claims



1. A printed circuit board comprising, adjacent at least one of its edges and on at least one of its faces, conducting tracks adapted to cooperate with resilient contact members of a connector for receiving the board, the contact members being orientated in use in alignment with the tracks, in which at least one of the conducting tracks has a concave cross section and is formed by a cavity in a rigid insulating support forming part of the board or in a male conductor associated with the board, the surface of the cavity having a coating of conducting material said cavity being of generally V-shaped cross section.

4,054,743
FLUID ASSISTED INSTALLATION OF ELECTRICAL CABLE ACCESSORIES
Robert W. Mayer, Independence Township, Warren County, and Frank A. Silva, Basking Ridge, both of N.J., assignors to Amerace Corporation, New York, N.Y.
Filed May 14, 1975, Ser. No. 577,555
Int. Cl.² H01R 43/00; H02G 15/00; B23P 11/02
U.S. Cl. 174-135
24 Claims

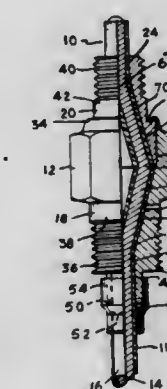


1. In an electrical cable accessory having a tubular member of elastomeric material which is to be installed over a cylindrical surface to grip the cylindrical surface, when in appropriate assembled relation therewith, with a predetermined gripping force established by dilation of the tubular member, said tubular member having opposite ends and a wall portion extending between said opposite ends, the improvement comprising: means in the tubular member for enabling the introduction of fluid under pressure through said wall portion and between the tubular member and the cylindrical surface to reduce said gripping force during installation of the tubular member over the cylindrical surface; and means adjacent at least one end of the tubular member for impeding the escape of said fluid from between the tubular member and the cylindrical surface at said one end.

14. In a method of installing an electrical cable accessory having a tubular member of elastomeric material which is to be installed over a cylindrical surface to grip the cylindrical surface, when in appropriate assembled relation therewith, with a predetermined gripping force established by dilation of the tubular member, said tubular member having opposite ends and a wall portion extending between said opposite ends, the improvement comprising: introducing fluid under pressure through said wall portion and between the tubular member and the cylindrical sur-

face as the tubular member is placed over the cylindrical surface; and simultaneously impeding the escape of said fluid from between the tubular member and the cylindrical surface at least at one of said opposite ends to dilate the tubular member and establish a fluid layer between the tubular member and the cylindrical surface, thereby reducing said gripping force during installation.

4,054,744
SEAL FOR AN INSTRUMENT PROBE ASSEMBLY
Norman Vane Beaman, La Habra, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Jan. 10, 1977, Ser. No. 757,869
Int. Cl.² H01B 7/00; H01B 17/30
U.S. Cl. 174-151
7 Claims



1. A sealed pressure fitting for mounting in an aperture of a pressure vessel which comprises: a body having a body gland end for insertion into said aperture and sealing and attachment means to secure said body in a fluid tight connection therein; a probe member projecting into said pressure vessel through an opening in the face of said body end received in said aperture; a body sleeve member projecting from said face of said body, concentric to and surrounding said probe member, and terminating thereabout to define an annular joint intermediate the projected length of said probe member; and sealing means overlying said annular joint and contiguous regions of said sleeve and probe members comprising a laminate sleeve having an inner, thermoplastic sleeve and a concentric, outer thermoplastic sleeve of heat shrinkable plastic of higher melt temperature than said inner sleeve, said laminate sleeve being thermally shrunk into sealing engagement with said sleeve and probe members about said annular joint.

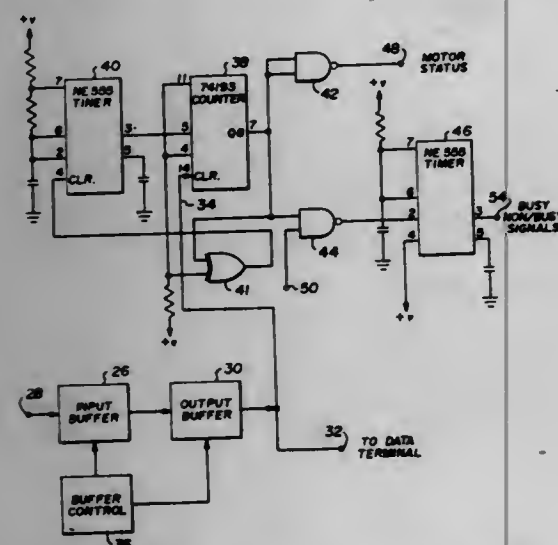
4,054,745
MOTOR CONTROL DEVICE FOR DATA TERMINALS
Stanley R. C. Norman, Brockville, Canada, assignor to GTE Automatic Electric (Canada) Limited, Brockville, Canada
Filed Dec. 6, 1976, Ser. No. 748,079
Int. Cl.² H04L 7/00; H04N 1/32
U.S. Cl. 178-4.1 R
7 Claims

1. A control device linking a data processor to a motor operated data terminal wherein the data processor provides information signals including data characters and data terminal motor-start signals, and wherein the data terminal motor is selectively operable between an on condition and an off condition, is programmed to switch from the on condition to the off condition after a first predetermined interval following the last reception of data characters from the data processor, switches to the on condition upon receipt of a data terminal motor-start signal, and reaches its normal operating speed in at least a second predetermined interval after the receipt of a data terminal motor-start signal, said control device comprising: means for receiving information signals from the data pro-

processor and for transmitting the information signals to the data terminal;

a first circuit for sensing receipt of information signals from the data processor and for providing a motor status signal to the data processor, said first conduit being responsive to receipt of information signals from the data processor for providing a motor-on status signal, and responsive to the absence of information signals from the data processor for a first predetermined interval for providing a motor-off status signal;

a second circuit for sensing the receipt of a motor-start signal from the data processor for providing to the data processor a terminal busy condition signal of a second predetermined interval, and for thereafter providing to the data processor a terminal non-busy condition signal upon the expiration of said second predetermined interval,



whereby upon interruption of transmission of data characters by said data processor for an interval of time equal to said first predetermined interval, said control device provides a motor-off signal to the data processor to indicate that a motor-start signal must be sent prior to further transmission of data characters, whereby upon transmission thereafter of a data terminal motor-start signal by the data processor to the control device, said first circuit provides a motor-on status signal to the data processor and said second circuit provides a terminal busy condition signal to the data processor, the terminal busy condition signal further inhibiting transmission of data characters for said second predetermined interval until said second circuit thereafter provides a terminal non-busy condition signal.

4,054,746
ELECTRONIC COORDINATE POSITION DIGITIZING
SYSTEM

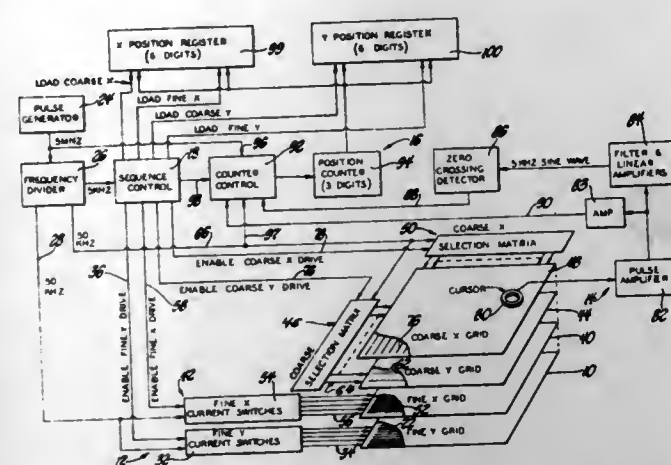
Vernon C. Kamm, Farmington Hills, Mich., assignor to Data
Automation Corporation, Farmington, Mich.
Continuation-in-part of Ser. No. 624,527, Oct. 22, 1975,
abandoned. This application Aug. 20, 1976, Ser. No. 716,039
Int. Cl.² G08C 21/00

U.S. Cl. 178-19

25 Claims

1. Apparatus for measuring the position of a cursor along a coordinate axis on a reference surface comprising: a polyphase grid winding disposed in a plane parallel to said surface with each phase winding having multiple parallel conductors spaced in the direction of said coordinate axis and forming multiple pairs of poles in said grid winding, polyphase excitation means connected with said grid winding for sequentially applying square wave current pulses to the successive phase windings, said cursor including a sensing coil inductively coupled with the polyphase grid winding for producing a position

signal having a phase angle corresponding to the position of the cursor within a pole pair of said grid winding, and means



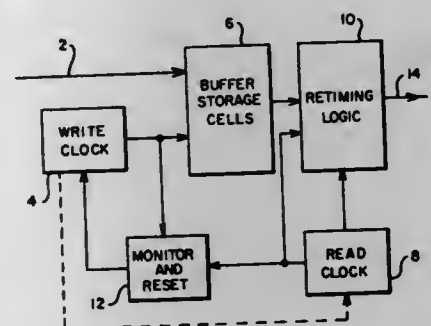
connected with the cursor and responsive to said position signal for determining the position of said cursor.

4,054,747
DATA BUFFER

DATA BUFFER
Alvin L. Pachynski, Jr., Palo Alto, Calif., assignor to GTE
Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed May 20, 1976, Ser. No. 687,979
Int. Cl.² H04L 7/00

U.S. Cl. 178-69.1

9 Claims



1. Apparatus for retiming a serial bit stream which comprises:

a first timing means providing N sequentially timed outputs, each at a rate which is $1/N^{\text{th}}$ that of the bit rate of said serial bit stream,

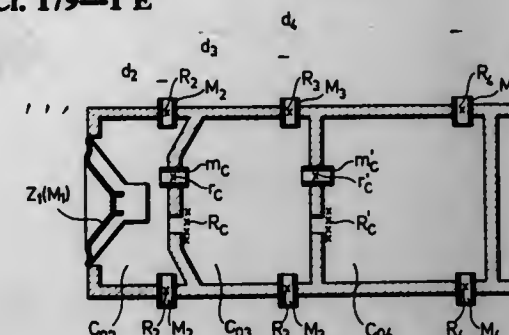
means for sequentially storing N binary digits, each said digit being written into said storing means by one of said N timed outputs from the first timing means;

a second timing means including a clock means having an output which provides a clock rate at substantially the bit rate of said serial bit stream and having N sequentially timed outputs, each at a rate which is $1/N^{\text{th}}$ of said clock rate;

logic means responsive to said second timing means for sequentially reading out the binary digits from said storage means; and

monitoring means having one input connected to monitor one of the N sequential timed outputs of said first timing means, having second and third inputs connected to monitor two of the N timed outputs of said second timing means to determine if the write-read inputs alternate and to provide an output signal which resets the N sequential outputs of one said timing means in the event the write-read sequence does not alternate.

4,054,748
CARDIOID ELECTRO-ACOUSTIC RADIATOR
Géza Balogh, Budapest, Hungary, assignor to Elektroakusztikai
Gyar, Budapest, Hungary
Filed Aug. 17, 1976, Ser. No. 715,143
Claims priority, application Hungary, Oct. 22, 1975, EE 2382
Int. Cl.² H04R 1/20
U.S. Cl. 179—1 E 6 Claims

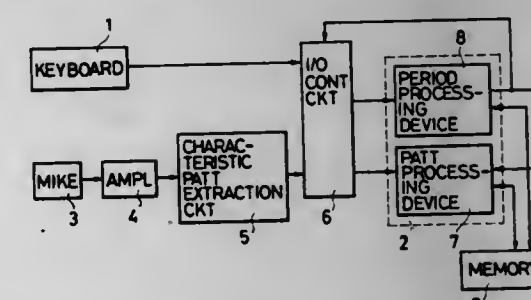


1. Directional electro-acoustical converter, comprising an electrodynamic moving-coil loudspeaker and sound radiator, at least two phase shifting members equalized to the second degree, said phase shifting members having apertures and being disposed at different distances from the front side of a membrane of the loudspeaker, the phase shifting member which is at the smallest distance (d_2) from the membrane being coupled directly to the membrane or by means of an acoustic resistance (R_c) or by means of an auxiliary membrane (C_{ca}), said other phase shifting members at greater distances (d_3, d_4, \dots) from said membrane being coupled to the membrane each by means of at least one acoustic resistance (R_c, R_c', r_c, \dots) or each by means of at least one mass (m_c, m_c') such that the quarter of the wavelength λ_k belonging to the transposition frequency (f_k) determined by the phase shifting members having d_2 and d_3 sound route distances has one to four times the value of the smallest sound route distance D_2 , whereby $d_2 \leq (\lambda k/4) \leq 4d_2$.

4,054,749
METHOD FOR VERIFYING IDENTITY OR
DIFFERENCE BY VOICE

Matsumi Suzuki, and Saburo Kitamoto, both of Ebina, Japan,
assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Nov. 29, 1976, Ser. No. 745,755

Claims priority, application Japan, Dec. 2, 1975, 50-144378
Int. Cl.² G10L 1/04



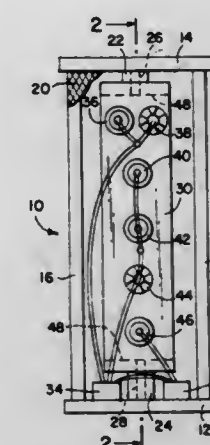
1. A method of verifying the identity or non-identity of a voice by comparing electrical signals representing characteristic parameters of the voice to be identified with electrical signals obtained from a record file containing prerecorded characteristic parameters of a voice, the improvement comprising, storing in said record file along with the said characteristic parameters a time characteristic indicative of a duration beyond which said recorded characteristic parameters are not acceptable for verification, extracting said characteristic parameters from a voice to be verified in the form of electrical signals, blocking further verification if the time of verification is after said duration indicated by said recorded time characteristic, and comparing the electrical signals representing said extracted and recorded characteristic parameters and deliver-

ing a verification indication only if the time of verification is within the duration indicated by the time characteristic recorded along with said recorded characteristic parameters.

2 4,054,750
15 **FULL RANGE ROTATABLE SPEAKER HOUSING WITH**
OPPOSITELY DIRECTED SPEAKERS
Ralph Montgomery, and Richard E. Bowe, both of 11475 Kit-
tridge St., North Hollywood, Calif. 91606
Filed June 18, 1976, Ser. No. 697,376
Int. Cl.² H04R 1/02, 1/20

U.S. Cl. 179—1 E

4 Claims



1. A speaker housing comprising a plurality of speakers, a mounting board carrying each of said speakers with the axes thereof in general parallel relationship, means for carrying said mounting board for pivotal movement about a vertical axis, said plurality of speakers each having an open mouth sound emitting portion and a sound generating portion, a first sub-plurality and a second sub-plurality of speakers comprising said plurality of speakers, said first sub-plurality of speakers having said open mouth portions thereof disposed on one face of said mounting board, said second sub-plurality of said plurality of speakers having said open mouth portions thereof disposed on the other face of said mounting board, said mounting board being located intermediate said sound generating portion of each of said first plurality of speakers and each of said sound generating portions of said second plurality of speakers whereby the sound emanating from said first plurality of speakers is oppositely directed from the sound emanating from said second plurality of speakers, an audio amplifier, a crossover network, said audio amplifier and said crossover network being disposed within said housing, said mounting board is generally planar and disposed generally vertically, wherein said first sub-plurality comprises a first speaker and a second speaker and a third speaker and a fourth speaker, said first speaker having a different size from said second speaker and said third speaker and said fourth speaker, said second speaker and said third speaker and said fourth speaker having the same size, said first speaker being operated substantially in the 8,000 to 20,000 Hz region, said second speaker and said third speaker being operated substantially in the 500 to 10,000 Hz region, said fourth speaker being operated substantially in the 20 to 800 Hz region, said second sub-plurality comprises a fifth speaker and a sixth speaker, said fifth speaker having the same size as said first speaker, said fifth speaker being operated in the same frequency range as said first speaker, said sixth speaker having the same size as said second speaker, said sixth speaker being operated substantially in the same frequency range as said second speaker, said fourth speaker being driven by said amplifier, wherein said crossover network comprises three outputs, a first output electrically driving said first and said fifth speakers, a second output electrically driving said second speaker and said third speaker and said sixth speaker, a third output electrically driving said amplifier.

4,054,751

MASKING NOISE GENERATOR

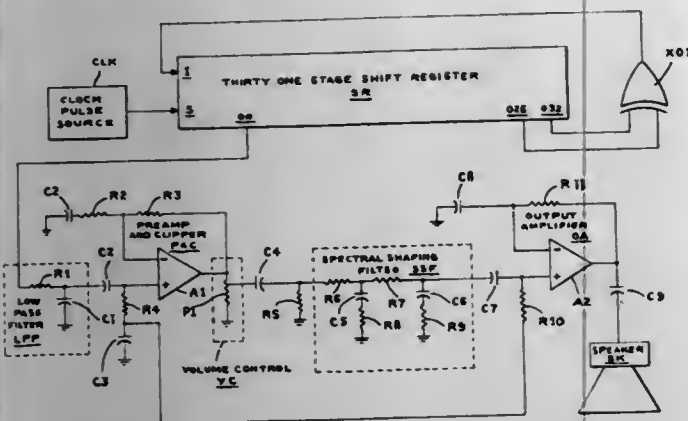
George Donald Calder, Glen Ridge; John Duda, Dumont, and John Fatovic, Palisades Park, all of N.J., assignors to CDF Industries, Inc., Palisades Park, N.J.

Filed Mar. 1, 1976, Ser. No. 662,522

Int. Cl.² H04R 3/00

U.S. Cl. 179—1.5 M

3 Claims



1. Apparatus for generating audible masking noise comprising: a multi-stage shift register having an input and at least two outputs connected to two different stages, an exclusive-or means having two inputs respectively connected to the outputs of said two stages and an output connected to the input of said shift register; means for generating shift pulses for shifting said shift register; a low-pass filter for passing signals only in the audio range, said low-pass filter having an input connected to one of the outputs of said multi-stage shift register and an output; a signal clipping amplifier means having an input connected to the output of said low-pass filter and an output; a spectral shaping filter having an input connected to the output of said signal clipping amplifier means and an output; and a loud speaker connected to the output of said spectral shaping filter.

4,054,752

CASH REGISTER PROTECTION RECORDING AND ALARM SYSTEM

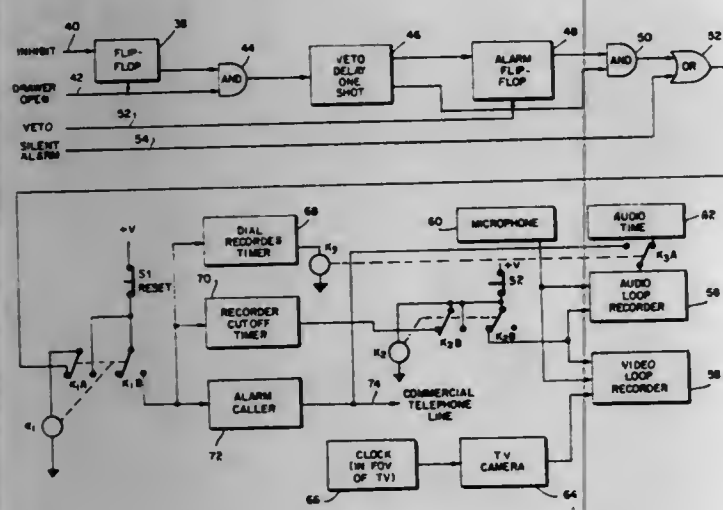
Clay E. Dennis, Jr., 4330 Ferrara St., Jacksonville, Fla. 32217, and Joseph N. Filzen, 5422 Waterside Drive, Jacksonville, Fla. 32210

Filed Jan. 30, 1976, Ser. No. 653,713

Int. Cl.² H04M 11/04

U.S. Cl. 179—5 R

8 Claims



1. A police alarm and robbery recording system for a telephone subscriber station comprising:

- Continuous-loop taping means for continuously recording over a cyclic time interval events occurring in the area of said subscriber station;
- a silent alarm generator adapted to generate an alarm signal during an alarm condition, timing means activated by said alarm signal for terminating the recording of

events by said continuous-loop tape recording means at the end of a predetermined time period, said time period being shorter than said time interval;

- means for recording a time reference signal on said continuous-loop tape recorder; and
- an alarm caller operatively connected to said generator for causing a number to be dialed from said telephone station at the beginning of said time period and for transmitting prerecorded business identifying information to said system dialed number.

4,054,753

DOUBLE SYNC BURST TDMA SYSTEM

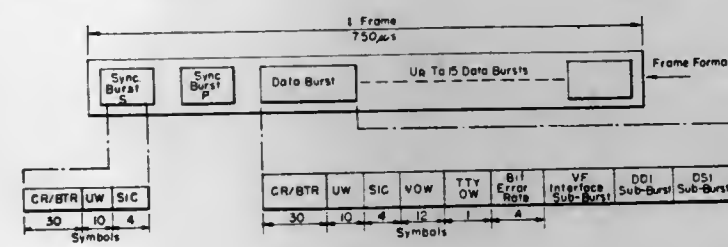
Pradman Kaul, Gaithersburg; Ova Gene Gabbard, Germantown, both of Md., and John M. Husted, Vienna, Va., assignors to Digital Communications Corporation, Gaithersburg, Md.

Filed Oct. 20, 1975, Ser. No. 624,093

Int. Cl.² H04J 3/06

U.S. Cl. 179—15 BS

26 Claims



1. Synchronization apparatus for a TDMA communication system for maintaining synchronization regardless of failure of a synchronizing burst transmitted by the reference station, said TDMA communication system having a number of stations communicating with each other in a TDMA mode through a communication link, said synchronization apparatus comprising,

- means for periodically transmitting a primary synchronization burst,
- means for periodically transmitting a secondary synchronization burst in at least each frame including a primary synchronizing burst,
- detecting means at a plurality of said stations for detecting both said synchronization bursts,
- a burst synchronizer at each of said plurality of stations for maintaining transmission bursts of said station within a pre-assigned time slot, and
- means at said plurality of stations responsive to said detecting means for controlling said burst synchronizer to maintain synchronization even in the absence of said primary synchronization burst.

4,054,754

ARRANGEMENT FOR TRANSMITTING DIGITAL DATA AND SYNCHRONIZING INFORMATION

Keith Lynn Nicodemus, Wheaton, Ill., and Stephen Davis Shoap, Tinton Falls, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 7, 1976, Ser. No. 693,372

Int. Cl.² H04J 3/06

U.S. Cl. 179—15 BS

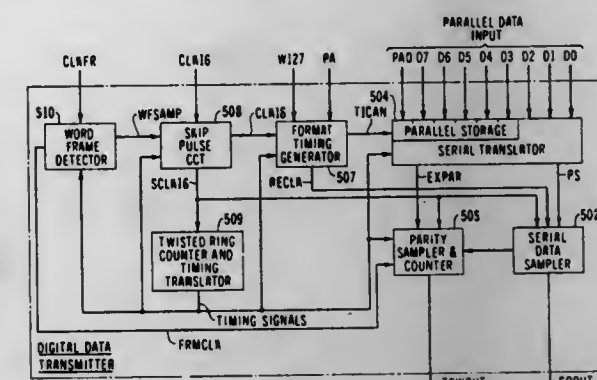
18 Claims

13. In combination:

- means for generating a true representation and a complement representation of each of a plurality of binary digits; and
- transmitting means for transmitting a true representation and a complement representation of predetermined ones of said binary digits to convey only the information content of said predetermined binary digits and for transmitting a true representation only of the remaining ones of said binary digits to convey both synchronizing information and the information content of said binary digits.

16. In a transmission system for transmitting data words in

recurring frames each comprising a plurality of data words in time separated channels, an arrangement for simultaneously transmitting data and synchronizing information comprising: an address generator for generating a recurring series of addresses, each address being uniquely representative of one of said time separated channels; means for generating bit position indicia uniquely identifying each of said bit positions;



means, responsive to said address and said bit position indicia, for defining certain of said bit positions to convey both data and synchronizing information; means for transmitting a true representation followed by a complement representation of each digit in bit positions other than those defined by said defining means; and means for transmitting a first true representation followed by a second true representation of each digit in a bit position defined by said defining means.

4,054,755

CONFERENCE CIRCUIT FOR PULSE CODED MODULATED TELEPHONY

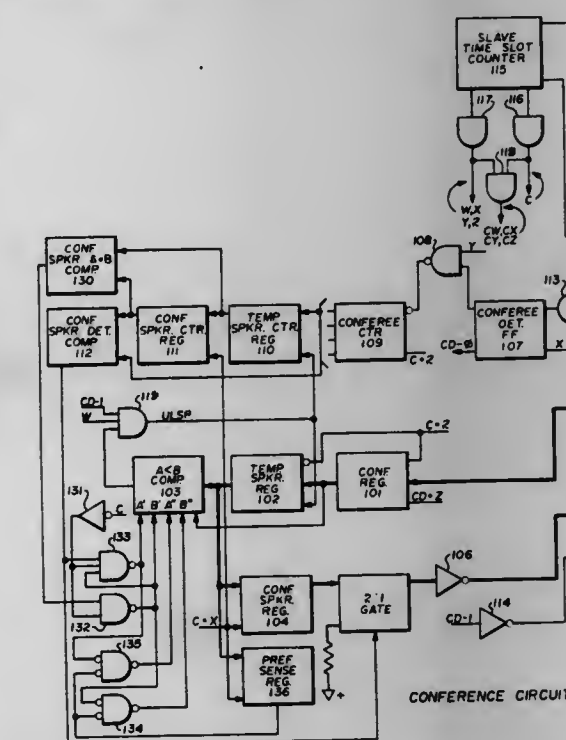
David Quon Lee, Chicago, and Donald W. McLaughlin, Naperville, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 14, 1976, Ser. No. 732,251

Int. Cl.² H04M 3/56

U.S. Cl. 179—15 AT

5 Claims



1. In a pulse code modulated communication system, a plurality of communication channels arranged on a multiplexed basis, a switching system including a memory access by said communication channels and a conference circuit including, a first register connected to said memory operated to store the coded value of information from each of said channels conducted sequentially through said memory, a second register

connected to said first register and including an output circuit connection to said channels, a first comparator circuit connected to said first and to said second registers operated to compare the coded value of information stored in said first and said second registers and in response to determination that the value of information stored in said first register is less than the coded value of information stored in said second register to cause the coded value of information stored in said first register to be transferred to said second register for transfer of said coded value of information to said channels under control of said switching system, counting means connected to said memory periodically incremented in response to signals from said memory, a fourth register connected to said counting means operated to store the count of said counting means, a fifth register connected to said fourth register, said count stored in said fourth register transferred to said fifth register in response to signals from said counting system, and a second comparator circuit connected to said fourth and fifth registers and including a circuit connection to said channels, operated in response to determination that the count stored in said fourth and fifth registers are equal, to inhibit transfer information to said channels, the improvement comprising: a third comparator circuit connected to said fourth and fifth registers operated in response to determination that the count stored in said fourth and fifth registers are equal; a sixth register connected to said second register and to said switching system operated in response to a signal of at least a predetermined digital value stored in said second register; and gating means connected to said second comparator circuit, to said third comparator circuit, to said sixth register, and to said switching system, and including a plurality of output circuit connections to said first comparator circuit, selectively operated in response to said second and third comparator circuits and said sixth register to operate said first comparator circuit to modify the coded values of information stored in said first and said second registers.

4,054,756

METHOD AND APPARATUS FOR AUTOMATING SPECIAL SERVICE CALL HANDLING

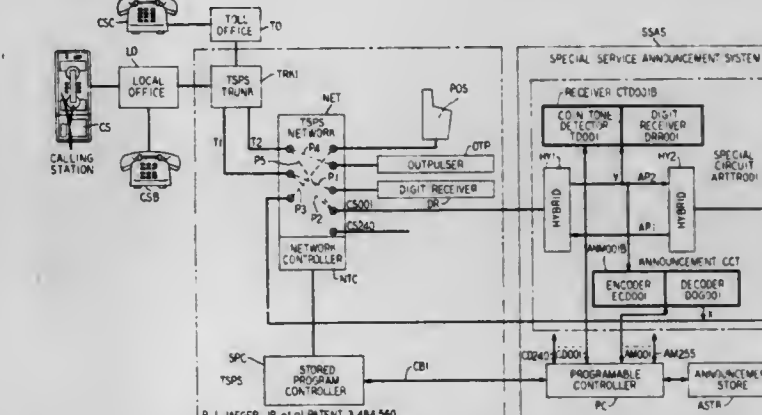
William Kirk Comella, Naperville, Ill., and Bernard Julius Yokelson, Mendham Township, Morris County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 29, 1976, Ser. No. 727,767

Int. Cl.² H04M 3/42, 17/00

U.S. Cl. 179—18 B

19 Claims



1. In an automated special service telephone system for servicing a plurality of types of special service calls and selectively connectable to calling and called subscriber stations, the combination comprising:

- receiving means for receiving from a connected calling subscriber station information indicating a type of special service call requested;
- generating means comprising means responsive to said received information for generating and applying to said connected calling subscriber station a first voice announcement requesting a voice answer to a specific ques-

tion corresponding to said type of special service call requested;
 storing means for storing said voice answer received from said connected calling subscriber station;
 said generating means further comprising means for generating and applying to a connected called subscriber station a second voice announcement including said stored voice answer and requesting a subscriber at said connected called subscriber station to provide information responsive to said second voice announcement indicating whether or not said special service call is to be completed; and
 said receiving means also arranged for receiving from said called subscriber station information responsive to said second voice announcement.

4,054,757

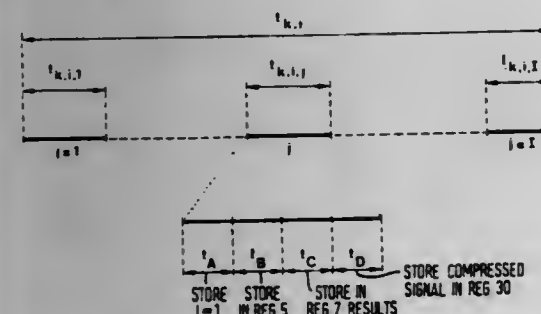
CONFERENCE CIRCUIT USING PCM TECHNIQUES
 Augustin LeJay, Verrieres le Buisson, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,326

Int. Cl.² H04M 3/56

U.S. Cl. 179—18 BC

5 Claims



1. A conference circuit for interconnecting plural subscribers within a PCM switching network having a predetermined frame repetition rate comprised of a plurality of successive time slots, the invention including: memory means for storing non-linear coded data received from subscribers during time slots allotted to the respective subscribers, expander means receptive of coded data received from said memory means, for expanding the received data, adder means for receiving expanded data and for combining the expanded data with data fed back from the output of the adder means, and further means for compressing linear data received from the adder means, wherein said memory means comprises a read/write memory comprised of a memory line for each subscriber served, the lines of said memory means being grouped into plural groups of consecutive time slots with the number of groups corresponding to the number of simultaneous conferences possible and the number of lines per group corresponding to the maximum number of subscribers per conference, means for writing into said memory means at the rate of one line per time slot, and means for successively reading the lines of an entire group during one time slot.

4,054,758

MOUNTING OF PICKUP STYLUS

Werner Fidi, Baden, Austria, assignor to AKG Akustische u. Kino-Geräte Gesellschaft m.b.H., Austria

Continuation-in-part of Ser. No. 587,291, June 16, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,337

Claims priority, application Austria, June 20, 1974, 5137/74

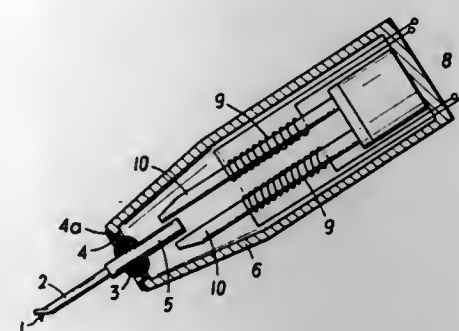
Int. Cl.² G11B 3/02; H04R 9/16, 11/12

U.S. Cl. 179—100.41 K

11 Claims

1. In a magnetic sound pickup, for tracking mechanically modulated grooves in a record support by means of a tracking stylus, having a magnetic circuit, selected from the type including a fixed permanent magnet and a movable stylus holder having a ferromagnetic part and the type including a permanent magnet movable as a unit with a stylus holder and combined with fixed magnetic circuit elements of ferromagnetic

material, and fixed pickup coils associated with the magnetic circuit, and in which the reluctance of the magnetic circuit is varied by displacement of the stylus holder by the tracing stylus mounted therein, the stylus holder being elastically mounted in a bearing element of elastic material, such as rubber and rubber-like material, an improved pickup mounting comprising, in combination, a thin annular magnetically permeable metal plate embedded in said bearing element and extending perpendicular to the longitudinal axis of said stylus holder, said thin metal plate having a central opening therein and a wall thickness which is small relative to the external diameter of said stylus holder; said bearing element having an opening therethrough whose diameter is smaller than that of said central opening in said thin metal plate; said stylus holder extending through the opening in said bearing element with its center of motion being substantially in the plane of said thin metal



plate; the diameter of said central opening being only slightly larger than the external diameter of said stylus holder in the portion of said stylus holder passing through said central opening so that said plate and said stylus holder combine to form a portion of the magnetic circuit with only a small gap therebetween, and said stylus holder being connected to said thin metal plate only through said bearing element; said thin metal plate exerting no compression force on said bearing element, and said thin metal plate and said bearing element and their restoring forces acting upon said stylus holder, due to said thin metal plate and said bearing element, being constituted solely by torsional shear forces with the portion of said bearing member extending in opposite directions from the planes defined by the opposite surfaces of said thin metal plate being not forced into compression during motion of said stylus holder and thus being not subjected to compression forces and acting solely as a resistance-controlled damping.

4,054,759

SUBSCRIBER LOOP VERIFICATION DEVICE AND METHOD

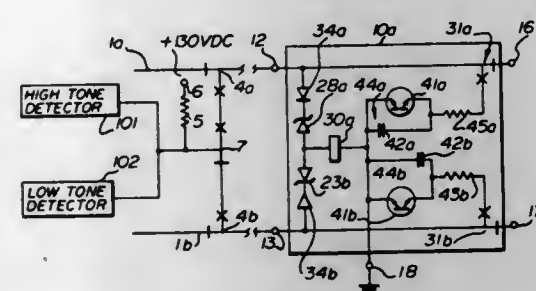
Ronald George McGrath, and George Howard Wright, both of Dollard des Ormeaux, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 15, 1976, Ser. No. 741,899

Int. Cl.² H04B 3/46

U.S. Cl. 179—175.3 R

8 Claims



1. A subscriber loop test device, for connection to a subscriber loop adjacent a subscriber equipment and remote a switching facility associated with the subscriber loop, the test

device being operable in response to a predetermined DC signal from the switching facility, the test device comprising: oscillator means responsive to the predetermined DC signal for generating a predetermined inband AC signal to modulate the current in the subscriber loop;
 connection means for connecting the oscillator means to the subscriber loop in response to the predetermined DC signal,
 in the connection means, a relay having an operate coil connected across the subscriber loop, and a plurality of contacts, one contact connected in series with the coil and another contact connected in series with the oscillator means, and a relay operate circuit connected in parallel with said one contact and to the subscriber loop, the relay operate circuit being responsive to the predetermined DC signal to cause a current flow in the operate coil whereby said contacts are closed to electrically connect the operate coil across the subscriber loop and to electrically connect the oscillator means across the subscriber loop.

4,054,760

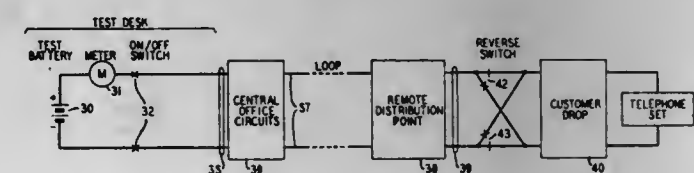
REMOTE TESTING OF TELEPHONE LOOPS
 Dennis Howard Morgen, Verona, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1976, Ser. No. 709,256

Int. Cl.² H04M 1/24

U.S. Cl. 179—175.2 B

8 Claims



1. A ringer continuity test circuit for a telephone loop comprising
 a source of direct current test voltage at a central location;
 a line reversal switch connected in said telephone loop at a location remote from said central location;
 means for operating said line reversal switch; and
 metering means for indicating current level changes in said loop.

4,054,761

ELECTRICAL SWITCH COMBINED WITH FLUID CONTROL DEVICE

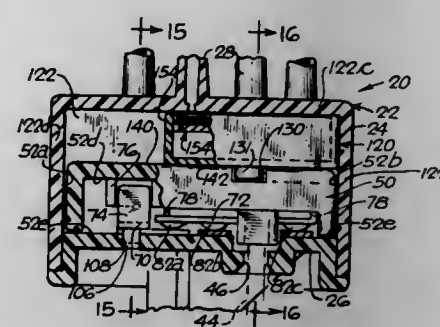
Andrew F. Raab, Morton Grove, and Raymond T. Halstead, Wheeling, both of Ill., assignors to Indak Manufacturing Corporation, Northbrook, Ill.

Filed Feb. 17, 1976, Ser. No. 658,615

Int. Cl.² H01H 15/06

U.S. Cl. 200—16 C

6 Claims



1. An electrical switching device, comprising
 a casing,
 a control member movable in said casing along a predetermined path,
 a conductive contactor mounted on said control member and movable therewith,

said contactor having first and second contact points movable along first and second paths,
 said casing having an electrically insulating wall opposite said contactor,
 and first and second elongated conductive contact bar members mounted on said insulating wall opposite said contactor,
 said first contact bar member extending along said first path and being engageable by said first contact point on said contactor,
 said first and second contact bar members having first and second segments thereon projecting laterally in opposite directions into said second path and disposed alternately along said second path for successive engagement by said second contact point on said contactor,
 said first and second segments having a narrow gap therebetween of less width than the width of said second contact point whereby said second contact point will ride between said first and second segments without engaging said insulating wall to avoid burning of said insulating wall and to avoid contamination of said second contact point by said insulating wall.

3. A device according to claim 1, including
 resilient means for biasing said contactor toward said casing for resilient engagement with said first and second members.

4,054,762

ELECTRICAL CONNECTORS

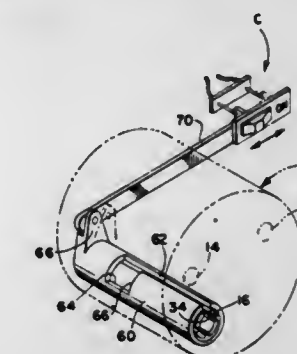
George W. Knecht, Brooklyn, N.Y., assignor to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 649,395, Jan. 15, 1976, Pat. No. 4,007,976, which is a division of Ser. No. 530,061, Dec. 6, 1974, Pat. No. 3,771,609. This application July 22, 1976, Ser. No. 707,918

Int. Cl.² H01H 9/20

U.S. Cl. 200—50 B

1 Claim



1. An electrical connector including a plurality of socket electrical contacts and a ground socket contact, movable locking means adjacent said ground contact selectively movable between locking and unlocking positions for respectively preventing insertion or removal of a ground pin relative to said ground contact and permitting insertion or removal of a ground pin relative to said ground contact, said ground contact having a longitudinal slot therein for receiving a key on a ground pin, said locking means including a sleeve member rotatably surrounding said ground contact and having a generally L-shaped slot having a main slot leg aligned with said ground contact slot in said unlocking position and misaligned with said ground contact slot in said locking position, said L-shaped slot including a rear lateral slot leg for receiving the pin key in said locking position, and an electric circuit breaker connected with said locking means for moving said locking means between locking and unlocking positions as said circuit breaker is moved between on and off positions.

4,054,763

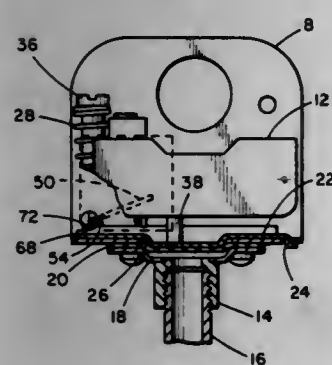
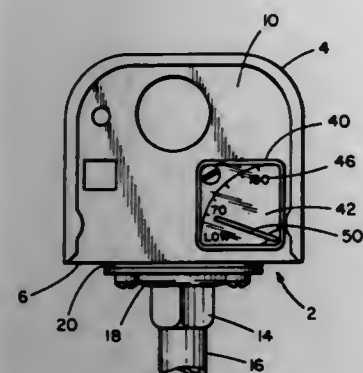
PRESSURE SWITCH AND GAUGE

Dale F. Willcox, Aurora, Ill., assignor to Furnas Electric Company, Batavia, Ill.

Filed Apr. 23, 1976, Ser. No. 679,800
Int. Cl.² G01D 13/26; H01H 35/24

U.S. Cl. 200—56 R

3 Claims



1. A pressure switch and indicator comprising: a supporting frame having a bottom and side walls upstanding therefrom on opposite sides thereof; said bottom wall having an opening therein; a resilient diaphragm secured to said bottom wall over said opening; a pressure lever pivoted at one end on said bottom wall and in contact with said diaphragm at a point intermediate its length; adjustable biasing means mounted in said housing; and engaging the free end of said pivoted pressure lever to urge it toward said bottom wall, a switch mechanism mounted in said frame; a push rod in contact with said pivoted pressure lever and movable therewith in response to upward movement of said diaphragm to operate said switch mechanism; a gauge mounted on the outside of a side wall of said frame and including indicia thereon; an indicator having a pointer extending toward said indicia; a shaft portion extending through said side wall, and a crank portion overlying the free end of said pivoted pressure lever and a clip attached to said free end and trapping said crank portion to cause said crank portion to rotate said shaft portion and said pointer portion to move past said indicia as said diaphragm flexes in response to variations in pressure thereon.

4,054,764

SPEED RESPONSIVE SWITCHING DEVICE

Eric Whiteley, Peterborough, Canada, assignor to General Electric Company, Schenectady, N.Y.

Filed May 17, 1976, Ser. No. 686,912

Claims priority, application Canada, June 5, 1975, 228772

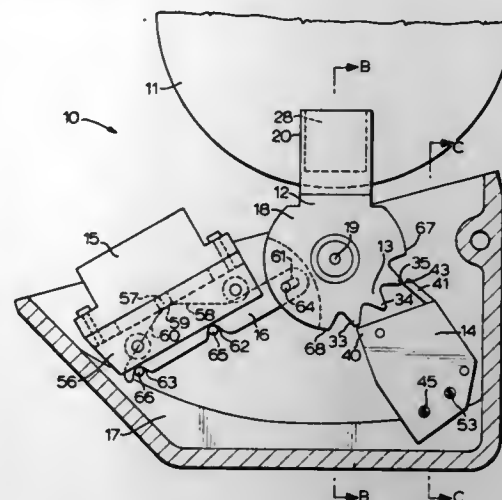
Int. Cl.² H01H 35/00

U.S. Cl. 200—61.46

7 Claims

1. An overspeed switching mechanism for a motor comprising an electrically conductive rotor member supported for rotation with the rotor of the motor; a drag mechanism supported for limited movement and having a first permanent magnet structure linked magnetically with said rotor member for movement of the drag mechanism through electromagnetic interaction between the magnet structure and the rotor member during rotation thereof; a latching mechanism linked with

said drag mechanism by means of a second permanent magnet structure for restraining movement of the drag mechanism until said rotor member attains a preset speed at which the latching mechanism releases the drag mechanism and allows



limited movement thereof with a snap action; switching means; actuating means operatively linked with said drag mechanism and said switching means for translating movement of the drag mechanism into switching action of the switching means; and means for resetting said drag mechanism.

4,054,765

PIN-JOINT COUPLING FOR THREE OR MORE INTERRELATED COMPONENTS

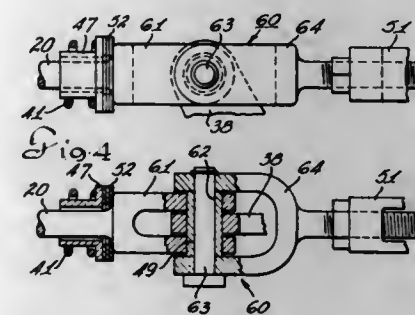
Henry L. Peek, Brandon, and Douglas B. Weatherly, Jackson, both of Miss., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 24, 1975, Ser. No. 635,160

Int. Cl.² H01H 33/82

U.S. Cl. 200—148 F

5 Claims



1. In a gas insulated circuit breaker; an enclosure; a plurality of circuit interrupters connected in electrical series relationship and disposed within said enclosure; a stationary contact and a movable contact associated with each of said circuit interrupters; an operating crank associated with each circuit interrupter and operatively connected to effect the movement of said interrupter movable contact between open and closed positions; a pull-rod associated with each circuit interrupter; an acceleration spring mounted on each pull-rod and operable to store energy therein for effecting a movement of the associated pull-rod in a contact opening movement; a pin-bushing disposed in aligned openings formed in the pull-rod and operable to provide an articulated between the pull-rod and the operating crank; and, a pin disposed in said pin-bushing and operatively arranged to provide an articulated connection of said pull-rod of the second circuit interrupter with the pull-rod of the adjacent first circuit interrupter.

4,054,766

PORTABLE TOOL SWITCH STRUCTURE

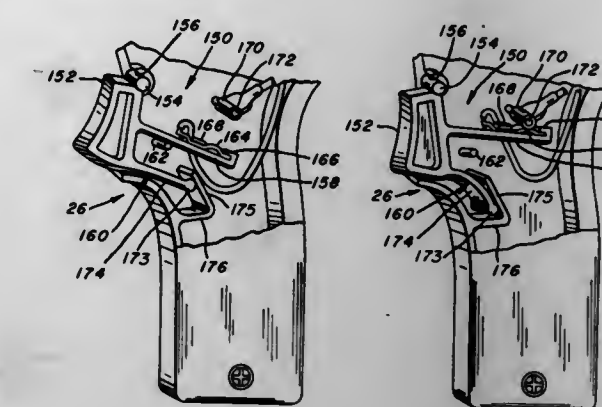
John J. Kramer, Jackson, Tenn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 15, 1976, Ser. No. 649,206

Int. Cl.² H01H 9/06

U.S. Cl. 200—157

5 Claims



1. In a manually-manipulable, portable electric power tool, the combination comprising:
a. a handle having an aperture formed therein;
b. an electric switch housed completely within said handle, protected from external exposure, and having "on" and "off" positions; and
c. a trigger member mounted within said handle, said trigger member being molded from a plastic material having high dielectric properties and a degree of inherent resiliency, and comprising:
1. pivoting means for mounting in recesses in said handle of said power tool;
2. a finger-engaging portion protruding through said aperture;
3. a leg portion with retaining means for mounting one contact of said electric switch;
4. a second leg portion adapted to engage wall members of said handle;
d. whereby inward depression of said finger-engaging portion produces pivotal movement of said trigger in said handle and thereby moves said one contact into engagement with another electrical contact fixedly mounted in said handle; and
e. whereby, during said inward depression, said second leg portion engages said wall member and flexes, due to the resiliency of the plastic material;
f. thereby providing a biasing force to move said actuator member to its initial position upon release of finger pressure, causing separation of said electrical contacts and interrupting power to the tool.

4,054,767

SWITCH TERMINAL ASSEMBLY HAVING STRIP TERMINAL AND MOUNTING MEMBER ADAPTED TO GROUND DYNAMOELECTRIC MACHINE CASING ON SIMILAR CONDUCTIVE SURFACE

Wesley K. Anderson, DeKalb, and Willard H. Stanley, Sterling, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed July 31, 1975, Ser. No. 600,880

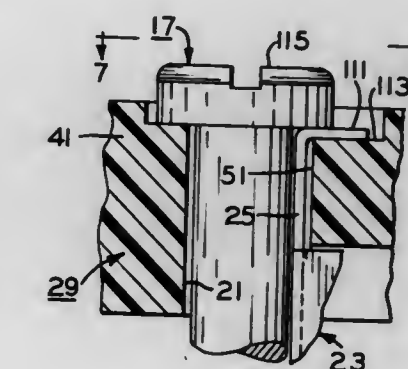
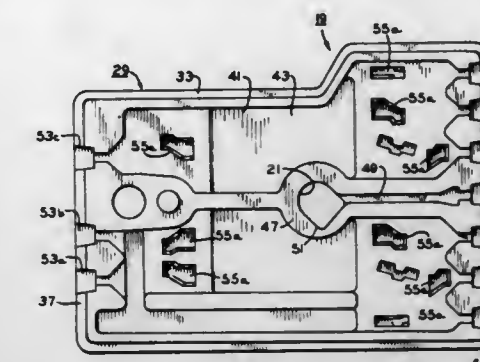
Int. Cl.² H01H 9/12; H01R 3/02; H02K 11/00; H05K 5/02
U.S. Cl. 200—293

42 Claims

1. A switch and terminal assembly adapted to be mounted to a structural component of a dynamoelectric machine by an electrical conductive mounting member comprising:

- a casing;
- receiving means in said casing for accommodating the mounting member; and
- a grounding device disposed in said casing for connecting the dynamoelectric machine with a ground including means associated with said receiving means for grounding engagement with the mounting member upon the mount-

ing thereby of the switch and terminal assembly to the dynamoelectric machine structural component, and means



exposed exteriorly of said casing for connection with the ground.

4,054,768

SYSTEM FOR INCREASING VISIBILITY AND MICROWAVE DISTRIBUTION WITHIN A MICROWAVE OVEN

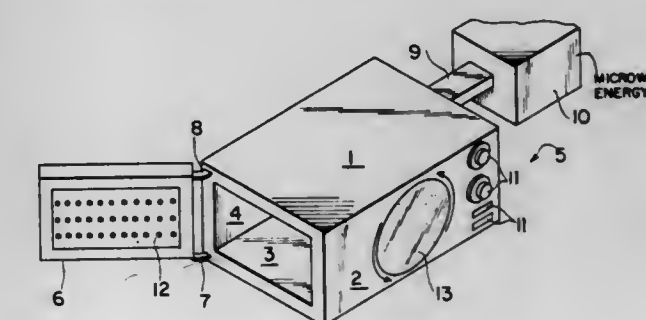
Donald A. White, and Donald J. White, both of 4701 E. Kessler View, Indianapolis, Ind. 46220

Filed Aug. 6, 1976, Ser. No. 712,198

Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 D

15 Claims



1. A microwave oven, comprising: enclosure means for confining microwave energy and creating a cavity for receiving a body to be heated by the confined microwave energy; and means for introducing microwave energy into said cavity; said enclosure means including a door mounted for movement between a first closed position that with the remainder of said enclosure means confines said microwave energy and a second open position providing access to said cavity for the insertion and withdrawal of a body to be heated; said enclosure means being provided with a microwave shield having a plurality of transparent portions of insufficient size to pass the microwave energy from the cavity through said enclosure means to the exterior, and of sufficient size and quantity to provide visibility through said enclosure means from the outside to view the body within said cavity; and means for periodically moving said shield relative to the remainder of said enclosure means to

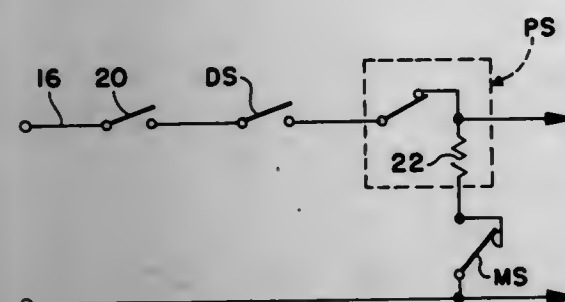
increase the visibility through said shield to the cavity for viewing of the body to be heated.

4,054,769

MICROWAVE OVEN INTERLOCK SWITCH SAFETY
Carl L. Anderson, and John T. Lamb, both of Mansfield, Ohio, assignors to The Tappan Company, Mansfield, Ohio
Filed Mar. 4, 1976, Ser. No. 663,904
Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 C

10 Claims



1. In a microwave oven having door interlock switch means in the oven power supply and monitor switch means, the two switch means being respectively sequentially opened and closed in response to opening of the oven door, the monitor switch means being between the oven and in the interlock switch means to short-circuit the power supply upon closing if the interlock switch means fails to open with power supplied to the oven; protector switch means also in the oven power supply, the contacts of said protector switch means being normally open, actuator means for forcibly and releasably closing said contacts, and heat deformable electrical resistance means mechanically acting on said actuator means to hold the same in switch closing condition, said heat deformable means being in circuit with said monitor switch means to receive current flow through the latter, such flow of current being sufficient to rapidly deform the resistance means sufficiently to release the actuator means and thereby interrupt the supply of power to the oven.

4,054,770

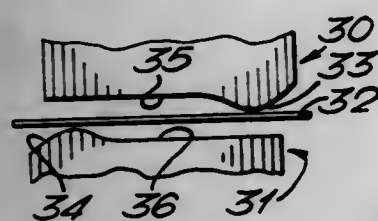
INDUCTION HEATING OF STRIP AND OTHER ELONGATE METAL WORKPIECES

William Barry Jackson, Wirral; Roger Charles Gibson, and Ralph Waggott, both of Chester, all of England, assignors to The Electricity Council, England
Filed Mar. 10, 1976, Ser. No. 665,365
Claims priority, application United Kingdom, Mar. 10, 1975, 9952/75

Int. Cl.² H05B 5/06

U.S. Cl. 219—10.61 R

11 Claims



1. An induction heater for heating elongate strip material of a predetermined width, which strip is moved lengthwise through the heater at a uniform speed, which heater comprises at least one pole assembly extending transversely across the width of the strip, said pole assembly comprising at least one ferromagnetic pole carrier having a slot extending across the width of the strip and a plurality of pole pieces mounted in said slot for adjustment across the width of the strip but supported by said pole carrier against movement normal to the strip, said

pole pieces being shaped and positioned to give a flux per unit width which varies across the width of the strip.

4,054,771

DEVICE FOR ELECTRONIC BEAM WELDING OF COAXIAL CYLINDRICAL SLEEVES PLACED IN END-TO-END RELATION

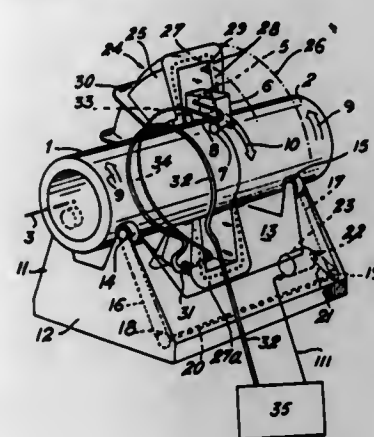
Henri Foulquier, La Celle St.-Cloud, and Philippe Martin, Orsay, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 5, 1976, Ser. No. 646,549

Claims priority, application France, Jan. 16, 1975, 75.01302
Int. Cl.² B23K 9/00

U.S. Cl. 219—121 EB

35 Claims



1. A device for electronic beam welding of coaxial cylindrical sleeves placed in end-to-end relation forming a line of junction, comprising:

carriage means;
means for moving said carriage means in a circumferential direction along a surface of the cylindrical sleeves in the proximity of the line of junction;
an electron gun for producing an electron welding beam, said electron gun carried by said carriage means and secured in a position for a substantial radial directing of said beam with respect to the surface along which the carriage means is moved, said electron gun disposed in a pivotal relationship with respect to said carriage means;

means for continuous fine adjusting of the relative position of said electron gun with respect to said carriage means during movement thereof for fine adjusting of the beam direction in conformance with the location of the line of junction, said continuous fine adjusting means including:

a. a stationary guide rail positionable in relationship with respect to the line of junction;
b. a guide bar adjustably mountable to said stationary guide rail for varying the position of said guide bar with respect to the line of junction, said guide bar positionable in a parallel relationship with respect to and coextensive with the line of junction;
c. a pivoting arm having two ends, one of said ends rigidly fixed to said gun and other of said ends for cooperating with said guide bar for maintaining the beam of said gun in a fixed relationship with respect to said guide bar;

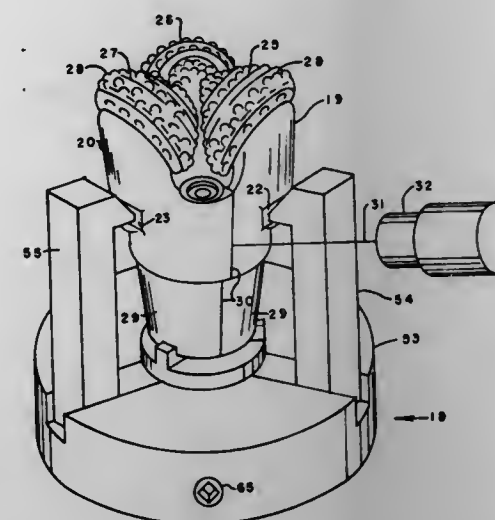
enclosure means for enclosing an area surrounding the line of junction providing a vacuum-tight, sealed enclosure, said area of a size to receive said carriage means permitting movement of the same therewithin; and
means for rotating the cylindrical sleeves in a relatively fixed relationship with respect to each other at a speed of opposite sign and equal magnitude to that of said carriage means for maintaining said carriage means in a relative fixed position with respect to the axis of the sleeves.

4,054,772

POSITIONING SYSTEM FOR ROCK BIT WELDING
Carl Laurent Lichte, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Continuation-in-part of Ser. No. 409,209, Oct. 24, 1973, abandoned. This application May 5, 1975, Ser. No. 574,228
Int. Cl.² B23K 9/00

U.S. Cl. 219—121 EM

7 Claims



1. A method of positioning segments of a rock bit for alignment with a beam of energy to weld the segments together along the seams between segments by positioning the segments in a welding chamber and sequentially indexing the segments, wherein relative movement between said beam of energy and an individual seam establishes a beam plane, and wherein each seam between adjacent segments establishes a seam plane with an exposed edge, said rock bit having a central axis with said seam plane being out of alignment with said central axis, comprising the steps of:

clamping the segments together in position for the final assembled bit,
tilting said segments about an axis that will be parallel to said beam of energy when the segments are positioned in said welding chamber to bring an exposed edge of a seam plane into a position wherein it would be parallel to said beam plane when positioned in said welding chamber,
rotating said segments about said central axis to bring said seam plane into a position wherein it would be parallel to said beam plane when positioned in said welding chamber, and
moving said clamping means laterally along an axis that is perpendicular to said axis that will be parallel to said beam of energy when the segments are positioned in said welding chamber to bring said beam plane into a position wherein it would be in alignment with said beam plane when positioned in said welding chamber.

4,054,773

PROCESS AND WELDING ROD FOR THE WELDING OF WHITE CAST IRON

Patsie Carmen Campana, 2614 Sherwood Drive, Lorain, Ohio 44053

Filed Sept. 12, 1975, Ser. No. 612,667

Int. Cl.² B23K 35/22

U.S. Cl. 219—137 WM

9 Claims

1. A process for the electric arc welding of cast iron comprising:

providing a cast iron article to be welded containing, by weight, about 1.8 to about 3.6 percent carbon, about 0.5 to about 1.9 percent silicon, about 0.25 to about 0.80 percent manganese, about 0.06 to about 0.20 percent sulphur, about 0.06 to about 0.18 percent phosphorus, with the balance being iron plus incidental impurities;
electrically applying to the cast iron article to be welded, at

welding temperatures, a welding material obtained by simultaneously melting a first and second welding rod; said first welding rod containing, by weight, about 0.085 to about 0.095 percent carbon, about 0.0285 to about 0.0315 percent chromium, about 0.0095 to about 0.0105 percent nickel, about 0.0095 to about 0.0105 percent molybdenum, about 0.618 to about 0.672 percent manganese, about 0.01615 to about 0.01785 percent sulphur, about 0.01805 to about 0.01995 percent phosphorus, about 2.50 percent silicon, with the balance being iron plus incidental impurities, said first welding rod being provided with a low hydrogen fluxing material;

said second welding rod containing, by weight, from about 2.35 to about 2.75 percent carbon, from about 0.01 to about 0.03 percent chromium, from about 0.20 to about 0.50 percent nickel, from about 0.08 to about 0.10 percent molybdenum, from about 0.50 to about 0.90 percent manganese, from about 0.05 to about 0.08 percent sulphur, from about 0.20 to about 0.50 percent phosphorus, from about 2.50 to about 2.75 percent silicon, with the balance being iron plus incidental impurities.

4,054,774

PROCESS AND WELDING ROD FOR THE WELDING OF MALLEABLE CAST IRON

Patsie Carmen Campana, 2614 Sherwood Drive, Lorain, Ohio 44053

Filed Sept. 12, 1975, Ser. No. 612,674

Int. Cl.² B23K 35/22

U.S. Cl. 219—137 WM

14 Claims

1. A process for the electric arc welding of cast iron containing, by weight, about 2.0 to about 2.6 percent carbon, about 1.1 to about 1.6 percent silicon, about 0.2 to about 1.0 percent manganese, about 0.18 to about 0.40 percent sulphur, about 0.0 to about 0.18 percent phosphorus, with the balance being iron plus incidental impurities which comprises:

electrically applying to the cast iron to be welded, at welding temperatures, a welding material obtained by simultaneously melting a first and second welding rod; said first welding rod containing, by weight, about 0.085 to about 0.095 percent carbon, about 0.0285 to about 0.0315 percent chromium, about 0.0095 to about 0.0105 percent nickel, about 0.0095 to about 0.0105 percent molybdenum, about 0.618 to about 0.672 percent manganese, about 0.01615 to about 0.01785 percent sulphur, about 0.01805 to about 0.01995 percent phosphorus, about 2.50 percent silicon, with the balance being iron plus incidental impurities, said first welding rod being provided with a low hydrogen fluxing material;
said second welding rod containing, by weight, from about 1.40 to about 2.20 percent carbon, about 0.04 percent chromium, from about 0.60 to about 1.00 percent nickel, from about 0.10 percent molybdenum, from about 0.90 to 1.00 percent manganese, about 0.05 percent sulphur, about 0.20 percent phosphorus, about 2.75 percent silicon, with the balance being iron plus incidental impurities.

4,054,775

PROCESS AND WELDING ROD FOR WELDING GRAY CAST IRON

Patsie Carmen Campana, 2614 Sherwood Drive, Lorain, Ohio 44053

Filed Sept. 12, 1975, Ser. No. 612,666

Int. Cl.² B23K 35/22

U.S. Cl. 219—137 WM

8 Claims

1. A process for the electric arc welding of cast iron comprising:

providing a cast iron article to be welded containing, by weight, about 2.5 to about 4.0 percent carbon, about 1.0 to about 3.0 percent silicon, about 0.25 to about 1.0 percent manganese, about 0.20 to about 0.25 percent sulphur, about 0.5 to about 1.0 percent phosphorus, with the bal-

ance being iron plus incidental impurities which comprises:

electrically applying to the cast iron to be welded, at welding temperature, a welding material obtained by simultaneously melting a first and second welding rod;

said first welding rod containing, by weight, about 0.085 to about 0.095 percent carbon, about 0.0285 to about 0.0315 percent chromium, about 0.0095 to about 0.0105 percent nickel, about 0.0095 to about 0.0105 percent molybdenum, about 0.618 to about 0.672 percent manganese, about 0.01615 to about 0.01785 percent sulphur, about 0.01805 to about 0.01995 percent phosphorus, about 2.50 percent silicon, with the balance being iron plus incidental impurities, said first welding rod being provided with a low hydrogen fluxing material;

said second welding rod containing, by weight, from about 2.60 to about 2.85 percent carbon, about 0.01 percent chromium, from about 0.10 to about 0.30 percent nickel, from about 0.05 to about 0.08 percent molybdenum, about 0.50 percent manganese, about 0.08 percent sulphur, about 0.50 percent phosphorus, about 2.50 percent silicon, with the balance being iron plus incidental impurities.

4,054,776

PROCESS AND COATED WELDING ROD FOR WELDING WHITE CAST IRON

Patric Carmen Campana, 2614 Sherwood Drive, Lorain, Ohio 44053

Filed Sept. 12, 1975, Ser. No. 612,665
Int. Cl.² B23K 35/22

U.S. Cl. 219—137 WM

16 Claims

1. A process for the electric arc welding of cast iron containing, by weight, about 1.80 to about 3.60 percent carbon, about 0.50 to about 1.90 percent silicon, about 0.25 to about 0.80 percent manganese, about 0.06 to about 0.20 percent sulphur, about 0.06 to about 0.18 percent phosphorus, with the balance being iron plus incidental impurities which comprises:

electrically applying to the cast iron to be welded, at welding temperatures, a welding material obtained by simultaneously melting a welding rod containing, by weight, from about 2.30 to about 3.00 percent carbon, from about 0.03 to about 0.06 percent chromium, from about 0.01 to about 0.04 percent nickel, about 0.01 percent molybdenum, from about 0.82 to about 0.90 percent manganese, from about 0.023 to about 0.032 percent sulphur, from about 0.103 to about 0.115 percent phosphorus, about 2.64 percent silicon, with the balance being iron plus incidental impurities, said welding rod being provided with an effective amount of a low hydrogen fluxing material comprised of a mixture of calcium carbonate, ferric oxide, aluminum oxide, silicon dioxide and clay.

4,054,777

PROCESS AND WELDING ROD FOR THE WELDING OF DUCTILE CAST IRON

Patric Carmen Campana, 2614 Sherwood Drive, Lorain, Ohio 44053

Filed Sept. 12, 1975, Ser. No. 612,664
Int. Cl.² B23K 35/22

U.S. Cl. 219—137 WM

5 Claims

1. A process for the electric arc welding of cast iron comprising:

providing a cast iron article to be welded containing, by weight, about 3.00 to about 4.00 percent carbon, about 1.80 to about 2.80 percent silicon, about 0.10 to about 1.00 percent manganese, about 0.00 to about 0.03 percent sulphur, about 0.00 to about 0.10 percent phosphorus, with the balance being iron plus incidental impurities;

electrically applying to the cast iron to be welded, at welding temperatures, a welding material obtained by simultaneously melting a first and second welding rod;

said first welding rod containing, by weight, about 0.085 to about 0.095 percent carbon, about 0.0285 to about 0.0315

percent chromium, about 0.0095 to about 0.0105 percent nickel, about 0.0095 to about 0.0105 percent molybdenum, about 0.618 to 0.672 percent manganese, about 0.01615 to about 0.01785 percent sulphur, about 0.01805 to about 0.01995 percent phosphorus, about 2.50 percent silicon, with the balance being iron plus incidental impurities, said first welding rod being provided with a low hydrogen fluxing material;

said second welding rod containing, by weight, about 2.85 percent carbon, about 0.01 percent chromium, about 0.10 percent nickel, about 0.05 percent molybdenum, about 0.50 percent phosphorus, about 0.50 percent manganese, about 0.08 percent sulphur, about 2.50 percent silicon, with the balance being iron plus incidental impurities.

4,054,778

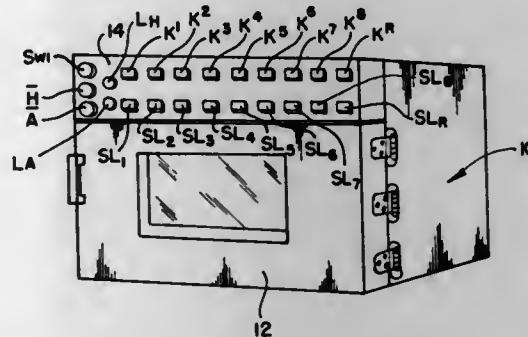
SOLID STATE ELECTRONIC OVEN CONTROL SYSTEM

Ferid Wollich, Wauwatosa, Wis., assignor to M & M Enterprises, Inc., Milwaukee, Wis.

Filed June 30, 1975, Ser. No. 591,358
Int. Cl.² A21B 1/00; H05B 1/02

U.S. Cl. 219—413

6 Claims



1. A control system for an electric meatcooking oven for controlling the current flow in an electric heating cable associated with the oven, the control system including: switching means connected in circuit with the cable and a source of energizing electric current; an oven temperature module for generating an output signal so long as the oven temperature is below a pre-set temperature level; a meat temperature module for generating an output signal so long as the internal temperature of the meat being cooked in the oven is below a pre-set cooking temperature level; electric circuitry connecting said oven temperature module and said meat temperature module to said switching means and having an automatic mode in which said switching means is controlled to permit current flow through the cable until the pre-set oven temperature is reached and thereafter to control the current flow in the cable to maintain the oven at the pre-set oven temperature until the pre-set internal temperature of the meat is reached; switching circuitry connecting said electric circuitry to the oven temperature module to cause the oven temperature module to generate its output signal in said automatic mode only when the oven temperature falls below a pre-set holding temperature lower than said pre-set cooking temperature level, after said pre-set internal temperature of the meat has been reached; said electric circuitry also including manually controlled logic circuit means to set the system to its automatic mode, and alternately to set the system to a manual mode in which the circuitry is independent of the output of the meat temperature module so that the oven is established at the pre-set temperature by said oven temperature module; and manually controlled switching means connected to said oven temperature module and to said meat temperature module for setting the oven temperature module and the meat temperature module to different pre-set temperature levels.

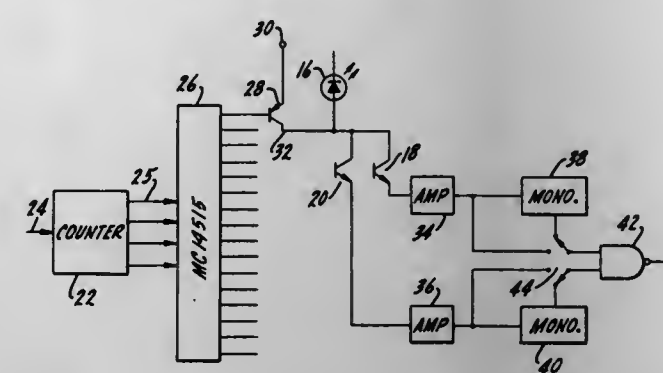
4,054,779 COUNTING DEVICE

Robert A. Wilke, Winona, Minn., assignor to Lake Center Industries, Winona, Minn.

Filed July 19, 1976, Ser. No. 706,797
Int. Cl.² B65G 51/36

U.S. Cl. 235—92 PK

12 Claims



1. A seed monitor for a multiple station planter including a light source adjacent the seed path for each planter station, a pair of spaced light responsive devices in alignment with each light source,

means for causing operation of each light source, a pair of pulse generating means, each pulse generating means being connected to one of each pair of light responsive devices for providing a constant width pulse in response to an interruption in light received from the light source, and logic circuit means connected to each pulse generating means, said logic circuit means providing an output signal whenever either pulse generating means provides a pulse at its input:

4,054,780

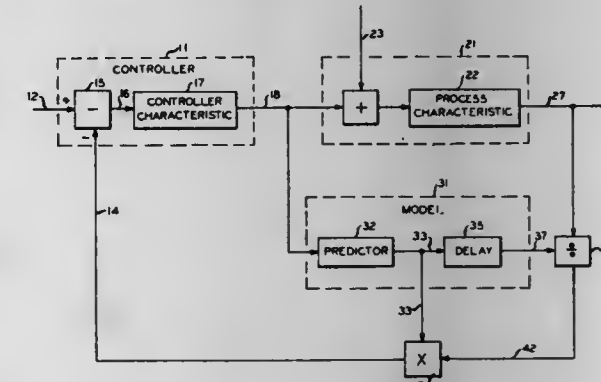
GAIN-ADAPTIVE PROCESS CONTROL

Thomas M. Bartley, Brownsville, Tex., and Richard F. Giles, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 1, 1976, Ser. No. 737,374
Int. Cl.² G05B 17/00

U.S. Cl. 364—106

18 Claims



1. A method of controlling a process, said method comprising:

generating a process control signal in response to a comparison of a controller variable input signal and a controller setpoint signal;
applying said process control signal to said process to effect control thereof;
generating, in response to said process control signal, a process prediction signal representative of the predicted response of a measured process variable to said process control signal;
applying a delay factor, modeled after the response delay of said process, to said process prediction signal to produce a delayed prediction signal;

generating a process measurement signal representative of the value of said measured process variable;
generating in response to said process measurement signal and said delayed prediction signal, a correction signal responsive to the ratio of said measured process variable to the delayed process response prediction; and
generating said controller variable input signal in response to the product of said process prediction signal and said correction signal.

4,054,781

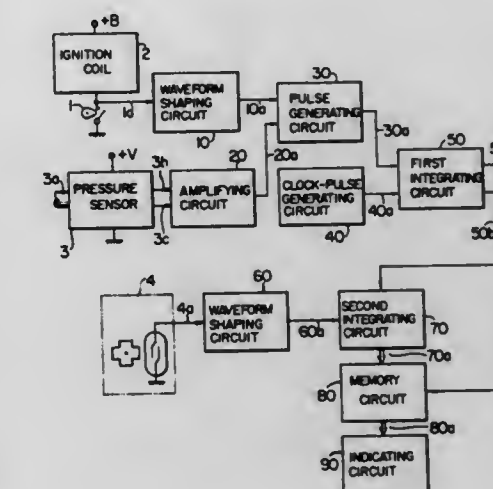
METHOD AND APPARATUS FOR INSTANTANEOUSLY MEASURING AND INDICATING FUEL CONSUMPTION RATE

Akira Kuno, Nagoya; Yoshio Shinoda, Okazaki, and Hiroshi Arai, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed Dec. 15, 1975, Ser. No. 640,929
Claims priority, application Japan, Jan. 7, 1975, 50-4822
Int. Cl.² G01M 15/00; G06G 7/70

U.S. Cl. 364—442

8 Claims



1. An apparatus for instantaneously measuring fuel consumption rate comprising:

measuring means, responsive to at least two operating parameters of an engine mounted on a vehicle, for indirectly measuring fuel amount consumed by the engine to generate a fuel signal indicative thereof, said measuring means including a pulse generating circuit which includes a flip-flop having first and second input terminals and first and second output terminals and a voltage comparator, one input terminal of said flip-flop receiving an input signal indicative of one operating parameter of the engine, one output terminal of said flip-flop being connected, through an integrator circuit having a capacitor, to one input terminal of said voltage comparator, the other input terminal of said voltage comparator receiving another input signal indicative of another operating parameter of the engine, an output terminal of said voltage comparator being connected to the other input terminal of said flip-flop, and the fuel signal being generated at the other output terminal of said flip-flop;
a speed sensor for detecting running speed of said vehicle and generating a speed signal proportional thereto;
a first circuit connected to said measuring means for integrating said fuel signal and generating an output signal indicative of a predetermined fuel consumption;
a second circuit connected to said speed sensor and said first circuit for integrating said speed signal controlled by said output signal and for generating an output signal directly proportional to running distance and inversely proportional to fuel amount consumed; and
indicating means connected to said second circuit for indicating fuel consumption rate in response to said output signal of said second circuit.

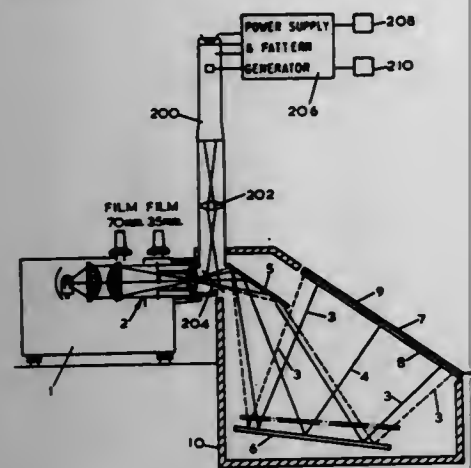
4,054,782

DEVICE FOR COUNTING AND CALCULATING
Ewald Rudolph Weibel, Bern, Switzerland, assignor to Image Analysing Computers Limited, England
Continuation-in-part of Ser. No. 530,535, Dec. 9, 1974, abandoned. This application Oct. 13, 1976, Ser. No. 732,043
Claims priority, application Switzerland, Dec. 10, 1973, 1748/73

Int. Cl.² G02B 27/22; G06F 15/02

U.S. Cl. 364-555

10 Claims



1. A stereological counting and computing device comprising, in combination:
 - an optical system for forming an image of a specimen;
 - means for causing a test system to be seen in the plane of the image of the specimen;
 - at least two manually operable counters for separately recording numerical data obtained from a visual analysis of the image of the specimen using the test system;
 - a computing unit;
 - means for determining which one of a plurality of test systems is in use and for supplying to the computing unit data relating to the test system whereby the computing unit is programmed to calculate numerical values of at least two parameters of the specimen from the data recorded in the counters together with the mean and relative standard deviation of the calculated values; and
 - at least one display device for each of the mean and relative standard deviation whereby an estimate of the accuracy of the calculated values can be made after each entry of data from the counters.

4,054,783

DECOMPRESSION PLAN DEVICE

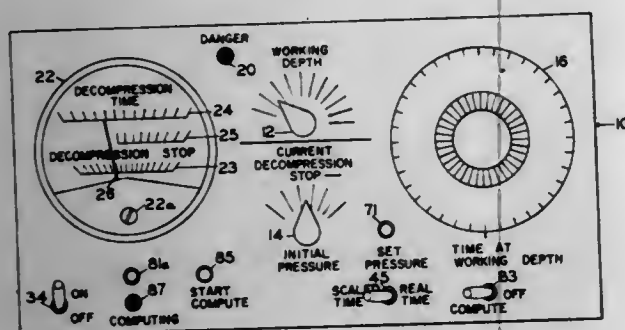
Ali A. Seireg, Madison, Wis., and Amr M. S. Baz, Heliopolis, Egypt, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 9, 1976, Ser. No. 665,172

Int. Cl.² G06G 7/60

U.S. Cl. 364-418

27 Claims



1. A decompression plan device for an underwater diver comprising:
 - a pressure monitor means for sensing the ambient working depth pressure of a diver and for providing an electrical signal corresponding thereto;
 - computing means for receiving the working depth pres-

sure signal and for computing an electrical output signal corresponding to the simulated tissue pressure due to the uptake and elimination of inert gases at the working depth pressure in a single simulated tissue having an uptake time constant and a different elimination time constant; and

- c. display means for receiving the tissue pressure signal and for displaying a safe decompression stop depth corresponding to the tissue pressure signal and to a chosen supersaturation ratio.

4,054,784

WEIGH FEEDER SYSTEM

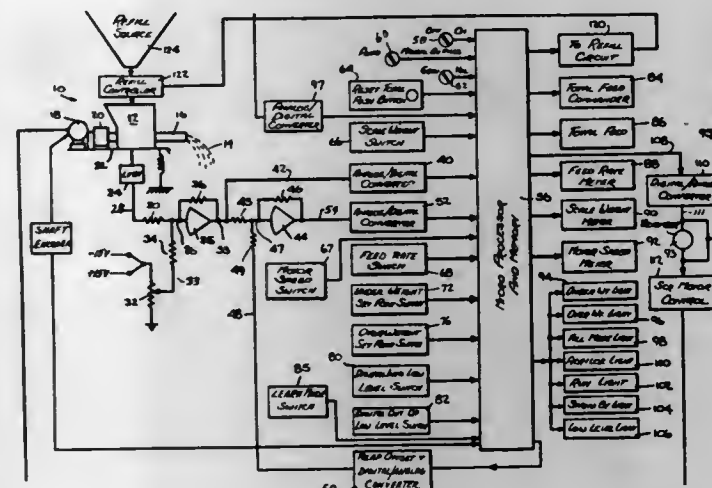
Ronald J. Ricciardi, 108 Malcolm Ave., Garfield, N.J. 07026; Angelo Ferrara, 7 Bryn Mawr Way, Fairfield, N.J. 07006, and Joseph L. Hartmann, 85 Hillside Ave., West Caldwell, N.J. 07006

Continuation-in-part of Ser. No. 587,869, June 18, 1975. This application Apr. 19, 1976, Ser. No. 678,391

Int. Cl.² G01G 11/04

U.S. Cl. 364-479

20 Claims



1. A weigh feeding apparatus comprising a container for a prefilled substance, means for discharging said substance from said container at a controllable rate; means for weighing said container prefilled with said substance; means coupled to said weighing means for producing a first electrical signal proportional in amplitude to the weight determined by said weighing means; high gain amplifier means for amplifying said first electrical signal, an analog-digital converter coupled to said amplifier means, digital computer means coupled to said analog-digital converter for computing and outputting a signal corresponding to the signal received, digital-analog converter ramp offset means controlled by said computer output signal, having a controlled stepping output applied as a second input signal to said amplifier means to algebraically combine with said first electrical signal, each step corresponding to one time cycle of operation thereby to maintain the output of said amplifier in a given preselected range of amplitude during said one time cycle of operation, said computer means being adapted to compute a corrective signal based on said signal received, and means coupled between said computer means and said means for discharging said substance from said container for controlling the rate of discharge responsive to said corrective signal.

4,054,785

SPECTRUM ANALYZER WITH MULTIPLE OPERATIONAL MODES

Joseph L. Lehmann, Sarasota, FL, assignor to Sangamo Weston, Inc., Sarasota, Fla.

Filed Sept. 16, 1976, Ser. No. 723,785

Int. Cl.² G06F 15/34

U.S. Cl. 364-726

10 Claims

1. A spectrum analyzer including means operative in a first analyzer mode for processing digital samples representing the time history of an analog signal to derive power spectrum

4,054,786

RUNNING AVERAGE COMPUTER

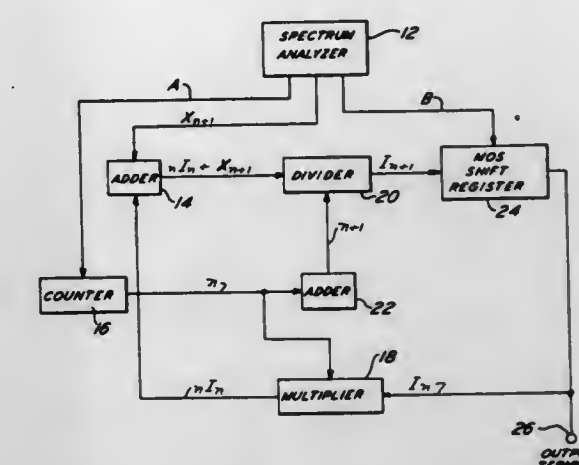
Allen E. Vincent, Fort Wayne, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 24, 1973, Ser. No. 398,279

Int. Cl.² G06F 7/38

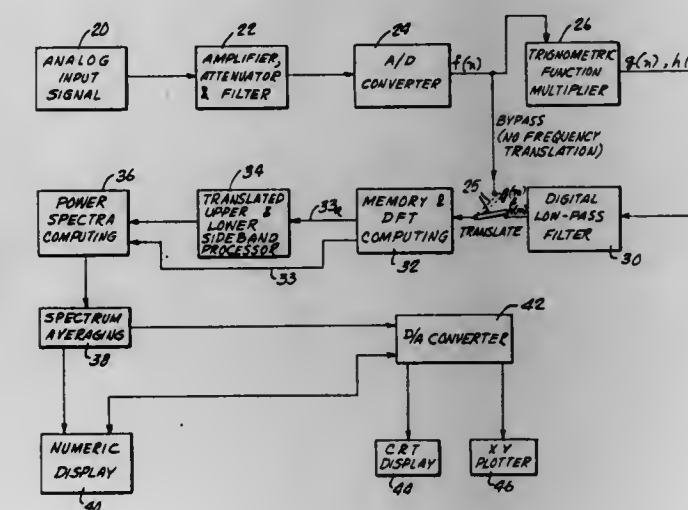
U.S. Cl. 364-575

9 Claims



values for each of a plurality of spectral lines uniformly distributed over a frequency range starting at or about zero frequency, said spectrum analyzer further including means operative in a second analyzer mode for deriving power spectrum values for spectral lines distributed only within a frequency range that does not start at zero frequency, said means operative in the second analyzer mode comprising:

- means for defining a finite frequency band of interest which starts at a non-zero frequency;
- means for providing a sequence of digital words $f(n)$, where $n = 1, 2, \dots, N$, which correspond to samples of an analog signal at a sampling rate at least twice the upper limit of said band;
- means for combining each of said digital words $f(n)$ with a first and a second trigonometric function, said functions being in quadrature with respect to each other and having arguments determined by the center frequency of said band and the order of the digital word $f(n)$ in the sequence, to form respective first and second sequences of resulting digital words $g(n)$ and $h(n)$;
- means for digitally filtering the sequences of digital words $g(n)$ and $h(n)$ in accordance with a filter function deter-



- mined by the width of said band to form respective sequences $g(m)$ and $h(m)$, where $m = 1, 2, \dots, M$ and M is less than N ;
- a discrete Fourier transform processor and means for applying thereto the digital word sequences $g(m)$ and $h(m)$ to form thereby a set of discrete Fourier transform terms RG' and IG' from each word $g(m)$ and RH' and IH' from each word $h(m)$, a set of terms being formed from each of the words $g(m)$ and $h(m)$ for each of a selected plurality of spectral lines, where R designates the real term and I the imaginary term of a discrete Fourier transform;
- means for combining the like named terms for each subscript m to form respective discrete Fourier transform terms RG , IG , RH , and IH for each spectral line; and
- means for algebraically combining the terms RG , IG , RH and IH with each other to form a set of terms RU and IU representing the discrete Fourier transform of the upper half of said band translated about zero center frequency and a set of terms RL and IL representing the discrete Fourier transform of the lower half of said band translated about zero center frequency, and means for algebraically processing said terms RU , IU , RL and IL to form power spectrum values for each of said spectral lines.

1. A signature recognition system for minimizing the effects of spurious variations of background noise, comprising, in combination:

analyzer means for periodically sampling the energy level in a frequency spectrum of an input signal for providing a digital output representative of the energy level within discrete frequency cells of said spectrum, and for providing a pulse at the beginning of each sampling period;

summing means having first and second inputs, said first input connected to receive said analyzer means output, and for providing an output representative of the sum of said first and second inputs;

dividing means having first and second inputs, said first input connected to receive the summing means output and providing an output representative of the average energy level of each of said foregoing cells;

storage means having an input connected to receive the dividing means output, and for providing an output representative of the average energy levels stored therein;

counting means connected to receive said pulse for providing an output indicative of the cumulative number of the sampling periods, said counting means output being connected to said dividing means second input; and

multiplying means having a first input connected to receive the storage means output, and a second input connected to receive said counting means output for providing an output representative of the product of the inputs, and said multiplying means output being connected to the summing means second input.

4,054,787

APPARATUS FOR COMPUTING AN ARITHMETICALLY ACCUMULATED SEQUENCE OF NUMBERS

Norman D. Pos, Imperial Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 6, 1975, Ser. No. 584,679

Int. Cl.² G06F 7/50

U.S. Cl. 364-748

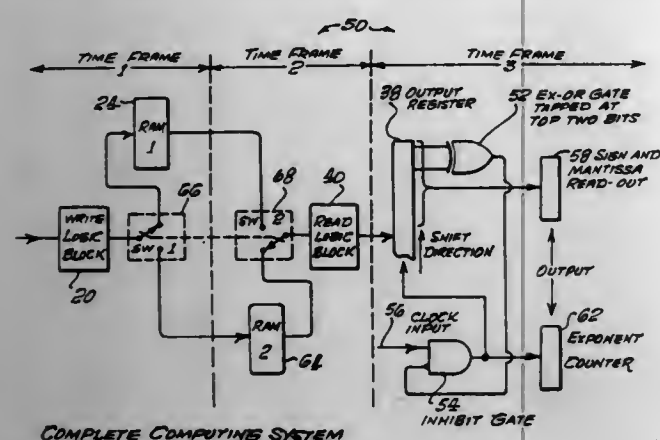
6 Claims

1. Apparatus for computing an arithmetically accumulated sequence of exponent-mantissa formatted numbers, comprising write-in apparatus and readout apparatus, the write-in apparatus comprising:

means for separating each of a sequence of binary numbers in exponent-mantissa form according to the values of the exponent, the value of the exponent being employed as a storing address for the number;

means connected to the separating means for algebraically

summing mantissas of like exponents, the two above means comprising a write logic block; first means connected to the summing means for storing the sum of the mantissas; means for connecting the mantissa storing means and the summing means, which enables writing the last stored



quantity back into the summing means, so that it may be summed algebraically to the latest incoming mantissa of like exponent from the sequence of numbers, the new sum then being written back into the storing means having the same, like, exponent address; and means, connected to the separating means, for addressing the storing means.

4,054,788

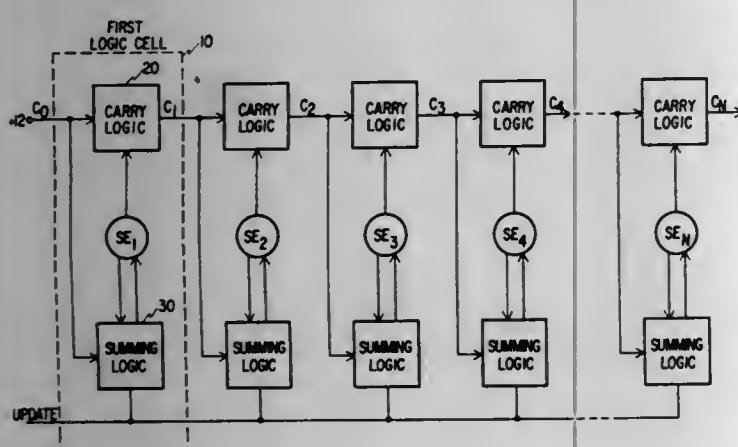
MODULAR BINARY HALF-ADDER

David Steven Maitland; Sandy Lee Chumbley, both of Loveland, and Havyn E. Bradley, Fort Collins, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed June 4, 1976, Ser. No. 693,063

Int. Cl.² G06F 7/50

U.S. Cl. 364-786



1. Binary half-adder module comprising: a storage element for retaining a logical bit of binary data in states corresponding to either a logical "1" or a logical "0", wherein the output can be monitored while the input is being changed; a first inverter responsive to the output of said storage element for providing a logical signal complementary to the logical output of said storage element; means for applying an input carry signal (corresponding to either a logical "1" or a logical "0") to said binary half-adder module; a second inverter responsive to said input carry signal for providing a logical signal complementary to said input carry signal; means for charging an output carry line; means for applying an increment signal to said binary half-adder module; means for discharging said output carry line upon detection of a charge on the logical output of said storage element and detection of said increment signal;

means for discharging said output carry line upon detection of said input carry signal corresponding to a logical "0"; means for applying a decrement signal to the binary half-adder module; means for discharging said output carry line upon detection of a signal corresponding to a logical "1" on the output of said first inverter and detection of said decrement signal; means for applying an update signal to an update signal line; means for recirculating the contents of said storage element upon detection of signals corresponding to the logical "1" on the output of said second inverter and the update signal line; and means for loading the signal on the output of said first inverter into the storage element upon detection of said input carry signal and said signal on the update signal line each corresponding to a logical "1"

4,054,789

VEHICLE SAFETY LIGHT

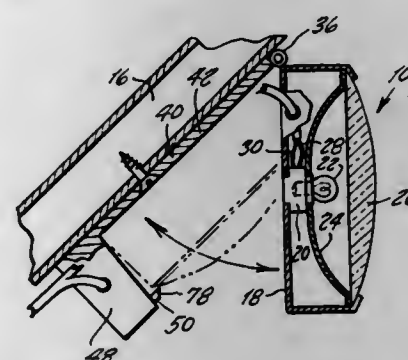
Frances Romanelli, 162 W. Oldis St., Rochelle Park, N.J. 07662

Filed Mar. 30, 1976, Ser. No. 672,041

Int. Cl.² B60Q 1/26

U.S. Cl. 362-80

6 Claims



1. A warning light adapted to be secured to the interior surface of the trunk cover of a motor vehicle comprising: a housing including electrical socket means for receiving a bulb, a reflector, and a lens for transmitting reflected light from a bulb electrically connected to said electrical socket means, bracket means for mounting said housing on a trunk cover of a motor vehicle including a bracket, hinge means pivotally connecting said housing to said bracket for pivotal movement from a storage position wherein said housing is complementally supported by said bracket to a use position in a substantially vertical plane, means associated with said hinge means for urging said housing to its use position, retractable latch means for locking said housing in its storage position, and electrical circuit means connected to said socket means and retractable latch means for simultaneously activating a bulb received within said socket means and retracting said latch means.

4,054,790

LIGHT FIXTURE

Robert A. Slaughter, Houston, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed May 17, 1976, Ser. No. 687,039

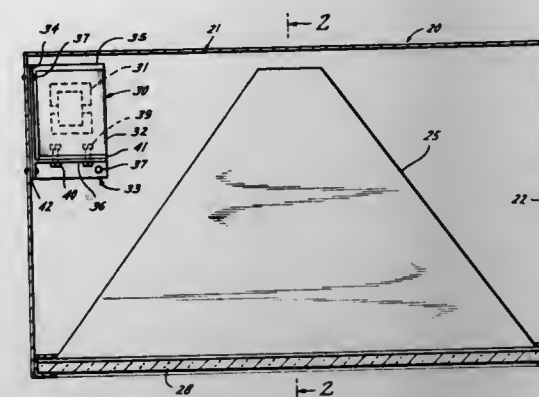
Int. Cl.² F21S 1/02; H01F 15/02

U.S. Cl. 362-264

14 Claims

1. A light fixture, comprising a housing having first and second metal walls connected to one another at a corner thereof, a metal bracket having first and second walls connected to one another to form a corner, and a third wall connected to each of the first and second walls intermediate their opposite ends, a ballast including a core and coil device, means for releasably connecting the ballast to the third wall of the

bracket, resilient material compressed tightly between the third wall and the ballast, means for securing each of the first and second walls of the bracket to the first and second walls of the housing, and a layer of acoustically insulating, heat con-



ductive material compressed tightly between adjacent walls of the housing and bracket, the walls of the ballast being spaced a short distance from the inner faces of the first and second walls of the bracket.

4,054,791

PORTABLE LANTERN WITH HIGH SPEED ROTATORY BEAM

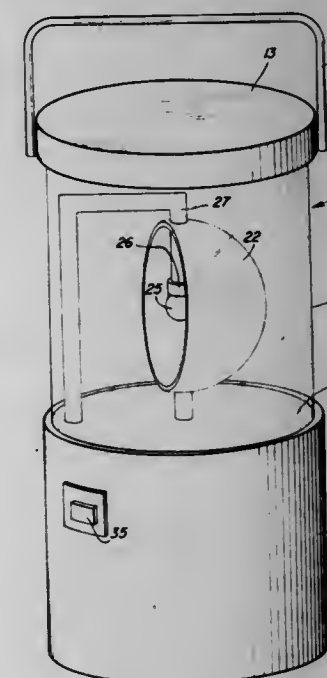
Harold P. Du Shane, 1774 Greenwood Ave., Trenton, N.J. 08609

Filed Feb. 6, 1975, Ser. No. 547,705

Int. Cl.² F21M 7/00

U.S. Cl. 362-35

9 Claims



1. A portable lantern suitable for providing general illumination of increased intensity for a large area comprising in combination: a portable lantern housing having a base section upon which said housing is independently supported and a transparent lens section removably secured thereto, said lens section having cover means removably secured thereto; an electric light source mounted within the transparent lens section of said housing; reflector means rotatably mounted for rotation at a continuous speed of at least about 600 revolutions per minute within the transparent section of said housing and disposed to project a concentrated, intensified beam of light from said light source into a substantially horizontal beam through the full 360° periphery of said transparent lens section; motor means mounted within said base section of said housing with the shaft thereof extending into said transparent lens section being connected to said rotatable re-

flector means for continuously rotating said reflector means about the axis of said motor shaft at a speed of at least about 600 revolutions per minute and projecting light through said transparent section in a circular pattern about said lantern at a frequency that exceeds the threshold of discrimination of the human eye and provides continuous general illumination for a large area about said lantern; e. electric power means arranged within said housing for energizing said light source and said reflector means; and f. electric switch means mounted on said housing for said electric light source and said reflector rotating means.

4,054,792
LAMP

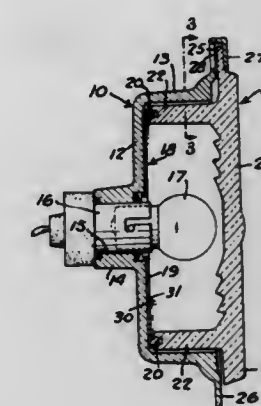
Peter E. Brady, West Hill, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Canada

Filed Feb. 26, 1976, Ser. No. 661,441

Int. Cl.² F21M 3/00

U.S. Cl. 362-267

14 Claims



1. In a lamp, the combination comprising a body having an axially extending inwardly facing surface, and an annular radial surface extending radially inwardly with respect to said axial surface, a resilient annular seal mounted on said radial surface and extending axially therefrom, a lens, said lens having a light transmitting wall and an annular wall extending axially with respect to said light transmitting wall into said body, the axial end of said annular wall having a groove therein into which said annular seal extends, and means on said body for engaging said lens and urging said annular wall axially against said seal.

4,054,793

LIGHTING SYSTEM

Sylvan R. Shemitz, Woodbridge, Conn., assignor to Sylvan R. Shemitz Associates, Inc., New Haven, Conn.

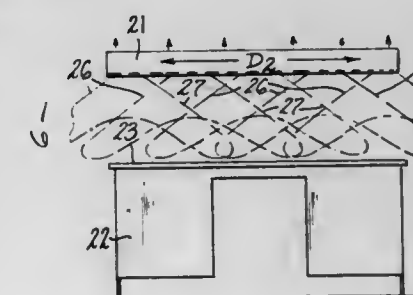
Continuation of Ser. No. 390,570, Aug. 22, 1973, abandoned.

This application May 27, 1975, Ser. No. 581,374

Int. Cl. F21v 5/02

U.S. Cl. 362-127

9 Claims



1. In combination: a substantially horizontally disposed work surface spaced from ground level and adapted to be

for light emitter means having an active surface, a semi-conductor photo detector means having an active surface disposed in spaced face-to-face relation with the active surface of said light emitter means, an electrically insulating light transmissive solid medium interposed between and imbedding the active surfaces of said light emitter means and said photo detector means, a light reflective surface layer on said light transmissive medium, surrounding said light emitter means and said photo detector means and providing a concave curved surface extending approximately in the direction of propagation of light from said light emitter means toward said photo detector means for reflecting internally of said light transmissive medium and toward said photo detector means light from said emitter means that is incident on said curved surface, and a protective housing surrounding said light transmissive medium, said reflective layer providing electrical insulation between said light transmissive medium and said housing.

4,054,802

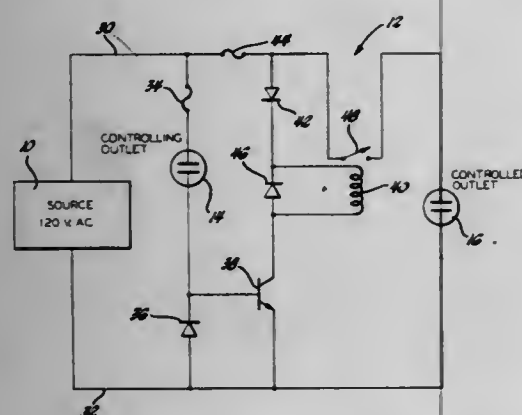
POWER CONTROL CIRCUIT

Donovan L. Mock, Marion, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 4, 1976, Ser. No. 729,090

Int. Cl.² H01H 47/32

U.S. Cl. 307—38



1. A power control circuit comprising, power supply conductors for connection to a source of alternating current, a first power outlet comprising first outlet terminals adapted to be connected to an electrical load, a transistor having collector, base and emitter electrodes, means connecting said first outlet terminals and the base and emitter electrodes of said transistor in series across said power supply conductors whereby base-emitter current is supplied to said transistor through said outlet terminals to bias said transistor conductive between collector and emitter when an electrical load connects said outlet terminals to provide a current path between said outlet terminals, said base-emitter current being comprised of first half cycles of alternating current supplied through said power supply conductor, a diode, means connecting said diode and said first outlet terminals in series across said power supply conductors, said diode connected across the base and emitter electrodes of said transistor and connected to provide second opposite half cycles of alternating current supplied by said source through said first outlet terminals when an electrical load is connected thereto, a second power outlet comprising second outlet terminals connectable to a second electrical load, a relay having a coil winding and contacts, means connecting said coil winding and the collector and emitter electrodes of said transistor across said power supply conductors, and means connecting said relay contacts in series with said second outlet terminals and across said power supply conductors whereby said second outlet terminals are energized from said source of alternating current when the power control circuit is connected to a said source of alternating current and said transistor is biased conductive by base-emitter current flow through said first pair of output terminals and whereby said second outlet terminals are disconnected from said source when said first outlet terminals

are open-circuited to prevent transistor base-emitter current flow.

4,054,803

MATCHER CIRCUIT

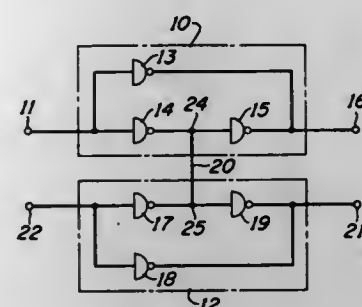
John Walter Lurtz, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 26, 1976, Ser. No. 717,596

Int. Cl.² H03K 19/20

U.S. Cl. 307—218

4 Claims



1. A matcher circuit for comparing first and second input signals to determine the equality or inequality of said signals comprising:
identical first and second half matcher circuits each comprising: an input terminal, an output terminal, a cross-coupling terminal and means for generating an inequality signal at said output terminal in response to predetermined signals occurring simultaneously at said input terminal and said cross-coupling terminal; and
a signal conduction means comprising a single wire interconnecting said cross-coupling terminals of said identical half matcher circuits.

4,054,804

BIPOLAR CHARGING AND DISCHARGING CIRCUIT
Yuji Tanaka, Kawasaki, Japan, assignor to Nippon Tsu Shin Kogyo K.K., Kawasaki, Japan and TIE/Communications, Inc., Stamford, Conn.

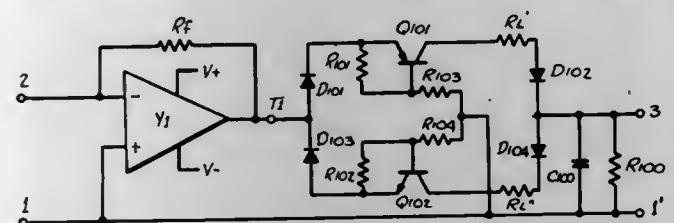
Filed Oct. 1, 1976, Ser. No. 728,862

Claims priority, application Japan, Feb. 2, 1976, 51-10173

Int. Cl.² H03K 17/56, 5/13

U.S. Cl. 307—246

3 Claims



1. A timing circuit which has different charging time constants in response to positive and negative input signal pulses and a different discharging time constant in response to the removal of an input signal, said circuit comprising,
a reference potential terminal,
an input terminal for receiving said input positive and negative signal pulses, said pulses being of positive or negative potential with respect to the potential of said reference potential terminal,
an output terminal,
a capacitor connected between said output terminal and the reference potential terminal,
a discharge resistor connected in parallel with said capacitor,
a first series connection comprising a first charging resistor connected in series with a first switching means, said series connection being interposed between said input terminal and said output terminal, said first switching means being in a conducting state only when the input potential to said

input terminal is at a level higher than said reference potential, and
a second series connection comprising a second charging resistor connected in series with a second switching means, said series connection being interposed in parallel with said first series connection between the input terminal and the output terminal, said second switching means being in a conducting state only when the input potential to said input terminal is at a level lower than said reference potential.

4,054,805

ELECTRONIC SWITCHING DEVICE

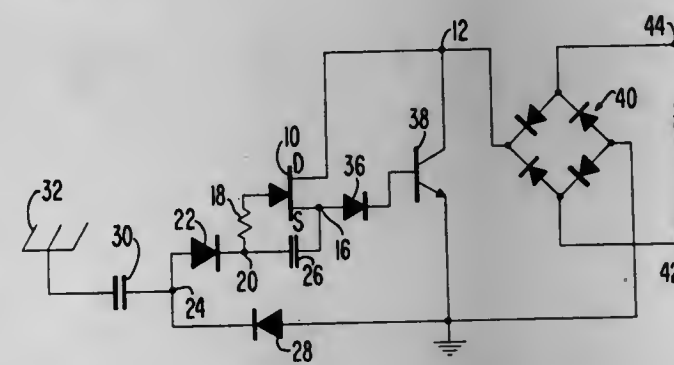
Russell T. Stebbins, 112 Ferne St., Palo Alto, Calif. 94306

Filed Dec. 15, 1975, Ser. No. 640,450

Int. Cl.² H03K 19/00

U.S. Cl. 307—251

7 Claims



1. An electronic switch for an energizable load, the switch comprising a first high input impedance, field effect transistor (FET) having gate, source and drain electrodes, means for connecting the energizable load in series with the source and drain electrodes, and diode input means having a first input terminal, a circuit ground and being connected between the gate and source electrodes for normally making the first FET nonconductive by ensuring that in the absence of an input signal between the first input terminal and the circuit ground the source electrode is at a potential with respect to the gate electrode which reverse biases the gate electrode and for making the first FET conductive when an input signal of a predetermined magnitude is applied between the first input terminal and the circuit ground, the diode means further including a first resistor connected at one end to the gate electrode, and at the other end to a junction point, a first diode having its anode connected to the first input terminal and its cathode connected to the junction point, a first capacitor connected between the junction point and the source electrode, and a second diode having its cathode connected to the anode of the first diode and its anode connected to the end of the capacitor which is connected to the source electrode.

4,054,806

DRIVE CIRCUIT FOR PIEZOELECTRIC HIGH VOLTAGE GENERATING DEVICE

Juichi Moriki, Nishinomiya, Masayoshi Shioji, and Teruo Itoh, both of Ibaragi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 357,543, May 7, 1973, abandoned, which is a continuation of Ser. No. 228,112, Feb. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 88,515, Nov. 10, 1970, abandoned, which is a continuation of Ser. No. 752,672, Aug. 14, 1968, abandoned. This application Jan. 19, 1976, Ser. No. 650,320

Claims priority, application Japan, Aug. 18, 1967, 42-53376

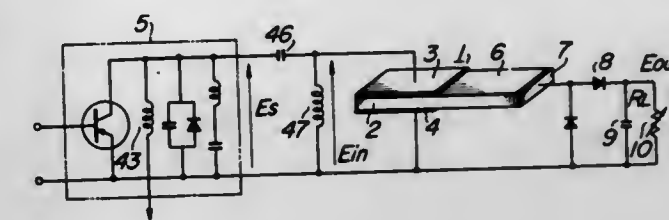
Int. Cl.² H01L 41/04

U.S. Cl. 310—318

13 Claims

1. In a high voltage generating device comprising a piezoelectric transformer including two input drive electrodes on its driver portion, said input electrodes having an interelectrode capacitance C_p , and an output electrode on its generator portion; a rectifying and smoothing means connected to said out-

put electrode for supplying a DC output voltage; and a variable frequency drive voltage signal source for driving said transformer, said device exhibiting a frequency versus DC output voltage characteristic having a peak portion including a maximum voltage generated substantially at a natural resonant frequency of the transformer when said transformer is driven over a predetermined frequency range from said voltage signal source, said transformer defining an equivalent series resonant



circuit including a resonant inductance L_r and a resonant capacitance C_r at said natural resonant frequency; the improvement comprising:
an independent capacitor having a capacitance C connected between said drive electrodes, and
an inductor having an inductance L_s connected serially between said voltage signal source and said capacitor to form a series resonant having the relationship

$$\frac{1}{\sqrt{L_s(C + C_r)}} = \frac{1}{\sqrt{L_r C_r}}$$

thereby producing a frequency versus input driving voltage characteristic having a double-humped shape over said predetermined frequency range for the voltage between said drive electrodes, said double-humped characteristic having a valley-portion including a minimum voltage at about said resonant frequency to compensate for the peak-portion of said DC output voltage at said natural resonant frequency, whereby the resultant frequency versus effective DC output voltage characteristic of said device is flattened.

4,054,807

QUARTZ OSCILLATOR MOUNTINGS

Toshio Terayama, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Continuation-in-part of Ser. No. 456,311, March 29, 1974, abandoned. This application May 22, 1975, Ser. No. 579,931

Claims priority, application Japan, Mar. 29, 1973, 48-38188;

Mar. 29, 1973, 48-38189

Int. Cl.² H01L 41/04

U.S. Cl. 310—348

4 Claims

1. The combination comprising: an oscillator element comprising an elongated substrate having a pair of opposed major surfaces and a plurality of oscillatable parallel prongs extending in a longitudinal direction therefrom, and a plurality of metallic electrodes on at least one of said major surfaces, at least one of said metallic electrodes including a unitary beam lead portion extending away from and beyond said substrate in a longitudinal direction therefrom generally parallel to said at least one major surface on which said at least one metallic electrode is disposed and away from said plurality of prongs, said beam lead portions having a remote end remote from said substrate; a base; a first pedestal mounted on said base for supporting said substrate; means securing said oscillator element to said first pedestal, said oscillator element being supported by said first pedestal at an end portion of said substrate remote from said plurality of prongs whereby said plurality of prongs remain free to oscillate, and said substrate being disposed with one of its major surfaces secured to said first pedestal by said means securing said oscillator element; and a second pedestal mounted on said base and positioned beneath the remote end of said beam lead portion of said at least one metal-

ic electrode, said second pedestal having a height extending from said base to the remote end of said beam lead portion for supporting the same and for bearing loads developed when connection is made with said beam lead portion.

4,054,808

VIBRATION DETECTING DEVICE HAVING A PIEZOELECTRIC CERAMIC PLATE AND A METHOD FOR ADAPTING THE SAME FOR USE IN MUSICAL INSTRUMENTS

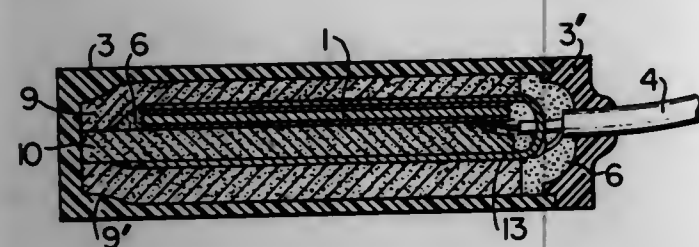
Toshiharu Tanaka, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 14, 1975, Ser. No. 604,611

Claims priority, application Japan, Aug. 19, 1974, 49-99364; Aug. 20, 1974, 49-99924; Aug. 20, 1974, 49-99925; Nov. 1, 1974, 49-133570; Nov. 11, 1974, 49-136942; Nov. 18, 1974, 49-139843

Int. Cl.² H01L 41/04

U.S. Cl. 310—323



1. A vibration detecting device, comprising: a U-shaped metal plate electrode; a piezoelectric ceramic plate; conductive bonding means bonding said ceramic plate to one leg of said metal plate; and an envelope-like vibration absorbing material having a support member at a center thereof, said metal plate being inserted into said envelope-like vibration absorbing material, said support member being held by at least part of said metal plate and said vibration absorbing material being housed in said case.

4,054,809

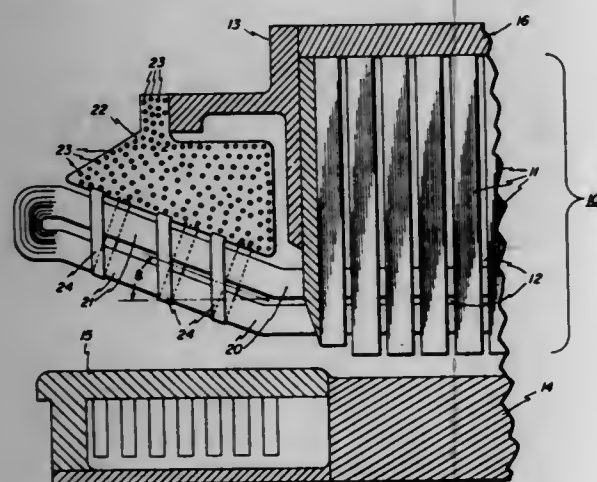
STATOR CORE END MAGNETIC SHIELD FOR LARGE A.C. MACHINES

Michael J. Jefferies, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,098

Int. Cl.² H02K 1/12

U.S. Cl. 310—256



1. A stator core-end magnetic shield for a large A.C. machine having stator windings that extend, in the form of end-turns, beyond the axial end of the stator core in a longitudinal and radially-outward direction, said shield comprising: a plurality of circumferentially-wound turns formed of a single, continuous length of low magnetic reluctance

material surrounding said end-turns and situated adjacent said stator core at the axial end of said core, the material of each turn being spaced apart from the material of each other turn, said material being of sufficiently limited extent in the radial and axial directions to restrict eddy current paths therein in the radial and axial directions; and a matrix of epoxy-impregnated fiberglass filling the volume separating each of said circumferentially-wound low reluctance turns from each other, said matrix being adapted to support a radially-outward component of force on said end-turns as said end-turn tends to spread radially outward about said rotor under the influence of magnetic forces acting on said end-turns.

4,054,810

FIELD EMISSION ION SOURCE HAVING HEATED ANODE

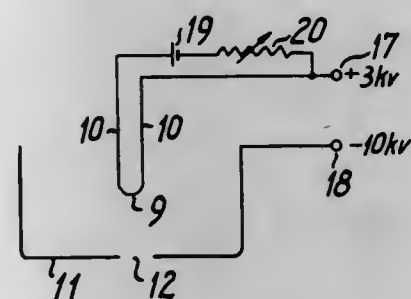
Hans-Dieter Beckey, Bonn, Germany, assignor to Varian MAT GmbH, Germany

Continuation of Ser. No. 160,123, July 6, 1971, abandoned, which is a continuation of Ser. No. 670,818, Sept. 26, 1967, abandoned. This application July 6, 1976, Ser. No. 702,766

Int. Cl.² H01J 39/34

U.S. Cl. 313—15

3 Claims



1. A method of obtaining low fragment ion yield from a field emission ion source of the type having
 - a. an evacuated ionization chamber,
 - b. a cathode
 - c. an anode having a thin elongated surface facing the cathode, and
 - d. focussing means for forming an ion beam, the method including the steps of
 1. placing the anode at a high electric potential relative to the cathode to create an intense electric field in the ionization chamber,
 2. introducing a vaporous or gaseous sample into the ionization chamber, and
 3. locally heating the anode to prevent condensation of the sample on the anode's thin elongated surface during the production of ions by field emission.

4,054,811

ELECTRON BEAM COLLECTOR

Günter Huber, Munich, and Wolf Wiehler, Neubiberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 5, 1976, Ser. No. 673,973

Claims priority, application Germany, Apr. 9, 1975, 2515356

Int. Cl.² H01J 23/02, 9/00

U.S. Cl. 313—30

15 Claims

1. An electron beam collector for a high power electron beam tube comprising a metallic hollow body, a metallic outer body surrounding said hollow body, and a casing of electrically insulating material interposed between said two metallic bodies, said hollow body comprising a hollow body core and a plurality of longitudinal fins connected with the outer surface of said hollow body, said insulating casing being firmly connected to the outer edges of said fins, each of said fins being formed of sheet metal with a thickness of less than 0.5 mm.

4,054,813

TRIGGERED SPARK-GAP DISCHARGER

Claude Agnoux, St. Germain les Arpajon, and René Destrée, Orsay, both of France, assignors to Compagnie Generale d'Electricite S.A., Paris Cedex, France

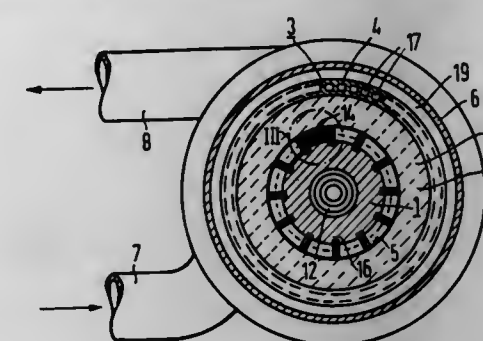
Filed Dec. 30, 1976, Ser. No. 755,915

Claims priority, application France, Dec. 30, 1975, 75.40118

Int. Cl.² H01J 17/30

U.S. Cl. 313—198

13 Claims



tube which has a lesser thermal co-efficient of expansion than the material comprising the inner body and said fins, raising the temperature of said assembly to soldering temperature for soldering the inner ends of said fins to said inner body, removing said assembly from said tube, machining the outer edges of said fins, providing a layer of solder on the inner surface of said insulating casing, and soldering the outer edges of said fins to the solder layer on the inner surface of said insulating casing.

1. A triggered spark-gap discharger comprising: two, spaced principal electrodes for establishing a DC electric voltage therebetween; two triggering electrodes insulated from each other by a thin dielectric sheet and disposed near the principal electrodes so that an electric triggering discharge taking place between these triggering electrodes causes a principal energy discharge between the two principal electrodes which is larger than that of the triggering discharge; and wherein said two triggering electrodes are constituted respectively by the edges of the two thin metal layers adhering to opposed surfaces of said thin dielectric sheet, said assembly being formed by these two layers and said dielectric sheet forming a thin metallized sheet and disposed so that said triggering discharge is produced on one of its edges between the two metal layers around the bare surface of the dielectric sheet.

4,054,812

INTEGRALLY FOCUSED LOW OZONE ILLUMINATOR

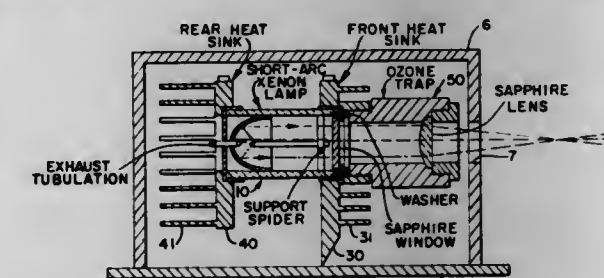
David L. Lessner, Baltimore; James H. Macemon, Glen Burnie; Rodolfo Rodriguez, Columbia, and Charles Soodak, Silver Spring, all of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 19, 1976, Ser. No. 687,861

Int. Cl.² H01J 61/40

U.S. Cl. 313—44

6 Claims



1. An integrally focused low ozone illuminator comprising: a source of radiant ultraviolet radiation comprising an opaque body and a window transparent to ultraviolet radiation, through which window the ultraviolet radiation is emitted; an ozone trap comprising an opaque barrel having a longitudinal bore therethrough; means for clamping the rear end of said barrel to the opaque portion of said source of radiant ultraviolet radiation, with the said bore about said window, so that the joint between said opaque portion and said barrel is substantially light-tight, airtight and rigid and so that the said window admits said ultraviolet radiation to the bore of said barrel; window means, transparent to some of the emitted radiation, for closing the fore end of said barrel with a substantially airtight joint; whereby ozone produced within said barrel by the ultraviolet radiation is kept confined within said barrel, wherein it acts as an absorption filter; and, whereby the mechanical combination of said source of radiant ultraviolet radiation and said ozone trap forms a rigid, unitary, optical component.

963 O.G.—40

4,054,814

ELECTROLUMINESCENT DISPLAY AND METHOD OF MAKING

Charles Robert Fegley, Laureldale, and Frank Joseph Valentino, Wyomissing, both of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

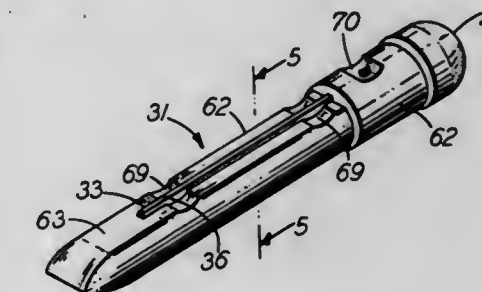
Continuation-in-part of Ser. No. 627,806, Oct. 31, 1975,

abandoned. This application June 14, 1976, Ser. No. 695,331

Int. Cl.² H01J 7/44, 13/46, 17/34; H01K 1/62

U.S. Cl. 315—71

26 Claims



1. An electroluminescent display device, comprising: at least two elongated, conductive contact members substantially adjacent to and spaced from each other with at least two ends extending partially together and having a light-emitting element electrically coupled between such contact members; and an elongated insulating base formed about and continuously between the contact members with their elongated outer edges extending beyond the elongated sides of the base, the base extending substantially the entire length of the outer edges of the contact members and being substantially integral between such contact members.

4,054,815

CIRCUIT ARRANGEMENT FOR IGNITING A GAS DISCHARGE FLASH TUBE

Ernst-Ludwig Hoene, Jalan Piala, Singapore; Werner Rech, and Josef Zimlich, both of Taunusstein, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

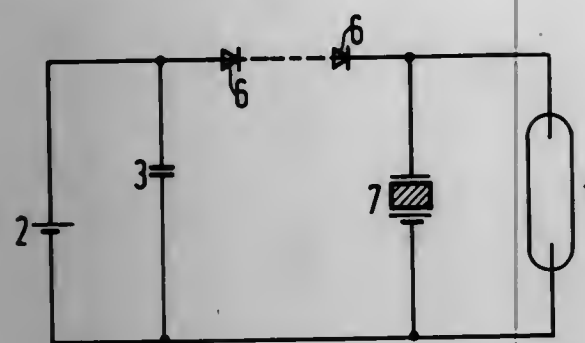
Filed Apr. 7, 1976, Ser. No. 674,648

Claims priority, application Germany, Apr. 15, 1975, 2516414; Nov. 24, 1975, 2552670

Int. Cl.² H05B 41/23

U.S. Cl. 315-241 R

7 Claims



1. A circuit arrangement for igniting a gas discharge flash tube which has only two electrodes, comprising: a voltage source connected in parallel with said flash tube; an electronic switch; a flash capacitor connected in parallel with said flash tube via said electronic switch; and an ignition voltage generator connected to said flash tube, said ignition voltage generator having a low inductance and operable to produce high voltage pulses to ignite said flash tube forming a plasma channel and at least approximately adiabatically heat the plasma channel.

4,054,816

SWEEP CIRCUIT FOR CATHODE-RAY TUBE DISPLAY

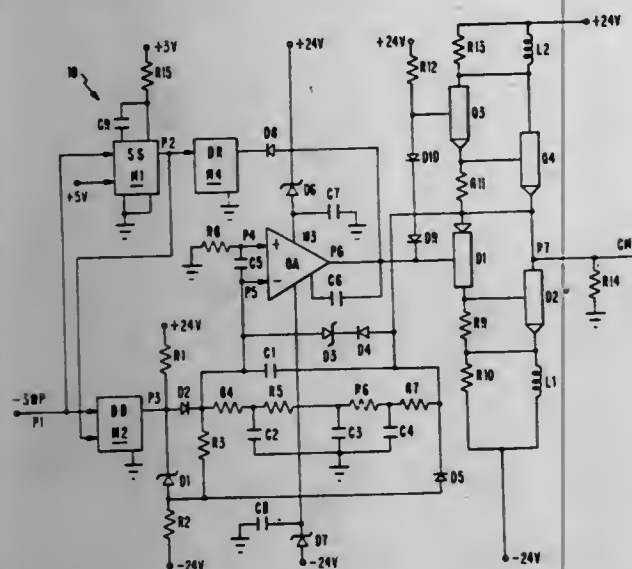
Steven Dennis Keidl, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 2, 1976, Ser. No. 702,308

Int. Cl.² H01J 29/70, 29/72

U.S. Cl. 315-387

9 Claims



1. A sweep circuit for a cathode-ray tube display, comprising: a reference for producing a constant reference signal; an integrator responsive to said reference signal and having a feedback loop for producing a drive signal with a rate of change determined by said reference signal; and driver means being responsive to said drive signal for passing a time-varying output current through a deflection-coil means, said driver means having a sensor receiving said output current and coupled to said feedback loop,

said deflection coil means being connected outside said feedback loop; and trigger means coupled to said integrator and to said reference, for resetting said drive signal to a value determined by said reference signal.

4,054,817

PULSE CONTROLLERS

David Gurwicz, and Albert Everett Sloan, both of Gateshead, England, assignors to Sevcon Limited, Gateshead, England

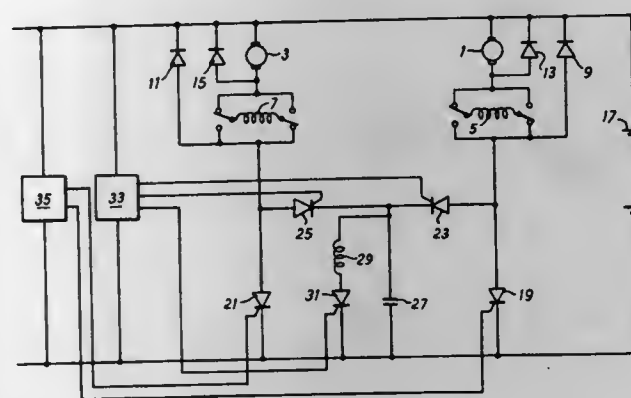
Filed Apr. 6, 1976, Ser. No. 674,129

Claims priority, application United Kingdom, Apr. 8, 1975, 14361/75

Int. Cl.² H03K 3/00

U.S. Cl. 318-82

5 Claims



1. A pulse controller for controlling the mean current supplied to each of a plurality of d.c. loads, comprising a plurality of main thyristors for connection in series between respective loads and a d.c. source, a common commutating capacitor, a plurality of commutating thyristors connected with respective main thyristors and each connected to the commutating capacitor to form with the capacitor a shunt across the corresponding main thyristor so that firing of the commutating thyristor effects commutation of the corresponding main thyristor and subsequent forward charging of the commutating capacitor from the d.c. source, means for reversing the charge on the commutating capacitor after it has been forward charged thereby to put the capacitor in condition to commutate any one of the main thyristors on firing of the corresponding commutating thyristor, and control circuit means for controlling firing into conduction of the thyristors so that conduction of the commutating thyristors occurs one at a time at intervals not less than the time required, from the commencement of commutation of any main thyristor, to effect forward charging of the commutating capacitor and reversal of the forward charge on the commutating capacitor.

4,054,818

SOLID STATE CURRENT SOURCE POLYPHASE INVERTER INDUCTION MOTOR DRIVE

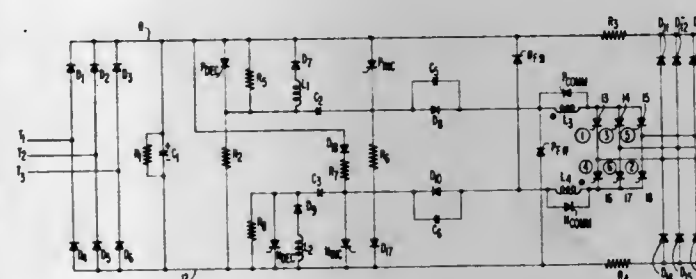
Robert L. Risberg, 16915 W. Judith Lane, Brookfield, Wis. 53005

Filed Oct. 20, 1975, Ser. No. 624,016

Int. Cl.² H02P 5/40

U.S. Cl. 318-227

11 Claims



1. A solid state current source, polyphase inverter induction motor drive comprising:

- a constant potential D.C. buss including a positive buss and a negative buss;
- a polyphase inverter comprising a plurality of thyristor switches supplied from said constant potential D.C. buss and providing polyphase driving current at its output;
- clamp means including a plurality of clamp diodes connected to the output of said polyphase inverter; and
- controlled current D.C. chopper means interposed between each side of said D.C. buss and said polyphase inverter for controlling the magnitude of current fed from said D.C. buss to said polyphase inverter and for interrupting the current flow to each side of said polyphase inverter for a period of time sufficient to permit said inverter thyristor switches to assume their blocking state prior to refiring a new set of inverter thyristor switches and thereby commutate current from one inverter switch of one phase to an adjacent switch in another phase, said polyphase inverter serving as a steering means for the controlled D.C. current and said chopper means operating to re-establish the desired magnitude of current following a starvation period that insures turn-off of the prior conducting inverter switches, said polyphase inverter being directly commutated only by said chopper.

4,054,819

MOTOR ANGULAR VELOCITY MONITOR CIRCUIT

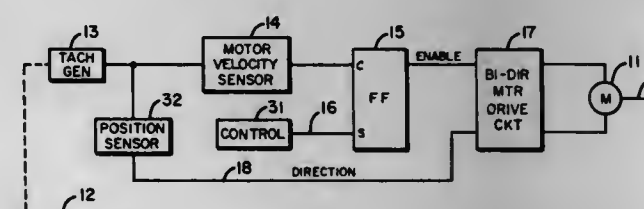
Richard Severn Johnson, Bountiful, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,451

Int. Cl.² H02P 3/10

U.S. Cl. 318-269

12 Claims



1. A circuit for controlling the operation of a bi-directional motor having an excitation winding, comprising in combination:

a motor drive circuit electrically connected to the motor, said motor drive circuit having first and second input terminals and including logic circuit means for energizing the motor in a first rotational direction only when said first and second input terminals have coincident highs and in a second rotational direction only when said first input terminal has a high coincident with a low on said second input terminal,

control means connected to said first terminal for removing the high therefrom to de-energize the motor when its speed reaches a predetermined amount.

4,054,820

SERVO SYSTEM

Alan Foster, Hitchin, England, assignor to International Computers Limited, Stevenage, England

Filed July 31, 1975, Ser. No. 600,583

Claims priority, application United Kingdom, May 17, 1975, 21096/75

Int. Cl.² H02P 5/16

U.S. Cl. 318-341

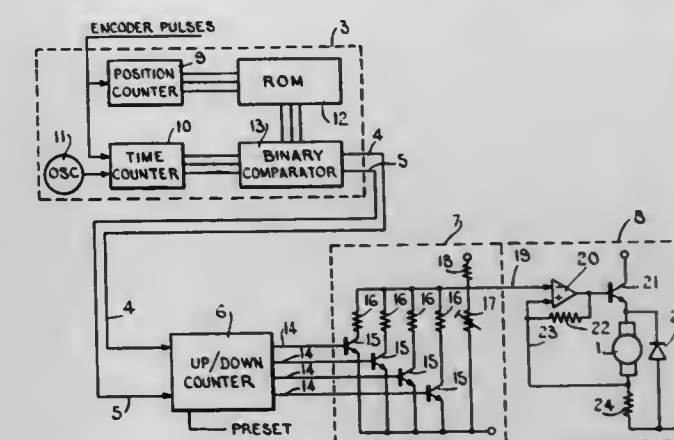
4 Claims

1. Apparatus for controlling the position of a motor according to a predetermined velocity profile including changes of velocity the position control being at a rate independent of the magnitude of its departure from the profile; including

- a means for producing output pulses characteristic of predetermined units of change of motor position,
- storage means for storing said predetermined velocity profile,
- first counter means for counting the output pulses to

determine the position of the motor and for causing the storage means to produce at its output, for each said output pulse, an output signal which is characteristic of the nominal velocity value of the motor as defined by the profile;

- means response to the output pulses for providing an indication of the actual velocity of the motor for each said output pulse;
- comparator means for comparing for each said output pulse the storage means output defining a nominal velocity as defined by the profile for each output pulse, with the actual velocity as determined for the same output pulse to



produce a first indication if the actual velocity is above the nominal value as defined by the profile, and a second indication if the actual velocity is below the nominal value as defined by the profile,

- f. means for stepwise varying the energising current input for the motor, and
- g. means for controlling the stepwise variation for each said decoder output pulse, which means is responsive to each of the first indications to change the current input by one of said steps as to cause the velocity value to be reduced, and is responsive to each of the second indications to cause the velocity to be increased.

4,054,821

D-C MOTOR DRIVE SYSTEM WITH FIELD CURRENT FLOW REVERSAL UPON TRANSITION BETWEEN MOTORING AND RETARDING MODES

Dennis Francis Williamson, Erie, Pa., assignor to General Electric Company, Erie, Pa.

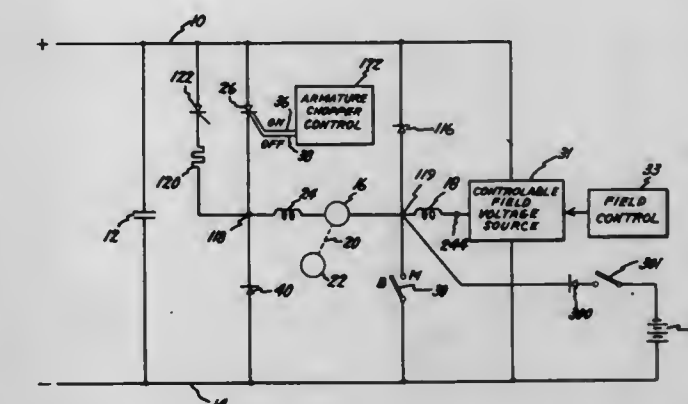
Continuation of Ser. No. 502,202, Aug. 30, 1974, abandoned.

This application Dec. 18, 1975, Ser. No. 641,846

Int. Cl.² H02D 3/14, 3/18

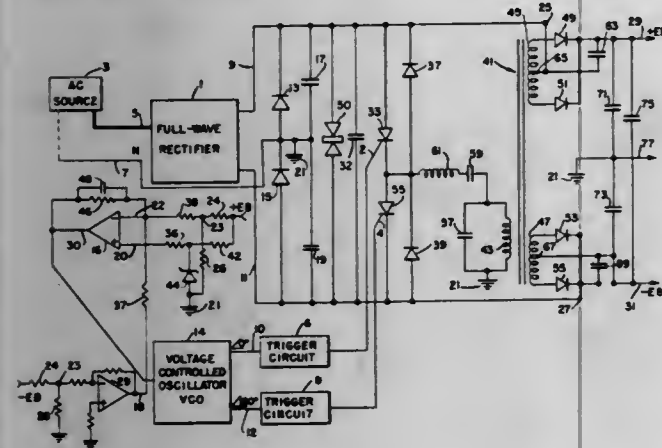
U.S. Cl. 318-375

14 Claims



1. In a drive system for d-c motors, comprising armature and field means, coupled to drive a mechanical load during a motoring mode and to be driven by said load during a retarding mode, and wherein during said motoring mode said armature means are coupled between first polarity and second polarity conductors adapted to be connected to a d-c source and during

tive leads for generating an alternating current voltage which comprises
a first thyristor and second thyristor connected in series between said first and second conductive leads, said first and second thyristors each having a gate electrode;
a transformer having a primary winding, a first secondary winding and a second secondary winding;
means to couple said primary winding to the common point of said first and second thyristors; and
means coupled to said gate electrode of said first thyristor and the said gate electrode of said second thyristor for alternately gating on said first and second thyristors;



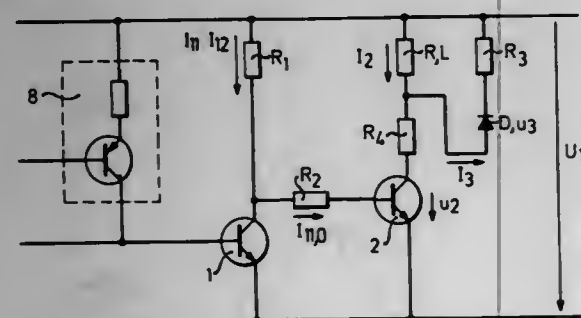
- d. means for deriving a second direct current voltage from said generated alternating current voltage, said means for deriving said second direct current voltage being coupled directly to the first and second secondary windings of said means for generating said alternating current voltage;
- e. a first output lead and a second output lead; and
- f. means to apply said first direct current voltage and said second direct current voltage on said first and second output leads in such a manner that said first and said second direct current voltages are added to form a third direct current voltage.

4,054,828

CYCLICALLY OPERATING TRANSISTORIZED POWER SWITCHING CIRCUIT SYSTEM

Gerhard Conzelmann, Leinfelden; Karl Nagel, Gomaringen, and Helmut Keller, Reutlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Jan. 8, 1975, Ser. No. 539,441

Claims priority, application Germany, Jan. 15, 1974, 2401701
Int. Cl.² H01L 31/00; H03K 3/26; H02H 7/06
U.S. Cl. 322—28 42 Claims



1. Transistor power cyclical switching circuit system, particularly for variable duty cycles, having a power switching transistor component (2), a load (R_L) connected to the power switching transistor component (2), driver transistor component (1) connected to selectively control repetitive, cyclical conduction of the power transistor, and at least two coupling resistor components (R₁, R₂) connected to the driver transistor (1) and to the power transistor (2);
wherein the collector of the driver transistor (1) is connected over a first resistor component (R₁) with one terminal of a source of operating potential; the emitter of the driver

transistor (1) and of the power transistor (2) being, each, connected to the other terminal of the source of operating voltage;

a second one of said resistance components (R₂) connecting the base of the power transistor (2) to the collector of the driver transistor (1);

and wherein the values of said components meet the conditions:

a. the resistance value of the first resistor component (R₁) is so dimensioned that, when the driver transistor is conductive, or ON, the sum of the power dissipated in said first resistor (R₁) and in the collector-emitter path of the driver transistor (1) is at least approximately equal to the sum of the power being dissipated in the two resistor components (R₁, R₂) and in the power transistor (2) when the driver transistor (1) is blocked, or OFF; and

b. the resistance value of the second resistor component (R₂) is so dimensioned that, when the driver resistor (1) is blocked, or OFF, the sum of the resistance values of the two resistance components (R₁, R₂) provide a base current to the base of the power transistor (2) at a level to hold the power transistor under all possible operating conditions of the system in saturated conduction, to provide for power dissipation losses in the system which are, in an initial approximation, independent of the duty cycle of the power switching transistor (2).

4,054,829

ELECTRICAL ISOLATORS

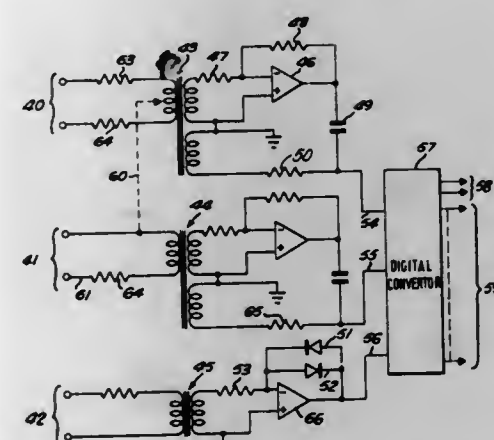
Terence John Searle, Walton on Thames, England, assignor to Memory Devices Limited, East Molesey, England
Filed May 25, 1976, Ser. No. 689,930

Claims priority, application United Kingdom, May 31, 1975, 23750/75

Int. Cl.² G05F 1/12; H03F 1/34

U.S. Cl. 323—6

4 Claims



4. Apparatus for converting into digital form signals comprising alternating carrier voltages from an angle sensing device, comprising at least two electrical isolators each comprising a transformer with primary and secondary circuits which are electrically isolated from each other, the transformer having a core, the primary circuit including a primary winding on the core and an impedance in series with the primary winding, the secondary circuit including a secondary winding on the core, a high gain amplifier having input and output terminals and connected to amplify voltage induced in the secondary winding and a feedback circuit connected and arranged to conduct a feedback current from the output terminal of the amplifier to produce magnetic flux in the core which is opposed to flux produced by current in the primary winding, the feedback circuit comprising a feedback impedance and a further winding on the core which are connected in series with each other and connected between the output terminal of the amplifier and a common line, the isolators having their primary circuits arranged for receiving said alternating carrier voltage

signals such that the output signals from their high gain amplifiers represent the sine and cosine of the angle sensed by the sensing device, and the apparatus further comprising a digital converter connected to receive said output signals for conversion into digital form.

4,054,830

REGULATED POWER SUPPLY

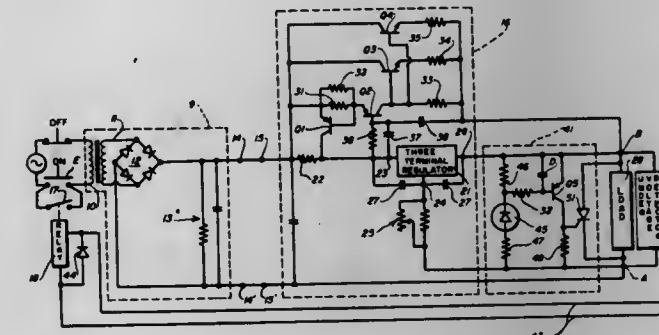
Jack D. Harrel, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.

Filed Mar. 25, 1974, Ser. No. 454,322

Int. Cl.² G05F 1/58

U.S. Cl. 323—8

9 Claims



5. A power supply comprising a regulating and current assist circuit for receiving D.C. power and for supplying regulated D.C. power to a load, said circuit including

a first current path having a three terminal regulator connected across the load, capable of handling current less than a predetermined maximum current,
at least one bypass current path connected in parallel with said first current for bypassing an amount of current which is at least equal to the difference between the total current flowing through said regulating and current assist circuit and said maximum current of the regulator, when the total current is less than a selected current, and
means for directing all of the current to said regulator when the total current exceeds the selected current, whereby the current flow through the regulator will exceed the capability of the regulator resulting in the regulator operating in a current limiting mode.

4,054,831

POWER SUPPLY TURN-ON AND TURN-OFF TRANSIENT ELIMINATION CIRCUITS

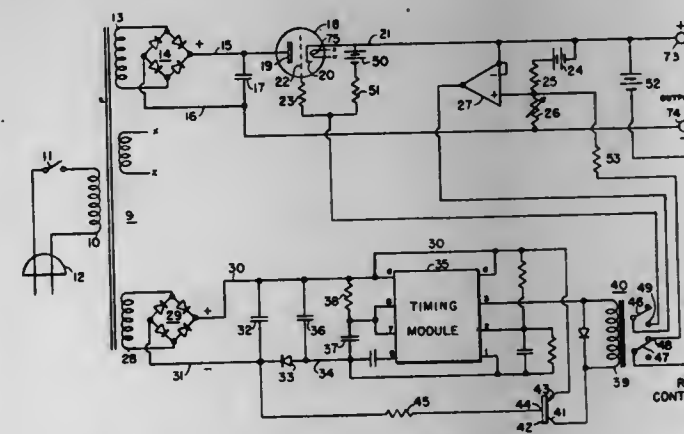
Sarkis Nercessian, Flushing, N.Y., assignor to Forbro Design Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,957

Int. Cl.² G05F 1/16

U.S. Cl. 323—22 V

4 Claims



1. In a voltage regulated power supply including a thermionic vacuum tube pass device and a control amplifier for controlling the conduction of the pass tube for controlling the output voltage of the power supply, circuit means for substan-

tially eliminating turn-on and turn-off transients including the combination of;

means for rendering said tube substantially non-conducting;
means for rendering said control amplifier substantially non-responsive to error signals;
means for turning on the power supply;
timing means adapted to start timing at the instant said turn-on means is actuated;
said timing means including means for disabling said means for rendering said tube non-conducting and said means for rendering said control amplifier non-responsive at the end of a predetermined interval of time;
and thereby permitting normal operation of said pass tube and control amplifier to control the output voltage of said power supply;
and means acting upon turn-off of said power supply for ending the action of said disabling means to restore non-conductivity to said tube and non-responsiveness to said amplifier at a time short compared to said predetermined time after the instant of turn-off on said power supply.

4,054,832

SYSTEM AND METHOD OF MEASUREMENT OF INSULATION QUALITIES OF THREE-PHASE POWER EQUIPMENT

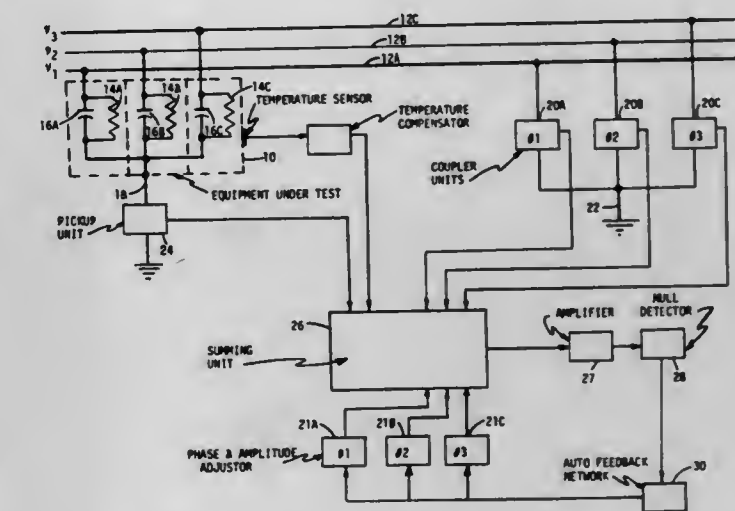
Peter H. Reynolds, Ambler; Donald S. Ironside, King of Prussia, both of Pa.; Joseph F. Barresi, Windsor, Conn.; Carl R. Scharle, Glenside, Pa.; Harry L. Latham, Bethayres, Pa., and Charles Saile, Norristown, Pa., assignors to James G. Biddle Company, Plymouth Meeting, Pa. and Northeast Utilities Service Company, Berlin, Conn.

Filed Oct. 21, 1975, Ser. No. 624,421

Int. Cl.² G01R 27/16, 31/12, 31/02

U.S. Cl. 324—54

13 Claims



3. A system for detecting changes in insulation qualities of alternating current equipment under test under operating conditions while the equipment remains connected to a power line comprising,

a coupler unit connectable between the power line to which the equipment under test is connected and ground and provided with means for sampling current passing through that coupler unit,
phase and amplitude adjustor means acting upon the amplitude and phase of the current sample to provide a modified current sample,
ground current sensing means for sensing current in the ground connection between the equipment and earth ground to provide a ground current sample,
a summing unit in which effects of modified current samples, as modified by the phase and amplitude adjustor means, is opposed to the effect of the ground current sample as modified so that, when the phase and amplitude adjustor means are adjusted to simulate conditions of the equipment, the effects may be caused to cancel one another, and

null detector means coupled to the summing unit to detect when such cancellation occurs.

4,054,833

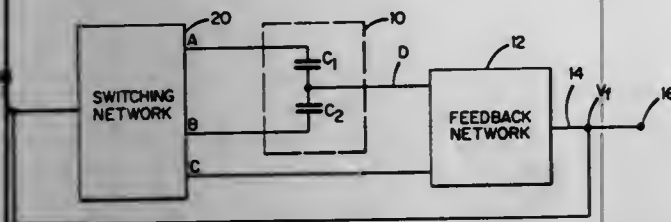
CAPACITANCE MEASURING SYSTEM

Dennis K. Briefer, Berlin, Mass., assignor to Setra Systems, Inc., Natick, Mass.

Filed June 11, 1976, Ser. No. 695,026
Int. Cl.² G01R 11/52, 27/26

U.S. Cl. 324-60 C

25 Claims



1. A system for generating a signal which is a predetermined function of the capacitance of a sensor capacitor, comprising:

- a sensor network including two series connected capacitors, one of said series capacitors being said sensor capacitor;
- a switching network including a switch element having two states and a switch control having means to cyclically switch said switch element between said two states;
- reference coupling means for coupling a plurality of externally applied reference potentials to said switching element;
- a feedback network coupled to said sensor network and switching network, and including means to generate a feedback signal at a feedback terminal, said feedback signal being representative of the difference in charge stored on said series capacitors from a predetermined value,

wherein said switching network is operative to cyclically interconnect said feedback network and sensor network with said feedback terminal and coupling means whereby the average charge stored on said series capacitors over each cycle is substantially equal to said predetermined value, said feedback signal being said predetermined function of the capacitance of said sensor capacitor.

4,054,834

DEVICE FOR MEASURING AC IN A HIGH TENSION LINE

Robert Boirat, Chilly-Mazarin; Claude Davila, Paris, and Christian Moreau, Marcoussis, all of France, assignors to Compagnie Generale d'Electricite S.A., Paris, France

Filed Jan. 3, 1977, Ser. No. 756,526

Claims priority, application France, Jan. 14, 1976, 76.00841; Mar. 31, 1976, 76.0935

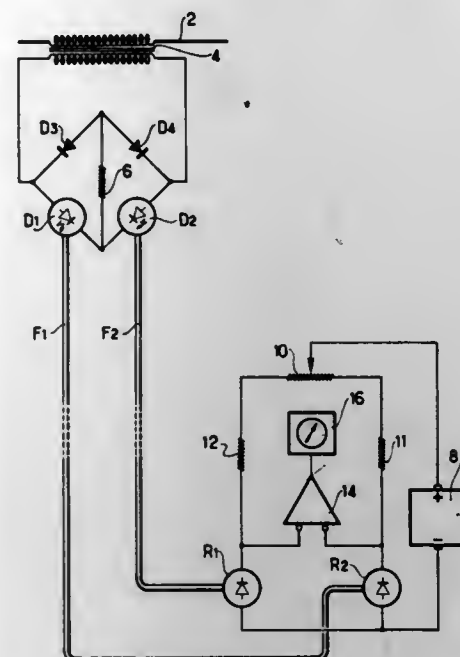
Int. Cl.² G01R 31/00

U.S. Cl. 324-96

6 Claims

1. A device for measuring alternating current flowing in a high tension line, comprising two fibre optic systems for conveying two light signals representative of the current flowing in the line to a point distant from the line;
- shunt means adjacent the line for providing an electric signal substantially proportional to the current flowing in the line, the direction of the electric signal corresponding to the direction of the said current;
- diode bridge means adjacent the line comprising at least two diodes fed by the said electric signal and so connected that one or other of the diodes is conductive according to the direction of the electric signal, each of the two diodes being electroluminescent and being arranged to supply a light flux when conductive representative of the value of the electric signal;
- the two said fibre optic systems receiving respective light

fluxes from the two said electroluminescent diodes and conveying the fluxes to a point distant from the line; two light receptors at a distance from the line receiving the fluxes conveyed by the two said fibre optic systems such that each receptor, on receiving light, supplies a half-wave signal representative of the light flux;



a differential circuit at a distance from the line receiving the two said half-wave signals and supplying an output signal of one polarity or the other according to whether it is receiving the half-wave signal from one or the other of the two said receptors, the amplitude of the output signal being representative of the amplitude of these half-wave signals; and

a measuring unit receiving the said output signal.

4,054,835

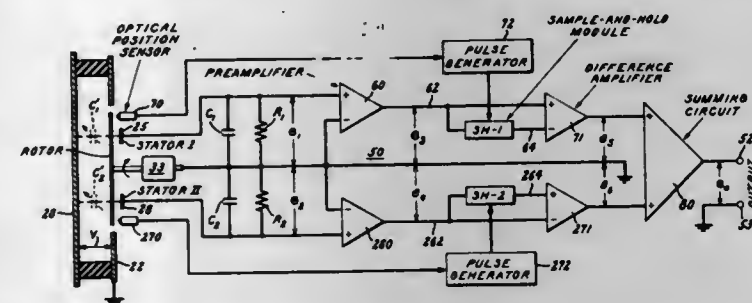
RAPID RESPONSE GENERATING VOLTMETER

Edward Joseph Los, Pittsfield, and David Russell Humphreys, Dalton, both of Mass., assignors to General Electric Company, Philadelphia, Pa.

Filed Nov. 22, 1976, Ser. No. 744,066
Int. Cl.² G01R 5/28, 29/08

U.S. Cl. 324-109

14 Claims



1. In a rapid-response generating voltmeter for measuring a high d-c voltage applied between first and second spaced-apart points,

- a first electrode adapted to operate at the potential of said first point;
- a second electrode spaced from said first electrode and comprising a first stator including a plurality of segments arranged in angularly-spaced relationship about a predetermined center and electrically connected together so as to be at the same potential as each other;
- a first capacitor connected between said first stator and said second point;
- a third electrode spaced from said first electrode, electrically insulated from said second electrode, and comprising a second stator including a plurality of segments arranged in angularly-spaced relationship about said center and positioned physically between the segments of said first

stator, the segments of said second stator being electrically interconnected so as to be at the same potential as each other,

- a second capacitor connected between said second stator and said second point;
- capacitance-varying means for periodically varying substantially simultaneously in opposite senses the capacitance between said first electrode and said second electrode and the capacitance between said first electrode and said third electrode, said capacitance-varying means comprising a rotatable rotor having vanes normally at the potential of said second point located between said first electrode on one hand and the segments of said stators on the other hand, rotation of said rotor causing said vanes to gradually cover the segments of one stator with respect to said first electrode as said vanes gradually uncover the segments of the other stator with respect to said first electrode;
- said rotor vanes effectively completely covering the segments of said first stator at successive instants spaced in time by predetermined successive first intervals;
- first circuit means for sensing the voltage across said first capacitor and for developing during said first intervals a first intermediate signal varying in magnitude directly in accordance with: the voltage then present across said first capacitor minus a first error voltage substantially equal to the voltage across said first capacitor at the start of each of said first intervals;
- said rotor vanes effectively completely covering the segments of said second stator at successive instants spaced in time by predetermined successive second intervals;
- second circuit means for sensing the voltage across said second capacitor and for developing during said second intervals a second intermediate signal varying in magnitude directly in accordance with the voltage then present across said second capacitor minus an error voltage substantially equal to the voltage across said second capacitor at the start of each of said second intervals;
- and summing means for developing an output signal substantially proportional to the instantaneous sum of said first and second intermediate signals.

4,054,836

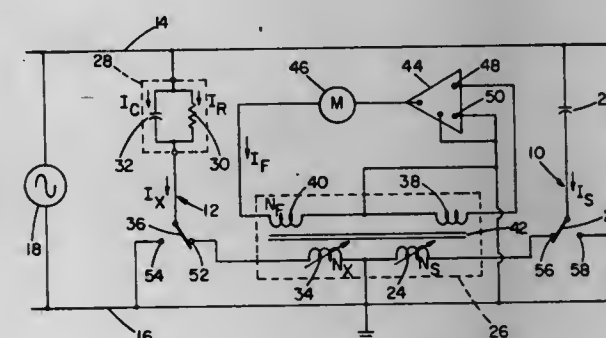
TRANSFORMER RATIO-ARM BRIDGE WITH IMPROVED BALANCING MEANS

Edmund H. Povey, Medford, Mass., assignor to Doble Engineering Company, Watertown, Mass.

Filed Apr. 19, 1976, Ser. No. 678,072
Int. Cl.² G01R 7/00

U.S. Cl. 324-140 D

21 Claims



1. In a bridge circuit of the transformer ratio arm type comprising a standard branch for producing a current corresponding to the current that would flow through a standard high voltage capacitor; a specimen branch in which a test specimen is connectable; and a transformer having a first winding connected to said standard branch, a second winding connected to said specimen branch, and a third winding coupled to said first and second windings to produce an output as a function of the difference between the two magnetomotive forces produced by said first and second windings; a feedback circuit connected between said third winding and said transformer to produce a

compensating magnetomotive force in said transformer in such direction as to reduce unbalance due to the magnetomotive forces produced by said first and second windings.

4,054,837

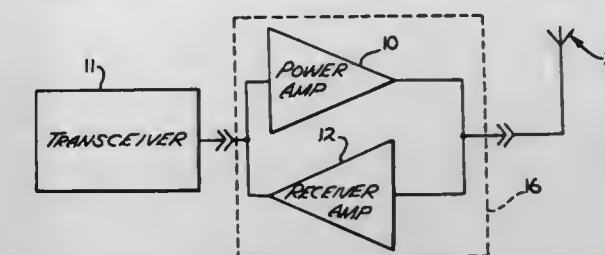
BIDIRECTIONAL RADIO FREQUENCY AMPLIFIER WITH RECEIVER PROTECTION

Eugene B. Hibbs, Jr., 1206 Fernside Drive, La Canada, Calif. 91011, and Michael J. Derem, 7777 Hollywood Blvd., Hollywood, Calif. 90046

Filed Aug. 2, 1976, Ser. No. 710,595
Int. Cl.² H04B 1/40

U.S. Cl. 325-21

8 Claims



1. A radio frequency amplifier for transmitting and receiving a radio frequency signal on a common line, including a common input/output terminal for communicating with a transceiver and a circuit for enabling a receiver amplifier to be coupled to said common line comprising:

- a pair of parallel diodes coupled to said common line such that said diodes provide a low impedance path to a transmitted signal on said common line, and a high impedance to a received signal on said common line;
- the output of said receiver amplifier coupled to said input/output terminal, said receiver amplifier providing an amplified output signal at said terminal which is approximately 180° out-of-phase with said transmitted signal so that said receiver amplifier output signal provides negative feedback to the input of said radio frequency amplifier;
- whereby said parallel diodes prevent a large transmitted signal from being fully coupled into said receiver amplifier, and said receiver amplifier provides negative feedback to said radio frequency amplifier input.

4,054,838

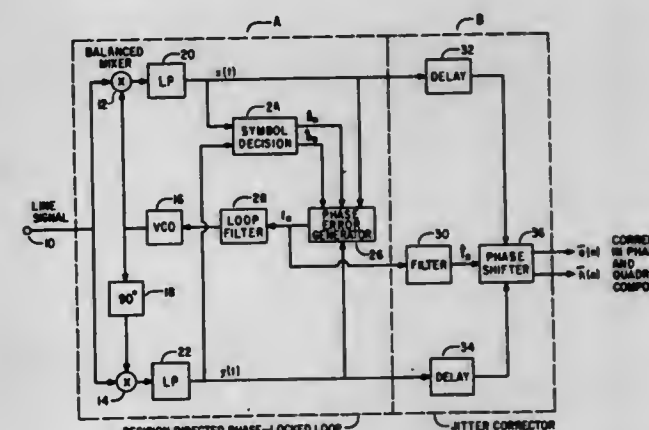
QAM PHASE JITTER AND FREQUENCY OFFSET CORRECTION SYSTEM

Steven Alan Tretter, Silver Spring, Md., assignor to Rixon, Inc., Silver Spring, Md.

Filed Apr. 19, 1976, Ser. No. 678,431
Int. Cl.² H04L 5/12

U.S. Cl. 325-323

4 Claims



1. A QAM receiver system for correcting phase jitter and frequency offsets in a transmitted QAM signal, said system comprising a decision directed phase-locked loop for receiving the transmitted signal and for generating a phase error signal

based on estimates of the transmitted symbols, and phase jitter correction means, located outside of said phase-locked loop and including a low pass filter for passing the expected jitter frequencies, for receiving the inphase and quadrature components of the transmitted signal and said phase error signal, and for correcting said inphase and quadrature components for phase jitter.

4,054,839

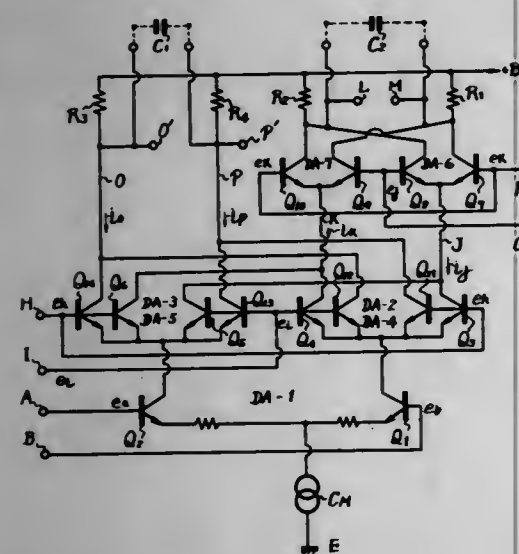
BALANCED SYNCHRONOUS DETECTOR CIRCUIT
Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 11, 1976, Ser. No. 741,125

Claims priority, application Japan, Nov. 18, 1975, 50-138415
Int. Cl.² H03D 3/18; H04H 5/00

U.S. Cl. 329—50

10 Claims



1. A balanced synchronous detector circuit for detecting the amplitude of a received signal and for detecting the phase difference between said received signal and a generated signal, comprising:

a first double-balanced modulator having a first section provided with a first set of input terminals to which said received signal is applied and a second section provided with a second set of input terminals to which said generated signal is applied, said second section being provided with a set of output terminals;

a second double-balanced modulator having a first section formed of a portion of said second section of said first double-balanced modulator and a second section provided with a set of input terminals to which a signal whose frequency is an integral multiple of the frequency of said generated signal is applied, said second section of said second double-balanced modulator being provided with a set of output terminals;

means coupled to said set of output terminals of said first double-balanced modulator to provide a signal proportional to the phase difference between said received signal and said generated signal applied to said first and second sets of input terminals, respectively, of said first double-balanced modulator; and

means coupled to said set of output terminals of said second double-balanced modulator to provide a signal proportional to the amplitude of said received signal applied to said first set of input terminals of said first double-balanced modulator.

4,054,840 FM DEMODULATOR USING MULTIPLIER TO WHICH DELAYED AND UNDELAYED INPUT SIGNALS ARE APPLIED

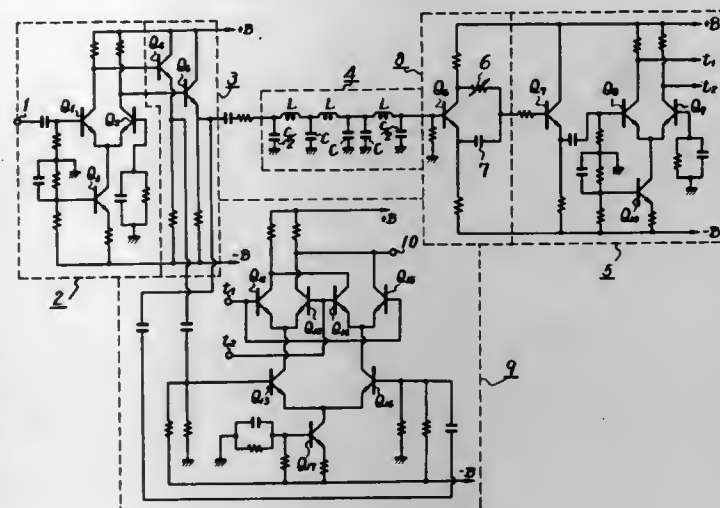
Teruo Sato, Yamato, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 8, 1976, Ser. No. 721,525

Claims priority, application Japan, Sept. 10, 1975, 50-109865
Int. Cl.² H03D 3/14

U.S. Cl. 329—103

7 Claims



1. An FM demodulator comprising:
 - a signal input terminal supplied with a frequency modulated signal;
 - a multiplier having a pair of input terminals and an output terminal;
 - a low pass filter connected to the output terminal of said multiplier to filter the output signal of the multiplier;
 - coupling means for coupling said signal input terminal to one of said input terminals of said multiplier;
 - a series circuit comprising a delay line and a phase shifter connected between said signal input terminal and the other of the input terminals of said multiplier.

4,054,841

DIFFERENTIAL DEMODULATORS USING SURFACE ELASTIC WAVE DEVICES

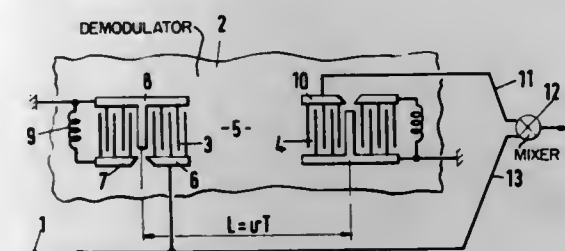
Jeannine Le Goff Henaff, 3ter, Place Marquis; Gilbert Lainey, 7, rue Hebert, and Michel France Carel, 3, rue des Volontaires, all of, Clamart, France (92140)

Filed May 14, 1976, Ser. No. 686,387

Claims priority, application France, May 29, 1975, 75.17351
Int. Cl.² H03D 3/16

U.S. Cl. 329—118

7 Claims



1. A differential demodulator for electrical waves which are phase-shift-modulated responsive to a digital pulse train, said demodulator including an input, an output, an elastic-surface-wave means, an input transducer means formed on said elastic-surface-wave means, the input transducer means being connected to the input of the demodulator, mixer means having first and second inputs and an output, and an output transducer means, the output transducer means being connected to the first input of the mixer means, the second input of the mixer means being connected to the input of the demodulator and the output of the mixer means being connected to the output of the demodulator and path means including the elastic-surface-

wave means interposed between the input transducer and the output transducer, the length of the said path means being determined by the repetition frequency of the train.

4,054,842

CHANNEL GAIN IMBALANCE COMPENSATION FOR FSK DEMODULATOR

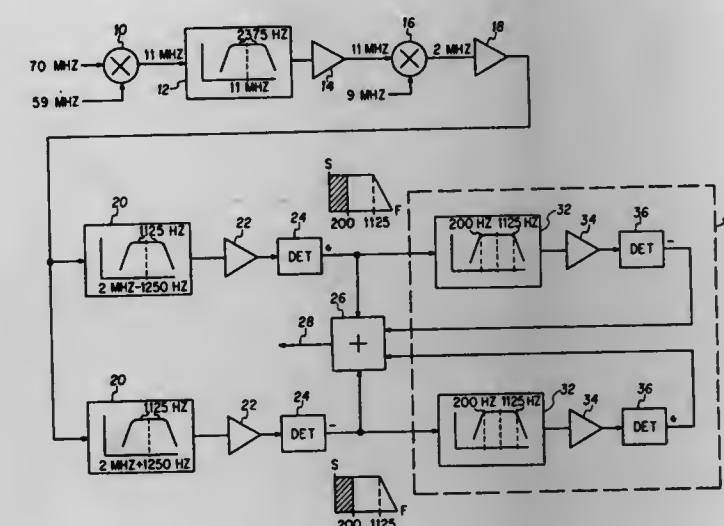
William S. Elliott, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 19, 1977, Ser. No. 760,780

Int. Cl.² H03D 3/00

U.S. Cl. 329—133

11 Claims



1. In combination with an FSK demodulator having a pair of bandwidth limited channels formed with a pair of envelope detectors for providing D.C. output signals indicative of binary data and an arithmetic means for arithmetically combining the detector output signals to replicate the transmitted data bit stream, a gain imbalance compensating means, comprising:
 - a pair of compensating circuits, each being connected to the output of a different one of the pair of detectors for providing a D.C. compensating signal proportional to the energy contained within a predetermined bandwidth of its associated detector output signal, and
 - means for applying the compensating signals to the arithmetic means such that each counteracts its associated detector output applied thereto.

4,054,843

AMPLIFIER WITH MODULATED POWER SUPPLY VOLTAGE

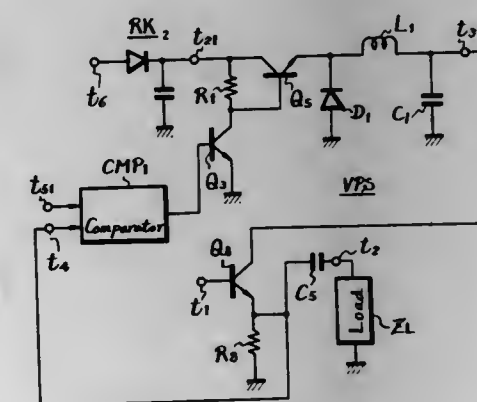
Osamu Hamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 676,926

Claims priority, application Japan, Apr. 17, 1975, 50-46694
Int. Cl.² H03F 3/183

U.S. Cl. 330—263

10 Claims



1. In an amplifier having signal input means supplied with an input signal to be amplified, signal output means connected with a load, amplifying means connected between said signal

input means and said signal output means for supplying an output signal to the latter, and power supply means for supplying an operating voltage to said amplifying means; a circuit for modulating said operating voltage supplied to the amplifying means in accordance with one of said input and output signals comprising direct voltage source means, a first transistor having base, emitter and collector electrodes, smoothing means connected in series with the collector-emitter circuit of said first transistor between said direct voltage source means and said amplifying means, a first resistor connected between the base and collector electrodes of said first transistor, a second transistor having base, emitter and collector electrodes, the collector-emitter circuit of said second transistor being connected between the base electrode of said first transistor and a reference voltage point, an amplitude comparator, and means for applying to said comparator a sawtooth wave signal and a signal varying with said one of the input and output signals so that said comparator provides a pulse width modulated signal having a duty factor varying with said one signal and which is applied to said base electrode of said second transistor.

4,054,844

AMPLIFYING SYSTEM

Kenro Oguri, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

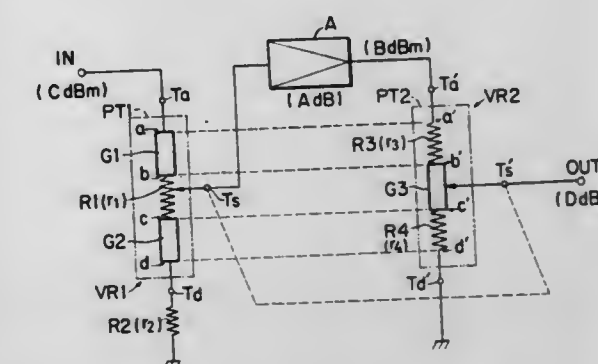
Filed Apr. 13, 1976, Ser. No. 676,661

Claims priority, application Japan, Apr. 15, 1975, 50-51077[U]; June 12, 1975, 50-80230[U]

Int. Cl.² H03F 1/00; H01C 10/16

U.S. Cl. 330—155

8 Claims



6. An amplifying system having an over-all gain which is adjustable for a gain-variable range which is set for this amplifying system, comprising:

a first variable attenuating means for receiving an input signal for the amplifying system to thereby deliver out said input signal of the level attenuated by this variable attenuating means,

an amplifier having a certain gain for amplifying the signal derived from said first variable attenuating means,

a second variable attenuating means for receiving the output signal of said amplifier to deliver out, as an output signal of the amplifying system, said received output signal of the level attenuated by this variable attenuating means,

said over-all gain being varied for said gain-variable range depending upon the total of the respective attenuation factors of said first and second variable attenuating means,

said gain-variable range including at least a first sub-range covering from the maximum gain value of said gain-variable range to a first gain value which is less than said maximum gain value and a second sub-range covering from said first gain value to a second gain value which is less than said first gain value, and

movable means ganging said first and second variable attenuating means for mutually substantially exclusively changing the respective attenuation factors of said first and second sub-ranges.

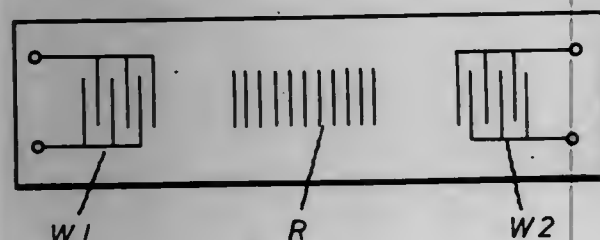
conductor members, said second terminal means extending through said axially extending openings through the walls of said first conductor members.

4,054,851

ACOUSTIC SURFACE-WAVE FILTER

Manfred Borner, and Gerhard Kohlbacher, both of Ulm (Danne), Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Filed Dec. 17, 1974, Ser. No. 533,695

Claims priority, application Germany, Dec. 21, 1973, 2363701
Int. Cl.² H03H 9/02, 9/26, 9/30, 9/32; 330 5.5:57
U.S. Cl. 333-72 34 Claims



1. In an acoustic surface-wave filter comprising at least one element excitable to perform surface oscillations, at least partly of piezoelectric material and defining a surface, on at least one side thereof, with interference locations for surface waves, input transducer means for converting electrical energy into mechanical energy and output transducer means for converting mechanical energy into electrical energy, the improvement wherein at least some said interference locations are oriented perpendicular to the original direction of propagation of an excited acoustic surface wave, are disposed between said input and output transducer means in the path of propagation of an excited acoustic surface-wave, and are combined into a resonator in the form of a ruled grating with the average distance between said interference locations in said resonator being equal to half the wavelength of the surface-waves or a whole-number multiple of a half of the wavelength of the surface-waves.

4,054,852

SOLID STATE BLUE-GREEN LASER WITH HIGH EFFICIENCY LASER PUMP

Van O. Nicolai, Reston, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

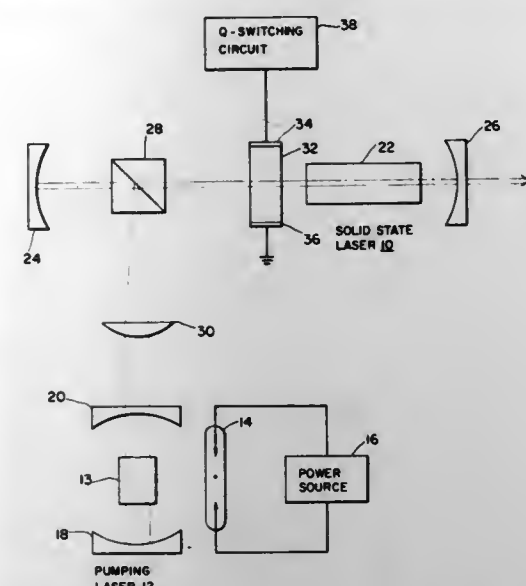
Filed July 28, 1976, Ser. No. 709,477
Int. Cl.² H01S 3/00

U.S. Cl. 331-94.5 G

7 Claims

1. A high efficiency, high peak power blue-green laser comprising:
a pumping laser providing blue output pulses;
a solid state laser pumped by said pumping laser, said solid state laser producing blue-green output pulses; and

Q-switching means coupled to said solid state laser, said Q-switching means operating to limit the output pulses of



said solid state laser to a shorter duration than the duration of said pumping laser pulses.

4,054,853

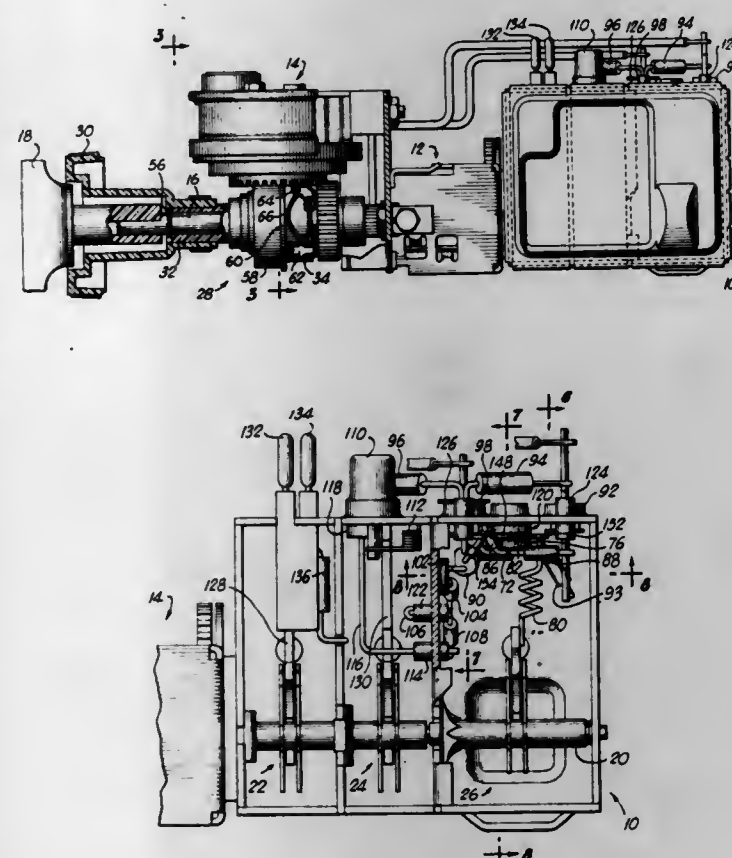
UHF TELEVISION TUNER WITH ELECTRICAL FINE TUNING

William A. Tarr; James E. Krepps, both of Bloomington, and Thomas L. Opsahl, Fort Wayne, all of Ind., assignors to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed May 11, 1976, Ser. No. 685,153
Int. Cl.² H03J 5/12

U.S. Cl. 334-15

29 Claims



1. A UHF television tuning system comprising:
a UHF tuner having a housing, a continuously variable main tuning shaft rotation of which is effective to cause said tuner selectively to receive signals on all channels in the UHF television band, a channel selector shaft, means interconnecting said selector shaft and said main tuning shaft, detent means for said selector shaft for establishing a stop position of said main tuning shaft for each of the television channels in the UHF band, a mechanically variable capacitor mechanically coupled to said tuning

shaft, a variable frequency oscillator electrically coupled to said mechanically variable capacitor and having a frequency of oscillation that is adjustable upon rotation of said main tuning shaft over a range of frequencies corresponding to the entire UHF television band for determining the frequency of the signal received by said UHF tuner;

a leadless capacitor having first and second plates separated by an insulating material mounted within said housing in close proximity to said oscillator;

a voltage variable capacitor electrically coupled to said oscillator for controlling the frequency of said oscillator to fine tune said tuner independently of the operation of said main tuning shaft, said voltage variable capacitor being connected to said first plate of said leadless capacitor and mechanically supported thereby in close proximity to said oscillator; and

a fine tuning potentiometer electrically coupled to said voltage variable capacitor for effecting fine tuning of said tuner.

4,054,854

VALVE OPERATOR

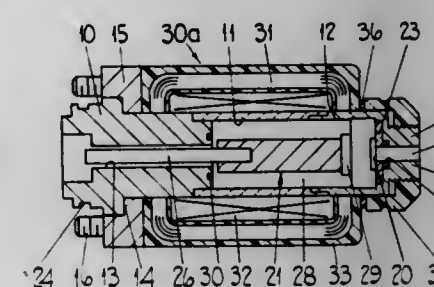
John Thomas Marsden, Stoke-on-Trent, England, assignor to Expert Industrial Controls Ltd., Ashby de la Zouch, England
Filed Apr. 1, 1975, Ser. No. 564,024

Claims priority, application United Kingdom, Apr. 4, 1974, 14916/74

Int. Cl.² H01F 3/10, 7/16

U.S. Cl. 335-260

24 Claims



1. A valve operator of the kind specified comprising a pole piece formed from magnetisable material, a hollow intermediate member formed from non-magnetic material, said intermediate member being secured in a fluid pressure proof manner to the pole piece, a further hollow member secured to said intermediate member at its end remote from the pole piece, said further member being formed of magnetisable material and secured to the intermediate member in a pressure proof manner, an end closure for the further hollow member, said pole piece and said members defining said fluid pressure proof compartment, an armature in said compartment, means whereby the pole piece can be secured to a fluid control valve, and a magnetising structure detachably mounted about the pressure proof compartment, said magnetising structure including an electric winding and the structure being arranged so that when the winding is supplied with electric current, said pole piece and the further member will be magnetically polarised establishing a magnetic field, the armature moving under the influence of the magnetic field towards the pole piece, said pole piece and said members defining a cylindrical outer surface, said magnetising structure being slidable over said surface and being angularly movable about said surface to a desired position, said magnetising structure includes a rectangular core having apertures in its end members, said pressure proof compartment extending through said apertures so that the end members of the core are aligned with the pole piece and said further member respectively.

4,054,855

ADJUSTABLE-INDUCTANCE ELECTRIC COIL

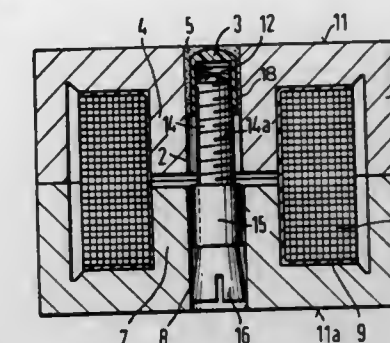
Max Schlotterbeck, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 19, 1976, Ser. No. 668,700

Claims priority, application Germany, Mar. 20, 1975, 2512309
Int. Cl.² H01F 21/06

U.S. Cl. 336-83

2 Claims



1. In an adjustable inductance electrical coil including:
1. a fixed core body formed of a magnetizable material and having an upper and a lower core portion, each core portion having a substantially double U-shaped cross-sectional configuration which includes an outer leg and a shorter inner leg extending from a wall thereof, a free end of each outer leg of one core portion abutting against a free end of a respective outer leg of the other core portion so as to define a lateral passage within said core body, said core portions each having a circumferential space between said inner and outer legs thereof and an axial passage located between the respective inner legs of a core portion extending from a wall thereof to the free end of said inner legs thereof, said axial passage and circumferential space of a core portion being substantially aligned with the axial passage and circumferential space of the other core portion so as to define an aligned circumferential space and an aligned axial passage within said core body;
2. a winding means positioned within said aligned circumferential space of said core body so as to create an inductance in the core upon energization of said coil; and
3. means positioned within said aligned axial passage in said core body and extending across said lateral passage for adjusting the inductance of said coil;
the improvement comprising wherein:

a. an internally threaded sleeve formed of a non-magnetizable material having an elongated cylindrical body of a length less than the length of the axial passage in said upper core portion, said cylindrical body having a crowned closed upper end portion and an opposite open end portion providing access to the interior of said sleeve, said sleeve being positioned within said axial passage in said upper core portion so that a top of said passage in said upper core portion is substantially aligned with a top surface of said upper core portion;
b. a mastic means positioned on the outside of said sleeve between inner walls of said axial passage in said upper core portion, said crowned closed upper end portion of the sleeve and outside surface portions of said sleeve; and
c. said means for adjusting the inductance of said coil consists essentially of:
c₁. a solid shaft formed of a non-magnetizable material having a body of a length less than the length of said aligned axial passage in said core body but greater than the length of the axial passage in said upper core portion so that said body extends from the lower core portion at least across the lateral passage in said core body, said shaft body being externally threaded at least along upper portions thereof and having a slotted tool-engagable head positioned at a select location within the axial passage in said lower core portion and having the body thereof threadably engaged

in said sleeve with an end portion of said shaft opposite the slotted head portion thereof being selectively spaced from an inner wall of said sleeve located interiorly of the crowned upper end portion thereof; and

C₂, a hollow elongated internally threaded cylindrically-shaped tube core formed of a magnetizable material having a length less than the length of the respective axial passages in said upper and lower core portions, said tube core being threadably engaged on said shaft at a select location thereof above the slotted head portion thereof and below said sleeve; whereby rough inductance adjustment of the coil is attained by moving said tube core to a select location on said shaft and fine inductance adjustment of the coil is attained by moving said shaft to a select location within said sleeve.

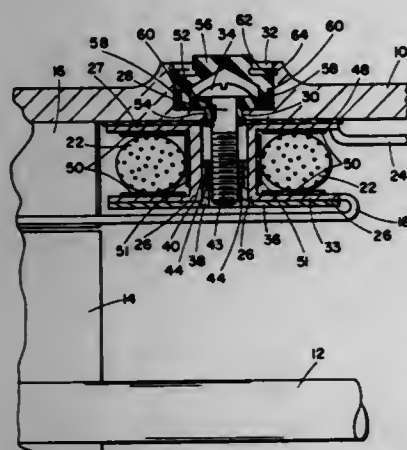
4,054,856

CURRENT TRANSFORMER ASSEMBLY FOR DYNAMOELECTRIC MACHINES

Philip S. Linscott, Jr., Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Sept. 8, 1976, Ser. No. 721,256
Int. Cl.² H01F 27/06, 40/06

U.S. Cl. 336—84 M



1. A current transformer and a dynamoelectric machine housing assembly comprising:

- a current transformer;
- an aperture configured in the machine housing;
- a fastening member extending through said aperture in the housing and secured to said current transformer effective to secure said current transformer to the interior of the housing;
- first insulating element interposed between said current transformer and the interior surface of the housing;
- second insulating element interposed between said fastening element and the housing;
- covering means for enclosing the portions of said fastening means extending outwardly through said aperture in the housing;
- retaining means for securing said covering means to the housing; and
- sealing means cooperating with said covering means and the housing to provide a substantially fluid-tight seal for the aperture of the housing.

4,054,857

TIME DELAY DISCONNECT SWITCH

Thomas Bowling, Fern Creek, Ky., assignor to General Electric Company, Louisville, Ky.

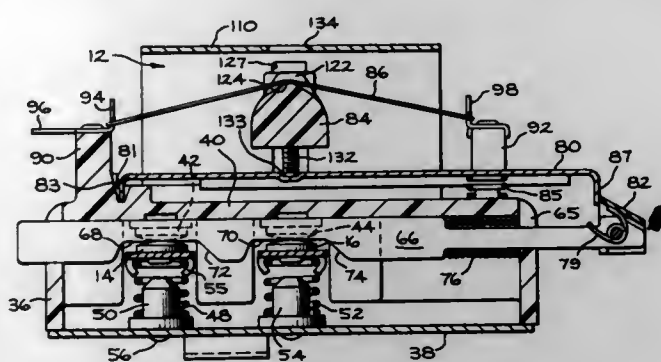
Filed Aug. 2, 1976, Ser. No. 710,568
Int. Cl.² H01H 61/04

U.S. Cl. 337—129

8 Claims

1. A time delay disconnect switch for controlling the flow of current in a conductor and interrupting the flow in the event of a predetermined current, said switch comprising a housing with fixed and movable contact means for making and break-

ing a circuit with the conductor, biasing means for holding the movable contact means normally closed with the fixed contact means, biased actuator means for forcing the movable contact means away from the fixed contact means at a relatively slow rate, and a biased latch means for disabling the actuator means, an adjustable thermal-responsive means acting upon the said latch means for holding the latch means in engagement with the said actuator means, whereby a predetermined current



20 Claims

flow in the conductor causes the thermal-responsive means to release the latch means for engagement with the actuator means thereby allowing the biased actuator means to force the movable contact means away from the fixed contact means with a controlled contact gap in less than a half cycle, said actuator means being manually resettable with respect to the latch means when the said thermal-responsive means has returned to its normal condition.

4,054,858

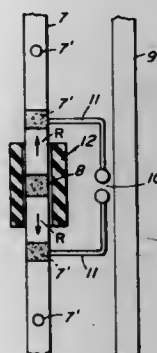
ELECTRIC FUSE CAPABLE OF INTERRUPTING SMALL OVERLOAD CURRENTS BY SERIES MULTIBREAKS

Philip C. Jacobs, Jr., Newtonville, Mass., assignor to Gould, Inc., Newburyport, Mass.

Filed Oct. 19, 1976, Ser. No. 733,918
Int. Cl.² H01H 85/12

U.S. Cl. 337—162

9 Claims



1. An electric fuse adapted to form multibreaks at the occurrence of small protracted overload currents including
 - a. a tubular casing of electric insulating material;
 - b. a pulverulent arc-quenching filler inside said casing;
 - c. a pair of metallic terminal elements closing the ends of said casing;
 - d. conductive means interconnecting said pair of terminal elements, said conductive means including a fusible element and a shunt shunting a portion of said fusible element;
 - e. said fusible element having a relatively small resistance and forming a plurality of serially related points of reduced cross-section area and said fusible element further having means situated between two of said points of reduced cross-sectional area for causing formation of a break therein at the occurrence of small protracted overloads;
 - f. said shunt shunting said point of break formation, having

an arc gap in the center region thereof and having ends conductively connected to said fusible element; and
g. bead means mounted on said conductive means of a material evolving a gas when heated and generating jets of hot gas directed at the points of connection of said fusible element and said shunt to help in the ionization of these points.

4,054,859

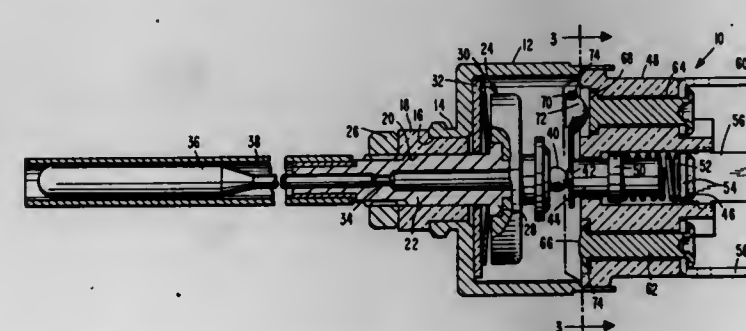
FLAME PROBE

Allen L. Teichert, Placentia, and Richard E. Jones, Los Alamitos, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed June 28, 1976, Ser. No. 700,663
Int. Cl.² H01H 37/36

U.S. Cl. 337—309

17 Claims



14. A flame probe comprising
a thermally responsive motive device,
a tubular electrode mounted on the thermally responsive motive device,
electrical conductive means connecting to the tubular electrode through the thermally responsive motive means,
a pair of switch contacts, and
insulating operator means transmitting the movement of the thermally responsive motive device to the pair of switch contacts to operate the switch contacts in response to the movement of the thermally responsive motive device.

4,054,860

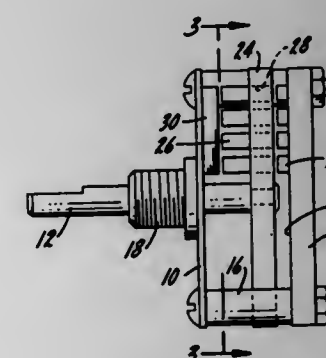
HALL EFFECT ROTARY SWITCH

Donald Max Henderson, Crystal Lake, and Raymond F. Lewandowski, Mount Prospect, both of Ill., assignors to Oak Industries Inc., Crystal Lake, Ill.

Filed Dec. 1, 1975, Ser. No. 636,800
Int. Cl.² H01L 43/04

U.S. Cl. 338—32 H

18 Claims



1. A Hall effect rotary switching device including a stator mounting a plurality of spaced Hall effect sensing circuits, magnetic means for causing activation of said Hall effect sensing circuits, a rotor rotatable adjacent said stator for selectively positioning said magnetic means adjacent said Hall effect sensing circuits to provide position indicating outputs therefrom, and cooperating magnetic indexing means on said rotor and stator for providing a plurality of fixed rotor positions.

4,054,861

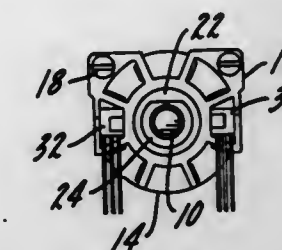
PULSING TYPE HALL EFFECT ROTARY SWITCH

William C. Markison, Crystal Lake, Ill., assignor to Oak Industries Inc., Crystal Lake, Ill.

Filed Oct. 18, 1976, Ser. No. 733,114
Int. Cl.² H01L 43/04

U.S. Cl. 338—32 H

9 Claims



1. A Hall effect rotary switching device including a rotor and a stator, a plurality of peripherally unequally spaced Hall effect sensing circuits on said stator, a plurality of localized magnetic areas on said rotor, a switch frame for said rotor and stator and mounting said rotor to move said localized magnetic areas adjacent said Hall effect sensing circuits, with such movement causing output signals therefrom, and cooperating magnetic detent means on said rotor and stator including said rotor localized magnetic areas.

4,054,862

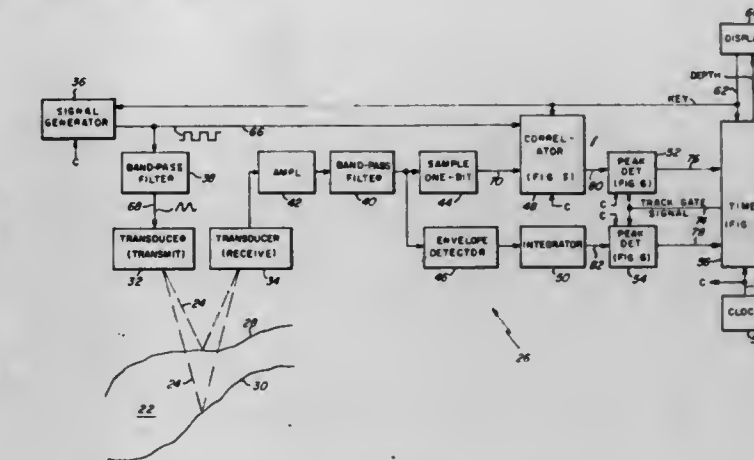
RANGING SYSTEM WITH RESOLUTION OF CORRELATOR AMBIGUITIES

William R. Backman, Jr., Portsmouth, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 28, 1975, Ser. No. 626,581
Int. Cl.² G01S 9/68

U.S. Cl. 340—3 R

9 Claims



1. A ranging system comprising:
means for receiving echoes from a reflecting surface, said receiving means including means for obtaining one bit samples of said echoes;
means for correlating said samples of said echoes against a reference of said echoes signals;
means coupled to said receiving means detecting an envelope of a sequence of said echoes, said detecting means including means for combining signals of individual ones of said echoes of said sequence of echoes to provide said envelope of said sequence of said echoes;
means coupled to said correlating means for measuring the time of occurrence of a peak in an output signal of said correlator; and
means coupled between said envelope detecting means and said time measuring means for operating said time measuring means during an interval of time designated by said envelope detecting means.

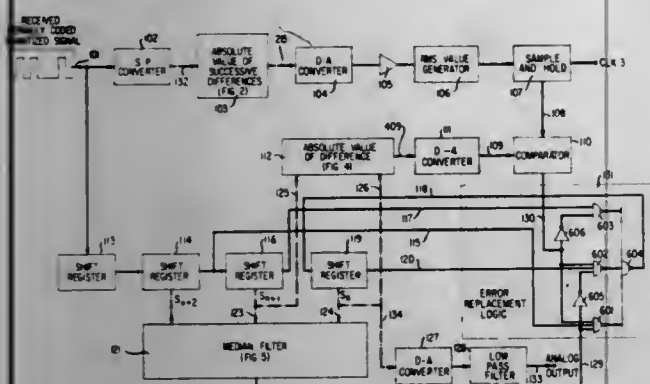
4,054,863

ERROR DETECTION AND CORRECTION SYSTEM
David Joel Goodman, Summit, N.J., and Raymond Steele, Long Wharton, England, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 29, 1976, Ser. No. 745,831
Int. Cl.² G06F 11/00; G08C 25/00

U.S. Cl. 340-146.1 R

13 Claims



1. An error reducing circuit comprising means for receiving an input signal, means for dividing said signal into a plurality of segments, means for partitioning each signal segment into subsegments, means responsive to each signal segment for generating a first signal representative of the deviations of said input signal within said signal segment, means responsive to each signal subsegment of said signal segment for generating a second signal representative of the deviations of said input signal within said subsegment, means for generating a third signal for each subsegment corresponding to the difference between said subsegment second signal and said segment first signal, means for generating a predetermined threshold signal, and means responsive to said difference signal exceeding said threshold signal for forming a predetermined alteration of said subsegment signal.

4,054,864

METHOD AND DEVICE FOR THE STORAGE OF ANALOG SIGNALS

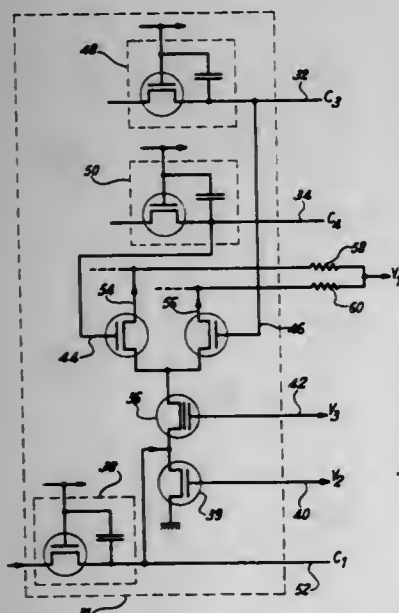
Luc Audaire, St-Nizier-du-Moncherotte; Joseph Borel, Echiroles; Vincent Le Goasoz, Claix, and Robert Poujois, Grenoble, all of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Division of Ser. No. 464,879, April 29, 1974, Pat. No. 3,956,624.
This application Sept. 15, 1975, Ser. No. 613,375

Claims priority, application France, May 4, 1973, 73.16246
Int. Cl.² G11C 27/00, 11/40

U.S. Cl. 340-173 R

1 Claim



1. A method for storing analog signals in integrated circuit memory elements, wherein the memory elements are constituted by field-effect transistors having a number of layers of

different dielectrics between the gate and the doped semiconductor substrate of the transistor, comprising the steps of performing a discrete sampling of an analog signal at N points, applying N writing voltages having values which are proportional to those of each point of the sampled signal to be recorded between the gate and the inversion channel of the multiple dielectric layer transistors which constitute said memory elements, the value of the analog signal at N points being stored in the form of a corresponding threshold voltage in each of said transistors.

4,054,865

SENSE LATCH CIRCUIT FOR A BISECTIONAL MEMORY ARRAY

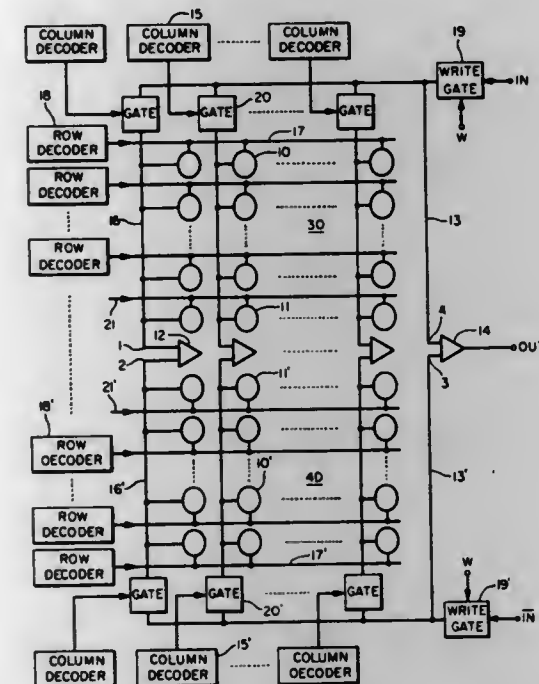
Hajime Shirato, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1976, Ser. No. 680,700

Claims priority, application Japan, Apr. 30, 1975, 50-52694
Int. Cl.² G11C 5/02, 7/06

U.S. Cl. 340-173 R

8 Claims



6. A memory circuit comprising a plurality of memory cells arranged in an array of rows and columns, said array being divided into first and second row groups; a plurality of differential amplifiers having first input terminals respectively connected to the memory cells belonging to said first row group and each of said columns, and second input terminals respectively connected to the memory cells belonging to said second row group and each same column as that connected to said first input terminals; first and second input-output bus lines; first means for operatively connecting the first terminal of the selected differential amplifier to said first input-output bus line; second means for operatively connecting the second terminal of said selected differential amplifier to said second input-output bus line; and means for simultaneously supplying said first input-output bus line with one of the logic "1" and "0" signals and said second input-output bus line with the other of said logic "1" and "0" signals when said memory circuit is enabled in the write-operation mode.

4,054,866

CONVERSION ELEMENT AND SYSTEM UTILIZING MAGNETIC BUBBLES

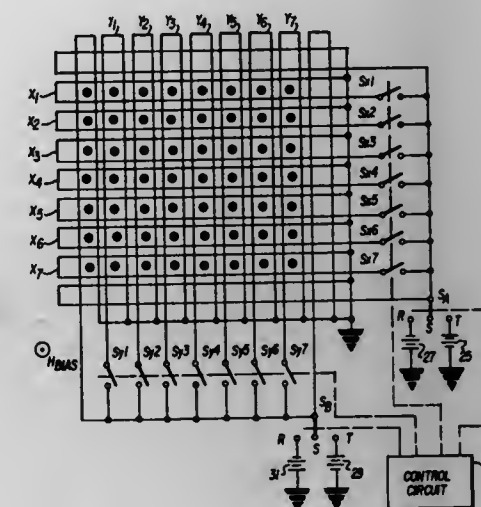
Yoshiki Kikuchi, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed June 11, 1976, Ser. No. 695,315

Claims priority, application Japan, June 25, 1975, 50-77558
Int. Cl.² G11C 19/08

U.S. Cl. 340-174 TF

5 Claims



1. A conversion element comprising a thin plate capable of having magnetic bubbles formed therein; and at least two conductive segment patterns disposed adjacent said thin plate, each pattern comprising a plurality of conductive segments, each conductive segment including switching means therein and having outward and return lines parallel to each other, said plurality of conductive segments of each conductive segment pattern being aligned parallel to one another so that the space between any two adjacent conductive segments thereof is smaller than the space between said outward and return lines, and said two conductive segment patterns being disposed with respect to one another so as to form a lattice shape on said thin film.

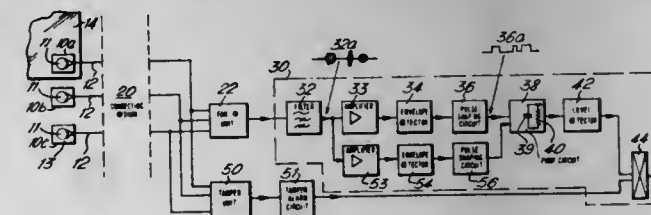
4,054,867

DETECTING DAMAGE TO BULK MATERIAL

John Murry Owens, Edinburgh, Scotland, assignor to Microwave and Electronic Systems Limited, Newbridge, Scotland
Continuation of Ser. No. 358,578, May 9, 1973, abandoned, and a continuation-in-part of Ser. No. 247,180, April 24, 1972, abandoned. This application Apr. 16, 1976, Ser. No. 677,645
Claims priority, application United Kingdom, Dec. 10, 1971, 57598/71; South Africa, Dec. 5, 1972, 72/8609
Int. Cl.² G08B 13/04, 29/00

U.S. Cl. 340-274 R

6 Claims



1. Apparatus for detecting damage to sheet glass including: a rigid housing having a surface for attachment to a sheet of glass; a transducer element of a ceramic piezoelectric material rigidly supported in said housing, said element having electrical contacts made thereto to provide signals corresponding to vibrations transmitted to said element; and an electrical circuit connected to said transducer element contacts, said circuit including filtering means preventing response to any audio frequency signals generated

by said transducer element while allowing response to signals in an ultrasonic frequency range about 100 kHz, and output means responsive to signals in said ultrasonic frequency range and constructed to provide a predetermined requirement of signal amplitude and/or duration in said ultrasonic frequency range to provide an output signal in response to ultrasonic signals meeting said requirement.

4,054,868

ELECTRONIC MUSICAL SCALE AND CHORD DISPLAY APPARATUS

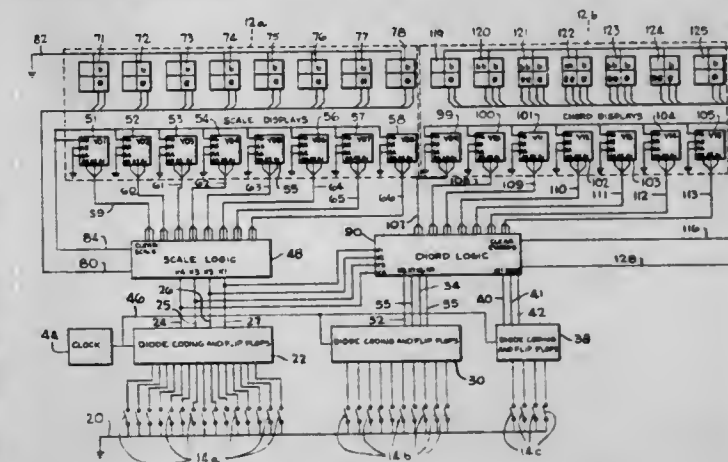
William J. Rose, Tonawanda, N.Y., assignor to Rokore Concepts Associates Ltd., Buffalo, N.Y.

Filed May 12, 1976, Ser. No. 685,523

Int. Cl.² G06F 3/14

U.S. Cl. 340-337

9 Claims



1. Apparatus for displaying selected combinations of information quantities in the form of musical notes of scales and chords comprising:

- a housing which is small in size and light in weight so as to be portable;
- display means on said housing for providing a visual display of said selected combinations of information quantities, said display means comprising first and second groups of display elements for displaying alphabetical letters corresponding to musical notes of scales and chords, respectively;
- storage means in said housing and operatively connected to said display means, said storage means storing signals for operating said display means to display said information quantities, said storage means comprising first and second programmable memory means each providing predetermined combinations of logical output signals in response to particular combinations of logical input signals, said first and second memory means being operatively coupled to said first and second groups of display elements, respectively, said first and second memory means being operatively connected together;
- selector means on said housing and including first and second groups of manually operated selector elements for selecting particular combinations of said information quantities in the form of musical notes and scales, as determined by the particular ones on of said selector elements which are manually operated; and
- circuit means for converting manual operation of said selector elements into operation of said storage means to operate said display means, said circuit means including means for converting operation of said selector elements into logic signals for inputs to said first and second memory means.

4,054,869

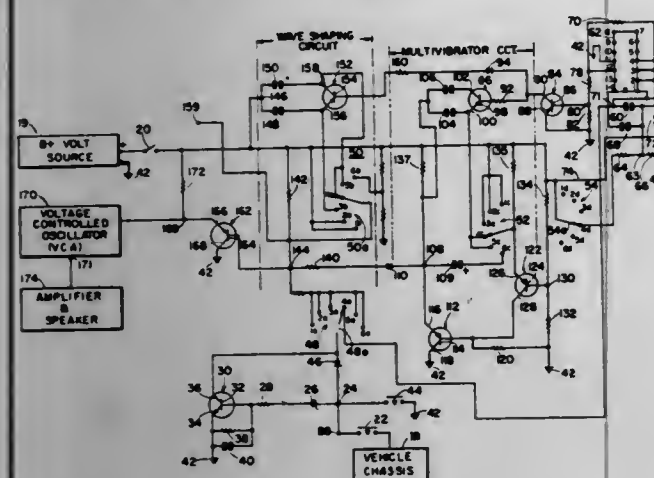
SIGNAL SWITCHING CIRCUIT FOR MULTIPLE SOUND SIREN SYSTEM

Gerald D. Smith, and Sammie S. Witte, both of Indianapolis, Ind., assignors to Carson Manufacturing Company, Indianapolis, Ind.

Filed Nov. 5, 1975, Ser. No. 629,016
Int. Cl.² G08B 3/00

U.S. Cl. 340—384 E

15 Claims



1. Apparatus comprising:
variable frequency means for providing a first signal having a first frequency and a second signal having a second frequency; and
control means selectively operable to produce first and second control signals for changing said variable frequency means from said first signal to said second signal, said control means being coupled to a single manually manipulable switch member operable between first and second positions for selecting respective ones of said first and second control signals, said control means changing said variable frequency means to said first signal upon operation of said switch member from said first to said second position and changing said variable frequency means to said second signal upon the next operation of said switch member from said first to said second position.

4,054,870

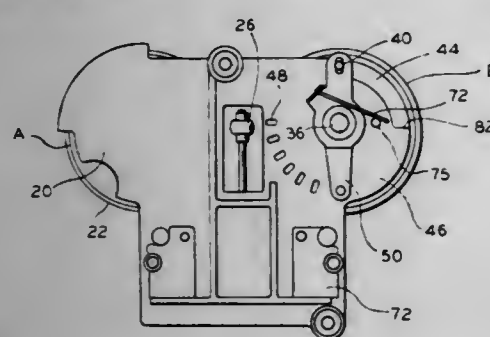
RINGER ASSEMBLY

Eugene Barber, Glen, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 21, 1976, Ser. No. 698,419
Int. Cl.² G10K 1/06

U.S. Cl. 340—397

9 Claims



1. A telephone ringer assembly adapted to mount on a mounting base within a totally enclosed housing, said assembly comprising a clapper and a gong, said gong having a circular section concentric about a first axis normal to said mounting base in which said clapper is normally spaced from said gong a settable distance through which said clapper can travel on actuation thereof to strike the gong and emit a ring, means for variably setting said gong to vary the distance of said gong from said clapper, said setting means comprising a wheel rotatable on a second axis normal to a frame member with said gong mounted on said wheel for rotation therewith, means mounting said gong on said first axis eccentric to said second axis for

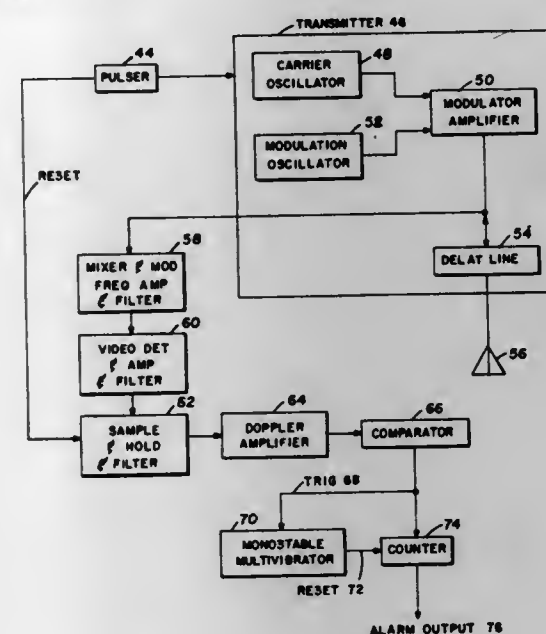
rotation relative to said second axis, spring means mounted on said second axis and including a first member cooperative with said frame member to position said wheel in one of a finite plurality of positions, a second member of said spring means engaging said wheel for rotating said wheel responsive to rotation of said spring means, and a further member of said spring means including a driving member for causing rotation of said spring means and wheel.

4,054,871

ELECTROMAGNETIC INTRUSION SENSOR
James D. Terrell, King George, Va., and Richard O. Giorgis, Olney, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.Filed Sept. 9, 1974, Ser. No. 504,625
Int. Cl.² G01S 9/42

U.S. Cl. 343—7.7

29 Claims



16. An electromagnetic intrusion sensor, comprising:
means for generating an electromagnetic signal having a carrier frequency modulated in amplitude at a modulation frequency;
an antenna circuit having an electrical length equal to one quarter of the wavelength of said modulation frequency, for propagating said electromagnetic signals and for receiving echoes thereof;
a first stage having an input terminal coupled in common with said means for generating and said antenna circuit, for producing an intermediate signal by mixing the components of said electromagnetic signal and said echoes;
a low pass filter having a cut off frequency less than said carrier frequency, coupled to receive said intermediate signal from said first stage; and,
a second stage for producing an output signal varying in dependence upon the envelope of said intermediate signal passed by said low pass filter.

4,054,872

PULSE DOPPLER RADAR RECEIVER HAVING A MOVING CURVE TRANSIT TIME FILTER

Wolfgang Koethmann, Feldafing, and Heinz-Dieter Guenther, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 29, 1976, Ser. No. 709,921

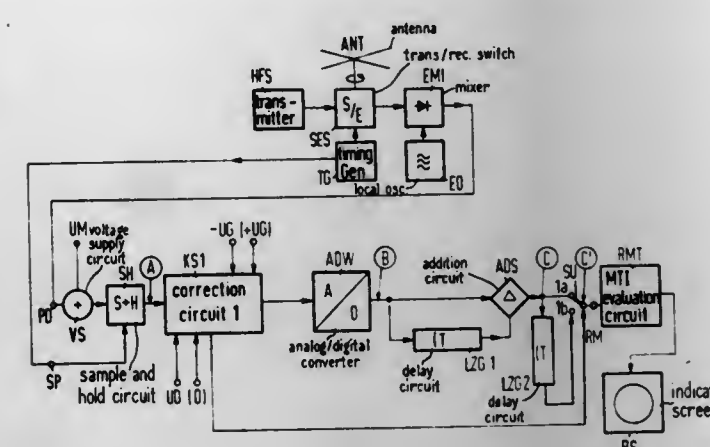
Claims priority, application Germany, Aug. 8, 1975, 2535462
Int. Cl.² G01S 9/42

U.S. Cl. 343—7.7

7 Claims

1. In a pulse Doppler radar receiver having a moving target indicating filter which has a differentiating effect and in which limiting of the received signals is temporarily effected with a limiter including an analog-digital converter, the improvement therein comprising:

means for providing an auxiliary voltage which is opposite in polarity to the voltage of the received signal; and



means for adding the auxiliary voltage to the voltage of the received signal to prevent overdriving and maintain the original envelope.

4,054,873

DEVICE FOR FORMING CHANNELS

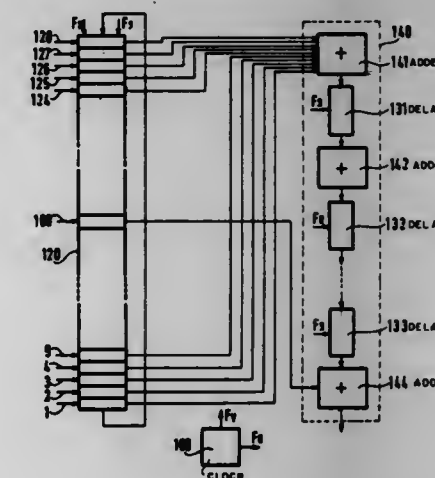
Guy Parent, Le Plessis Robinson, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed June 18, 1976, Ser. No. 697,666

Claims priority, application France, June 26, 1975, 75.20103
Int. Cl.² G01S 3/00

U.S. Cl. 343—113 R

12 Claims



1. In a device for forming channels comprising H detectors regularly spaced out on a circular base, H peak limiters, each peak limiter being connected to the output of a detector, a chain constituted by an alternate sequence of adders and of delay devices, each delay device comprising several elementary delay cells of delay τ ($\tau = 1/F_H$, F_H being a clock frequency applied to the delay devices) and being connected at their output to an input of an adder of the chain, the improvement comprising:

a shift register forming a looped circuit and comprising H stages, the parallel inputs of the said stages being connected to the outputs of the H peak limiters and the parallel outputs of the said stages being connected to inputs of the said adders of the chain; and
a clock supplying a frequency $F_V = F_H/H$ by means of which the output signals of the H peak limiters are sampled by the said register and a frequency F_H by means of which the data advances along the stages of the said register and along the delay devices.

4,054,874

MICROSTRIP-DIPOLE ANTENNA ELEMENTS AND ARRAYS THEREOF

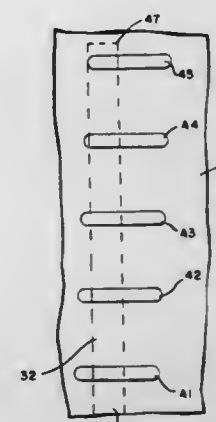
Henry G. Oltman, Jr., Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 11, 1975, Ser. No. 585,920

Int. Cl.² H01Q 1/38

U.S. Cl. 343—700 MS

34 Claims



1. An antenna element comprising:
a microstrip board having a conductive feed line on a first side thereof and a conductive surface on its second side; and
at least one conductive dipole separated from said conductive surface by less than one-sixth of a wavelength of the antenna element's operational frequency as measured in the medium between said dipole and said conductive surface, and with said at least one dipole being spaced apart from and asymmetrically disposed relative to said feed line such that one end portion of said dipole overlaps said feed line and the remaining portion of said dipole does not overlap said feed line and with said asymmetrical orientation of said dipole being sufficient to cause substantially different amounts of reactive coupling between the feed line and the respective end portions of the dipole; whereby
signals can be applied or received across said feed line and said conductive surface.

4,054,875

MICROWAVE CIRCUIT FOR OPERATING ON MICROWAVE RADIATIONS

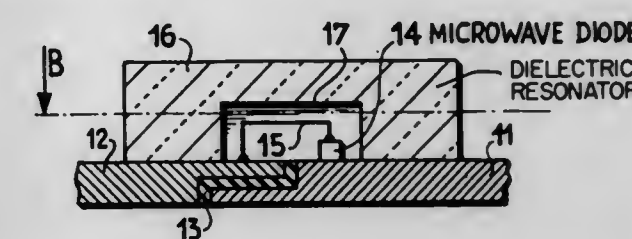
Gerard Cachier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 19, 1976, Ser. No. 650,262

Claims priority, application France, Jan. 22, 1975, 75.01970
Int. Cl.² H01Q 1/26

U.S. Cl. 343—701

10 Claims



1. A microwave circuit for radiating microwave radiations, which comprises:
an electrically conductive substrate for reflecting said microwave radiations;
a dielectric resonator made of semiconductor material and mounted on said substrate;
a semiconductor oscillator diode fitted with two connections, lying above said substrate and being a structure integrated onto the face of said resonator adjacent to said substrate; and
means for coupling said diode to said resonator, and simulta-

aciously connecting the diode to an external biasing source.

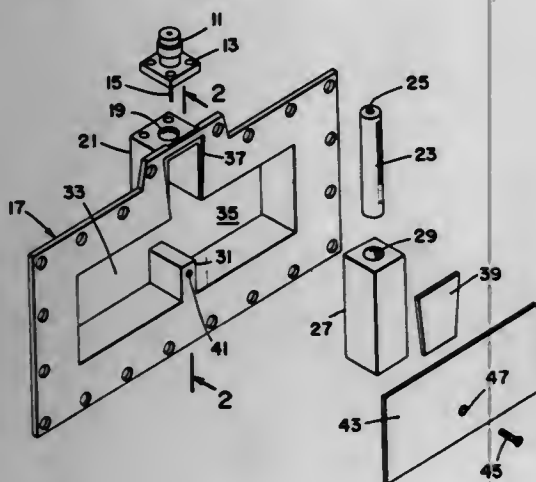
4,054,876 CAVITY ANTENNA

Gary R. Hoople, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1976, Ser. No. 662,481
Int. Cl.² H01Q 13/00

U.S. Cl. 343-789

10 Claims



1. In an antenna of the type having an input channel to receive electromagnetic energy transmitted by a coaxial cable and a cavity having an aperture to allow the radiation of said electromagnetic energy into free space wherein the improvement comprises:

- a. a chamber located at the top of said cavity and interposed between said input channel and said cavity and communicating interiorly therewith;
- b. a metallic probe positioned interior to said chamber, said chamber being dimensioned such that the reactive component of impedance due to the combined effects of said chamber and said probe is inductive in an amount to negate the susceptive component of admittance of said cavity and
- c. said probe in electrical connection with said coaxial cable.

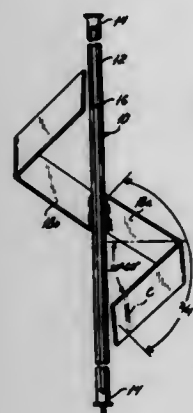
4,054,877 CIRCULARLY POLARIZED DIPOLE TYPE OMNIDIRECTIONAL TRANSMITTING ANTENNA

Richard D. Bogner, 4 Hunters Lane, Roslyn, N.Y. 11576, and Leonard H. King, 67 Southgate Road, Valley Stream, N.Y. 11581

Filed Feb. 27, 1976, Ser. No. 661,975
Int. Cl.² H01Q 9/16

U.S. Cl. 343-806

1 Claim



1. A transmitting antenna for radiation of signals of wavelength λ comprising:

- a. a coaxial transmission line consisting of an elongated metal tube serving as an outer conductor and a coaxial conduc-

- tive member coextensive therewith serving as a center conductor, said tube having two side wall portions isolated each from the other by a pair of diametrically opposed slots, each of a length of about $\lambda/2$;
- b. an electrically conductive member joining the said center conductor to one of said side wall portions; a first conductive arm electrically connected to one said side wall portion at approximately the midpoint of the slot and having a length of about $\lambda/4$ extending at an angle of from 30° to 60° downward relative to the axis of the said outer conductor said arm extending generally outwardly in an arc from said first side wall; and a second conductive arm electrically connected to the other side wall portion at approximately the midpoint of the slot and having a length of about $\lambda/4$ extending at an angle of from 30° to 60° upward relative to the axis;
- c. a continuous resin bonded electrically non-conductive fiber cover surrounding the said outer conductor; and
- d. a metal band surrounding said cover and capacitively coupled to the said side walls.

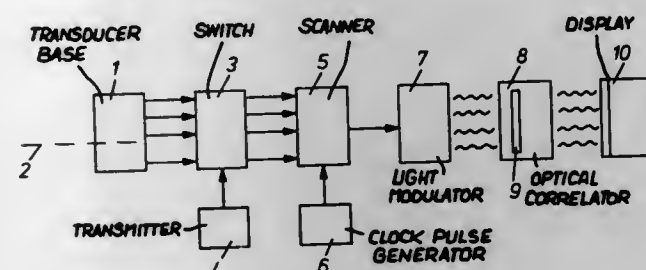
4,054,878 RANGING SYSTEM INCLUDING APPARATUS FOR FORMING DIRECTIONAL CHARACTERISTICS AT THE RECEIVING END AND FOR CORRELATING

Reiner Diehl, Bremen, Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Germany

Filed Mar. 27, 1975, Ser. No. 563,118
Claims priority, application Germany, Mar. 27, 1974, 2414644
Int. Cl.² G01S 9/06, 9/68; G02B 5/22

U.S. Cl. 343-11 R

13 Claims



1. In an apparatus for the formation of beams characteristics at the receiving end of a ranging system operating according to the reflected-beam ranging technique with acoustical or electromagnetic waves and for correlating the received signals, said apparatus including a plurality of transducers arranged in rotational symmetry in a transmitting-receiving plane, a transmitter for providing pulse-shaped wave energy to be transmitted by said transducers and a transmitting-receiving switch for selectively connecting said transducers to said transmitter to cause the transmission of wave energy or, in order to evaluate the reflected energy, to a scanner means for repeatedly interrogating the received signals in succession during one reflected-beam ranging period, each switch position of said scanner being associated with one directional angle and each interrogation cycle covering all transducers being associated with one directional angle revolution; the improvement comprising: a two-dimensional light producing means, responsive to the output from said scanner means, for producing a light-wave output with an intensity or phase distribution dependent on the directional angle in one dimension and dependent on the time of reception of the received signals within each ranging period in the other dimension, whereby the wavefront of the light-wave output is modulated by the successively scanned received signals; a series-connected, two-dimensional optical correlator means, having its input connected to the output of said light producing means and containing a reference disc, as the reference function of the correlator, with a transmission function which corresponds to directional characteristic for a transmitted signal received without interference from a reference direction, for correlating the input signal thereto with

said reference function; and a two-dimensional display device connected in series with the output of said optical correlator means.

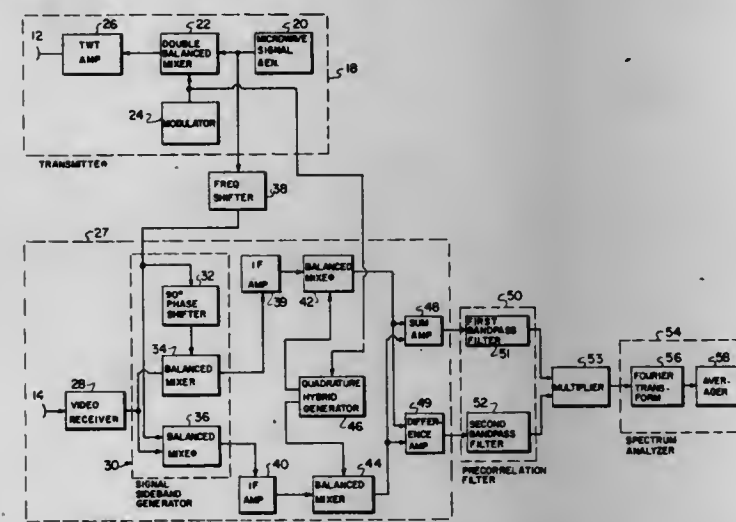
4,054,879 DUAL-FREQUENCY, REMOTE OCEAN-WAVE SPECTROMETER

John W. Wright, Accokeek, Md.; William J. Plant, Annandale, and Dale L. Schuler, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 19, 1976, Ser. No. 743,372
Int. Cl.² G01S 9/02

U.S. Cl. 343-5 SA

12 Claims



1. An ocean-wave spectrometer radar system comprising: transmitter means, having closely spaced, coherently related, dual-frequency channels, for generating a first local-oscillator frequency and for transmitting a pair of closely spaced microwave frequencies; coherent receiver means for receiving and separating the radar returns of said transmitter dual-frequency channels; frequency-shifter means connected to said transmitter means and said receiver means for shifting the frequency of said first local-oscillator frequency; and multiplier means receiving said separated radar returns from said receiver and multiplying said separated radar returns to obtain a Bragg resonance condition.

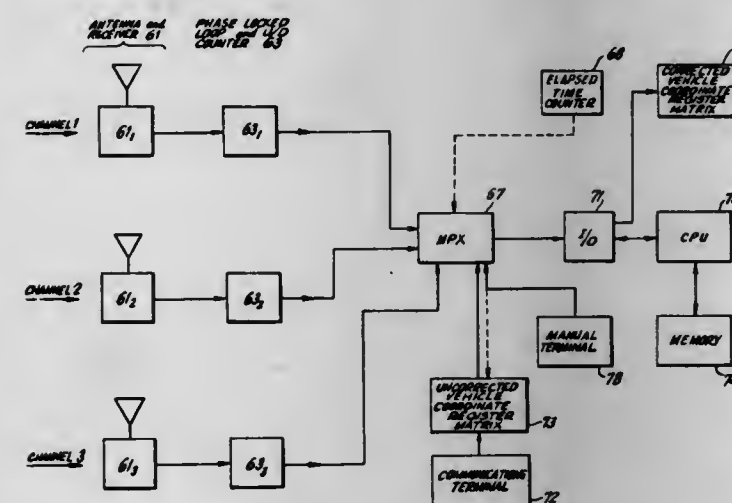
4,054,880 POSITION FIXING SYSTEM UTILIZING PLURAL COMMERCIAL BROADCAST TRANSMISSIONS AND HAVING FREQUENCY CORRECTION

Eli J. Dalabakis, Seminole, and Harry D. Shearer, St. Petersburg, both of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Jan. 19, 1976, Ser. No. 650,006
Int. Cl.² G01S 5/14

U.S. Cl. 343-112 R

12 Claims



1. In combination in displacement determining apparatus for

determining displacement information utilizing the phase of a carrier wave, said displacement determining apparatus including means for selecting said carrier wave, divider means for reducing the frequency of said carrier wave, a reference oscillator, phase locked loop means connected to said divider means and said reference oscillator means, said phase locked loop means including phase comparator means, and pulse adding and deleting means for selectively adding pulses to and deleting pulses from the pulse wave supplied by said reference oscillator, accumulator means connected to said pulse adding and deleting means, the improvement comprising:

common station equipment for correcting the contents of said accumulator means for frequency variations in said carrier wave, said common station equipment correcting means comprising:

- a. additional means for selecting said carrier wave,
- b. a common station oscillator,
- c. an up-down counter,
- d. additional phase locked loop means connected to the outputs of said common station oscillator and said additional carrier wave selecting means for changing the state of said up-down counter means in a direction which reflects any changes in frequency of the wave being monitored, and
- e. means responsive to pulses in said accumulator means and the state of said up-down counter for algebraically combining the pulses of said up-down counter with the contents of said accumulator means to correct the contents of said accumulator means for variations in the frequency of said selected carrier wave.

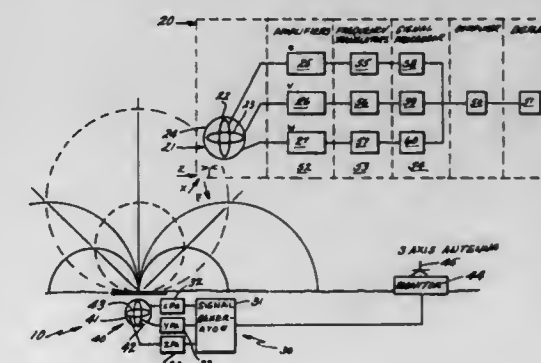
4,054,881 REMOTE OBJECT POSITION LOCATER

Frederick H. Raab, Burlington, Vt., assignor to The Austin Company, Cleveland, Ohio

Filed Apr. 26, 1976, Ser. No. 680,471
Int. Cl.² G01S 3/02

U.S. Cl. 343-112 R

22 Claims



1. Apparatus for determining position coordinate of an object, constrained to move in a plane, relative to a reference coordinate frame and remote from said reference coordinate frame comprising:

two radiating means having orthogonal components centered about the origin of said reference coordinate frame: means for applying to said two radiating means electrical signals which are multiplexed with respect to one another for producing two electromagnetic fields radiated in response to said electrical signals, said two electromagnetic fields being distinguishable from one another and containing information characterizing the polarity of the electromagnetic radiation;

two receiving means having orthogonal components for detecting and measuring the spatial components of said electromagnetic fields; and

analyzing means coupled to said receiving means for converting said electromagnetic field components into remote object position coordinates relative to said reference coordinate frame, said analyzing means operating open loop

with respect to said radiating means and including computation means for determining the separation distance between said radiating means and said receiving means by comparing the total transmitted magnetic moment to the total received magnetic moment.

4,054,882

NON-SEQUENTIAL INK JET PRINTING

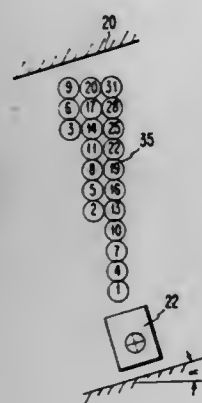
Paul Anthony Ruscitto, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1973, Ser. No. 325,494

Int. Cl.² G01D 15/18

U.S. Cl. 346—1

5 Claims



1. A method of fluid drop recording in which drop registration is improved comprising the steps of:
vibrating the recording fluid prior to drop formation such that drops of uniform size and spacing are formed;
generating a sequential stream of individual drops, all of said drops being available for recording;
selecting ones of adjacent said drops of said sequential stream to be recorded at non-sequential recording locations on a record medium, each drop location being in a fixed matricial scan and separated in a first direction from the drop location of the immediately preceding drop of said sequential stream by at least one intervening drop location;
selecting others of said drops to be recorded at ones of said intervening non-sequential recording locations separated in a second direction from the drop location of said ones drops;
charging said adjacent drops of said sequential stream to be recorded for deflection by a static field to said non-sequential recording locations in separate columns on said recording medium; and
electrostatically deflecting said charged drops with an electrostatic field.

4,054,883

INK PEN DEVICE

Kiyoharu Ozone, Ibaragi, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Mar. 11, 1976, Ser. No. 665,882

Claims priority, application Japan, Mar. 12, 1975, 50-33276[U]; Mar. 13, 1975, 50-34188[U]

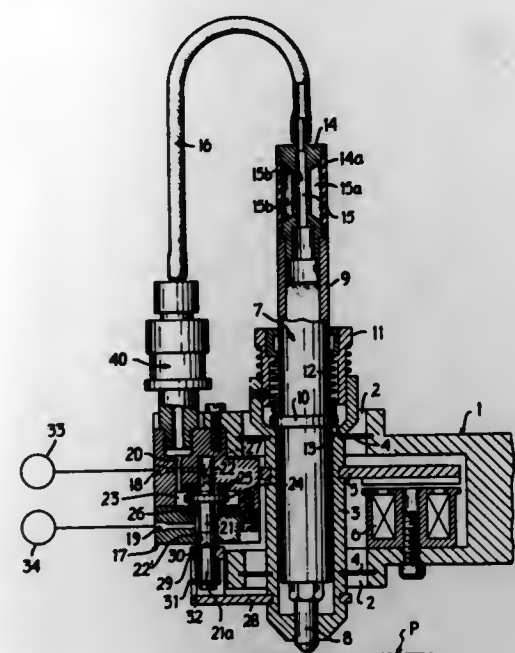
Int. Cl.² G01D 15/16

U.S. Cl. 346—140 R

6 Claims

1. An ink pen device comprising: an ink pen having a pen nib and an ink tank for supplying ink to the pen nib; means for supporting the ink pen for upward and downward axial movement thereof; means for shifting the ink pen downward to move the pen nib into a predetermined writing position and upward to move the pen nib out of the writing position; and a changeover valve means receptive of sources of positive and negative pressurized air and connected to said ink tank and responsive to the shifting of the ink pen by the shifting means for directing positive pressurized air into the ink tank during downward movement of the pen nib into the writing position

and for directing negative pressurized air into the ink tank during upward movement of the pen nib out of the writing position.



position to simultaneously effect an ink pen shift with a pressure change.

4,054,884

FACSIMILE COPY MEDIUM

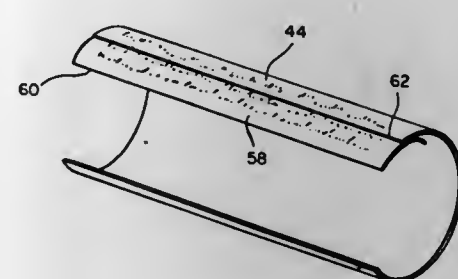
Richard L. Nelson, New York, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 533,194, Dec. 16, 1974, abandoned, which is a division of Ser. No. 333,616, Feb. 20, 1973, Pat. No. 3,872,239. This application July 6, 1976, Ser. No. 702,459

Int. Cl.² G01D 15/28

U.S. Cl. 346—134

6 Claims



1. A sheet-like facsimile copy medium formed from a severed closed loop adapted to be mounted on a facsimile drum comprising:

a first segment of sheet material having one preformed edge and another edge formed by severing said closed loop, one side of said first segment carrying markings up to said one preformed edge;

a second segment of sheet material having one preformed edge and another edge formed by severing said closed loop, one side of said second segment also carrying markings;

a portion of said first segment adjacent said one edge thereof overlapping a portion of said second segment adjacent said one edge thereof, said markings on said one side of said second segment terminating at the overlapped portion of said second segment and being substantially continuous with said markings on said first segment adjacent said one preformed edge; and

adhesive means forming a permanently bonded seam between said portion of said first segment and said portion of said second segment, said severed edges being spaced from said overlapping portions.

4,054,885

ELECTROSTATIC RECORDING DEVICE

Ulf Rothgordt, Hamburg, Germany, assignor to U.S. Phillips Corporation, New York, N.Y.

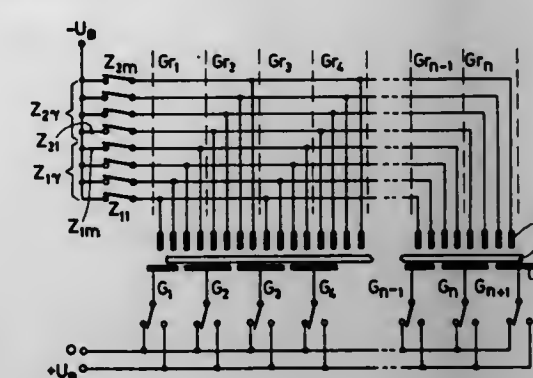
Filed Sept. 15, 1970, Ser. No. 572,265

Claims priority, application Germany, Sept. 16, 1969, 1946815

Int. Cl.² G01D 15/06; G11B 9/08

U.S. Cl. 346—154

5 Claims



1. An electrographic recording system for recording on a record medium having a charge retentive surface, said system comprising:

a plurality of arrays of recording electrodes, with each recording electrode mounted with an area thereof in close proximity to said charge retentive surface;

circuit means interconnecting like-numbered recording electrodes of separated arrays to establish at least two electrically independent groups of arrays, with each array of each group separated from every other array of said group by at least one array of another group;

a plurality of complementary electrodes mounted with an area of each in electrical cooperative relationship with said record medium, each complementary electrode being mounted adjacent to a single array of a group of arrays and spaced from all other arrays of said group by at least a portion of an array of another group;

means for applying a first voltage of one polarity to any selected recording electrode;

means for applying a second voltage of opposite polarity to at least one complementary electrode adjacent to the selected recording electrode, in coincidence with said first voltage and wherein the record medium is threaded between the recording electrodes and the complementary electrodes and is in intimate contact with the complementary electrodes.

4,054,886

TRANSMITTING/RECEIVING ANTENNA HAVING MIRROR SYMMETRY AND DEFINED POLARIZATIONS

Armin Bergander, Ay (Iller), and Georg Kurz, Ulm (Danube), both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 633,023, Nov. 17, 1975. This application Dec. 10, 1975, Ser. No. 639,604

Claims priority, application Germany, Nov. 16, 1974, 2454401; Dec. 11, 1974, 2458584

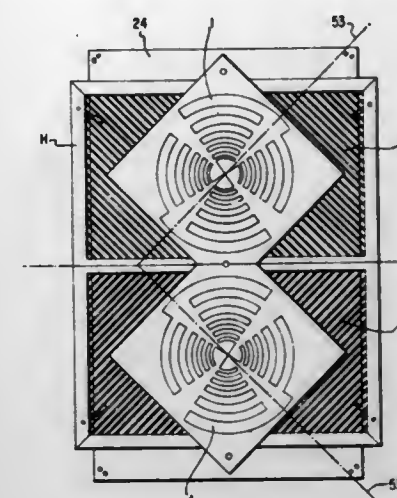
Int. Cl.² H01Q 11/10, 3/26

U.S. Cl. 343—792.5

19 Claims

1. An antenna arrangement comprising at least two individual antennas each having a pair of signal applying terminals and each presenting a frequency dependent polarization characteristics, and circuit means connected to said terminals of said antennas for establishing a selected relation between the voltages across all said terminals or between voltages derived from these voltages, wherein two of said individual antennas each have an asymmetrical radiation pattern and, for giving said arrangement a desired radiation polarization characteristic, one of said two individual antennas is constructed to constitute the mirror image of the other, and said two individual

antennas are positioned in mirror symmetry to one another with respect to a selected plane so that their radiation patterns



are in mirror symmetry to one another with respect to said selected plane.

4,054,887

EXPOSURE CONTROL DEVICE FOR PHOTOGRAPHIC CAMERAS

Werner Holle, Wetzlar; Walter Bletz, Braunfels, and Rolf Magel, Steinbach, all of Germany, assignors to Ernest Leitz GmbH, Wetzlar, Germany

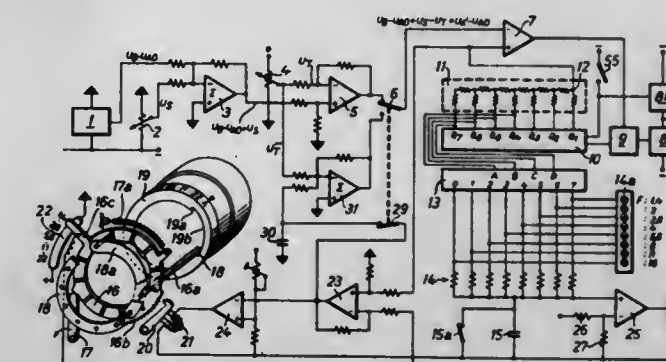
Continuation-in-part of Ser. No. 452,321, March 18, 1974, abandoned. This application July 1, 1976, Ser. No. 701,802

Claims priority, application Germany, Apr. 16, 1973, 2319167

Int. Cl.² G03B 7/08

U.S. Cl. 354—24

7 Claims



1. In an exposure control device for a photographic camera having a shutter, a diaphragm release, a diaphragm automatically movable from one starting position in the closing direction after diaphragm release, first means for generating a voltage logarithmically analogous to the brightness of an object to be photographed, second means for generating a voltage logarithmically analogous to the exposure time, third means for generating a voltage logarithmically analogous to the film sensitivity, means for deriving from said analogous voltages a voltage logarithmically analogous to the required diaphragm setting, and means for storing said voltage logarithmically analogous to the required diaphragm setting, the improvement comprising:

a. a diaphragm setting mechanism and fourth means for generating a voltage coupled with said diaphragm setting mechanism and actuated by said diaphragm release, said fourth means generating a voltage logarithmically analogous to the actual aperture of the diaphragm;
b. means for comparing said voltage analogous to the diaphragm aperture and said stored voltage analogous to the required diaphragm setting and stopping said diaphragm when said compared voltages are equal;
c. means for determining a difference between said voltage analogous to the actual aperture and said stored voltage analogous to the required diaphragm setting and adding

said difference to said voltage analogous to the exposure time; and
d. means for opening said shutter for a period of time actuated by the sum of said voltage analogous to the exposure time and said difference between said voltage analogous to the aperture and said stored voltage analogous to a diaphragm setting.

4,054,888

MOTOR DRIVEN PHOTOGRAPHING CONTROL CIRCUIT

Susumu Kozuki, Yokohama; Toshikazu Ichihyanagi, Tokyo; Yoshiki Watanabe, Fujisawa; Takashi Uchiyama, Yokohama, and Akio Sunouchi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

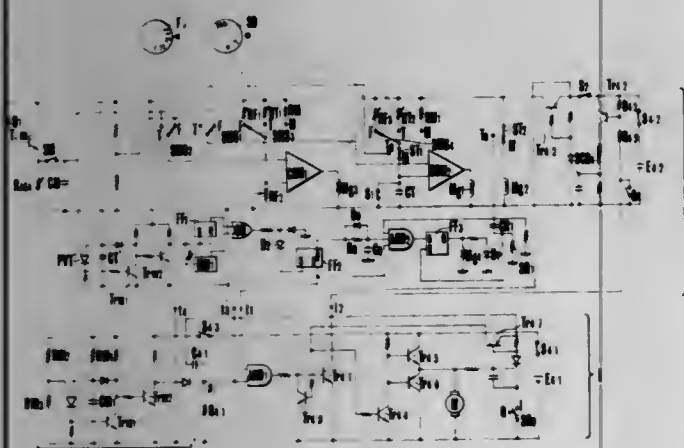
Filed Aug. 6, 1976, Ser. No. 712,424

Claims priority, application Japan, Aug. 9, 1975, 50-96909

Int. Cl.² G03B 7/08, 1/18

U.S. Cl. 354—50

9 Claims



1. A motor driven photographing control circuit comprising:
 1. a motor drive device including an interval timer which produces a photographing start signal in a preset cycle, and, at least, a film winding circuit which controls a shutter charging action;
 2. a camera which begins an exposure control action in response to the photographing start signal from the interval timer, the camera including:
 - a. a shutter time control circuit which controls a shutter at a shutter time corresponding to the brightness of a photographing object, the shutter time control circuit being connected to said film winding circuit to transmit a shutter control action completion signal to the winding circuit for actuating the winding circuit;
 - b. a discriminating circuit which detects a shutter time controlled by the shutter time control circuit, a length of the cycle time of the interval timer and a length of time for the action of the winding circuit and which produces an output when the detected shutter time becomes longer than a length of time obtained by subtracting the length of time required for the action of the winding circuit from the length of the cycle time of the interval timer; and
 - c. a display circuit which makes a display in response to the discriminating circuit.

4,054,889

MOTOR-DRIVEN APPARATUS FOR CAMERA

Kiyoshi Tsujimoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed July 3, 1975, Ser. No. 592,965

Claims priority, application Japan, July 26, 1974, 49-086262;

Aug. 30, 1974, 49-100306

Int. Cl.² G03B 17/50, 1/18, 9/00

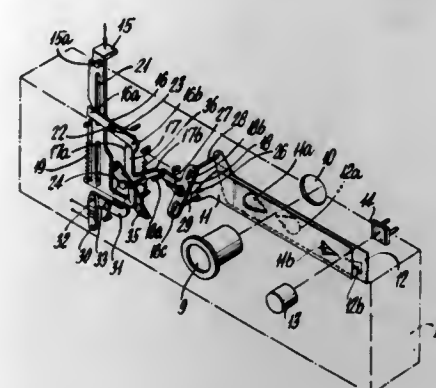
U.S. Cl. 354—83

21 Claims

1. A motor-driven apparatus for a film exposing camera including a body, a manual-release member, an objective lens,

a shutter device normally biased to be closed and opened for an exposure against its normal bias in response to movement of said release member to its operative position, said motor driven apparatus comprising:

- means for transferring said film, including a motor driven for transference of said film;
- means for producing a signal only when said shutter device has been transferred from its opened condition to its closed condition;
- first switch means operable between an open position and a closed position;



semi-conductor switch means made conductive for driving said motor upon receipt of said signal when said first switch means is in its closed position and being made non-conductive when said first switch means is opened; and
means responsive to said film transferring means for opening said first switch means at a moment during the transference of said film and closing said first switch means upon termination of the transference of said film.

4,054,890

EXPOSURE CONTROL DEVICE IN A CAMERA USING AN ELECTRO-OPTIC LIGHT CONTROL ELEMENT

Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

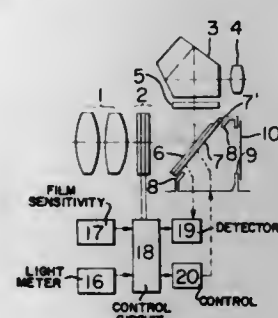
Filed Sept. 12, 1975, Ser. No. 612,725

Claims priority, application Japan, Sept. 18, 1974, 49-107358

Int. Cl.² G03B 9/56

U.S. Cl. 354—227

18 Claims



1. An exposure control device in a camera comprising:
 1. light intercepting means disposed between a picture-taking lens and a film and in the light path of said picture-taking lens, said light intercepting means being retractable out of said light path by operation of a shutter release member;
 2. electro-optic light control means disposed in said light path of said picture-taking lens and having its transmittivity to light variable by an electrical signal; and
 3. control means including means for applying to said electro-optic light control means a first signal which causes the light transmittivity of said electro-optic light control means to reach a maximum at about a point of time close to that whereat the retraction of said light intercepting means out of said light path is completed, means for applying to said electro-optic light control means a second

signal which decreases said light transmittivity, and means dependent upon the timing of said second signal for applying to said light intercepting means a third signal which consistently returns the same to its intercepting position automatically so as to terminate the exposure of said film to light at about a point of time close to that whereat the light transmittivity of said electro-optic light control means reaches the minimum.

4,054,892

SLIT SHUTTER BLADE STABILIZING DEVICE FOR CAMERAS

Tadashi Nakagawa; Mitsuo Koyama, and Eiichi Onda, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

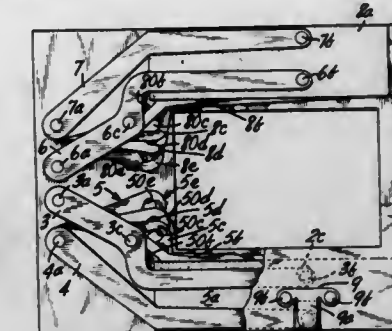
Filed Dec. 1, 1975, Ser. No. 636,725

Claims priority, application Japan, Dec. 3, 1974, 49-146571[U]

Int. Cl.² G03B 9/10

U.S. Cl. 354—252

2 Claims



4,054,891

DRIVING DEVICE FOR A CAMERA SHUTTER

Eiichi Onda, Yotsukaido, and Masanori Watanabe, Narashino, both of Japan, assignors to Reiko Koki Kabushiki Kaisha, Japan

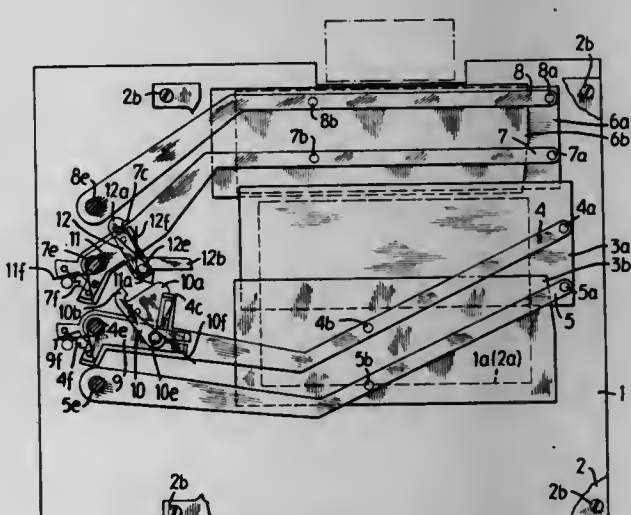
Filed July 23, 1976, Ser. No. 708,026

Claims priority, application Japan, July 23, 1975, 50-89982; July 23, 1975, 50-89983

Int. Cl.² G03B 9/40

U.S. Cl. 354—246

11 Claims



1. In a camera having an aperture and a shutter comprising an opening blade and a closing blade for opening and closing the aperture, shutter actuating mechanism comprising:
 - first operating means for moving said opening blade between open and closed positions,
 - second operating means for moving said closing blade between open and closed position,
 - first means for biasing said first operating means in a direction to move said opening blade to set position in which it closes said aperture,
 - driving means for driving said first operating means,
 - second means for biasing said driving means in a direction to move said opening blade to open position,
 - connecting means releasably connecting said driving means with said first operating means when in set position whereby said driving means when released from set position to make an exposure acts through said connecting means to drive said first operating means in a direction to open said aperture to make an exposure,
 - means for sequentially moving said second operating means to move said closing blade to a position to close said aperture and thereby complete the exposure, and
 - means acting on said connecting means upon completion of the exposure of release said first operating means from said driving means and thereby permit said first operating means to be moved by said first biasing means to return said opening blade to set position.

4,054,893

SEMICONDUCTOR SWITCHING DEVICES UTILIZING NONOHMIC CURRENT PATHS ACROSS P-N JUNCTIONS

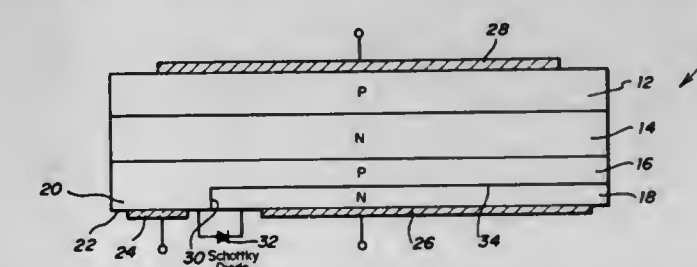
Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234

Filed Dec. 29, 1975, Ser. No. 644,562

Int. Cl.² H01L 29/48, 29/56, 29/64, 29/74

U.S. Cl. 357—15

19 Claims



1. A semiconductor device comprising:
 - a semiconductor body having layers of opposite conductivity type to form at least one P-N emitter junction which intersects a face of said body,
 - means for providing a nonohmic current path across said P-N junction, all conductance and input admittance characteristics of said means being positive, said means having a reverse breakdown higher than the forward conduction characteristic of said P-N junction and having a forward voltage drop lower than the effective emitter formed by said P-N junction, and

electrodes contacting said body to form an electrical semiconductor device.

4,054,894

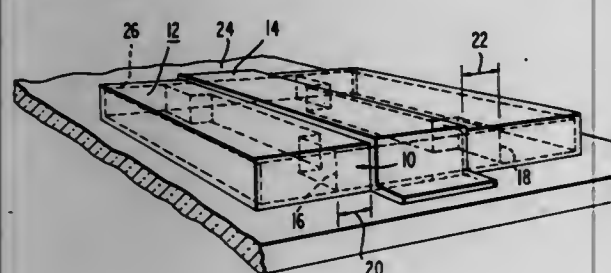
EDGELESS TRANSISTOR

William Frederick Heagerty, Norristown, Pa., and Luke Dillon, Jr., Marlton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 27, 1975, Ser. No. 581,041
Int. Cl.² H01L 27/12, 29/78

U.S. Cl. 357—23

10 Claims



1. A metal-oxide-semiconductor transistor comprising a semiconductor island, a layer of an insulator adjacent the island, a gate electrode adjacent the insulator, the island comprising heavily doped T-shaped source and drain regions of a first conductivity type, a lesser doped I-shaped channel region between said source and drain regions the channel region having a central portion comprising a channel controllable by the gate, the gate overlying the channel, a pair of end portions of the second conductivity type doped to a carrier concentration of about 10^{15} atoms/cm³ or less connected to each end of the channel, the channel being located only underneath the gate, the end portions each extending away from the gate and the channel and terminating away from the gate and the channel adjacent the source or the drain region, each end portion being separate and disjointed from the others.

4,054,895

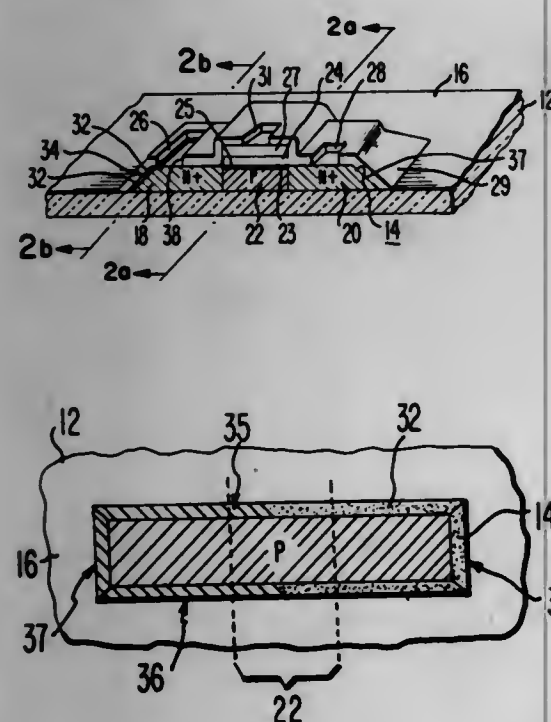
SILICON-ON-SAPPHIRE MESA TRANSISTOR HAVING DOPED EDGES

William Edward Ham, Mercerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,689
Int. Cl.² H01L 29/78

U.S. Cl. 357—23

9 Claims



1. In a semiconductor device comprising:

a substrate of electrically insulating material, a mesa of single crystal semiconductor material on said substrate, said mesa having transverse surfaces extending transversely from said substrate, means defining a field effect transistor having source and drain regions and a channel region, said channel region extending between said source and drain regions and between two of said transverse surfaces, and doped edge regions, in said channel region adjacent said two transverse surfaces of said channel region, having more conductivity modifiers than in the remainder of said channel region, said conductivity modifiers being of the opposite conductivity type as that of said source and drain regions, the improvement comprising said doped edge regions being extended only partly across said channel region adjacent a portion of the two transverse surfaces of the channel region and further comprising the doped edge region being extended adjacent the side surfaces only in said source region, whereby the breakdown voltage at any junction including said channel region at a side surface is substantially the same as the breakdown voltage of said field effect transistor.

4,054,896

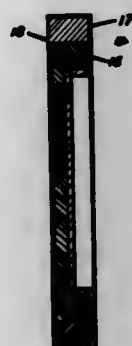
SEMICONDUCTOR HETEROJUNCTION TELEVISION IMAGING TUBE

Amos Picker, Sharon, and Wolfgang M. Feist, Burlington, both of Mass., assignors to Raytheon Company, Lexington, Mass. Continuation of Ser. No. 76,920, Sept. 30, 1970. This application Aug. 23, 1972, Ser. No. 283,252

Int. Cl.² H01L 27/14

U.S. Cl. 357—31

23 Claims



1. In combination: a solid state junction device comprising a plurality of layers of different materials forming a substantially unidirectionally conductive junction at their interface; a first of said layers comprising semiconductor material; a second of said layers comprising a compound having a bulk resistivity which is substantially greater than the bulk resistivity of said first layer; the resistance per unit area through said second layer in a direction normal to said junction being substantially less than the resistance per unit area through said semiconductor layer; means for producing a voltage bias across said junction; and means for injecting charge carriers into the region of said junction.

4,054,897

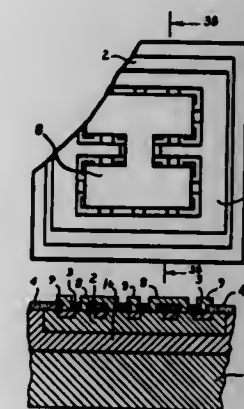
SEMICONDUCTOR DEVICE WITH HIGH FREQUENCY, HIGH POWER OUTPUT

Masumi Fukuda, Kobe, Japan, assignor to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 114,371, Feb. 10, 1971, abandoned, which is a continuation of Ser. No. 688,493, Dec. 6, 1967, abandoned. This application Sept. 8, 1975, Ser. No. 611,418 Claims priority, application Japan, Dec. 9, 1966, 41-80829 Int. Cl.² H01L 29/72

U.S. Cl. 357—36

13 Claims



1. A semiconductor device comprising a semiconductor body having a region of one conductivity type, a second region adjacent to said first region and having a conductivity type opposed to that of said first region so as to form a first PN junction therewith, a third region embedded in said second region at the surface of the latter and having parallel to said surface a mesh-grid configuration for providing high frequency, high power outputs, said mesh-grid configuration having a plurality of strips forming therebetween mesh windows in which said second region forms a number of respective surface portions individually surrounded by said third region, said third region extending from said surface into said second region a distance short of said first junction and having said one conductivity type so as to form a second PN junction with said second region, an insulating coating disposed on said surface and covering at least one of said two junctions at said surface, said coating having openings on top of said respective second and third regions, and two metallic layers partly overlaid upon said insulating coating and insulated from each other, said metallic layers being in ohmic contact through said openings with said respective second and third regions, one of the metallic layers electrically connecting the parts of the second region within the meshes of the third region to each other in parallel and the other of the metallic layers being in individual contact with the third region at the spaced apart points of intersection formed by the strips of the third region.

4,054,898

SWITCHING SYSTEM TO SHORT-CIRCUIT A LOAD WITH MINIMUM RESIDUAL VOLTAGE

Klaus Streit, Tübingen; Karl Staiger, Wannweil; Gerhard Conzelmann, Leinfelden; Hartmut Seiler, Reutlingen, and Karl Nagel, Gomaringen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Division of Ser. No. 505,470, Sept. 12, 1974, Pat. No. 4,004,160. This application Sept. 20, 1976, Ser. No. 724,604

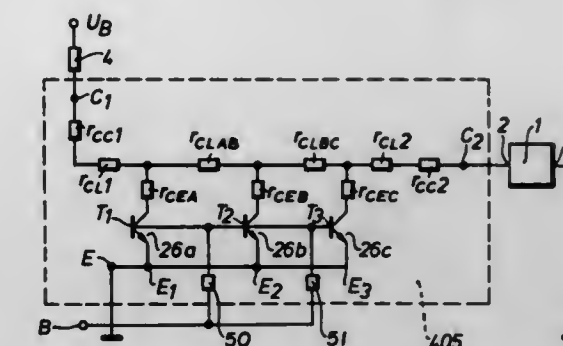
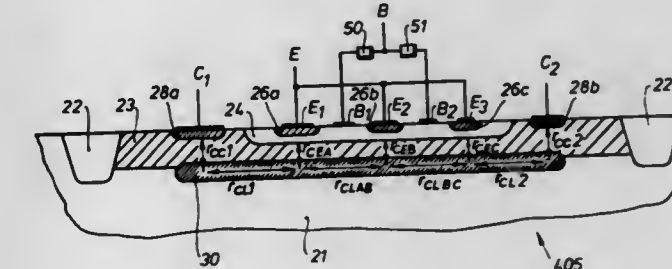
Claims priority, application Germany, Sept. 28, 1973, 2348765 Int. Cl.² H01L 29/72

U.S. Cl. 357—36

8 Claims

1. Monolithic integrated switching system to short-circuit a load (1) connected to a source (U_B) having a controlled semiconductor switch having its main switching terminals connected in parallel with the terminals (2, 3) of the load (1) and having a control terminal (B) effecting opening and closing of the switch under control of a control signal applied to the control terminal, wherein the controlled semiconductor switch comprises a monolithic integrated vertical transistor (405) having a base

zone (24), a collector zone, two collector electrodes (C_1 , C_2) connected to said collector zone, and located at opposite sides of the base zone (24), one collector electrode (C_1) being connected to the source (U_B) and the other collector electrode (C_2) being connected to the other terminal (2) of the load, a conductive layer (30) beneath the collector zone, and an emitter zone (26), sub-divided into a plurality of n spatially separated emitter sub-zones (26a, 26b, 26c), n being greater than one, each sub-zone having a metallization forming an emitter terminal (E_1 , E_2 , E_3), and a common external terminal connection (E) con-



ected to all said emitter terminals (E_1 , E_2 , E_3) and galvanically connected to one terminal of the load; the base zone (24) of the monolithic integrated circuit having $n-1$ terminal connections (B_1 , B_2), each being located between two adjacent emitter sub-zones (26a, 26b, 26c); a common external base terminal (B); and individual coupling resistors (50, 51), connected between the common base terminal (B) and each one of the separate base terminal connections (B_1 , B_2) connected to the base zone (24).

4,054,899

PROCESS FOR FABRICATING MONOLITHIC CIRCUITS HAVING MATCHED COMPLEMENTARY TRANSISTORS AND PRODUCT

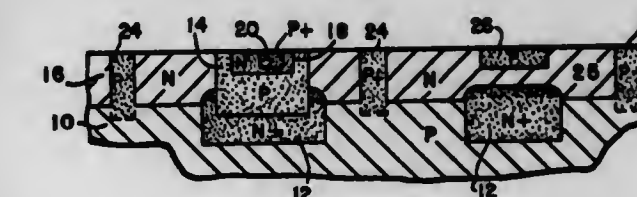
Robert A. Stehlin, Richardson, and William F. Cashion, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 3, 1970, Ser. No. 69,292

Int. Cl.² H01L 27/02, 27/04, 29/72, 7/36

U.S. Cl. 357—44

14 Claims



1. A monolithic integrated circuit including a substrate of one conductivity type and an epitaxial layer thereon of opposite conductivity type, said circuit having matched complementary transistors comprising in combination:

a. a transistor of one polarity type having a substantially completely retrograded impurity concentration profile

throughout its collector region, extending from said substrate through said epitaxial layer; and

b. an isolation region extending from said substrate through said epitaxial layer, having an impurity concentration profile substantially completely retrograded throughout, circumscribing a transistor of opposite polarity type; wherein

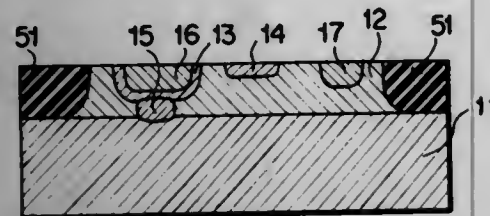
c. said one polarity type transistor is self-isolating and said opposite polarity type transistor is isolated by said retrograded isolation region.

4,054,900

INDEX MOUNTING UNITARY HEAT SINK APPARATUS WITH APERTURED BASE

Steven F. Edwards, Dallas; James A. Johnson, Lewisville; William D. Jordan, and James D. Pritchett, both of Dallas, all of Tex., assignors to Thermalloy, Inc., Dallas, Tex.

Filed Dec. 24, 1975, Ser. No. 644,293
Claims priority, application Japan, Dec. 27, 1974, 50-148564;
Dec. 27, 1974, 50-1915
Int. Cl.² H01L 29/72, 27/04; H03K 19/08
U.S. Cl. 357-46



1. An integrated injection logic semiconductor device which comprises a one conductivity type semiconductor substrate; an opposite type semiconductor layer superposed on said semiconductor substrate and having a lower impurity concentration than the semiconductor substrate; a first one conductivity type region formed in said opposite conductivity type semiconductor layer; an opposite conductivity type region formed in said first one conductivity type region; at least one second region of one conductivity type formed in said opposite conductivity type semiconductor layer; and a connector region of one conductivity type formed in said opposite conductivity type semiconductor layer disposed only beneath and more heavily doped than said first one conductivity type region for connection between said first one conductivity type region and said one conductivity type semiconductor substrate through a part of said first one conductivity type region, said first one conductivity type region, and said opposite conductivity type semiconductor layer jointly constitute a lateral transistor and said one conductivity type substrate, said opposite type semiconductor layer and said second one conductivity type region collectively form a vertical transistor.

4,054,901

INDEX MOUNTING UNITARY HEAT SINK APPARATUS WITH APERTURED BASE

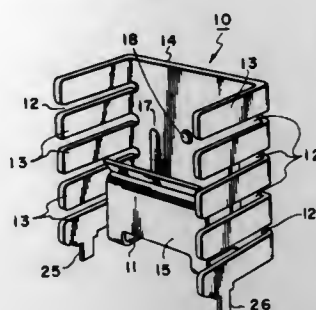
Steven F. Edwards, Dallas; James A. Johnson, Lewisville; William D. Jordan, and James D. Pritchett, both of Dallas, all of Tex., assignors to Thermalloy, Inc., Dallas, Tex.

Filed Oct. 14, 1975, Ser. No. 621,665
Int. Cl.² H01L 23/02, 23/28

U.S. Cl. 357-81

1. Unitary heat sink apparatus comprising a substantially U-shaped body of thermally conductive material, one leg of said U-shaped body providing a relatively broad area flat surface adapted to mate with the thermal transfer plate of a semiconductor encapsulation device and including indexing means protruding from said flat surface of said one leg for mating with indexing means provided in said encapsulation device, the opposite-leg of said U-shaped body providing

means for urging the thermal transfer plate of said encapsulation device into intimate contact with said one leg, and the base of said U-shaped body providing spring means for urging said



opposite leg of said U-shaped body toward said one leg of said U-shaped body, said base further having an aperture therein for permitting the leads extending from said encapsulation device to extend therethrough.

4,054,902

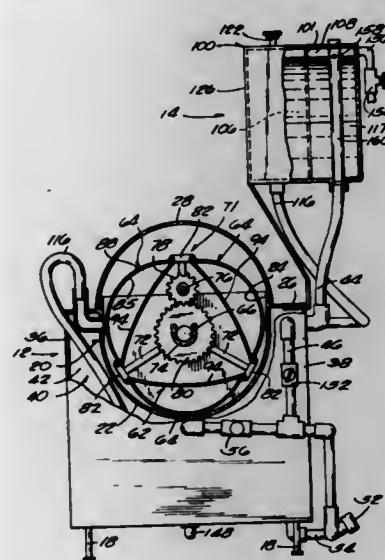
APPARATUS FOR DEVELOPING PHOTOGRAPHIC PRINTS

Dennis C. Rebek, c/o Flo Nowar, 111 Maple St., Grafton, Wis. 53024

Filed Feb. 3, 1975, Ser. No. 546,257
Int. Cl.² G03D 3/04

U.S. Cl. 354-329

12 Claims



1. An apparatus for developing photographic prints having an exposed side, a back side and spaced outer edges, said apparatus comprising a developing tank for receiving and containing developing liquid, an open fixture mounted inside said developing tank for rotation relative thereto about a pivot axis and through the liquid contained in said tank, said fixture including means for releasably holding at least one photographic print to be developed in a plano-arcuate shape with the exposed side of the print facing inwardly towards said pivot axis, said holding means including inwardly open support means adapted to contact only the outer edges and the back side of the print and being free of engagement with the exposed side of the print, said support means including a pair of circumferentially spaced generally radially extending surfaces located at a circumferential distance therebetween greater than the length of the print between the outer edges thereof and engageable by the outer edges of the print to hold the print in outwardly bowed condition, said support means also including respective flange surfaces extending transversely outwardly from the outer ends of said radially extending surfaces and adapted for engagement with the back side of the print so as to limit radially outward movement of the outer edges of the print, circumferentially extending respective guide surface means located inwardly of said flange surfaces and extending toward each other from said radially extending surfaces for engagement with the outer edges of the print so as to guide said

outer edges into engagement with said radially extending surfaces without engaging the exposed side of the print, and means for rotating said fixture about said axis and thereby moving the print through the developing liquid contained in said developing tank.

4,054,903

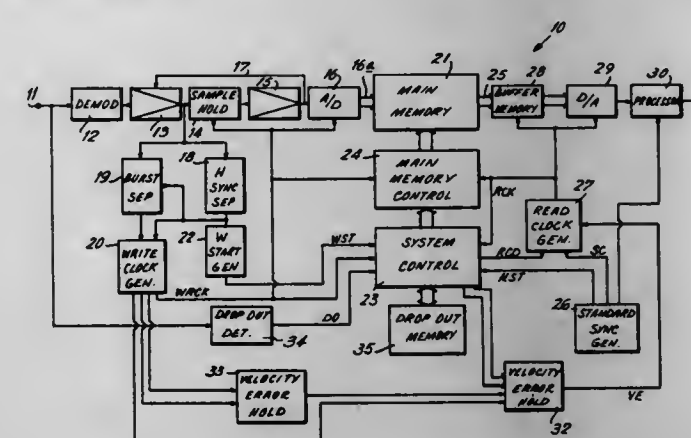
VIDEO TIME BASE CORRECTOR

Takeshi Ninomiya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 8, 1976, Ser. No. 703,650
Claims priority, application Japan, July 11, 1975, 50-85631
Int. Cl.² H04N 5/76

U.S. Cl. 358-8

13 Claims



1. A time base corrector for removing time base errors from video signals comprising: main memory means including a plurality of memory units each having a capacity sufficient to store a predetermined whole number of line intervals of the video signals; input means for receiving the video signals; write clock generating means coupled to said input means for generating write clock pulses at a variable rate dependent upon time base errors in the incoming video signals; read clock generating means for generating read clock pulses at a rate which is standard at least at the beginning and end of each standard line interval of the video signals; main memory control means for selectively enabling said memory units to write therein the video signals received from said input means at a clocking rate determined by said write clock pulses, and for selectively enabling said memory units to read out therefrom, at a clocking rate determined by said read clock pulses, the video signals written in said memory units; output means for receiving the video signals selectively read out from said memory units; drop-out detecting means for providing drop-out information in respect to the video signals received by said input means; drop-out memory means having a plurality of addresses respectively corresponding to said memory units for storing said drop-out information in respect to the video signals written in the respective memory units; and system control means including write addressing means generating write addresses of said memory units in a repeating cyclic order for causing said main memory control means to selectively enable said memory units in said repeating cyclic order for the writing therein of the video signals received from said input means, and read addressing means responsive to the drop-out information stored in said drop-out memory means for generating read addresses causing said main memory control means to selectively enable the thereby read addressed memory units for the reading-out of the video signals stored therein, with each memory unit thus addressed for reading-out being different from the memory unit then addressed for writing and further being a memory unit storing video signals free of drop-out as indicated by the drop-out information at the respective address in said drop-out memory means.

4,054,904

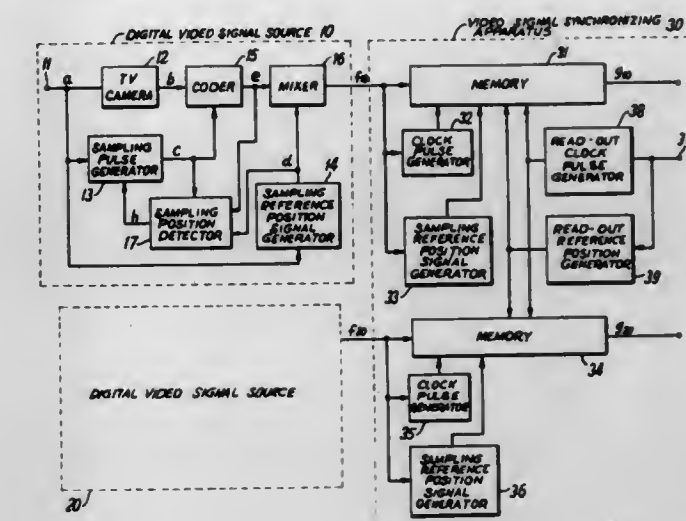
VIDEO SIGNAL CODING SYSTEM

Kohel Saltch; Hideo Akiyama, and Takashi Mizuguchi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1976, Ser. No. 673,593
Int. Cl.² H04N 5/22

U.S. Cl. 358-22

5 Claims



1. In combination, plural digital video signal forming means each including source means for supplying a video signal and synchronizing information including a color burst signal, controlled sampling means connected to said source means for sampling said video signal, and means for controlling said sampling means for sampling said video signal at times dependent upon the phase of said color burst signal, said sampling controlling means in each of said plural digital video signal forming means effecting a like relationship between sampling times and color burst signal, memory means associated with each of said digital video signal forming means for storing the digital video output signals therefrom, and reference wave supplying means for supplying a read-out signal to said memory means for obtaining from said memory means plural video signals with synchronized color burst signals, wherein said synchronizing information includes horizontal blanking level pulses, and said sampling means includes feedback means including first means for sampling and storing the horizontal blanking level, second means for sampling and storing the combined level of said pulses and color burst signal, comparator means for comparing the stored contents of said first and second means and for varying the sampling time of said controlled sampling means to obviate the output of said comparator means.

4,054,905

AUTOMATIC CHROMINANCE GAIN CONTROL SYSTEM

Leopold Albert Harwood, Bridgewater, and Erwin Johann Wittmann, North Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 28, 1976, Ser. No. 736,419
Int. Cl.² H04N 9/535

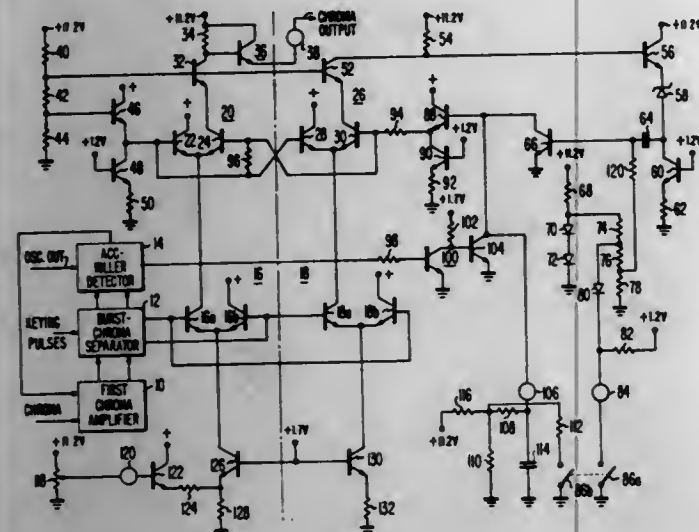
U.S. Cl. 358-27

8 Claims

1. In a color television receiver, an automatic gain controlled chrominance signal amplifier system for processing composite chrominance signals having burst and image-representative components comprising:

- a first amplifier having at least one input terminal adapted for coupling to a source of composite chrominance signals for providing amplified image-representative components at a first output terminal;
- a second amplifier having at least one signal input terminal coupled to said first output terminal of said first amplifier, having at least one control terminal adapted to receive a first gain control signal and having at least a first output

terminal at which gain controlled image-representative chrominance signal components are provided;
 a third amplifier having at least one signal input terminal coupled to said first output terminal of said first amplifier, having at least one control terminal adapted to receive a first gain control signal and having at least a first output terminal at which gain controlled image-representative chrominance signal components are provided;
 detector means having an input terminal coupled to said first



output terminal of said second amplifier and responsive to peak excursions of said gain controlled image-representative chrominance signal components for coupling said first gain control signal to said one control terminal of each of said second and third amplifiers; and
 further signal gain controlling means associated with said third amplifier for adjusting the amplitude of chrominance signal components at said first output terminal thereof without affecting the gains of said first and second amplifiers.

4,054,906

SOLID STATE COLOR CAMERA

Seizuke Yamanaka, Mitaka, Japan, assignor to Sony Corporation, Tokyo, Japan

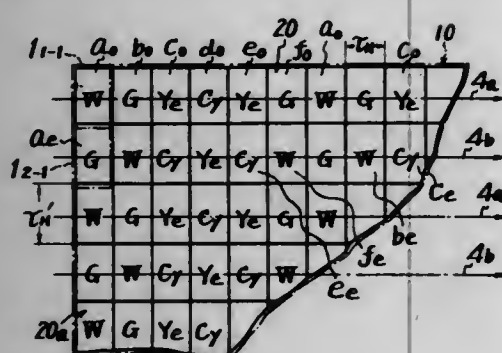
Filed Aug. 26, 1975, Ser. No. 607,880

Claims priority, application Japan, Aug. 29, 1974, 49-99234; Aug. 30, 1974, 49-99709

Int. Cl.² H04N 9/07

U.S. Cl. 358—43

12 Claims



3. A solid state television camera having a solid state image sensing device including a plurality of individual light sensing units arranged in both horizontal rows and vertical columns, means for establishing an image light path for casting an image on said image sensing units,
 a filter means having a plurality of color filter elements being arranged in horizontal rows and vertical columns within said light path and each element being of such size and location with respect to said light sensing units as to pass a portion of said image therethrough and display the same onto respective ones of said image sensing units.

said filter elements having transmissibilities selected to pass first, second and third primary color information,
 all of said filter elements permit the passage of a first primary color information of said object,
 said filter elements being arranged to pass said second and third primary color information in opposing phase relationship as between successive rows and in common phase relationship between alternate rows,
 the alternate filter elements in any given row being a plurality of types of filter elements with certain ones thereof having different light transmission characteristics than certain other ones,
 the ratio of the width of the filter elements which pass said second primary color to the spacing between said elements being a ratio which changes from row to row,
 means for developing an image signal from each of said individual light sensing units in response to respective portions of an image being displayed thereon through respective ones of said color filter elements, and
 means for processing said image signal into a desired form of video signal.

4,054,907

BACK PROJECTION APPARATUS

Norio Itoh, and Masayuki Omori, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

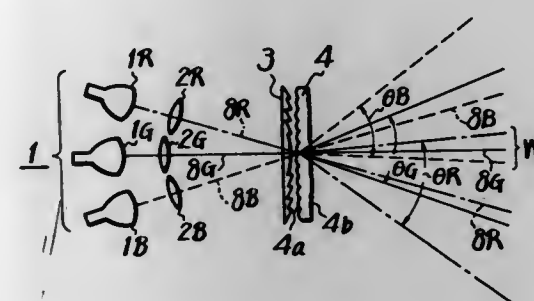
Filed Feb. 20, 1976, Ser. No. 659,687

Claims priority, application Japan, Feb. 28, 1975, 50-25435

Int. Cl.² H04N 9/31

U.S. Cl. 358—60

7 Claims



1. A back projection apparatus for displaying a color image comprising
 a screen including a light-transmitting screen member having lenticulated front and rear faces;
 a plurality of spaced apart color image sources disposed in back of said screen and producing a plurality of respective color images of different colors; and
 projection lens means disposed between said color image sources and said screen for projecting said plurality of different color images from said spaced apart sources thereof along convergent optical paths to said rear face of the screen member;
 said rear face of the screen member being constituted by lenticular lenses with the thickness of said screen member between said front and rear faces thereof and the radial curvature of said lenticular lenses being dimensioned to focus said different color images substantially at said front surface of the screen member and to provide a predetermined viewing angle of the resulting composite color image on the screen, and said front face of the screen member being constituted by lenticular lenses having a radial curvature which causes said optical paths of the projected different color images, on emerging from said front face, to be in parallel relation to each other for preventing color shading of said composite color image.

4,054,908

VIDEOTELEPHONE CONFERENCE SYSTEM

Alain M. Poirier, 82, rue de la Republique, Meudon, France (92190); Georges Buchner, 63, rue de Pixerecourt, Paris, France (75020), and Gilbert Francois Martel, 1, rue du Sergeant Blandan, Issy-les-Moulineaux, France (92130)

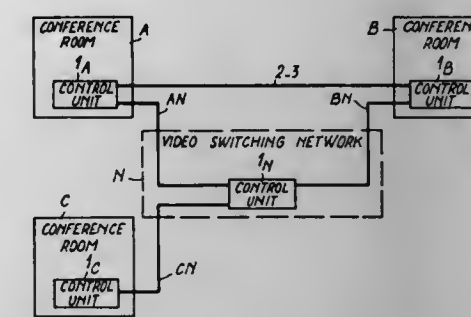
Filed May 24, 1976, Ser. No. 689,179

Claims priority, application France, May 27, 1975, 75.16471

Int. Cl.² H04N 7/18, 7/14

U.S. Cl. 358—85

4 Claims



1. A video conference system connecting a plurality of remotely located conference rooms, each containing a group of conferees, comprising a plurality of videotelephones in each room assigned to the conferees in said room and each comprising a camera and an image receiver, a plurality of microphones respectively associated with the videotelephones, means for comparing the levels of the speech signals generated by said microphones in each room and registering the address of the videotelephone associated with the microphone generating the loudest speech signal, means for mixing all the speech signals generated by the microphones in each room and thereby obtaining room mixed speech signals, means for comparing the levels of the mixed speech signals of the rooms and registering the address of the room whose microphones generate the loudest mixed speech signals, means for transmitting video signals from each conference room to the other, video switching means for selectively connecting the cameras of the videotelephones or each room to the image receiver of said room and to said video signal transmitting means and means controlled by the videotelephone address register means and the room address register means for generating control signals for said switching means in response to said loudest speech signal and said loudest mixed speech signal.

4,054,909

METHOD AND SYSTEM FOR BANDWIDTH-COMPRESSED TRANSMISSION OF A VIDEO SIGNAL IN THE NTSC SYSTEM

Takamoto Kojima, Kawasaki, and Mitsuo Ishii, Yokohama, both of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

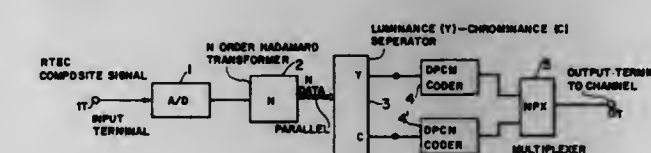
Filed May 2, 1975, Ser. No. 574,149

Claims priority, application Japan, May 2, 1974, 50-49340

Int. Cl.² H04N 9/32

U.S. Cl. 358—13

21 Claims



1. A system for bandwidth-compressed transmission of NTSC video signals, comprising:
 input means for supplying a composite NTSC signal to be transmitted,
 means connected to said input means for converting the supplied composite NTSC video signal to corresponding digital signals, and
 means for orthonormally transforming said digital signals; means responsive to said transformed digital signals for producing sum and difference signals as to each horizontal

line period of the composite signal with respect to the respectively next preceding horizontal line period thereof, whereby said sum and difference signals respectively correspond to luminance and chrominance signals,
 means receiving the sum and difference signals for separately predictively coding each thereof, and
 means for sequentially transmitting said separately predictively coded sum and difference signals.

4,054,910

COMMUNICATION SYSTEM FOR THE TRANSMISSION OF CLOSED CIRCUIT TELEVISION OVER AN ORDINARY PAIR OF WIRES

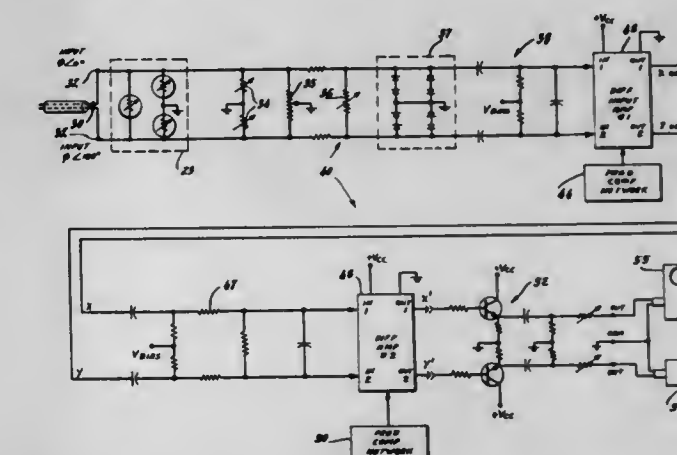
Wayne W. Chou, and Richard Erett, both of Stamford, Conn., assignors to Tel-E-Tel, Inc., Stamford, Conn.

Filed Feb. 26, 1976, Ser. No. 661,530

Int. Cl.² H04N 7/18

U.S. Cl. 358—86

3 Claims



1. A communications systems for the transmission from a television camera or other transmitter of different type signals to a monitor of closed circuit television signals or receiver for said different type signals over an ordinary pair of wires, comprising

- a transmitter adapter connected to an ordinary pair of wires for coupling a television camera to said pair of wires,
- said transmitter adapter including transmitter differential amplifier means having a transmitter frequency compensation network coupled thereto,
- a receiver adapter connected to said ordinary pair of wires at a desired distance from said transmitter adapter for coupling a television monitor to said pair of wires,
- said receiver adapter including receiver differential amplifier means having a transmitter compensation network coupled thereto,
- said transmitter and receiver differential amplifier means each having a pair of input terminals coupled to a differentially connected, emitter-coupled transistor pair,
- said transmitter and receiver frequency compensation networks each having mid-band and high-band frequency compensation networks coupled between the emitters of said emitter-coupled transistor pair for providing frequency compensation for transmission losses through said pair of wires,
- said mid-band frequency compensation means comprising a potentiometer having a slide thereon coupled to a capacitor which is coupled to one side of said potentiometer, in which the gain of said differential amplifier means increases with frequency as said slide is moved from a shortened position with respect to said capacitor to the other extreme on said potentiometer.

4,054,911 INFORMATION RETRIEVAL SYSTEM FOR PROVIDING DOWNSTREAM LOADING OF REMOTE DATA AND PROCESSING CONTROL THEREOF

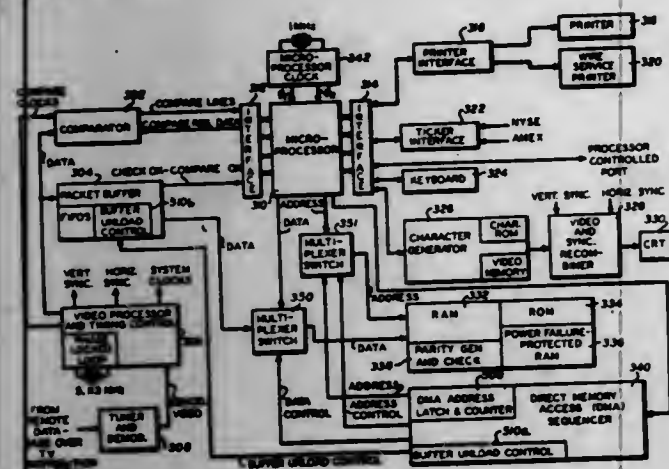
Maurice Fletcher, Sutton, England, and Lenard Winfield, Astoria, N.Y., assignors to IDR, Inc., Farmingdale, N.Y.

Filed June 3, 1976, Ser. No. 692,355

Int. Cl.² H04N 1/02

U.S. Cl. 358—141

18 Claims



1. An information retrieval system comprising a remote information source for remotely continuously transmitting information in a common predetermined format over a common predetermined video signal transmission media; and a local selectable purpose variable function terminal operatively connected to said remote information source via said common video signal transmission media for selectively receiving said remotely continuously transmitted information, said remote information source continuously transmitting information comprising continuously transmitted video displayable data and a plurality of continuously transmitted different sets of control instructions for said terminal, said transmitted video displayable data comprising a first plurality of pseudo video scan lines, each of said first plurality of pseudo video scan lines having a television video scan line format and capable of comprising a first complete self-contained packet of digital information sufficient to provide a displayable row of video data characters, each of said sets of control instructions corresponding to a different selectable purpose for said terminal, at least one of said purposes corresponding to control of the processing of said continuously transmitted data for providing a processed video display thereof, said terminal comprising microcomputer means for controlling the operation thereof to process said transmitted data in accordance therewith, said microcomputer means being operatively connected to said video signal transmission media for receiving said remotely continuously transmitted information, said different sets of control instructions for said microcomputer means for varying the operation thereof to vary the type of processing of said transmitted data by said terminal in accordance therewith, selection means operatively connected to said microcomputer means for variably selecting said data to be processed for providing said processed display and a first selectable purpose for said terminal for controlling said processing of said data in accordance therewith from a plurality of different selectable purposes for said terminal, said selectable purposes being variable, local storage means for selectively retrievably locally storing both said selected remotely transmitted displayable data and said selected first one of said remotely transmitted selected set of control instructions for said microcomputer means corresponding to said first selected purpose for said terminal, said local storage means being operatively connected to said microcomputer means with at least said selected data storage therein being continuously updateable in response to said remotely continuously transmitted data being updated, said microcomputer means being operable in accordance with said locally stored remotely transmitted selected first one of said selectable sets of control instructions, and video display means operatively connected to said microcomputer means, said microcomputer means selectively

enabling said processed video display of said selected remotely continuously transmitted updateable video displayable data, said selected continuously transmitted updateable remotely transmitted video displayable data being processed in said terminal in accordance with said locally stored remotely transmitted selected first one of said selected set of control instructions for providing said processed video display therefrom on said display means, said selection means enabling local storage in said local storage means of a different one of said plurality of remotely transmitted sets of instructions in place of said first one of said locally stored selected remotely transmitted selected set of instructions in response to selection of a different selected purpose, said microcomputer means differently processing said incoming video displayable data in accordance with said different locally stored set of instructions for said microcomputer means, whereby a local downstream program grabbing and data display means for remotely transmitted information is provided.

4,054,912 FILM SCANNER WITH COMPENSATION FOR FILM SHRINKAGE

John David Millward, Hitchin, and John Wright, Braughing, both of England, assignors to The Rank Organisation Limited, London, England

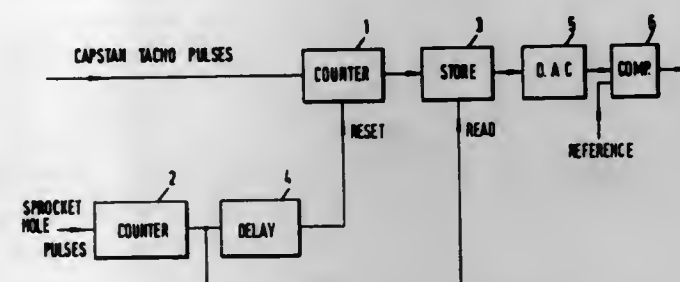
Filed Apr. 9, 1976, Ser. No. 675,590

Claims priority, application United Kingdom, Apr. 9, 1975, 14543/75

Int. Cl.² H04N 3/36, 5/36

U.S. Cl. 358—216

7 Claims



1. In a continuous film motion telecine apparatus, means for deriving a signal representing the angular speed of a roller in non-slipping contact with the film when the film is being driven at a constant frame rate, the value of such signal being dependent upon film shrinkage, and means using said signal to automatically control a registration adjusting means to compensate for such shrinkage.

4,054,913 HYBRID IMPLSION PROTECTION SYSTEM FOR A FLANGELESS FACEPLATE COLOR CATHODE RAY TUBE AND METHOD OF ASSEMBLY THEREOF

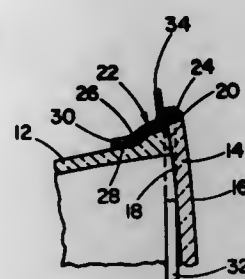
Martin L. Lerner, River Forest, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Sept. 1, 1976, Ser. No. 719,645

Int. Cl.² H01J 29/87

U.S. Cl. 358—246

4 Claims



1. A color television picture tube having a glass bulb including an approximately rectangular, flangeless, three-dimension-

ally curved faceplate having a convex front surface, a concave rear surface and an edge surface which, along the sides of the faceplate, arches away from a reference plane connecting the four corners of the faceplate, the glass bulb also having a funnel with a convex seal land which mates with the concave inner surface of the faceplate, said tube having a hybrid implosion protection system comprising:

- a high tensile strength frame which surrounds and closely hugs at least said edge surface of said faceplate to define a cavity between said frame and said edge surface;
- a hardened cement in said cavity between said frame and said faceplate, said frame and said cement binding up said edge surface of said faceplate to provide a measure of implosion protection; and
- a tension member disposed over said frame and the hardened cement in said cavity so as to surround said faceplate in straight lines between the faceplate corners, and means on said frame for retaining said tension member on the faceplate corners, said member being under tension to produce radially inwardly directed force components acting on the faceplate corners through said frame and the hardened cement, the combination of said cemented frame and tension member producing a high degree of implosion protection for the bulb.

4,054,914 FACSIMILE SCANNING CONVERSION SYSTEM

Kenji Fuknoka, Fussa, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

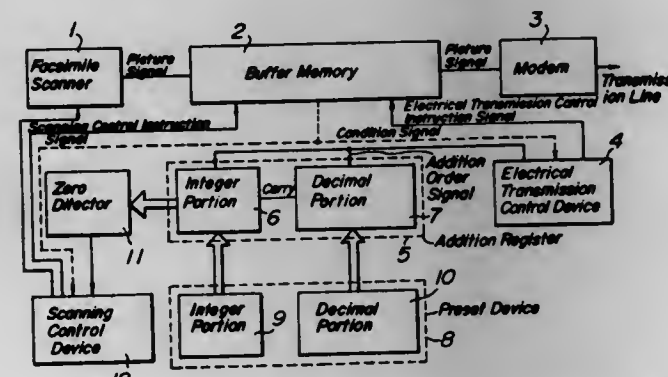
Filed Oct. 26, 1976, Ser. No. 735,770

Claims priority, application Japan, Oct. 29, 1975, 50-130038; Oct. 29, 1975, 50-130039

Int. Cl.² H04N 1/40

U.S. Cl. 358—256

2 Claims



1. A facsimile scanning conversion system which can convert a facsimile scanning at a transmitter side or a receiver side such that a picture surface received at the receiver is correctly similar to that to be transmitted from the transmitter when either one or both an index of cooperation and a scanning speed of a facsimile transmitter is or are different from that of those of a facsimile receiver, which makes use of a buffer memory having a capacity for memorizing at least one scanning line picture signal and an electrical transmission control device, which can read out one scanning line picture signal from said buffer memory or write in said one scanning line picture signal to said buffer memory with a given period which coincides with a scanning period of corresponding receiver or transmitter for effecting a continuous scanning operation with the aid of said electrical transmission control device, which makes use of an addition register, a scanning control device and a facsimile scanner, which can add a ratio between indexes of cooperation of said transmitter and said receiver to said addition register with said period, can effect when the value of an integer portion of said addition register is not 1 one line scanning operation of said facsimile scanner and can write in one scanning line picture signal to said buffer memory or read out one scanning line picture signal from said buffer memory and subtract 1 from the value of the integer portion of said addition register to repeatedly effect said scanning of said facsimile scanner and said writing in or reading out operation

of said buffer memory until the value of the integer portion of said addition register reaches to zero with the aid of said scanning control device.

4,054,915 COLOR TELEVISION CAMERA

Yasumasa Sugihara, Kawasaki, Japan, assignor to The General Corporation, Japan

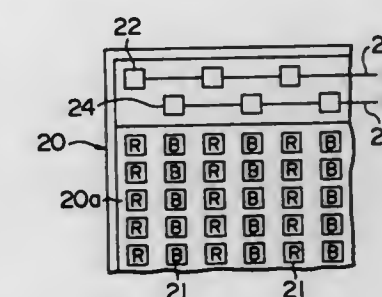
Filed June 20, 1975, Ser. No. 588,718

Claims priority, application Japan, Sept. 5, 1974, 49-102617; Sept. 5, 1974, 49-102618; Sept. 5, 1974, 49-102619; Sept. 5, 1974, 49-102621; Sept. 13, 1974, 49-105659; Oct. 16, 1974, 49-118954; Sept. 5, 1974, 49-102620

Int. Cl.² H04N 9/04

U.S. Cl. 358—41

13 Claims



1. A color television camera, comprising: an image sensor comprising an array of photosensitive photoelements arranged in a matrix and each responsive to only one particular color component and said array including photoelements responsive to different color components, wherein ones of said photoelements responsive to the same particular color component are arranged in groups within the matrix, and wherein an optical image focused in use on said array of photoelements induces in respective ones of said photoelements a respective stored quantity of charge representative of an intensity of the particular color components of the optical image at that position of each of the respective photoelements; and means for sequentially reading out the stored quantities of charge stored in the respective photoelements comprising each group of photoelements responsive to a same particular color component and for reading out the stored charges from the different groups simultaneously to simultaneously develop signal sequences each representative of a different color component of the optical image.

4,054,916 APPARATUS FOR IMPROVING SHARPNESS WHEN RECORDING CONTINUOUS-TONE PICTURES

Hans-Georg Knop, Ascheberg, Germany, assignor to Dr.-Ing. Rudolf Hell GmbH, Kiel, Germany

Division of Ser. No. 365,486, May 31, 1973. This application Oct. 24, 1974, Ser. No. 517,602

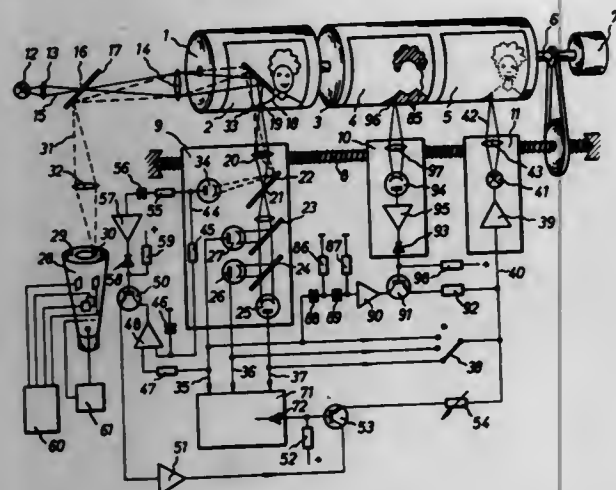
Claims priority, application Germany, June 2, 1972, 2226990 Int. Cl.² H04N 1/40, 1/46

U.S. Cl. 358—284

5 Claims

1. An arrangement for improving sharpness in the recording of a continuous-tone pictures, comprising: electro-optic picture scanning means for scanning a picture to produce picture signals; a recording medium; electro-optic recording means connected to said picture scanning means and responsive to said picture signals to produce said picture on said recording medium; means for generating a sharpness signal; modulating means for modulating said sharpness signal in dependence upon at least a selected portion of the picture pattern being scanned for its characteristics; control means for generating a

control signal for influencing the modulation of said sharpness signal; and means for superimposing said modulated sharpness



observer's line of sight with the simulated landscape, in a two coordinate system, generating signals defining features on said terrain, detecting coincidence in amplitude between the signals representing said intersection and said features, and modulating the scanning beam of said cathode ray tube with video signals indicative of said coincidence.

4,054,918

FILM SCANNING SYSTEM PROVIDING AUTOMATIC FRAME POSITIONING

Toshiro Kamogawa, Hirakata; Yoshifumi Teruuchi; Eiji Matsumoto, both of Katano, and Akira Nishiyama, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 344,205, March 23, 1973, abandoned.

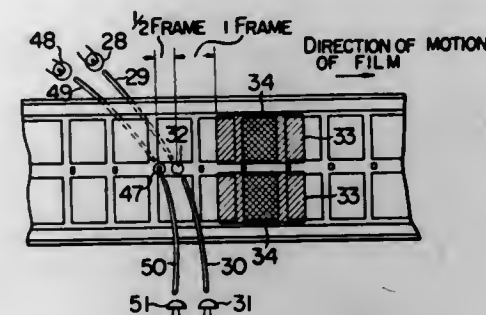
This application Dec. 20, 1974, Ser. No. 534,843

Claims priority, application Japan, Mar. 25, 1972, 47-30199; Mar. 25, 1972, 47-30200; July 14, 1972, 47-71029; July 14, 1972, 47-71030

Int. Cl.² H04N 3/36

U.S. Cl. 358-214

7 Claims



1. Apparatus for reproducing image information recorded in sequential frames on a tape-shaped reproducing medium in continuous motion and standstill modes, said reproducing medium having synchronizing signal marks located between adjacent frames of the recorded image information, said apparatus comprising:

first drive means for driving said reproducing medium past a reproducing station at a constant rate;

reproducing means located at said reproducing station for frame-by-frame reproducing said image information signals recorded in said continuous motion mode, including: means for scanning each frame driven past said reproducing station,

synchronizing signal mark detection means located at a position such that, if a raster scan for reproducing a moving picture is started when the sync signal mark is detected at this position, the scan is begun from a position which is spaced from the leading edge of a picture frame by an odd number multiple of $1/2$, where l designates the distance from the leading edge of a first moving picture frame to the leading edge of a succeeding adjacent moving picture frame, and

means for delaying the start of said scan when the detecting means detects a synchronizing signal mark for a period of time in which the reproducing medium moves a distance which is an odd number multiple of one-half l , said means for delaying operating only in said continuous mode;

means for stopping said first drive means in said standstill mode; and

means for reproducing a signal frame from said reproducing medium in said standstill mode, including:

said scanning means, said synchronizing signal mark detection means, second drive means energized in said standstill mode and de-energized in said continuous motion mode for aligning said reproducing medium with said scanning means in said standstill mode, and

4,054,917

SYNTHETIC TERRAIN GENERATORS

John Philip Adrian Race, Burnham, England, assignor to Tector Limited, Slough, England

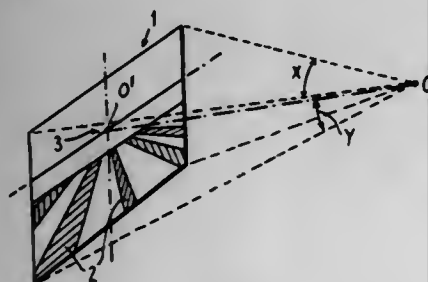
Filed June 17, 1974, Ser. No. 480,266

Claims priority, application United Kingdom, June 15, 1973, 28389/73

Int. Cl.² H04N 7/18

U.S. Cl. 358-104

17 Claims



1. A method of generating a synthetic terrain which is displayed on the screen of a cathode ray tube as a simulated landscape visible to an observer, which method includes modulating the scanning beam of a rectilinear raster scanned cathode ray tube with a video signal which is representative of the visual characteristics of the landscape at a point which at any instant is defined by the intersection of the line of sight passing from the observer's eye through the instantaneous scanning point on the cathode ray tube screen with the plane of the simulated landscape, said rectilinear raster appearing to said observer as a simulated window through which he views the landscape, said method further comprising:

generating first electrical signals representative of the instantaneous horizontal deviation angle and instantaneous vertical deviation angle of the line of sight from a predetermined reference line from the observer's eye generally parallel to and above the simulated landscape, said signals representing pure angles, and being of different frequency and being generated from ramp signals derived from the vertical and horizontal scanning signals producing said rectilinear raster,

generating from said vertical deviation angle signal a distance signal representative of the distance between a point on the simulated landscape defined by the vertical projection of the observer onto said simulated landscape and the intersection of the observer's line of sight with said simulated landscape,

generating further electrical signals from said first electrical signals and said distance signal, said further signals being representative of vectors defining said intersection of the

means responsive to the detection of a synchronizing signal mark by said detection means for reducing the size of a raster scanned by said scanning means to one-half the raster size in said continuous motion mode, wherein said second drive means is de-energized upon detection of said synchronizing signal mark by said detection means.

4,054,919

VIDEO IMAGE POSITIONING CONTROL SYSTEM

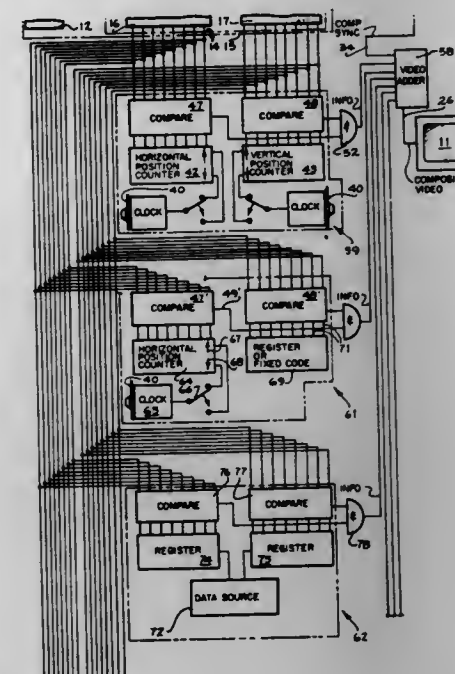
Allan E. Alcorn, Campbell, Calif., assignor to Atari Incorporated, Los Gatos, Calif.

Filed Sept. 15, 1975, Ser. No. 613,050

Int. Cl.² H04N 5/04

U.S. Cl. 358-148

2 Claims



2. In a video image control system of a type adapted to be contained in a cabinet for disposing a video image on a raster scan display, said system including a pulse generating clock means for generating a continuous stream of signals at a predetermined frequency, counting means coupled to count said signals and first output means providing a first output count in response to attainment of a predetermined count and second output means providing a second output count in response to attainment of a multiple of said predetermined count, a video adder of a type for receiving and combining composite sync signals and information signals to provide a composite video signal to be coupled to said display, means for generating composite sync signals and for supplying same to said adder, and means for generating information signals and for supplying same to said adder for causing an image to move on the display, the last named means including a data source and a register coupled to said source to receive data therefrom, and means for comparing the output of said register with an output of said counting means to generate and supply a portion of an information signal to said adder for providing the composite video signal thereof with information to be displayed.

4,054,920

DEVICE FOR STORING ELECTROMAGNETIC CONTROL SIGNALS ON MAGNETIC STRIP MATERIAL AND A SOUND FILM PROJECTOR EQUIPPED THEREWITH

Gerd Kittag, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Feb. 3, 1976, Ser. No. 654,922

Claims priority, application Austria, Feb. 6, 1975, 894/75

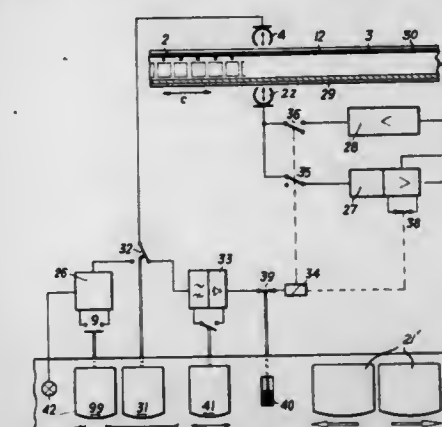
Int. Cl.² G11B 13/04, 15/06

U.S. Cl. 360-3

11 Claims

1. A device for the storage of electromagnetic control signals on at least one longitudinally extending section of magnetic strip material such as magnetic tape, motion picture film,

and the like, the opposite ends of each section being defined by marker signals and arranged to be operatively associated with a magnetic head connected to recording and reproduction amplifying means comprising, in combination, means for advancing said strip materials selectively either in a forwards or backwards directions a control signal generator; a control unit connected to said control signal generator for activating said control signal generator; first switch means connected to said means for advancing to select said forward direction and connected to said control unit to activate said signal generator during the advance of the strip material in said forwards direction to store a control signal on the strip material; a first detec-



tor responsive to the marker signals on the strip material for deactuating said control unit and said signal generator when one of said marker signals is detected by said first detector through the magnetic head; second switch means connected to said means for advancing to select said backwards direction; and a second detector connected to said control unit and responsive to said control signal at least during the advance of the strip material in said backwards direction for causing said control unit upon detecting said control signal to activate said control signal generator to store said control signal on said section of the strip material whereby when said first detector detects a marker signal said control unit is deactuated and the entire section of strip material then contains said control signal.

4,054,921

AUTOMATIC TIME-BASE ERROR CORRECTION SYSTEM

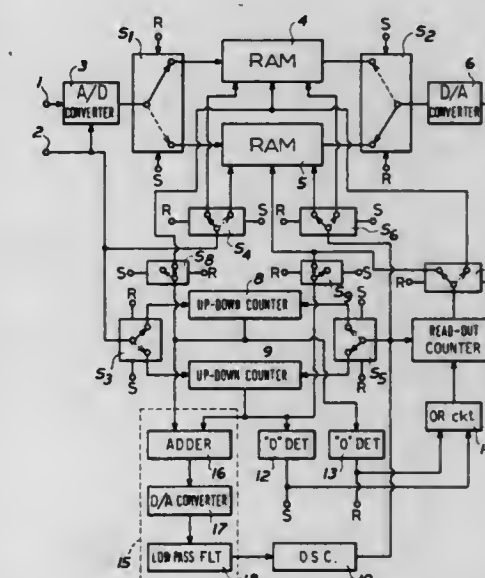
Mitsushige Tatami, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 19, 1975, Ser. No. 578,869

Int. Cl.² H04N 5/78; G11B 27/28

U.S. Cl. 360-27

7 Claims



1. An automatic time-base error correction system comprising:

- a. means for providing an input analog signal and a pilot signal having the same time-base errors;
- b. random access memory means;
- c. read-in addressing means for generating a read-in address signal for said random access memory means having a variable rate in accordance with the rate of said pilot signal;
- d. means for digitalizing the input analog signal at a time specified by said pilot signal;
- e. means for coupling the digitalized signal to a data port of one of said random access memory means as well as means for applying said read-in address signal from one of said read-in addressing means to an address port of said one random access memory means;
- f. read-out clock means for generating read-out clock pulses;
- g. read-out addressing means for generating a read-out address signal having a rate in accordance with said read-out clock means;
- h. means for applying said read-out address signal to an address port of another of said random access memory means as well as means for applying said read-out clock means to said another random access memory means to cause data at a specified location to be read-out said another random access memory means;
- i. means for converting the output of said another random access memory means into analog form;
- j. control means for selecting one of said read-in addressing means to generate read-in addresses for said one of said random access memory means having further means operable to control when said read-out addressing means generates read-out addresses for said another random access memory means; and
- k. means to detect when said another random access memory means has had all data read-out and means to interchange read-in, read-out functions of said one random access memory means and said another random access memory means at that time.

4,054,922

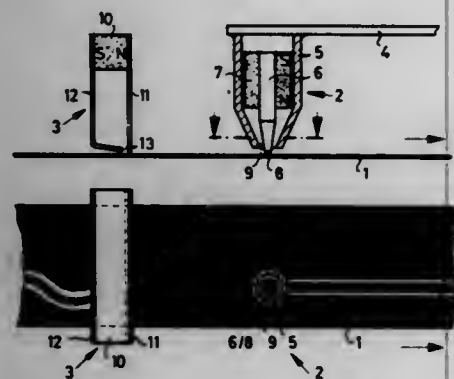
APPARATUS FOR FORMING AN ERASABLE RECORD OF THE VALUE OF A MEASURED QUANTITY

Manfred Fichter, Königsfeld, Germany, assignor to Kienzle Apparate GmbH, Villingen-Schwenningen, Germany
Filed Apr. 14, 1976, Ser. No. 676,913

Claims priority, application Germany, May 9, 1975, 2520581
Int. Cl.² G11B 5/02

U.S. Cl. 360-56

16 Claims



1. In a recording apparatus operative for making and erasing records of the values of a measured quantity on a transported record carrier of the type having characteristics alterable by means of magnetic fields, particularly a record carrier made of a material which can be caused to assume a first state of lower brightness and reflectivity by passing a magnetic field through the record carrier normal thereto and which can be caused to assume a visually distinguishable second state of higher brightness and reflectivity by establishing in the general plane of the record carrier two magnetic fields which are oriented generally perpendicular to each other, in combination, a writing unit operative for forming a recording trace on the record carrier during record carrier transport, the writing unit comprising

first means operative for generating a radial writing field lying in the general plane of the record carrier, the writing field because it is radial being comprised of field components which are oriented generally perpendicular to each other and which furthermore are oriented at angles to the record carrier transport direction, to thereby cause the record-carrier material to assume its second state of higher brightness and reflectivity; and an erasing unit for erasing the recording traces formed by the writing unit, the erasing unit comprising second means operative for establishing a magnetic erasing field which extends transverse to the record carrier transport direction and which is comprised of erasing field lines passing through the record carrier normal thereto to thereby cause the record-carrier material to assume its first state of lower brightness and reflectivity.

4,054,923

BELT DRIVEN TAPE TRANSPORT WITH RE-POSITIONED REEL

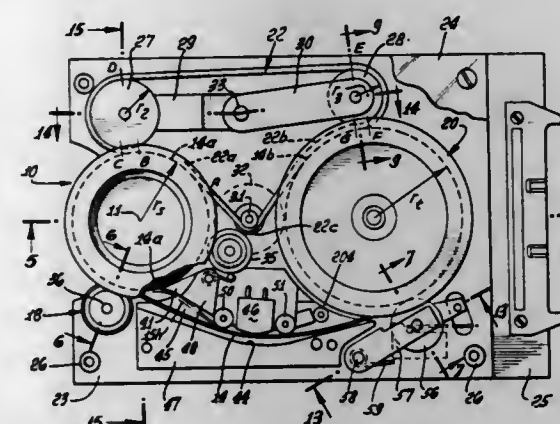
Richard A. Lewis, Sherman Oaks, Calif., assignor to Interdyne Company, Van Nuys, Calif.

Continuation-in-part of Ser. No. 680,195, April 26, 1976. This application June 7, 1976, Ser. No. 693,136

Int. Cl.² G11B 15/04, 15/32, 15/66

U.S. Cl. 360-60

19 Claims



18. In a tape transport assembly,

- a. first means to initially receive and peripherally locate a tape reel,
- b. other means to subsequently centrally support the tape reel for rotation,
- c. and belt means engaging tape on the reel when the reel is initially received by said first means and also engaging tape on the reel when the reel is subsequently centrally supported by said other means for rotation.

4,054,924

VARIABLE MESSAGE RECORDER EMPLOYING SINGLE TAPE LOOP HAVING FAST RESET

Joseph J. Zimmermann, Elm Grove, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 24, 1975, Ser. No. 644,221

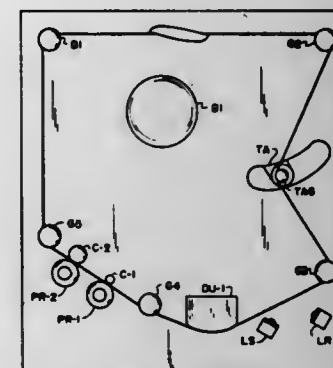
Int. Cl.² G11B 15/06, 15/44, 15/52

U.S. Cl. 360-71

4 Claims

1. A magnetic recording playback device including, a playback head, tape drive means operable at a plurality of speeds, switching means, a two-sides magnetic recording tape formed of a continuous strip with ends joined and having a 180° twist in the loop when disposed in the assembled configuration on said drive means, a tone signal prerecorded on a portion of said tape loop playback device, a light conditioning segment included on one side of said tape, a light source, light responsive means, and said tape drive means comprising: a drive motor initially operated in response to said switching means; first tape advance means operated in response to said motor to advance said tape at a first speed; control means connected to said playback head operated in response to detection of said tone

signal recorded on said tape; said first tape advance means rendered inoperative in response to said operated control means; second tape advance means operated in response to said



operated control means to advance said tape at a second speed; and said light responsive means operated in response to positioning of said light conditioning segment of said tape source to terminate operation of said drive motor.

4,054,925

ENDLESS LOOP RECORDER HAVING TEMPERATURE COMPENSATED TENSIONING

Frank Richard Towner, Seaford, and Joseph Charles Hawkins, Wokingham, both of England, assignors to Sperry Rand Corporation, New York, N.Y.

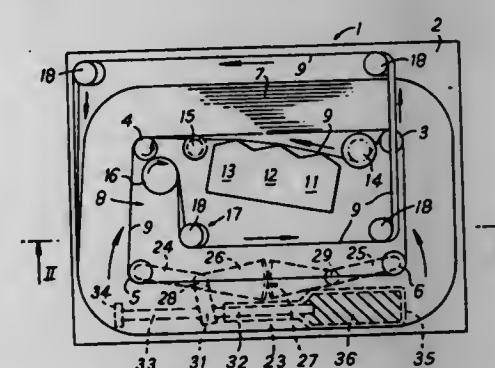
Filed May 7, 1976, Ser. No. 684,508

Claims priority, application United Kingdom, May 15, 1975, 20484/75

Int. Cl.² G11B 15/43, 15/70; B65H 17/48

U.S. Cl. 360-71

13 Claims



1. A data recorder comprising a recording medium in the form of an endless loop of magnetic tape, and magnetic head means, the magnetic tape being wound around former means comprising a plurality of roller members to provide a tape store, the roller members and inner turn of tape in said loop defining within the center of the store an area in which the magnetic head means are mounted, at least one of said roller members being mounted near one end of a movable arm, means mounting said movable arm for pivotal movement in a plane parallel to the plane of the endless loop whereby pivotal motion of the movable arm adjusts the tension in said tape, temperature-sensitive expandable means to pivot said movable arm in accordance with temperature changes, said temperature sensitive means being providing pivotal movement of said movable arm to an extent which compensates for the change in loop length due to the same temperature change so as to maintain tape tension substantially constant.

4,054,926

DEVICE FOR AUTOMATIC PROGRAM SELECTION ON PRERECORDED MAGNETIC TAPE

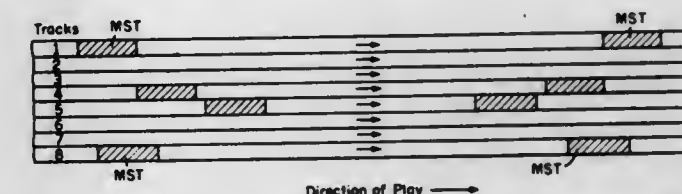
Paul Jeffries Haynes, St. Louis, Mo., assignor to Paul Jeffries Haynes, St. Louis, Mo.

Filed Feb. 11, 1976, Ser. No. 657,231

Int. Cl.² G11B 17/00, 15/18

U.S. Cl. 360-72

1 Claim



1. A device for automatic program selection from a prerecorded magnetic tape comprising:
- a. means for sensing and transmitting intermittent electric signals from the magnetic tape;
- a. means for scanning a matrix of selection switches comprising a first stepping relay having two positions connected per row of switches in order to scan each column of switches per cycle and being capable of stopping once at each position for each electrical signal, and a second stepping relay having one position connected per column of switches in order to scan each row per cycle, and both relays having their automatic resets connected so that the scan operates sequentially scanning a full cycle of the said first relay before resetting to the next position of said second relay, said first stepping relay having a 100 mf capacitor connected across its coil and further connected to a spring actuated switch which is closed by a solenoid connected to the play mechanism of the tape player;
- a. means for triggering the various modes of the device comprising three spring loaded relays and two capacitors, one of said relays having a 2000 mf capacitor connected therewith and having its normally closed contact connected to the sensor and opening the circuit when current flows through the device while simultaneously closing the second and third relays, the second trigger relay having a 100 mf capacitor connected therewith and its normally open contacts connected to the first stepping relay and the third trigger relay having its switch arm connected to the second stepping relay and having an alternative ground connected to its coil;
- a. means for automatically controlling the play, stop, fast forward and fast rewind modes comprising a primary transfer relay to transmit the beginning signal of a selection, having its normally closed contact connected in series to a solenoid attached to the stop mechanism of the tape player, its switch arm connected to the normally open contacts of the third trigger relay, and its normally open contacts connected to a secondary transfer relay for transmitting the signal at the end of a selection and the primary transfer relay also having a 250 mf capacitor connected across its coil and said capacitor being connected in parallel to a spring actuated switch which momentarily closes to ground when the stop solenoid is actuated; said secondary relay having two switches, the first of said switches having its normally closed contacts connected directly to a solenoid connected to the play mode of the tape player and said first switch having its normally open contacts connected to a manual double pole double throw switch located between solenoids which are connected to the fast forward and fast rewind mechanisms of a tape player and the switch arm of second trigger relay; the second switch of the secondary relay having its switch arm grounded, its normally closed contact being an open contact and its normally open contact being connected to a 350 mf capacitor which is connected across the coil, said normally closed contact being connected to a last relay, said last relay having a

1000 mf capacitor connected across its coil, a normally open contact which is an open contact and a ground switch arm, said last relay also having its coil connected to a spring actuated switch which is closed when the play solenoid is actuated but is normally open; further comprising an independent power source, a variable transformer, switches for manually operating each mode and an on-off switch for the device.

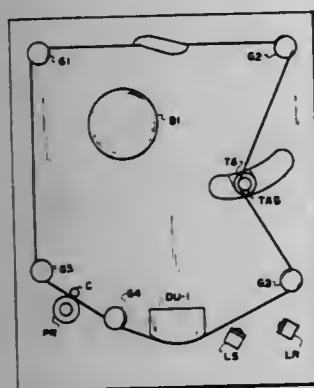
4,054,927

TELEPHONE ANSWERING APPARATUS WITH CONTROL IN RESPONSE TO SEGMENT OF THE ENDLESS TAPE LOOP

Joseph J. Zimmerman, Elm Grove, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Dec. 24, 1975, Ser. No. 644,222
Int. Cl.² G11B 15/06, 15/44, 15/52

U.S. Cl. 360—74

11 Claims



1. A magnetic record and playback device including, tape drive means operable at a plurality of speeds, switching means operable to render said tape drive means operated at a first speed, a two-sided magnetic recording tape loop formed of a continuous strip with ends joined and having a 180° twist in the loop when disposed in the assembled configuration on said drive means, the improvement comprising: first and second light conditioning segments included in said tape; first and second light sources; first light responsive means operated in response to positioning of said first light conditioning segment of said tape proximal to said first source; said first light responsive means including a light sensitive device and relay means, said light sensitive device operated in response to light from said first light source conditioned by said first light conditioning segment, to operate said relay means to render said tape drive means inoperable; and second light responsive means operated in response to positioning of said second light conditioning segment of said tape proximal to said second light source; said second light responsive means including a light sensitive device and relay means, said light sensitive device operated in response to light from said second light source conditioned by said second light conditioning segment, to operate said relay means to render said tape drive means operable at a second speed.

4,054,928

LASER OPERATED SCANNING AND PRINTING SYSTEM

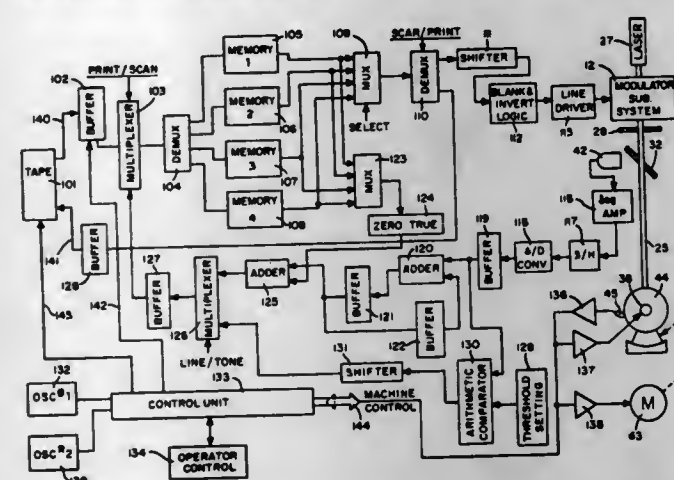
John Charles Butler, Centerville; Lysle Dwight Cahill; Ernest Warren Drumm, both of Dayton; Arnold Leroy Fife, James-town, and Vincent James Paul, Jr., Kettering, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio
Filed Feb. 20, 1976, Ser. No. 659,732
Int. Cl.² H04N 1/28

U.S. Cl. 360—79

9 Claims

1. A combination printing and scanning system comprising:
a. a laser for generating a linearly polarized beam of light;
b. signal generating means for generating a series of binary signals representative of the information content of an image to be reproduced;
c. beam deflection means for causing said beam of light to be

directed selectively along one of two different paths in correspondence with the state of said binary signal,
d. beam interception means for intercepting said beam when directed along one of said two different paths and permitting passage thereof when said beam is directed along the other of said paths,
e. collimating means including first and second lenses for collimating said beam after passage by said interception means,
f. support means for a graphic medium to be scanned or imaged,
g. a third lens for focussing said collimated beam, directing said beam toward a point on said graphic medium, and collimating specular and diffused light reflected back from said point,
h. scanning means for causing relative movement between said graphic medium and said point so that said point scans an entire working area within said graphic medium,



i. polarizing means for circularly polarizing the collimated beam of light transmitted by said collimating means and linearly polarizing the circularly polarized specular light component of the light which is reflected back from said point and collimated by said lens means,
j. filter means for filtering out from the collimated beam of light reflected back through said polarizing means the linearly polarized specular component thereof,
k. focussing means for focussing the collimated beam of diffuse light passing through said filter means,
l. a transducer placed at the image plane of said focussing means for generating an electrical signal related to the intensity of the focussed spot of diffuse light directed thereagainst,
m. digitizing means for digitizing electrical signal and storing digital samples thereof, and
n. selection means for selectively activating either said signal generating means and said beam deflection means or said digitizing means whereby said apparatus operates selectively either as a printing system or a scanning system.

4,054,929

TAPE RECORDING METHODS AND APPARATUS

Avner Levy, Irvine, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 19, 1976, Ser. No. 650,213

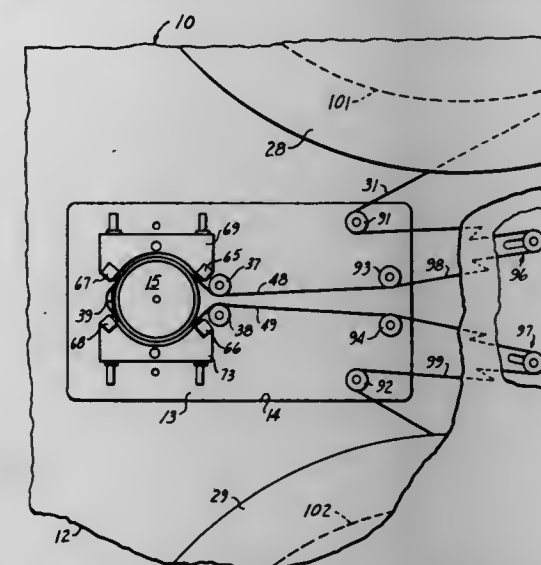
Int. Cl.² G11B 15/60

U.S. Cl. 360—90

26 Claims

1. In a method of transducing information relative to an information carrier tape, the improvement of driving said tape with, and transducing information relative to said tape at, a cylindrical tape drive capstan rotatable about a line of intersection of two relatively stationary planes extending through said cylindrical capstan at right angles to each other, comprising in combination the steps of:
placing said tape in a loop about said capstan;
forming at one side of one of said planes and at one side of the other of said planes a first unsupported tape portion in said loop and at the other side of said one plane and said

one side of said other plane a second unsupported tape portion in said loop by spacing said tape from said capstan along a curvature having a radius smaller than the radius of said capstan and having on said one plane an apex spaced from said capstan by a distance shorter than said smaller radius;
forming said tape into a first leg adjacent said loop at the other side of said other plane and bringing said first leg into proximity to said one side of said one plane, forming said tape into a second leg adjacent said loop at said other side of said other plane and bringing said second leg into proximity to said other side of said one plane, and bringing said first and second legs into proximity to each other at a distance between said first and second legs smaller than the distance between said first and second unsupported portions;



maintaining said tape in driving engagement with said capstan throughout a first peripheral region extending from said first unsupported portion to a portion of said loop adjacent said first leg;
maintaining said tape in driving engagement with said capstan throughout a second peripheral region extending from said second unsupported portion to a portion of said loop adjacent said second leg;
rotating said capstan to advance said tape;
transducing information relative to said advancing tape between said curvature and said first peripheral region at said first unsupported tape portion; and
transducing information relative to said advancing tape between said curvature and said second peripheral region at said second unsupported tape portion.

4,054,930

CASSETTE-TYPE MAGNETIC TAPE PLAYER

Takehiro Terada, Kawanishi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 26, 1975, Ser. No. 607,904

Claims priority, application Japan, Sept. 6, 1974, 49-107928[U]; Sept. 6, 1974, 49-107929[U]; Sept. 10, 1974, 49-104475

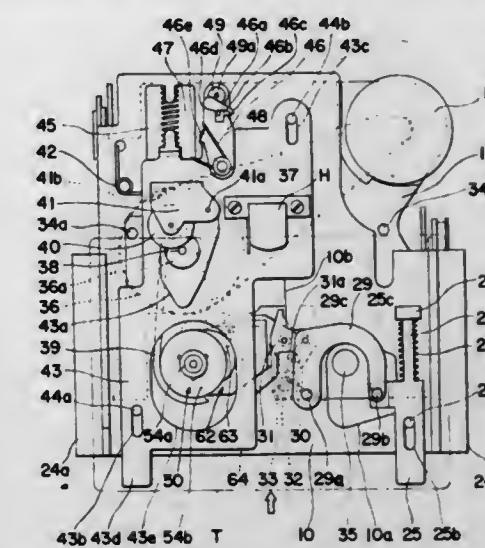
Int. Cl.² G11B 15/16, 15/22, 15/50

U.S. Cl. 360—96

9 Claims

7. An end-of-play detecting mechanism which comprises a take-up support for a take-up reel for winding a magnetic tape fed from a supply reel, the take-up reel and the supply reel being operatively housed within a self-contained container, such as a cassette or cartridge, utilizable in a cassette-type magnetic tape player; a take-up pulley rotatably mounted on said take-up support, said take-up pulley having an eccentric cam body thereon with an engagement recess therein with the slip clutch means coupled between said take-up support and said take-up pulley for driving said take-up support for tape winding; a biasing lever; detecting slip clutch means coupled to said take-up support for rotation by said take-up support and

engaging said biasing lever for exerting a rotational biasing force on said biasing lever; and a switching lever having one end adapted to be connected to a switching device for a tape player and having the other end with a projection thereon engagable in said engagement recess in said cam body, said biasing lever engaging said switching lever for biasing said switching lever for holding the projection out of engagement in said engagement recess as long as said detecting slip clutch



means exerts a biasing force on said biasing lever, whereby when substantially a full length of tape has been wound on the take-up reel and the rotation of the rotation of the take-up support is interrupted, the biasing lever no longer has the biasing force exerted thereon and said engagement on said switching lever is engaged in said engagement recess and continued rotation of said take-up pulley pulls said switching lever for actuating the switching device.

4,054,931

GAS FILTERING ARRANGEMENT FOR MAGNETIC DISK INFORMATION STORAGE APPARATUS

Ivor William Bolton, and Ian Charles George, both of Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.

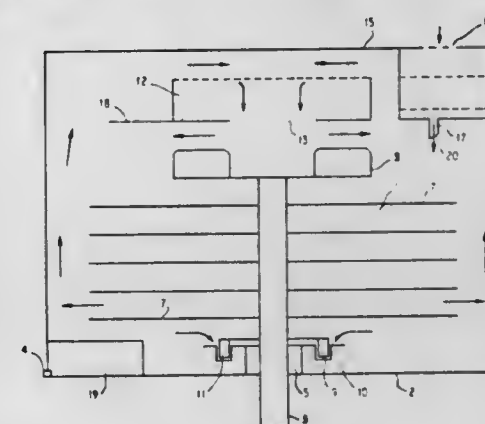
Filed Mar. 15, 1976, Ser. No. 666,554

Claims priority, application United Kingdom, Apr. 2, 1975, 13544/75

Int. Cl.² G11B 23/04

U.S. Cl. 360—97

8 Claims



1. Magnetic disk information storage apparatus of the kind employing heads flying in a gaseous medium adjacent a magnetic disk and comprising:
at least one magnetic disk;
at least one magnetic head for transducing signals representative of information onto or from said disk;
a housing substantially enclosing and sealing said at least one disk and said at least one head, and comprising first and second end walls spaced axially from said disk on opposite sides thereof and a side wall surrounding said disk;
a spindle supporting and being rigidly connected to said at

least one disk and having one free end within said housing and a second end external to said housing;
 a bearing located in said first wall of said housing and supporting said spindle for rotation about an axis thereof, said bearing constituting a path for gas leakage between the interior and exterior of said housing;
 an impeller mounted on said free end of said spindle for rotation therewith;
 a main filter within said housing for filtering said gaseous medium;
 means for supporting said main filter in a position spaced from and between said impeller and said second wall of said housing;
 and means for rotating said spindle thereby developing a pressure distribution within said housing with which is characterized by a region of relatively lower pressure in the vicinity of said impeller and a region of relatively higher pressure in the vicinity of said bearing;
 said apparatus further comprising
 a breather filter means having at least one external gas port to the exterior of said housing and having an internal gas port to the interior of said housing, said internal gas port being located in said relatively low pressure region whereby the pressure in said region is substantially equalized with the ambient pressure exterior to said housing and the pressure in the vicinity of said bearing is above ambient pressure so as to reduce the likelihood of contaminants entering the storage apparatus.

4,054,932

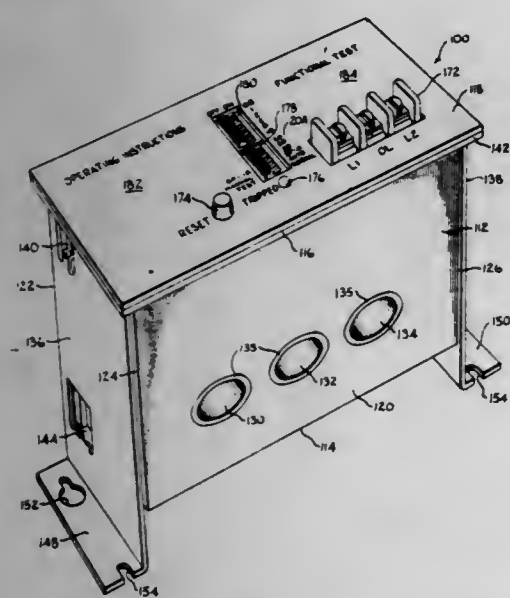
OVER-CURRENT PROTECTIVE APPARATUS FOR A POWER CIRCUIT

Robert Wayne Schmer; Joseph James Gribble, both of Milwaukee; Julian Carl Kampf, Grafton, and James Thomas Tucker, Milwaukee, all of Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Feb. 2, 1976, Ser. No. 654,424
 Int. Cl.² H02H 7/085

U.S. Cl. 361-31

10 Claims



1. An overload relay which may be programmed for use with alternating current motors having different full load current and service factor ratings, said relay comprising: a generally rectangular housing having a front end, a rear end and side and end walls extending between the front and rear ends to provide the housing with a closed interior, a pair of supports extending rearwardly of the rear wall providing means for mounting the relay on a panel so the rear end is spaced from the panel, at least one bore extending through the interior between openings in the side walls, circuit means within the interior responsive to the magnitude of alternating current in a conductor extending through the bore and connected between an alternating current source and an alternating current motor, said front end having three terminals thereon for connecting the circuit means across one phase of

the source and in series with a coil of an electromagnetic switch that has switching contacts arranged to interrupt the current in the conductor when the coil is de-energized, an opening exposing a light emitting diode which is included in the circuit means and energized when the relay responds to excess current in the conductor to visually indicate that the circuit to the coil is de-energized and the relay is in a tripped state, a reset switch having an operator extending externally of the front end for causing the coil circuit to be energized and the diode to be de-energized to indicate that the circuit means is reset when the switch operator is actuated a predetermined time interval after the circuit means has responded to an excess current in the conductor and the circuit means is programmed to operate in a manual reset mode, a plurality of switches having operators accessible from the front end, a first of said switches having contacts connected in the circuit means to cause the circuit to operate in a manual-reset or automatic-reset mode, a second of said switches having contacts arranged to program the circuit means so the relay may be used with two different motors having different service factor ratings, a third of said switches having contacts arranged to cause the circuit means to trip independently of the magnitude of current in the conductor to test the operation of the circuit means said plurality of switches also including a group of switches each arranged to program the circuit means response to a pre-selected increment of current flow through the conductor.

4,054,933

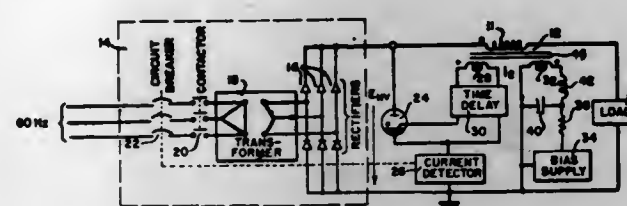
SATURATING TIME-DELAY TRANSFORMER FOR OVERCURRENT PROTECTION

Walter F. Praeg, Palos Park, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 18, 1975, Ser. No. 642,045
 Int. Cl.² H02H 3/08

U.S. Cl. 361-57

9 Claims



1. An apparatus for protecting an electrical load connected to a d-c supply from damage from overcurrent in case of a load fault comprising:

- a transformer having a primary winding, a secondary winding, and a ferromagnetic core capable of maintaining inductive coupling between the primary winding and the secondary winding, the primary carrying the load current and the ferromagnetic core in magnetic saturation from magnetic flux set up in the ferromagnetic core by the load current;
- a bias supply connected electrically to the secondary winding and supplying a current to the secondary winding in a direction to saturate the ferromagnetic core, the current in the secondary winding producing an mmf greater in magnitude and opposite in direction to the mmf produced by the load current, the net mmf placing the saturation of the core at a value near the knee of the B-H curve and in saturation;
- a filter connected between the bias supply and the secondary winding to isolate the bias supply from pulses generated in the secondary winding by changes in load current through the primary winding;
- a crowbar connected across the d-c supply; and
- a time-delay circuit connected to the crowbar and to the transformer and responsive to changes in the transformer that indicate a fault to apply a delayed triggering signal to the crowbar after a predetermined time interval, thereby

making the crowbar a short circuit and protecting the load.

4,054,934

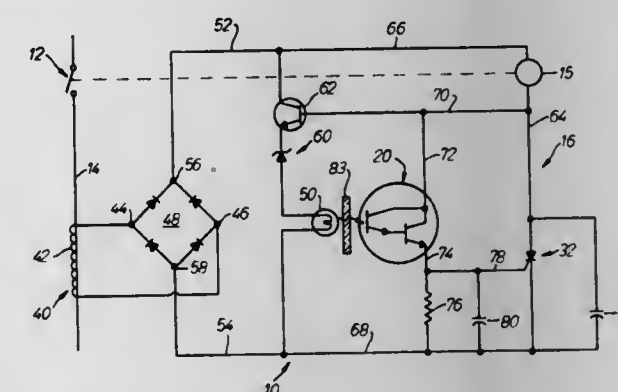
SOLID STATE INVERSE OVERCURRENT RELAY

Richard E. Riebs, Hales Corners, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Feb. 27, 1976, Ser. No. 662,248
 Int. Cl.² H02H 3/08

U.S. Cl. 361-93

15 Claims



1. A relay for tripping a circuit breaker in a power system, said relay comprising:

means connected to respond to current flow in the power system for providing a heat radiation signal having a time-current characteristic in which the time to reach a predetermined temperature is inversely proportional to the second power of current, and sensing means operatively connected to the circuit breaker, said sensing means being sensitive to the predetermined heat radiation signal from said heat radiation signal means for tripping said circuit breaker in response to the predetermined signal.

4,054,935

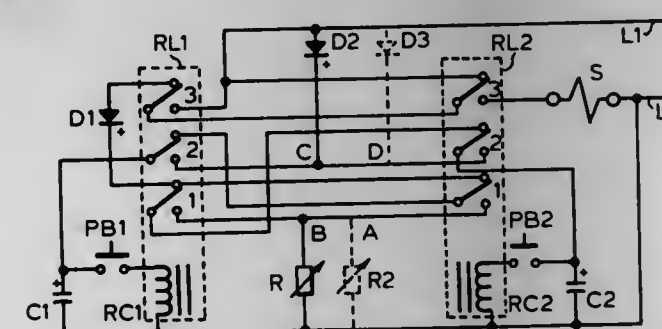
SAFETY CONTROL CIRCUIT

Leon Ginsberg, 288 Mill Road, P.H. 15, Etobicoke, Ontario, Canada

Filed May 28, 1976, Ser. No. 691,178
 Int. Cl.² H01H 47/22

U.S. Cl. 361-189

8 Claims



1. A safety control circuit for an electrically operable machine, the circuit comprising:
 input means for delivering electrical power to the machine;
 first and second relays each including switching means and an associated relay coil for operating said switching means, the switching means of said relays being connected in said input means so that electrical power is delivered to the machine only when both relay coils are energized;
 first and second capacitors associated respectively with said first and second relay coils;
 a source of direct current for charging the capacitors, said direct current source being connectible with both capacitors through said switching means of said relays when both relay coils are de-energized, whereby the capacitors are both normally charged when the circuit is at rest;
 first and second machine activating switch means associated

respectively with said first and second capacitors and each arranged, when operated, to connect the relevant one of said capacitors with the associated relay coil to cause the capacitor to discharge into the coil and operate the relay; and

resistor means connectible with either of said capacitors through the switching means of said relays, said switching means being arranged, in the event that only one of said machine activating switch means is operated, to connect the capacitor associated with the other switch means to said resistor means whereby, in use, the relevant capacitor will progressively discharge into the resistor means, preventing energization of the associated relay coil and hence activation of the machine after the level of charge in the capacitor has fallen below that required to energize the relevant relay coil.

4,054,936

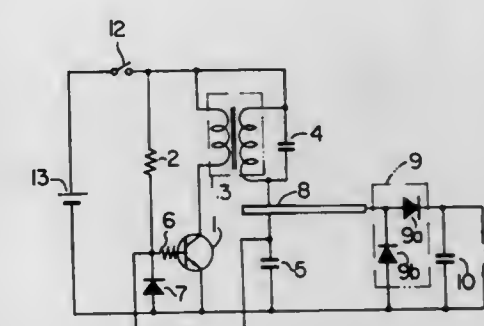
GAS IGNITION DEVICE

Yasuhiro Ansal; Hideo Mifune, both of Hirakata, and Kenroku Tani, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 16, 1976, Ser. No. 667,359
 Int. Cl.² F23Q 3/00

U.S. Cl. 361-257

2 Claims



1. A gas ignition device for operation from a D.C. power supply having first and second terminals comprising:

- a resistor and a diode connected in series across the terminals of said D.C. power supply,
- a transistor having an emitter connected to the second terminal of said D.C. power supply and a base connected to the junction of said resistor and said diode,
- an oscillation transformer having a secondary winding and a primary winding, said primary winding being connected between the first terminal of said D.C. power supply and the collector of said transistor,
- a first capacitor connected in parallel with the secondary winding of said oscillation transformer,
- a piezoelectric transformer having first and second primary side electrodes and a secondary side electrode, the secondary winding of said oscillation transformer being connected between the first terminal of said D.C. power supply and the first primary side electrode of said piezoelectric transformer,
- a second capacitor connected between the second terminal of said D.C. power supply and the second primary side electrode of said piezoelectric transformer,
- a feedback circuit for coupling the voltage at the junction of said second capacitor and said piezoelectric transformer back to the base of said transistor,
- a rectifying circuit having an input terminal coupled to the secondary side electrode of said piezoelectric transformer for rectifying the A.C. high voltage generated by said piezo-electric transformer, a common terminal connected to the second terminal of said D.C. power supply, and an output terminal,
- a third capacitor connected to the output terminal of said rectifying circuit, said capacitor storing the output voltage of said rectifying circuit, and

a discharging gap connected in parallel with said third capacitor.

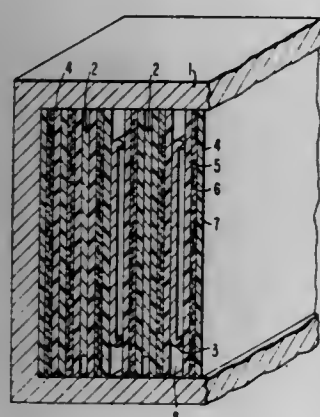
4,054,937 CAPACITOR

Lyon Mandelcorn, Pittsburgh; Robert L. Miller, Murrysville, both of Pa.; George E. Mercier, John H. Pickett, both of Bloomington, Ind., and Thomas W. Dakin, Murrysville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 28, 1976, Ser. No. 681,292
Int. Cl.² H01G 4/22; H01B 3/00

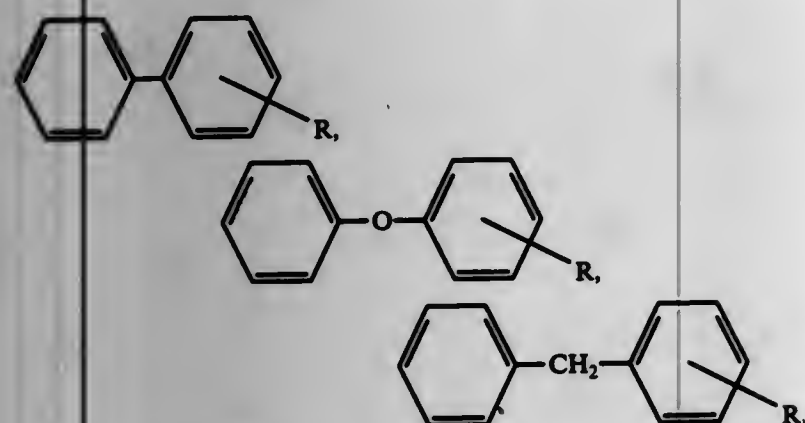
U.S. Cl. 361—319

15 Claims



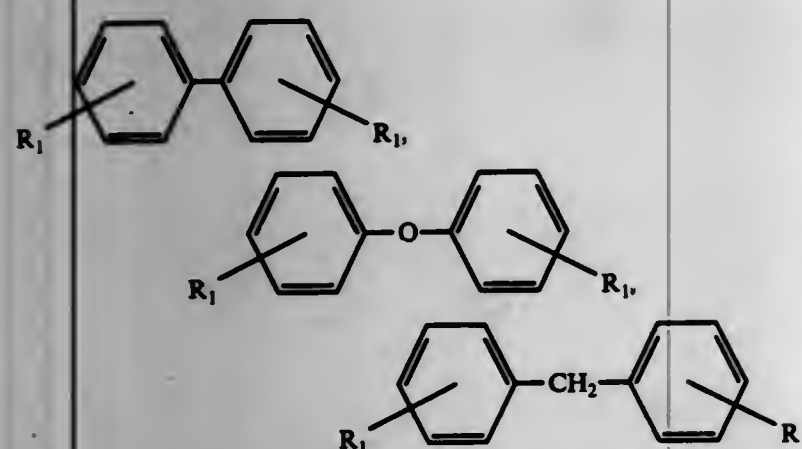
1. A capacitor comprising layers of metal foil alternating with a dielectric spacer impregnated with a dielectric fluid which comprises:

a. about 80 to about 99% by weight of a compound having the general formula



or mixtures thereof, where each R is independently selected from alkyl from C₂ to C₄; and

b. about 1 to about 20% by weight of a compound having the general formula



or mixtures thereof, where each R₁ is independently selected from alkyl from C₂ to C₄.

4,054,938 COMBINED SEMICONDUCTOR DEVICE AND PRINTED CIRCUIT BOARD ASSEMBLY

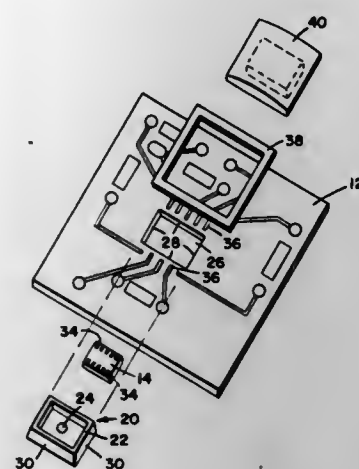
James B. Morris, Sr., San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Continuation of Ser. No. 469,460, May 13, 1974, abandoned.
This application Feb. 26, 1976, Ser. No. 661,539

Int. Cl.² H05K 1/04

U.S. Cl. 361—401

22 Claims



1. Method of constructing a thin unitized electronic circuit by securing a large scale integrated circuit semiconductor die having a plurality of terminal pads spaced apart along the edges of a top major surface thereof within a hole in a thin and flat printed circuit board and connecting said die terminal pads to spaced apart connection pads on a top major surface of said board positioned adjacently surrounding said opening comprising the sequence of:

a. providing a thin and flat die carrier with an external thickness closely approximating the thickness of said board and with peripheral walls surrounding a flat base thereby defining a rectangular well within said carrier which is sized so that said die fits snugly therewithin with a bottom major surface thereof oppositely adjacent said flat base; and then

b. attaching said semiconductor die to said die carrier entirely within said well by bonding said bottom major surface to said base; and then

c. placing said die carrier containing said die into said hold in said printed circuit board which has been preformed and sized to receive said die carrier substantially entirely therewithin; then

d. electrically interconnecting said terminal pads of said die and connection pads of said board with fine wires which pass adjacently across the tops of said peripheral walls; and then

e. covering completely said die, the exposed surfaces of said carrier, said fine wires and the portion of said board adjacently surrounding said hole with hardcuring liquid encapsulation material.

4,054,939 MULTI-LAYER BACKPANEL INCLUDING METAL PLATE GROUND AND VOLTAGE PLANES

J. Preston Ammon, Dallas, Tex., assignor to Elfab Corporation, Dallas, Tex.

Filed June 6, 1975, Ser. No. 584,264
Int. Cl.² H02B 1/02

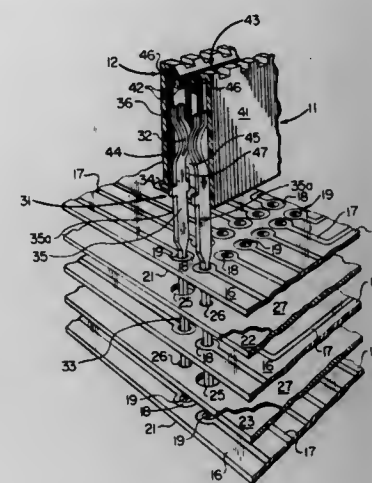
U.S. Cl. 361—414

39 Claims

14. A multi-layer printed circuit board assembly having a current carrying metal plate formed therein, comprising:

a stack of single layer printed circuit boards each of which includes a sheet of insulative material having a pattern of conductive material formed on at least one surface thereof and holes extending through the boards which holes extend through portions of the pattern of conductive material, said holes being plated with a conductive material which is in electrical contact with the conductive pattern

adjacent said holes and said boards being stacked to align a plurality of said holes;
a current carrying metal plate positioned between a top and a bottom printed circuit board in said stack, said plate having clearance holes formed therein in axial alignment with certain plated holes in said boards, a coating of insulative material covering both surfaces of said plate and the insides of the clearance holes, and connecting holes formed therein in axial alignment with certain other plated holes in said boards, said connecting holes having bare metal inner walls; and



a conductive contact having an edge press fitted through each of said axially aligned plated holes in said circuit boards and said aligned connecting holes in said metal plate with said edge deforming the conductive material within said plated and connecting holes and said contacts being spaced from said metal plate around the insulation coated aligned clearance holes, said contact edges frictionally engaging the conductive material on the walls of said plated holes mechanically joining the individual boards and plate into a single, multi-layer printed circuit board assembly.

4,054,940 THREE CONDUCTIVITY STATE CIRCUIT ELEMENT

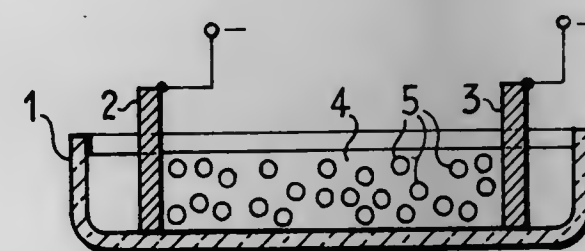
Francois Buchy, Pierre Merenda, and Jean Pierre D'Haenens, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 7, 1975, Ser. No. 539,062

Claims priority, application France, Jan. 10, 1974, 74.00811
Int. Cl.² H01G 9/18; H01L 45/00, 27/12

U.S. Cl. 361—435

4 Claims



1. A three conduction state circuit element, comprising one input electrode and one output electrode and a pasted composite connecting these electrodes to each other a said composite being formed by particles in suspension in a binder, and said binder undergoing a sudden increase in volume, at a first well-defined temperature, said substance changing from the insulating to the conducting state at a second given temperature, lower than said first temperature.

4,054,941 RANGE EXTENDER WITH GAIN

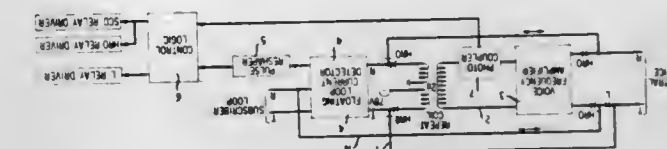
Harold Shichman, Scotch Plains, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 22, 1976, Ser. No. 752,900

Int. Cl.² H04M 1/76

U.S. Cl. 179—16 F

10 Claims



1. A range extender with gain used to provide selective amplification to signals applied to a relatively long subscriber loop comprising:

a through-transmission path coupled to said subscriber loop; a voice amplification path coupled to said subscriber loop; a loop current detector coupled to said subscriber loop; means for delivering to said detector a dc voltage corresponding to the dc current on the subscriber loop; means for supplying a bias potential to said detector; and control means for selectively applying telephone signals to either of said paths in response to the loop current detector, CHARACTERIZED IN THAT the range extender further comprises means responsive to common-mode time-varying currents on the subscriber loop for varying the bias potential supplied to the loop current detector thereby rendering said loop current detector insensitive to said common-mode time-varying currents.

4,054,942 TIP AUTOMATIC NUMBER IDENTIFICATION CIRCUIT

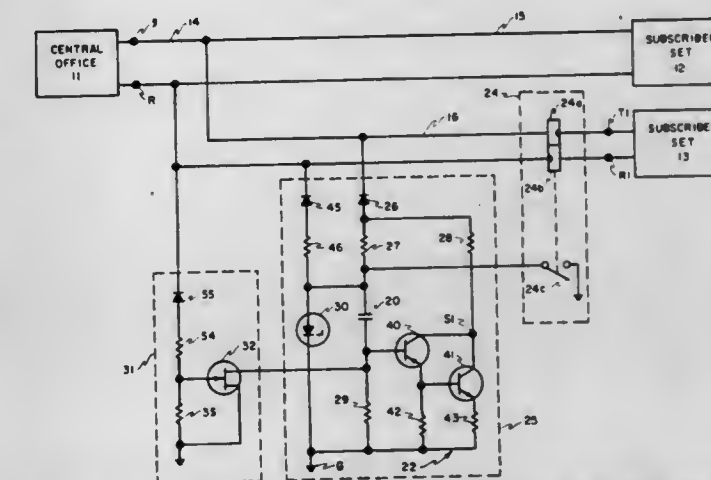
Charles W. Chambers, Jr., Amherst, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed May 13, 1976, Ser. No. 686,252

Int. Cl.² H04M 15/36

U.S. Cl. 179—17 A

14 Claims



1. In a circuit for applying a ground mark to the tip conductor of a transmission line to identify which party of a multi-party line has initiated a call, the combination of: ground mark switching means for applying a ground mark to the tip conductor, for a predetermined time, when a negative potential is applied to that tip conductor and loop current detecting means for preventing the switching means from applying the ground mark until loop current flow to a predetermined one of the parties is interrupted.

4,054,943

CIRCUIT ARRANGEMENT FOR THE AUTOMATIC DE-EXCITATION OF A HYSTERESIS MOTOR

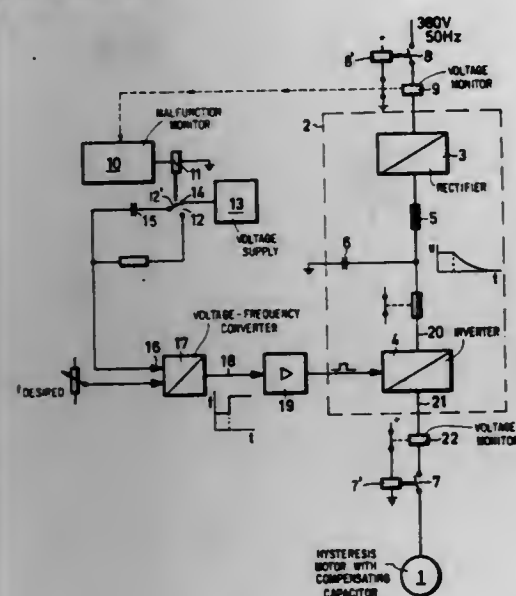
Johann Mundt, Julich-Koslar, Germany, assignor to URANIT Uran-Isotopentrennungs-GmbH, Julich, Germany

Filed July 6, 1976, Ser. No. 703,118

Claims priority, application Germany, July 5, 1975, 2530112 Int. Cl.² H02P 3/18

U.S. Cl. 318-166

4 Claims



1. In a circuit arrangement including a hysteresis motor having a ferromagnetic rotor and a three phase stator winding, capacitors connected to said stator windings for providing compensation for the reactive power intake of said motor, and a static frequency converter including the series connection of a rectifier circuit, a d.c. intermediate circuit and a controlled inverter circuit, said static frequency converter having its input connected to a three phase mains and its output connected to said stator windings for supplying power to said motor whereby the rotating field produced by the stator windings magnetizes said rotor and thus produces a permanently magnetic excitation which continues in said rotor, even after disconnection of said motor from said three phase mains, in the form of residual magnetic poles; the improvement comprising circuit means for the automatic de-excitation of said motor, said circuit means comprising in combination: voltage monitoring means for monitoring the voltage of said mains at the input of said frequency converter and for producing an output signal indicative of an interruption in the mains voltage due to malfunction or end of operation; a buffer circuit for said d.c. intermediate circuit of said static frequency converter, said buffer circuit including a storage capacitor which is connected to the input of said controlled inverter circuit and which discharges and transfers its stored energy with decaying voltage to said stator windings of said motor via said controlled inverter circuit when the output voltage of said rectifier is interrupted; and means responsive to said output signal from said voltage monitoring means for automatically increasing the output frequency f_0 of said inverter circuit by a predetermined amount Δf , whereby the residual magnetism in the rotor is quenched.

4,054,944

FINGER OPERATED SWITCHING DEVICE

Edward H. Lau, Old Westbury, N.Y., assignor to Redactron Corporation, Hauppauge, N.Y.

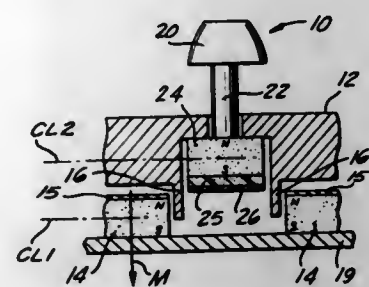
Continuation-in-part of Ser. No. 541,943, Jan. 17, 1975, abandoned. This application Jan. 28, 1976, Ser. No. 653,236 Int. Cl.² H01H 51/27

U.S. Cl. 335-207

17 Claims

1. A finger operated switching device comprising a biasing magnet having a first pole with a first magnetic polarity and a second pole with a second and opposite magnetic polarity, said poles being spaced from each other along a given axis whereby a first magnetic centerline is established within the said biasing magnet; a key assemblage, said key assemblage having a key

and a key magnet connected thereto, said key magnet having a first pole with said first polarity and a second pole with said second polarity, said poles being spaced from each other along a first line parallel to said given axis whereby a second magnetic centerline is established within said key magnet, said biasing magnet and said key magnet being magnetically polarized in the same direction; guiding means for guiding said key assemblage to move along a path adjacent and opposite said biasing magnet and parallel to said given axis between a first



end position wherein the second magnetic centerline is above and displaced from the first magnetic centerline by a first distance and a second end position wherein the second magnetic centerline is above and displaced from the first magnetic centerline by a second and shorter distance; electrical circuit means which is switchable between transmissive and non-transmissive states; and controlling means connected to said key assemblage for changing the state of said electrical circuit means as said key assemblage is moved from one to the other of the end positions of said first path.

4,054,945

ELECTRONIC COMPUTER CAPABLE OF SEARCHING A QUEUE IN RESPONSE TO A SINGLE INSTRUCTION

Takao Ichiko, and Yusuke Tsuji, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

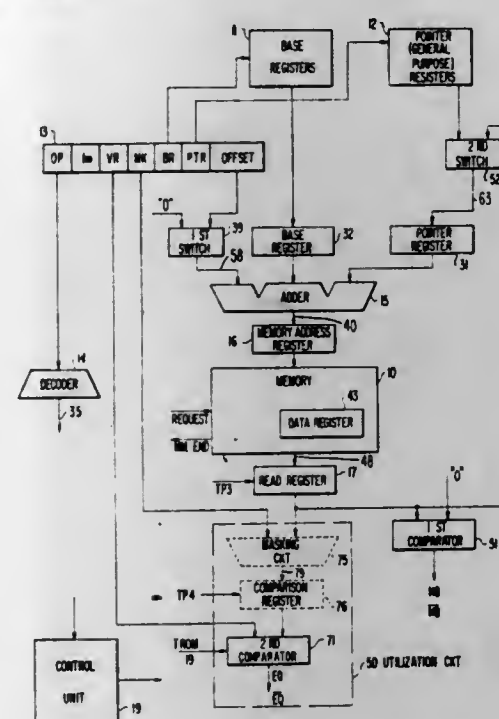
Filed June 23, 1976, Ser. No. 699,132

Claims priority, application Japan, June 24, 1975, 50-76782

Int. Cl.² G06F 7/00

U.S. Cl. 364-200

5 Claims



1. An electronic digital computer capable of searching any of a plurality of queues in response to a single instruction specifying a base datum, a pointer datum, and an offset datum relating to a specific queue, each queue comprising predetermined ones of data, one data from a predetermined one of the data fields of each of predetermined ones of a plurality of list components, each list component having in addition to a plurality of data fields at least one pointer field having pointers,

each particular pointer specifying, relative to said base datum, the particular pointer field of one of said predetermined list components that has one of said data next following in said specific queue, comprising:

- a memory for storing said plurality of list components;
- an instruction register for storing said single instruction, said single instruction being composed of an operation code specifying said specific queue to be searched and a condition of the search according to one of a plurality of conditions which may be preselected, a first operand code specifying reference values, and a second operand code specifying said base datum, said pointer datum and said off-set datum;
- a plurality of base registers connected to said instruction register, one of said base registers being preliminarily loaded with that portion of the second operand code specifying said base datum;
- a plurality of hardware registers connected to said instruction register, one of said hardware registers being preliminarily loaded with that portion of the second operand code specifying said pointer datum;
- a decoder connected to said instruction register and responsive to said operation code for producing a command signal;

pointer reader means connected to said one base register, said one hardware register, and said memory and responsive to said command signal and the codes stored in said one base register and said one hardware register for successively reading said particular pointers out of said particular pointer fields stored in said memory;

pointer loading means connected to said memory and to said one hardware register and responsive to said command signal and to the successively read-out pointers for loading, in place of the code specifying said pointer datum, said one hardware register with codes specifying successively read-out pointers, one at a time;

data reader means connected to said instruction register, said one base register, said one hardware register and said memory and responsive to said command signal, that portion of said second operand code specifying said offset datum and the codes stored in said one base register and said one hardware register for sequentially reading said predetermined ones of data out of said data fields of each of said predetermined ones of a plurality of list components stored in said memory;

- a read register connected to said memory for temporarily storing a sequentially read-out data from said memory;
- a first comparator connected to said instruction register and said read register and responsive to said command signal, said first operand code and the sequentially read-out data temporarily stored in said read register for making a comparison according to one of said conditions.

4,054,946

ELECTRON SOURCE OF A SINGLE CRYSTAL OF LANTHANUM HEXABORIDE EMITTING SURFACE OF (110) CRYSTAL PLANE

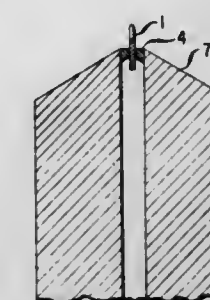
Stephen Duncan Ferris, Warren; David Charles Joy, Summit; Harry John Leamy, New Providence; Louis David Longinotti, South Plainfield, and Paul Herman Schmidt, Chatham, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 28, 1976, Ser. No. 727,466

Int. Cl.² H01J 1/14, 19/06; H01K 1/04

U.S. Cl. 313-346 R

5 Claims



1. An electron emission device comprising a lanthanum hexaboride single crystal characterized in that the emitting surface of said single crystal is defined by a {110} crystal plane.

4,054,947

COMPUTER TO TAPE DECK INTERFACE

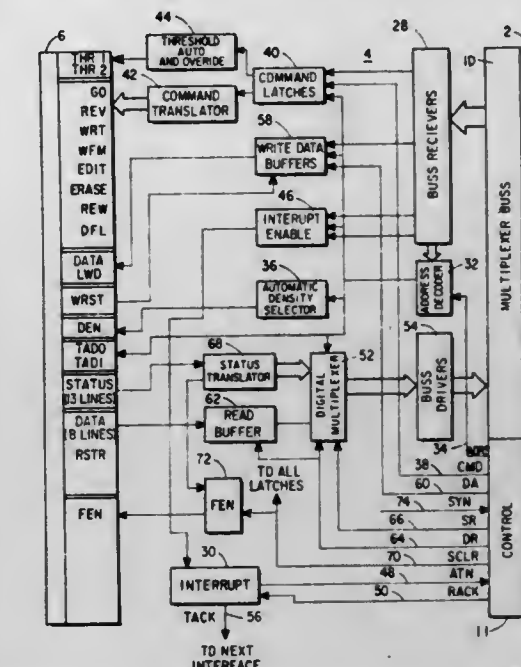
John L. Shanks; Everett L. Cox, both of Tulsa, and John W. Supernaw, Broken Arrow, all of Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed July 14, 1975, Ser. No. 595,960

Int. Cl.² G06F 3/06; G06K 19/08

U.S. Cl. 364-900

2 Claims



1. In an interface for coupling data and control signals from a computer to a formatter which controls a dual density magnetic tape transport and for coupling data and status information from the formatter to the computer, the improvement comprising:

density storage means for storing an indication of magnetic tape data density, said storage means having a output coupled to said transport for controlling data density of read and write operations of said transport in accordance with the stored indication, and having a first input coupled to said computer for receiving density indications for write operations, a second input for receiving a signal causing said storage means to store an indication of a phase encoded format density, and a third input for receiving

DESIGNS

OCTOBER 18, 1977

246,076
SUIT

Socratis Zavitsanos, 1605 W. Farwell, Chicago, Ill. 60626
Filed Jan. 2, 1976, Ser. No. 645,954
Term of patent 14 years
Int. Cl. D2-02

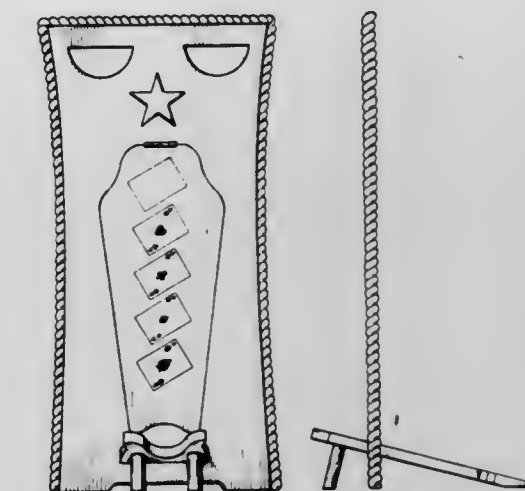
U.S. Cl. D2-62



246,078
BOOT JACK

G. R. Jack Bailey, 1712 E. Tenth, Odessa, Tex. 79761
Filed Dec. 12, 1975, Ser. No. 640,055
Term of patent 14 years
Int. Cl. D7-99

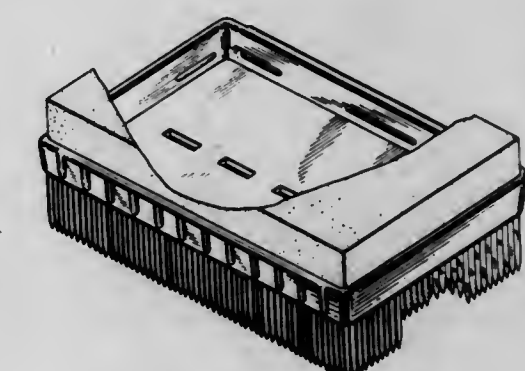
U.S. Cl. D2-378.2



246,079

COMBINED BRUSH AND SPONGE
Jack W. Kaufman, Merrick, N.Y., assignor to Bio-Med Plastics, Inc., Merrick, N.Y.
Filed July 9, 1975, Ser. No. 594,305
Term of patent 14 years
Int. Cl. D4-02

U.S. Cl. D4-17



246,077

HAND PROTECTOR FOR KARATE COMBAT
Pu Gill Gwon, Florissant, Mo., assignor to Pro-Tectors, Inc., St. Louis, Mo.
Filed Nov. 13, 1975, Ser. No. 631,482
Term of patent 14 years
Int. Cl. D2-06

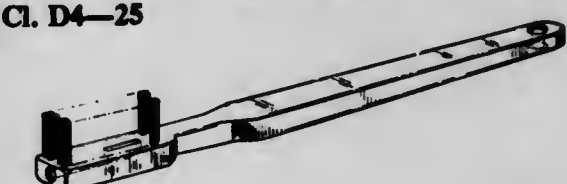
U.S. Cl. D2-361



246,080

TOOTHBRUSH
Theodore Rallis, 59 Railroad Ave., Beacon Falls, Conn. 06403
Filed Jan. 30, 1975, Ser. No. 545,573
Term of patent 14 years
Int. Cl. D4-02

U.S. Cl. D4-25

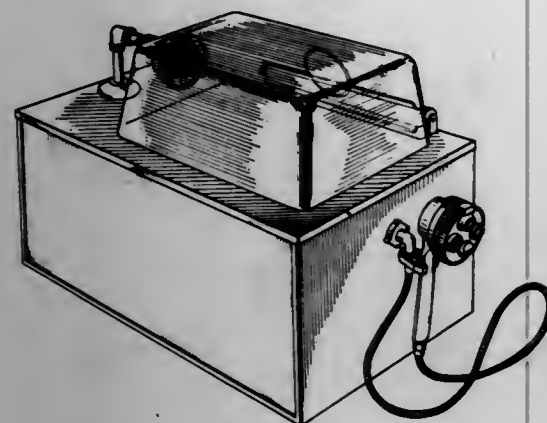


246,081

SHOWERHEAD DISPLAY CABINET

Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc.
 Filed Nov. 26, 1976, Ser. No. 745,341
 Term of patent 14 years
 Int. Cl. D6—99

U.S. Cl. D6—175

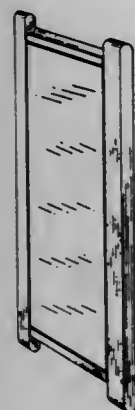


246,082

PANEL OR SIMILAR ARTICLE

Herst Friedrich, Bad Kreuznach, Germany, assignor to Milewski Moebelwerk Zell KG., Zell am Main, Germany
 Filed June 9, 1975, Ser. No. 585,280
 Claims priority, application Germany, Dec. 10, 1974, 671676
 Term of patent 14 years
 Int. Cl. D6—06

U.S. Cl. D6—192

246,083
HANGER

John Anersperg, Merrick, N.Y., assignor to Certified Creations, Inc.

Filed Jan. 3, 1977, Ser. No. 756,052
 Term of patent 14 years
 Int. Cl. D6—08

U.S. Cl. D6—247

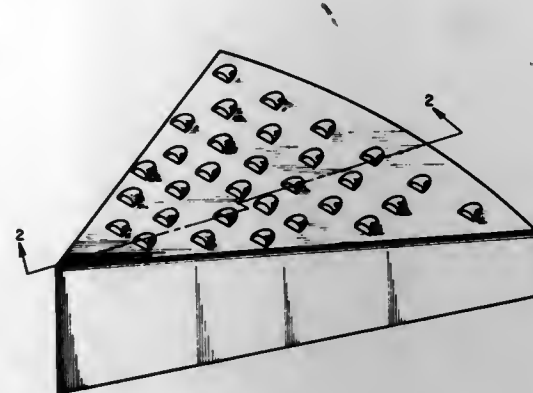


246,084

WEDGE-SHAPED GRATER

Ruth M. Graves, 400 Berthoud St., Sacramento, Calif. 95838
 Filed Nov. 10, 1975, Ser. No. 630,543
 Term of patent 14 years
 Int. Cl. D7—04

U.S. Cl. D7—47

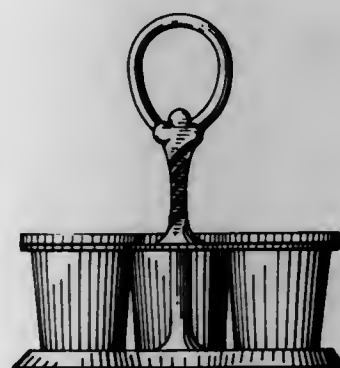


246,085

COMBINED CASTER AND CONDIMENT CONTAINERS

Adeline M. Nicholas, 8746 Bamarica Drive, Elk Grove, Calif. 95624
 Filed June 4, 1975, Ser. No. 583,566
 Term of patent 14 years
 Int. Cl. D7—06

U.S. Cl. D7—58

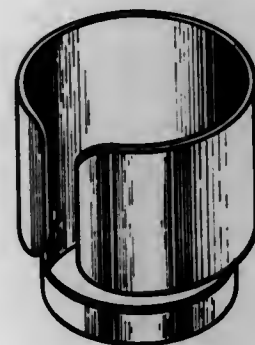


246,086

CONTAINER HOLDER OR SIMILAR ARTICLE

Ruth M. Graves, 400 Berthoud St., Sacramento, Calif. 95838
 Filed Jan. 22, 1975, Ser. No. 542,919
 Term of patent 14 years
 Int. Cl. D7—99

U.S. Cl. D7—70

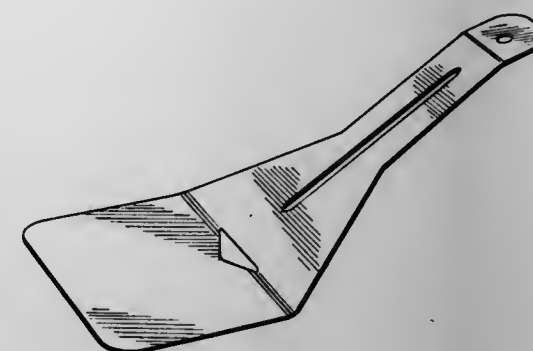


246,087

COMBINED SPATULA AND PEELER

Dana Peterson, 464 B Ave., Coronado, Calif. 92118
 Filed Apr. 5, 1976, Ser. No. 673,939
 Term of patent 14 years
 Int. Cl. D7—02

U.S. Cl. D7—102

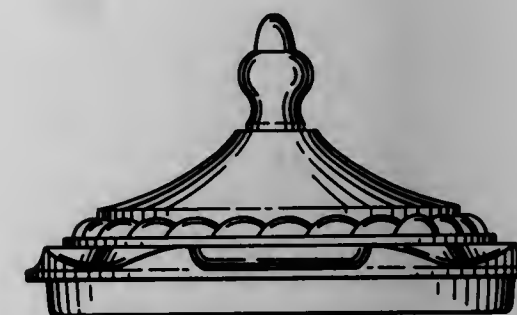


246,088

LID FOR AN APOTHECARY JAR OR THE LIKE

Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
 Filed Dec. 12, 1975, Ser. No. 640,001
 Term of patent 14 years
 Int. Cl. D7—01

U.S. Cl. D7—131



246,089

ARTICLE OF FLATWARE

Adeline M. Nicholas, 8746 Bamarica Drive, Elk Grove, Calif. 95624

Filed June 4, 1975, Ser. No. 583,563
 Term of patent 14 years
 Int. Cl. D7—03

U.S. Cl. D7—150



246,090

TRASH RECEPTACLE

Robert Gault, Corfu, N.Y., assignor to Bennett Manufacturing Company, Inc. (Entire), Alden, N.Y.
 Filed Mar. 25, 1976, Ser. No. 670,343
 Term of patent 14 years
 Int. Cl. D7—05

U.S. Cl. D7—194

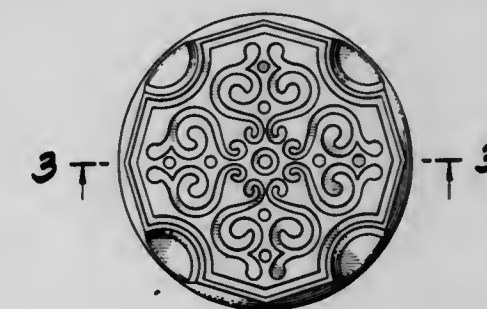


246,091

KNOB FOR DOORS, DRAWERS OR THE LIKE

David F. James, Redondo Beach, Calif., assignor to Norris Industries, Inc., Los Angeles, Calif.
 Filed Mar. 29, 1976, Ser. No. 671,126
 Term of patent 14 years
 Int. Cl. D8—06

U.S. Cl. D8—310



246,092

PULL FOR DOORS, DRAWERS OR THE LIKE

David F. James, Redondo Beach, Calif., assignor to Norris Industries, Inc., Los Angeles, Calif.
 Filed Mar. 29, 1976, Ser. No. 671,123
 Term of patent 14 years
 Int. Cl. D8—06

U.S. Cl. D8—313



246,093

HANDLE FOR DOORS, DRAWERS OR THE LIKE

David F. James, Redondo Beach, Calif., assignor to Norris Industries, Inc., Los Angeles, Calif.

Filed Mar. 29, 1976, Ser. No. 671,124

Term of patent 14 years

Int. Cl. D8—06

U.S. Cl. D8—317



246,095

BUOY FOR CRAB POTS OR THE LIKE

Jack A. Eby, 12510 NE. 9th St., Vancouver, Wash. 98664; Loren R. Eby, 1200 NW. 48th St., Vancouver, Wash. 98663; Eugene F. Andersen, 2000 Washington St., Vancouver, Wash. 98660, and Oscar MacLachlan, Vancouver, Wash., assignors to said Jack A. Eby, Loren R. Eby and Eugene F. Andersen, by said Oscar MacLachlan; part interest to each

Filed Oct. 30, 1975, Ser. No. 627,049

Term of patent 14 years

Int. Cl. D10—06

U.S. Cl. D10—107



246,094

PINCETTE TYPE MULTI-TESTER

Woo Chul Jone, No. 623-1 Ahyun-dong, Mapo, Seoul, and Yong Kuk Jone, No. 26-5 Yukchon-dong, Sahaemooon, Seoul, both of South Korea

Filed Oct. 22, 1975, Ser. No. 624,812

Term of patent 14 years

Int. Cl. D10—04

U.S. Cl. D10—78



246,096

PORTABLE GREENHOUSE

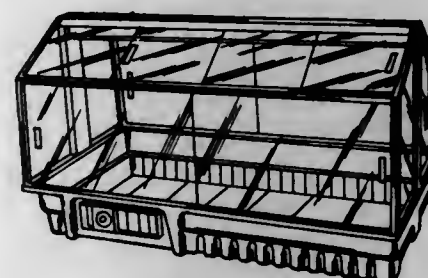
Richard L. Trumley, Charlotte, Mich., assignor to General Aluminum Products, Incorporated, Charlotte, Mich.

Filed Dec. 22, 1975, Ser. No. 643,404

Term of patent 14 years

Int. Cl. D11—02; D30—02; D20—02

U.S. Cl. D11—145



246,097

SPROCKET

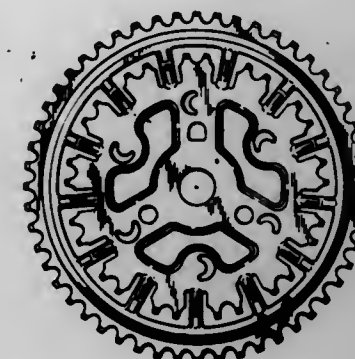
John C. McGregor, Sr., 252 N. Broadmoor Blvd.; Daniel P. McGregor, 1505 N. Lowry Ave., and James B. McGregor, 622 Snowhill Blvd., all of Springfield, Ohio 45504

Filed July 27, 1976, Ser. No. 709,233

Term of patent 14 years

Int. Cl. D12—11

U.S. Cl. D12—123



246,099

REAR VIEW MIRROR

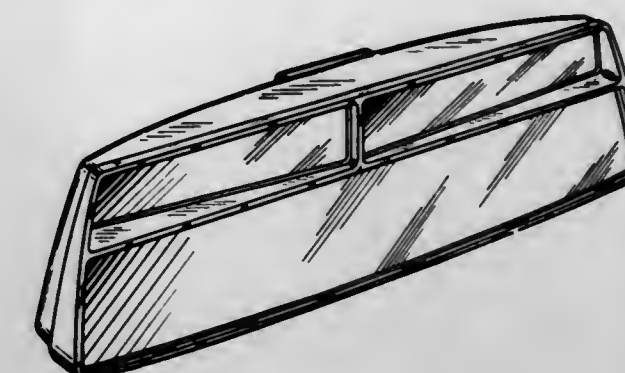
Donald F. Hassinger, 728 Onondaga Ave., Ann Arbor, Mich. 48104

Filed Jan. 24, 1977, Ser. No. 761,630

Term of patent 14 years

Int. Cl. D12—16

U.S. Cl. D12—187



246,100

AUXILIARY SUN VISOR

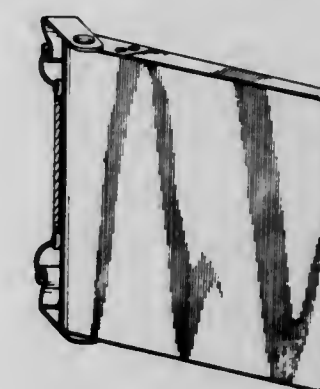
Robert J. Walker, 520 N. Palm, Ontario, Calif. 91763

Filed Aug. 30, 1976, Ser. No. 718,926

Term of patent 14 years

Int. Cl. D12—16

U.S. Cl. D12—191



246,098

MOTOR CYCLE FAIRING

Hans A. Muth, Hechendorf, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Germany

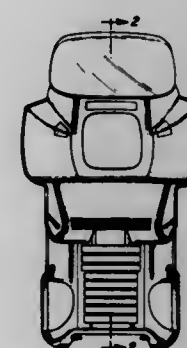
Filed Oct. 20, 1976, Ser. No. 734,308

Claims priority, application Germany, July 5, 1976, 10690

Term of patent 14 years

Int. Cl. D12—11

U.S. Cl. D12—182



246,101

VEHICLE BODY DOOR

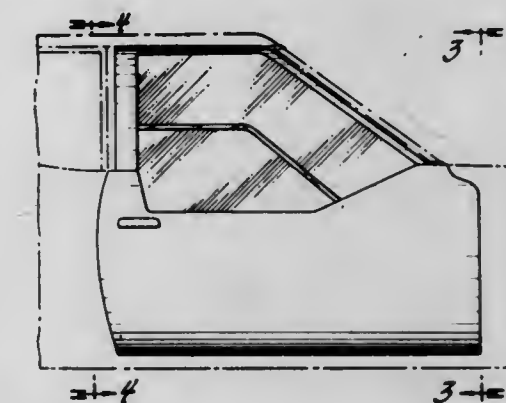
Delbert Duane DeRees, Utica, Mich., assignor to American Motors Corporation, Southfield, Mich.

Filed Apr. 2, 1976, Ser. No. 672,931

Term of patent 14 years

Int. Cl. D12—16

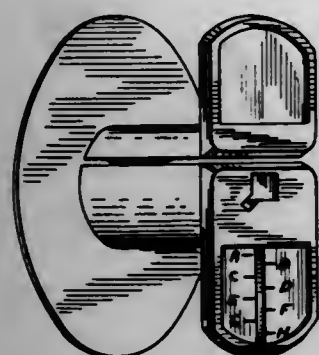
U.S. Cl. D12—196



246,102
FILM REEL

James G. Balmer, Jr., Bloomfield Hills, Mich., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 28, 1975, Ser. No. 626,391
Term of patent 14 years
Int. Cl. D14—09

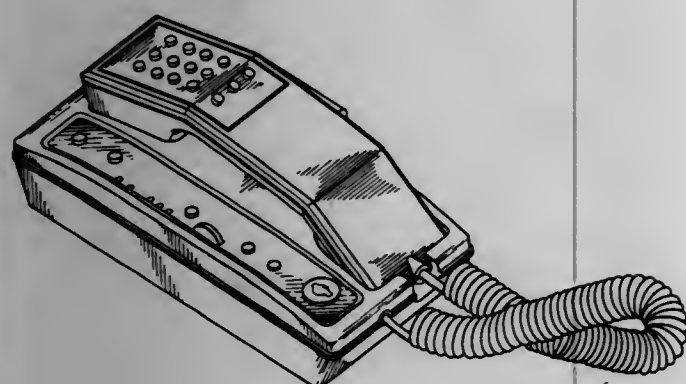
U.S. Cl. D14—11



246,103
VEHICULAR TELEPHONE APPARATUS OR SIMILAR ARTICLE

Terrance Nelson Taylor, Cary, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Division of Ser. No. 713,760, Aug. 12, 1976. This application
Mar. 24, 1977, Ser. No. 780,872
Term of patent 14 years
Int. Cl. D14—03

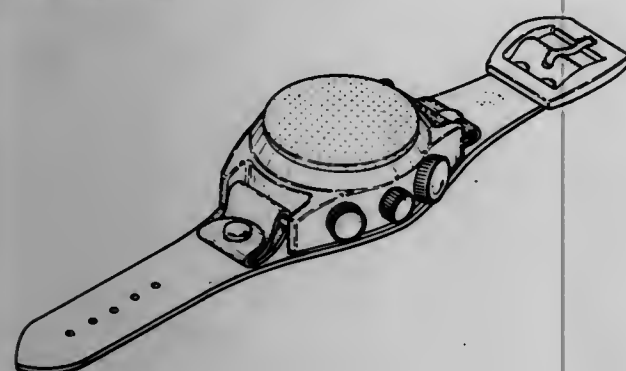
U.S. Cl. D14—53



246,104
COMBINED WRIST RADIO AND STRAP THEREFOR

Hoi Tong Vong, Hong Kong, assignor to Asia International Electronics, Ltd., Hong Kong
Filed Dec. 9, 1975, Ser. No. 639,083
Term of patent 14 years
Int. Cl. D14—03

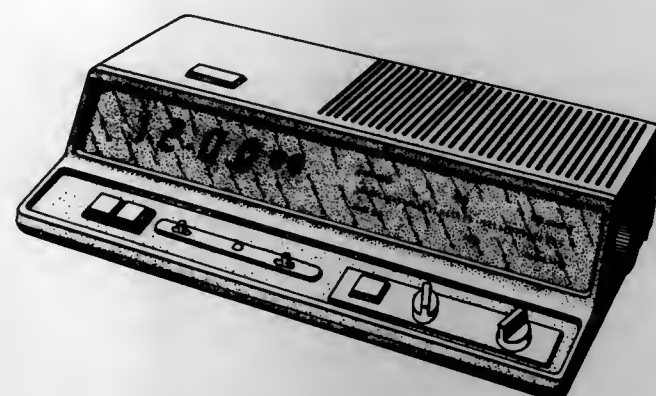
U.S. Cl. D14—70



246,105
DIGITAL CLOCK RADIO

John C. Coons, Cincinnati, Ohio, assignor to Arvin (Hong Kong) Ltd., Kowloon, Hong Kong
Filed Feb. 5, 1976, Ser. No. 655,406
Term of patent 14 years
Int. Cl. D14—03

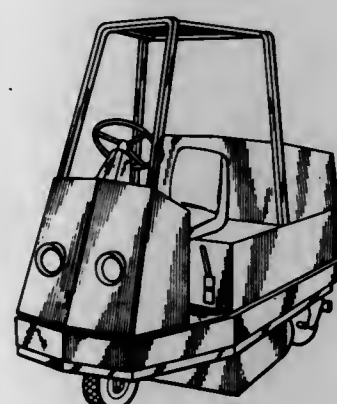
U.S. Cl. D14—73



246,106
SCRUBBER

Charles Russell, Southfield, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.
Filed Mar. 28, 1975, Ser. No. 562,811
Term of patent 14 years
Int. Cl. D15—05; D12—13

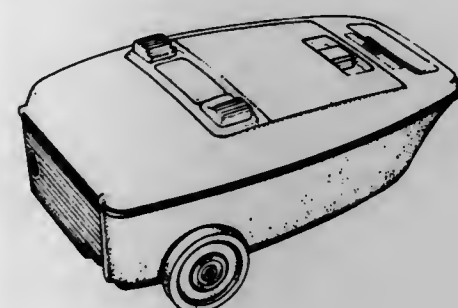
U.S. Cl. D15—48



246,107
VACUUM CLEANER

Toshihiko Yoshida, Suita, and Noriharu Furuyabu, Ashiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Feb. 11, 1976, Ser. No. 657,329
Claims priority, application Japan, Aug. 18, 1975, 50-33766
Term of patent 14 years
Int. Cl. D15—05

U.S. Cl. D15—52

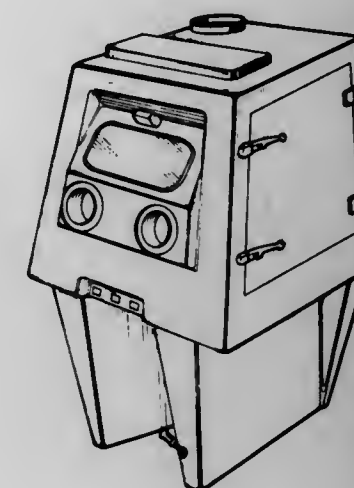


246,108
ABRADING MACHINE CABINET

Stewart Ives Ashworth, Vale, Guernsey (Channel Is.), assignor to Abrasives International Limited
Filed Sept. 18, 1975, Ser. No. 614,549
Claims priority, application United Kingdom, Apr. 26, 1975, 970882

Term of patent 14 years
Int. Cl. D15—09

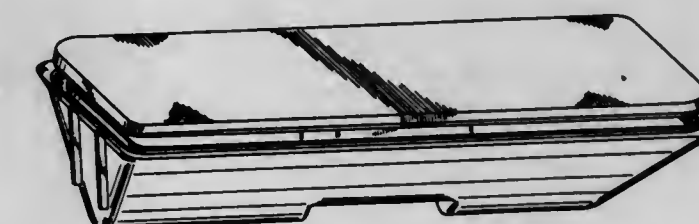
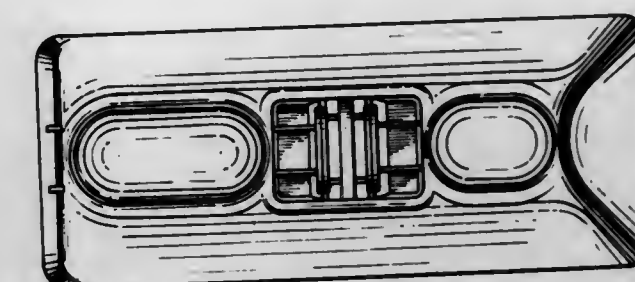
U.S. Cl. D15—124



246,110
DISPENSER FOR AIR TREATING MATERIAL

Frederick B. Hadtke, New Providence, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Oct. 3, 1975, Ser. No. 619,275
Term of patent 14 years
Int. Cl. D23—04

U.S. Cl. D23—150

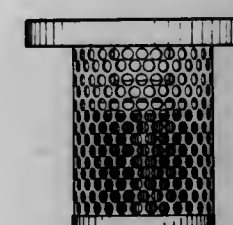
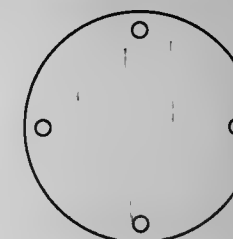


246,109
FLUID FILTER

Nils O. Rossen, 7108 Bridge Way Pebble Creek W., Bloomfield, Mich. 48013

Filed Mar. 23, 1976, Ser. No. 670,429
Term of patent 14 years
Int. Cl. D23—01

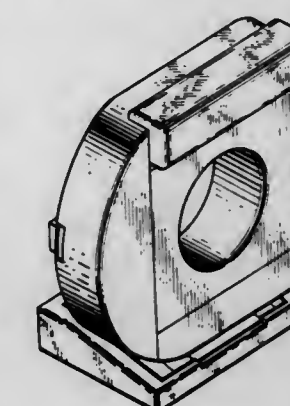
U.S. Cl. D23—4



246,111
AXIAL TOMOGRAPHIC SCANNER HOUSING

John Budd Steinhilber, Mill Valley, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Oct. 20, 1975, Ser. No. 623,831
Term of patent 14 years
Int. Cl. D24—01

U.S. Cl. D24—1.1



246,112
DENTAL PIN WRENCH

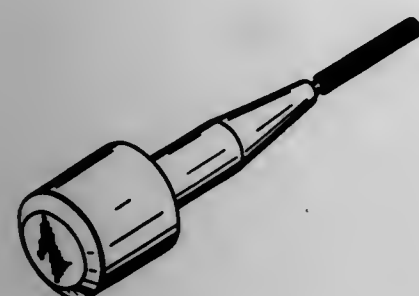
Anthony Joseph Biggs, 9 Westdown, Great Bookham, Surrey, England

Filed Oct. 1, 1976, Ser. No. 728,791

Claims priority, application United Kingdom, Apr. 7, 1976, 975218

Term of patent 14 years
Int. Cl. D24—02

U.S. Cl. D24—10



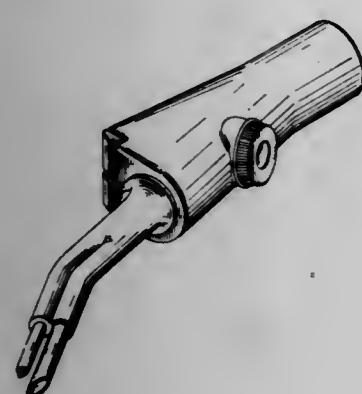
246,113
DENTAL SYRINGE

Danny Michael Truette, Pineville, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.

Filed Nov. 12, 1976, Ser. No. 741,363

Term of patent 14 years
Int. Cl. D24—02

U.S. Cl. D24—14



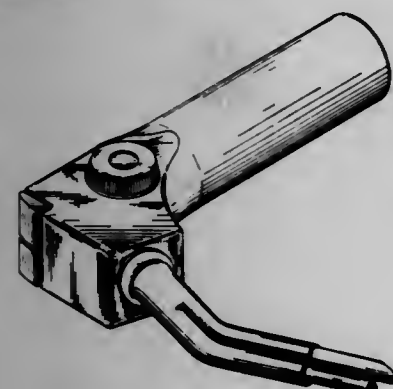
246,114
DENTAL SYRINGE

Danny Michael Truette, Pineville, N.C., assignor to Pelton & Crane Company, Charlotte, N.C.

Filed Nov. 12, 1976, Ser. No. 741,520

Term of patent 14 years
Int. Cl. D24—02

U.S. Cl. D24—14



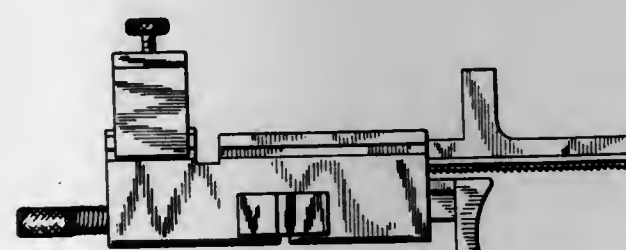
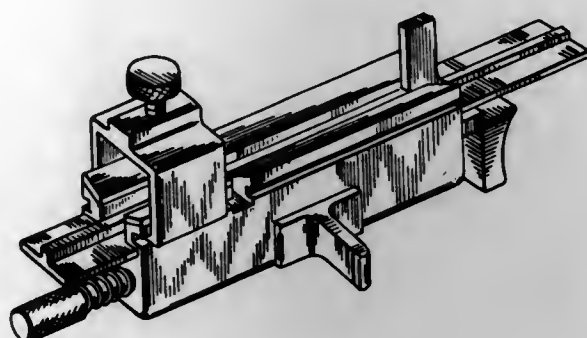
246,115
ACTUATOR FOR A SYRINGE

Paul S. Citrin, Danbury, Conn., assignor to Indicon Inc., Brookfield, Conn.

Filed Mar. 25, 1976, Ser. No. 670,163

Term of patent 14 years
Int. Cl. D24—04

U.S. Cl. D24—25



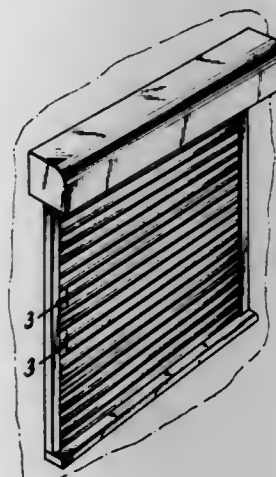
246,116
SHUTTER

Alfred A. Beirle, 49 Laurel Drive, Springfield, N.J. 07081

Filed July 2, 1975, Ser. No. 592,386

Term of patent 14 years
Int. Cl. D25—02

U.S. Cl. D25—49



246,117
PROPHYLACTIC DEVICE

Tadao Okamoto, Tokyo, Japan, assignor to Circle Rubber Corporation, St. Louis, Mo.

Filed July 24, 1975, Ser. No. 598,645

Term of patent 14 years
Int. Cl. D24—04, 99

U.S. Cl. 24—99



246,118
PROPHYLACTIC DEVICE

Tadao Okamoto, Tokyo, Japan, assignor to Circle Rubber Corporation, St. Louis, Mo.

Filed July 24, 1975, Ser. No. 598,646

Term of patent 14 years
Int. Cl. D24—04, 99

U.S. Cl. D24—99



246,119
PROPHYLACTIC DEVICE

Tadao Okamoto, Tokyo, Japan, assignor to Circle Rubber Corporation, St. Louis, Mo.

Filed July 24, 1975, Ser. No. 598,686

Term of patent 14 years
Int. Cl. D24—04, 99

U.S. Cl. D24—99



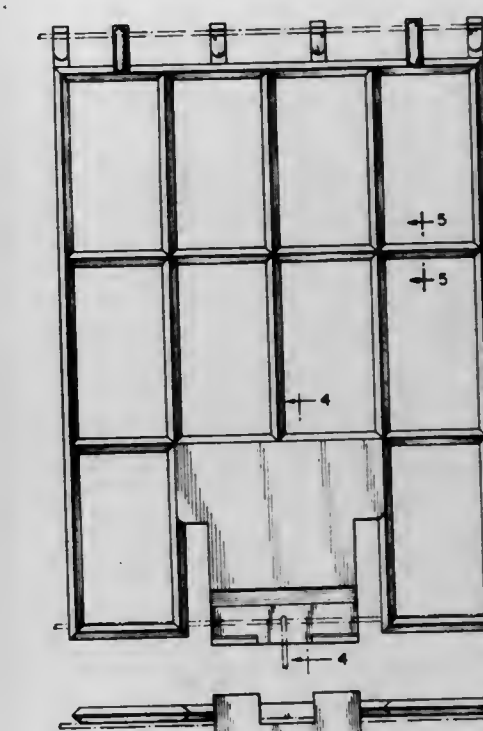
246,120
LATCHING POULTRY CAGE GATE

Donald L. DeMyer, Cycle Systems Inc. 9290 Belding Road NE., Rockford, Mich. 49341

Filed June 10, 1976, Ser. No. 694,567

Term of patent 14 years
Int. Cl. D30—02

U.S. Cl. D30—2



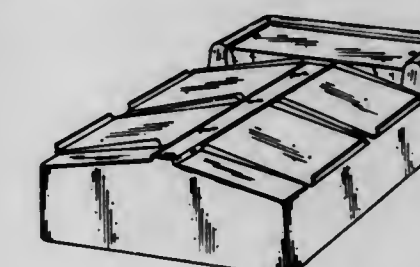
246,121
LIVESTOCK WATERER

Bueal F. Hedstrom, Rte. 3, Denison, Iowa 51442

Filed July 6, 1976, Ser. No. 702,516

Term of patent 14 years
Int. Cl. D30—03

U.S. Cl. D30—13

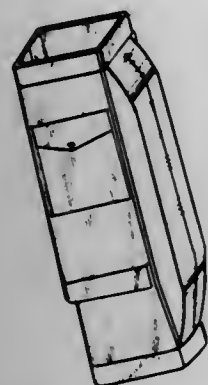


246,122

GOLF CLUB CARRYING CASE WRAPPER

John L. Findeisen, 11026 S. Ave. L, Chicago, Ill. 60617
Continuation-in-part of Ser. No. 405,931, Oct. 12, 1973, Pat. No. Des. 238,086. This application Dec. 10, 1975, Ser. No. 639,392
Term of patent 14 years
Int. Cl. D21-02

U.S. Cl. D34-5 GB



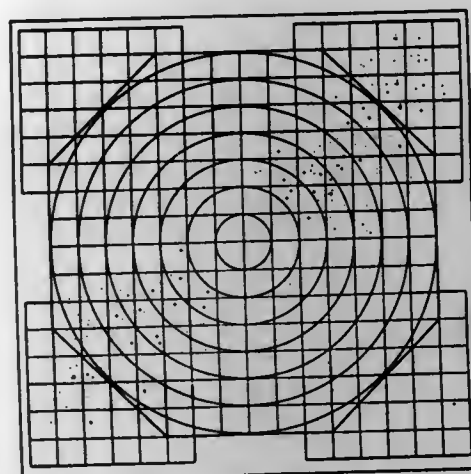
246,124

BOARD FOR PLAYING A GAME

Clifford John Forward, Singapore, assignor to Origineering Enterprises Pte. Ltd., Singapore
Filed Nov. 5, 1975, Ser. No. 629,151
Claims priority, application United Kingdom, May 12, 1975, 971045/75

Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-5 SS

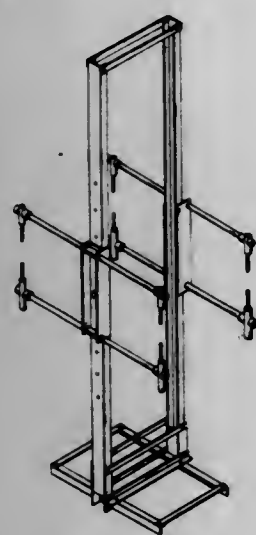


246,123

BATTING PRACTICE APPARATUS

Tommy Denzel Scoggins, 1086 Gant Road, Graham, N.C. 27253
Filed Jan. 19, 1976, Ser. No. 650,013
Term of patent 14 years
Int. Cl. D21-02

U.S. Cl. D34-5 R



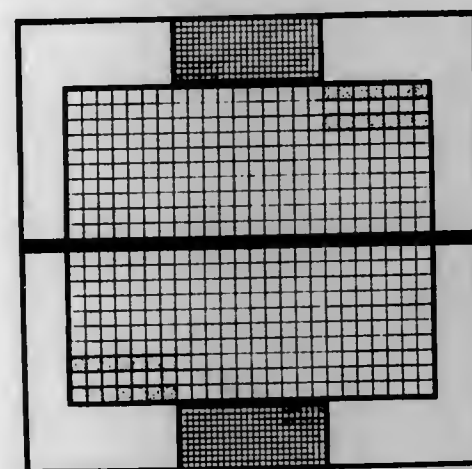
246,125

BOARD FOR PLAYING A GAME

Clifford John Forward, Singapore, assignor to Origineering Enterprises Pte. Ltd., Singapore
Filed Nov. 5, 1975, Ser. No. 629,189
Claims priority, application United Kingdom, May 12, 1975, 971044/75

Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-5 SS

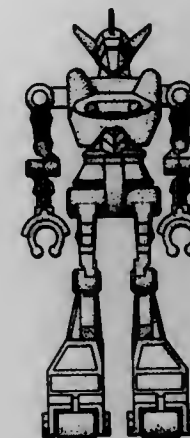


246,126

ARTICULATED TOY FIGURE

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 25, 1976, Ser. No. 689,950
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-15 AD

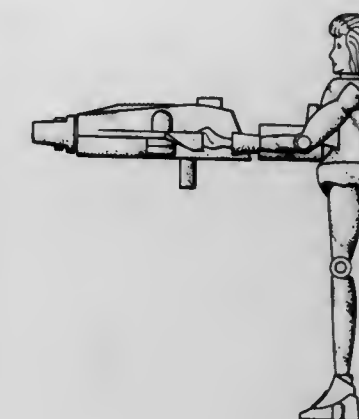


246,128

ARTICULATED TOY FIGURE WITH ROCKET GUN

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed June 15, 1976, Ser. No. 696,111
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-15 AD



246,127

ARTICULATED TOY FIGURE

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 25, 1976, Ser. No. 689,951
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-15 AD

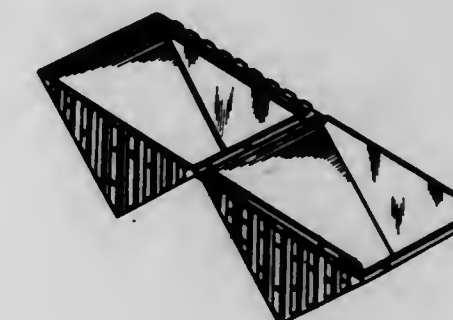


246,129

HOLLOW BUILDING BLOCK OR THE LIKE

Rueben B. Klammer, Los Angeles, Calif., assignor to Dart Industries Inc., Los Angeles, Calif.
Continuation of Ser. No. 170,415, Aug. 9, 1971. This application Jan. 27, 1975, Ser. No. 544,083
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-15 FF



246,130

TETHER BALL GAME APPARATUS

Jeffrey M. Koblick, New Brighton, Minn., assignor to K-tel International, Inc.

Filed Dec. 9, 1974, Ser. No. 531,151

Term of patent 14 years

Int. Cl. D21-01

U.S. Cl. D34-15 P



246,131

DOUBLE LAMP

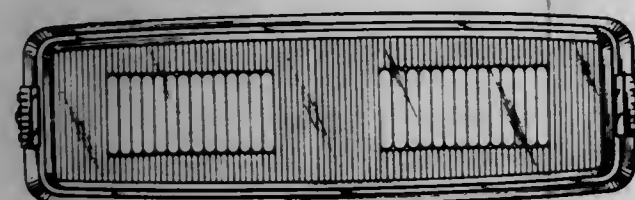
Arthur Schiffrin, 1302 Club Drive, Hewlett Harbor, Long Island, N.Y. 11557

Filed May 7, 1976, Ser. No. 684,379

Term of patent 14 years

Int. Cl. D26-06

U.S. Cl. D48-32 R



246,132

VENDING MACHINE PANEL

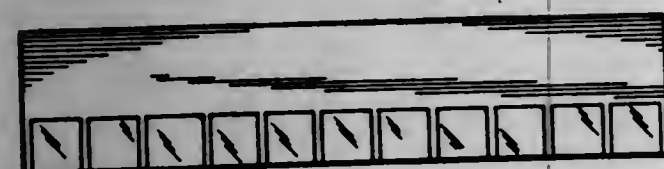
Joseph N. Abraham, Jr., 4330 Groveland Road, University Heights, Ohio 44118, and Frederick S. Farkas, 32700 White Road, Willoughby Hills, Ohio 44092

Filed Apr. 29, 1976, Ser. No. 681,388

Term of patent 14 years

Int. Cl. D20-01

U.S. Cl. D52-3 R



246,133

VENDING MACHINE PANEL

Joseph N. Abraham, Jr., 4330 Groveland Road, University Heights, Ohio 44118, and Frederick S. Farkas, 32700 White Road, Willoughby Hills, Ohio 44092

Filed Apr. 29, 1976, Ser. No. 681,389

Term of patent 14 years

Int. Cl. D20-01

U.S. Cl. D52-3 R



246,134

VENDING MACHINE PANEL

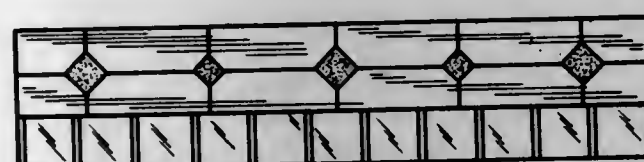
Joseph N. Abraham, Jr., 4330 Groveland Road, University Heights, Ohio 44118, and Frederick S. Farkas, 32700 White Road, Willoughby Hills, Ohio 44092

Filed Apr. 29, 1976, Ser. No. 681,392

Term of patent 14 years

Int. Cl. D20-01

U.S. Cl. D52-3 R



246,135

VENDING MACHINE PANEL

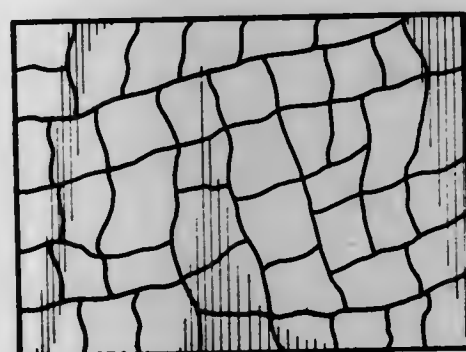
Joseph N. Abraham, Jr., 4330 Groveland Road, University Heights, Ohio 44118, and Frederick S. Farkas, 32700 White Road, Willoughby Hills, Ohio 44092

Filed Apr. 29, 1976, Ser. No. 681,402

Term of patent 14 years

Int. Cl. D20-01

U.S. Cl. D52-3 R



246,136

VENDING MACHINE PANEL

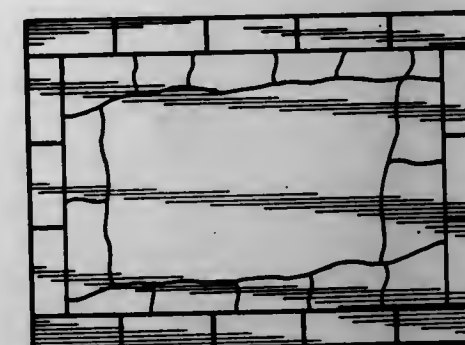
Joseph N. Abraham, Jr., 4330 Groveland Road, University Heights, Ohio 44118, and Frederick S. Farkas, 32700 White Road, Willoughby Hills, Ohio 44092

Filed Apr. 29, 1976, Ser. No. 681,403

Term of patent 14 years

Int. Cl. D20-01

U.S. Cl. D52-3 R



246,137

PORTABLE CREDIT CARD IMPRINTER

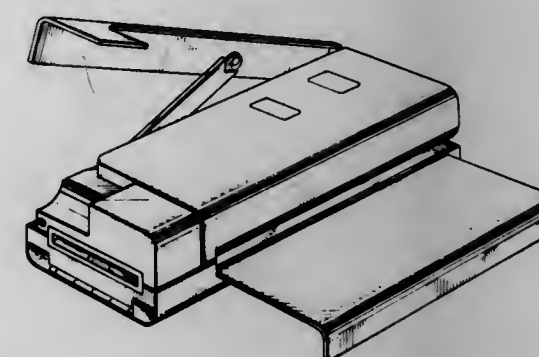
Volker Bartlmae, Ulm, Germany, assignor to Autelca AG, Gumligen, Switzerland

Filed Mar. 9, 1976, Ser. No. 665,306

Term of patent 14 years

Int. Cl. D18-02

U.S. Cl. D64-11 B



246,138

CARRYING CASE FOR AN ARCHER'S BOW OR THE LIKE

S. Norman Christensen, 135 Siesta Ave., and LeRoy J. Bryant, 1406 Calle DeOro, both of Thousand Oaks, Calif. 91360

Filed Oct. 20, 1975, Ser. No. 624,770

Term of patent 14 years

Int. Cl. D3-02

U.S. Cl. D87-1 R



246,139

TACKLE BOX

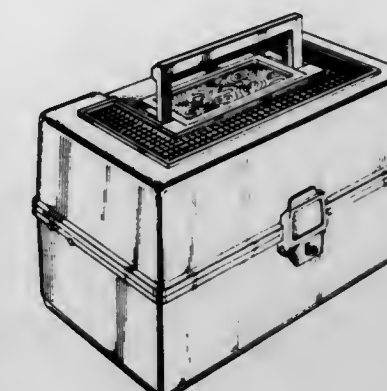
Harper Landell, Fort Washington, and Anthony J. Souza, Lancaster, both of Pa., assignors to Woodstream Corporation, Lititz, Pa.

Filed Feb. 3, 1976, Ser. No. 654,777

Term of patent 14 years

Int. Cl. D22-05

U.S. Cl. D87-1 R



246,140

CARRYING CASE FOR TOOLS AND ACCESSORIES

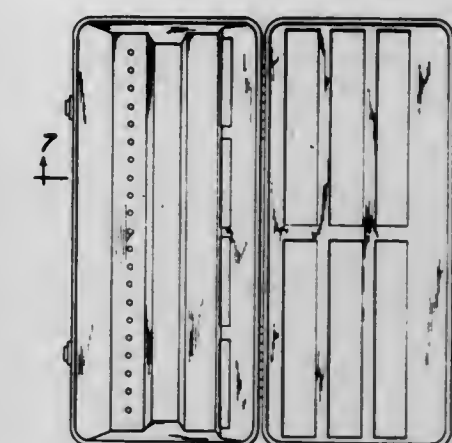
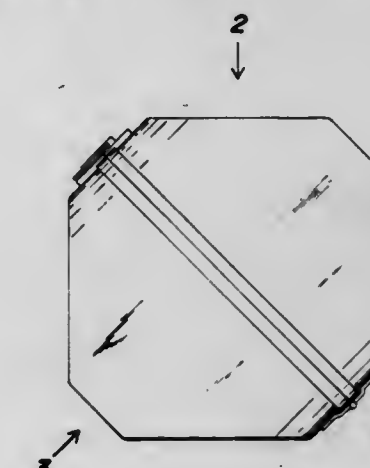
Logan W. Johnson, Hopkins, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.

Filed Feb. 6, 1976, Ser. No. 655,832

Term of patent 14 years

Int. Cl. D3-02

U.S. Cl. D87-1 R



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TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF OCTOBER, 1977

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- A-Z International Tool Company: See—
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- American Optical Corporation: See—
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- Brown, Trenton L., to Aluminum Company of America. Machining method. 4,054,081, Cl. 90-11.00C.
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- Chambers, Charles W., Jr., to Lorain Products Corporation. Tip automatic number identification circuit. 4,054,942, Cl. 179-17.00A.
- Chapman, George. Bathtub caddy. 4,053,954, Cl. 4-185.0AB.
- Chemburkar, Pramod B.: See—
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- Chervenak, Michael C.; and Johanson, Edwin S., to Hydrocarbon Research, Inc. Catalytic hydrogenation of blended coal and residual oil feeds. 4,054,504, Cl. 208-10.000.
- Chesley, Ronald F.: See—
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- Chever, Rene, to Fives-Cail Babcock. Apparatus for removing bulk material from a storage bed. 4,054,213, Cl. 214-10.000.
- Chew, Robert L.: See—
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- Chladek, Otokar: See—
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- Choate, Paul V.; and Papoulias, Thomas, to Norris Industries, Inc. Apparatus having a variable stroke reciprocating member and means responsive to a predetermined stroke to control a circuit. 4,054,087, Cl. 100-53.000.
- Chou, Wayne W.; and Erett, Richard, to Tel-E-Tel, Inc. Communication system for the transmission of closed circuit television over an ordinary pair of wires. 4,054,910, Cl. 358-86.000.
- Christensen, Glenn E.: See—
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- Chromalloy-Alcon, Inc.: See—
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- Chrysler Corporation: See—
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- Chumbley, Sandy Lee: See—
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- Ciba-Geigy AG: See—
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- Ciba-Geigy Corporation: See—
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- Bohner, Beat; Dawes, Dag; and Meyer, Willy, 4,054,575, Cl. 260-308.00R.
- Dear, Robert Ernest Arthur; and Falk, Robert Allan, 4,054,592, Cl. 560-25.000.
- Garner, Robert; and Petitpierre, Jean Claude, 4,054,718, Cl. 428-454.000.
- Huebner, Charles Ferdinand, 4,054,570, Cl. 260-293.800.
- Topfl, Rosemarie, 4,054,716, Cl. 428-413.000.
- Ciliberti, Frank L.: See—
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- Ciuci, Richard W. Foldable sand trap smoother. 4,054,313, Cl. 294-53.500.
- Claiborne, Jefferson Lyle, to Dixie Yarns, Inc. Sewing thread containing a flame retardant lubricant. 4,054,715, Cl. 428-375.000.
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- Clark, Donald W.; and Huestis, Allan C., to Midrex Corporation. Method for controlling the carbon content of directly reduced iron. 4,054,444, Cl. 75-35.000.
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- Clemens, James A.; Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. Method of inhibiting prolactin. 4,054,660, Cl. 424-261.000.
- Cloviss, James S.; and Sullivan, Francis R., to Rohm and Haas Company. Process for preparing nine-member ring phosphonates. 4,054,618, Cl. 260-968.000.
- Coal Industry (Patents) Ltd: See—
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- Cobra Metals Limited: See—
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- Cochran, Veronica: See—
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- Eastman Kodak Company: See—
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Cawley, John Duval, 4,054,233, Cl. 222-107.000.
Gerrish, Keith Gale, 4,054,850, Cl. 333-24.00R.
- Eaton Corporation: See—
Streeter, Kenneth R., 4,054,193, Cl. 192-58.00A.
- Eberle, Marcel K.; and Manning, Robert E., to Sandoz, Inc. 2-Amino-5-(trifluoromethylphenylalkyl)-1,3,4-thiadiazoles used in the treatment of insomnia and anxiety. 4,054,665, Cl. 424-270.000.
- Eckels, Robert E. Solar heating window cover. 4,054,125, Cl. 124-270.000.
- Eda, Yasuko: See—
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- Edging, Thomas E.: See—
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- Edwards, Steven F.; Johnson, James A.; Jordan, William D.; and Prichett, James D., to Thermalloy, Inc. Index mounting unitary heat sink apparatus with apertured base. 4,054,901, Cl. 357-81.000.
- Egger, Richard, to Boeing Company, The. Thermal extensometer. 4,054,049, Cl. 73-16.000.
- Elbe, Werner W., to Blaw-Knox Foundry & Mill Machinery, Inc. Closed loop integrated gauge and crown control for rolling mills. 4,054,043, Cl. 72-8.000.
- Elbe, Werner W., to Blaw-Knox Foundry & Mill Machinery, Inc. Strip detector unit. 4,054,046, Cl. 72-130.000.
- Eisenberg, Arnold J.: See—
Klink, Jerome F.; and Eisenberg, Arnold J., 4,054,249, Cl. 242-18.00G.
- Electricity Council, The: See—
Jackson, William Barry; Gibson, Roger Charles; and Waggott, Ralph, 4,054,770, Cl. 219-10.61R.
Wareing, Joseph Brian; and Hall, Herbert, 4,054,044, Cl. 72-38.000.
- Elektroakustikai Gyar: See—
Balogh, Geza, 4,054,748, Cl. 179-1.00E.
- Elfab Corporation: See—
Ammon, J. Preston, 4,054,939, Cl. 361-414.000.
- Eli Lilly and Company: See—
Beck, James R.; and Yahner, Joseph A., 4,054,603, Cl. 260-551.00S.
Beck, James Richard, 4,054,441, Cl. 71-94.000.
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Blanchard, William B.; and Ryan, Charles W., 4,054,582, Cl. 260-345.300.
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Hamill, Robert L.; Higgins, Calvin E.; and Hoehn, Marvin M., 4,054,564, Cl. 544-21.000.
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O'Doherty, George O. P., 4,054,573, Cl. 260-296.00H.
Soper, Quentin F., 4,054,439, Cl. 71-88.000.
Yang, Kuo S., 4,054,738, Cl. 544-26.000.
- Elitex, Koncern tekstilnih strojarenstvi: See—
Kucera, Jaromir; Novacek, Jindrich; Voda, Gustav; Chladek, Otokar; Kollmann, Jan; and Brada, Pavel, 4,054,041, Cl. 66-50.00A.
- Elliott, Edward Thayer: See—
Meyers, George Leroy; Mueller, David Charles; and Elliott, Edward Thayer, 4,054,241, Cl. 229-32.000.
- Elliott, James O., to General Motors Corporation. Vehicle body support and leveler device. 4,054,295, Cl. 280-6.100.
- Elliott, William S., to Rockwell International Corporation. Channel gain imbalance compensation for FSK demodulator. 4,054,842, Cl. 329-133.000.
- Elomanta, Vaito K., to Polaroid Corporation. Photographic apparatus. 4,054,231, Cl. 222-102.000.
- Elverson, Tord. Tool for moving a long flexible leading wire through hollow passages. 4,054,264, Cl. 254-134.3FT.
- Emerson Electric Co.: See—
Bennetson, Wayne J.; and Krump, Robert C., 4,054,245, Cl. 236-47.000.
- Eng, Jackson: See—
Dugan, John J.; and Eng, Jackson, 4,054,512, Cl. 208-309.000.
- Engelhard Minerals & Chemicals Corporation: See—
Carrubba, Robert V.; Heck, Ronald M.; and Roberts, George W., 4,054,407, Cl. 431-10.000.
- Engineering Dynamics Corporation: See—
Leask, John Wilson, 4,054,800, Cl. 250-505.000.
- English Clays Lovering Pochin & Company Limited: See—
Windle, William, 4,054,513, Cl. 209-214.000.
- Ensink, Gerardus Johannes; and Van Geest, Klaas Burtelle, to Siddons Industries Limited. Caravan. 4,054,011, Cl. 52-66.000.
- Erett, Richard: See—
Chou, Wayne W.; and Erett, Richard, 4,054,910, Cl. 358-86.000.
- Erhard & Leimer KG: See—
Mair, Franz, 4,053,967, Cl. 26-98.000.
- Ermico Enterprises: See—
Solimine, John S., 4,054,297, Cl. 280-87.04A.
- Ermishin, Anatoly Efimovich: See—
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- Ermolina, Nina Ivanovna: See—
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- Ernest Leitz GmbH: See—
Holle, Werner; Bletz, Walter; and Magel, Rolf, 4,054,887, Cl. 354-24.000.
- Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, to SKF Industrial Trading and Development Company B.V. Guide bearing. 4,054,336, Cl. 308-233.000.
- Ervin, Guy, Jr., to Rockwell International Corporation. System for storing and releasing thermal energy. 4,054,126, Cl. 126-271.000.
- Eschler, Hans; and Goldmann, Gerd, to Siemens Aktiengesellschaft. Process and apparatus for high resolution non-mechanical deflection of light beams. 4,054,367, Cl. 350-150.000.
- Eslick, Robert F.; and Goering, Kenneth J., to Research Corporation, The. Method for manufacturing beer. 4,054,671, Cl. 426-16.000.
- Esmond, William G. Bearing unit. 4,054,333, Cl. 308-6.00C.
- Esmond, William G. Countercurrent capillary transfer device. 4,054,527, Cl. 210-321.00B.
- Esquire, Inc.: See—
Slaughter, Robert A., 4,054,790, Cl. 362-264.000.
- Estlund, John P., to Marjac Inc. Puppet operated by both hands. 4,054,006, Cl. 46-154.000.
- Estradier, Françoise: See—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Françoise, 4,054,147, Cl. 132-7.000.
- Etablissements Heurtier et Cie-Societe anonyme: See—
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- Etes, Donald E., to Etes, Donald E. Ostomy appliance. 4,054,140, Cl. 128-283.000.
- Everitt, Delmar K.: See—
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 4,054,287, Cl. 273-101.000.
- Evstjugov-Babaev, Lev Mikhailovich: See—
Zhdanova, Nelli Isaakovna; Evstjugov-Babaev, Lev Mikhailovich; Balitskaya, Roza Mitrofanovna; Sholin, Albert Fedorovich; Kasatkina, Tatyana Borisovna; and Kuznetsova, Natalya Nikolaevna, 4,054,489, Cl. 195-47.000.
- Expert Industrial Controls Ltd.: See—
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- Exxon Research and Engineering Company: See—
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Nelson, Richard L., 4,054,884, Cl. 346-134.000.
Parker, Paul Thomas, 4,054,510, Cl. 208-120.000.
Segura, Marnell A.; Aldridge, Clyde L.; Riley, Kenneth L.; and Pine, Lloyd A., 4,054,644, Cl. 423-655.000.
- Ezoe, Takuji, to Kokusai Cable Ship Co., Ltd. Multi-blade ditching machine. 4,053,998, Cl. 37-98.000.
- Facey, Robert A.; Gravelle, Raynald A.; and Sheffer, Harry, to National Defence of Canada. Thermoluminescent detector for mixed gamma and fast neutron radiations. 4,054,405, Cl. 425-405.00R.
- Falk, Robert Allan: See—
Dear, Robert Ernest Arthur; and Falk, Robert Allan, 4,054,592, Cl. 560-25.000.
- Farquhar, Melville T., to Reynolds Metals Company. Carton and blank for making same. 4,054,203, Cl. 206-45.140.
- Fasbind, Karl. Apparatus for simultaneously packaging a series of elongate bodies. 4,054,021, Cl. 53-236.000.
- Fatovic, John: See—
Calder, George Donald; Duda, John; and Fatovic, John, 4,054,751, Cl. 179-1.50M.
- Federal-Mogul Corporation: See—
Dunn, William M.; and Sarnes, Myron C., 4,054,449, Cl. 75-208.00R.
Ladin, Eli M., 4,054,339, Cl. 308-216.000.
- Fegan, Francis. Motor vehicle metric conversion kit. 4,054,105, Cl. 116-129.00T.
- Fegley, Charles Robert; and Valentino, Frank Joseph, to Western Electric Company, Inc. Electroluminescent display and method of making. 4,054,814, Cl. 315-71.000.
- Feinland, Raymond; Iscovitz, Sigmund; and Bil, Milos S., to Clairol

- Incorporated. Autoxidizable hair dye containing preparations. 4,054,413, Cl. 8-10.200.
- Feist, Wolfgang M.: See—
Picker, Amos; and Feist, Wolfgang M., 4,054,896, Cl. 357-31.000.
- Felauer, Ethel E.; Kulka, Marshall; Von Schmeling, Bogislav; and Davis, Robert A., to Uniroyal, Inc. Furan-3-carboxamide derivatives and method of preparing same. 4,054,585, Cl. 260-347.300.
- Felix, Raymond A., to Stauffer Chemical Company. Certain 4-cyclopropylphenyl geranyl ethers and their use in controlling insects. 4,054,667, Cl. 424-278.000.
- Feltz, Edward J.; and Cunningham, Ross, to Cunningham, John. Chrome removal and recovery. 4,054,517, Cl. 210-45.000.
- Ferrara, Angelo: See—
Ricciardi, Ronald J.; Ferrara, Angelo; and Hartmann, Joseph L., 4,054,784, Cl. 364-479.000.
- Ferris, Stephen Duncan; Joy, David Charles; Leamy, Harry John; Longinotti, Louis David; and Schmidt, Paul Herman, to Bell Telephone Laboratories, Incorporated. Electron source of a single crystal of lanthanum hexaboride emitting surface of (110) crystal plane. 4,054,946, Cl. 313-346.00R.
- Fiberglass Limited: See—
Thomas, John Stuart; and Mason, Allan Frank, 4,054,434, Cl. 65-2.000.
- Fichter, Manfred, to Kienzle Apparate GmbH. Apparatus for forming an erasable record of the value of a measured quantity. 4,054,922, Cl. 360-56.000.
- Fidi, Werner, to AKG Akustische u. Kino-Gerate Gesellschaft m.b.H. Mounting of pickup stylus. 4,054,758, Cl. 179-100.41K.
- Field, George Francis, to Hoffmann-La Roche Inc. Hydroxybiotin. 4,054,740, Cl. 548-303.000.
- Fietz, William A.: See—
Scanlan, Ronald M.; and Fietz, William A., 4,053,976, Cl. 29-599.000.
- Fife, Arnold Leroy: See—
Butler, John Charles; Cahill, Lysle Dwight; Drumm, Ernest Warren; Fife, Arnold Leroy; and Paul, Vincent James, Jr., 4,054,928, Cl. 360-79.000.
- Filper Corporation: See—
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- Filzen, Joseph N.: See—
Dennis, Clay E., Jr.; and Filzen, Joseph N., 4,054,752, Cl. 179-5.00R.
- Firm of Eugen Schaufele, The: See—
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- Firmenich SA: See—
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- Fischer, Ronald H.: See—
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- Fiske, Kenton W.: See—
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- Fives-Cail Babcock: See—
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- Flatland, Lloyd P. Prophylactic angle head for use with a dental hand-piece. 4,053,983, Cl. 32-27.000.
- Fleck, Wolfgang: See—
Petersen, Rudolf Theodor; and Fleck, Wolfgang, 4,054,662, Cl. 424-263.000.
- Fleischman, Andor A., to Bell & Howell Company. Full-focus eyepiece. 4,054,370, Cl. 350-175.00E.
- Fletcher, Maurice; and Wintfield, Lenard, to IDR, Inc. Information retrieval system for providing downstream loading of remote data and processing control thereof. 4,054,911, Cl. 358-141.000.
- Flom, Leonard; and Rodgerson, Kenneth J. Posterior chamber artificial intraocular lens with retaining means and instruments for use therewith adapted to provide extraocular confirmation of operative engagement. 4,053,953, Cl. 3-13.000.
- Floyd, Middleton Brawner, Jr.: See—
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- Fockler, Douglas D.: See—
Hoeman, Terry E.; and Fockler, Douglas D., 4,054,158, Cl. 138-155.000.
- Fogg, Robert K., Jr.; and Staehli, Christopher P., to United States of America, Navy. Stand-aid invalid wheelchair. 4,054,319, Cl. 297-384.000.
- Foley, Charles F. Blow gun with mouthpiece indentations and projectile therefor prevented by indentations from movement therepast. 4,054,120, Cl. 124-62.000.
- Foltz, Donald R., to Hankison Corporation. Method and apparatus for removing carbon monoxide from compressed air. 4,054,428, Cl. 55-33.000.
- Forbro Design Corporation: See—
Nercessian, Sarkis, 4,054,831, Cl. 323-22.00V.
- Ford Motor Company: See—
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- Foster, Alan, to International Computers Limited. Servo system. 4,054,820, Cl. 318-341.000.
- Fould, Alain: See—
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- Foulquier, Henri; and Martin, Philippe, to Commissariat a l'Energie
- Atomique. Device for electronic beam welding of coaxial cylindrical sleeves placed in end-to-end relation. 4,054,771, Cl. 219-121.0EB.
- Fournier, Jacques: See—
Gallay, Maurice; and Fournier, Jacques, 4,054,351, Cl. 339-117.00R.
- Francisco N.V.: See—
van Keulen, Frans, 4,054,016, Cl. 53-64.000.
- Frank, Paul William. Emergency splint assembly. 4,054,130, Cl. 128-87.00R.
- Frank, Willard A., to H. B. Fuller Company. Method for forming hot melt adhesives into a readily packageable form. 4,054,632, Cl. 264-145.000.
- Frazer, John S.: See—
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- Frech, Thomas D. Refuse container assembly. 4,054,225, Cl. 220-63.00R.
- Freeborn, John O.: See—
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- Frenier, Wayne W.; and Settineri, William J., to Dow Chemical Company, The. Certain heterocyclic sulfonium compounds. 4,054,578, Cl. 260-327.00R.
- Fried, Joseph, to University of Chicago. Separation of diastereomers. 4,054,594, Cl. 560-32.000.
- Fried, Krupp Gesellschaft mit beschränkter Haftung: See—
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- Friedrich, Howard R.: See—
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- Friedrich, Richard D.: See—
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- Froberg, Robert W.: See—
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- Fromager, Maurice: See—
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- Fryklund, Linda: See—
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- Fuji Electric Company Ltd.: See—
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- Fuji Fibre Glass Company, Ltd.: See—
Kondo, Masahiro; Takehara, Suguru; Mitsufuji, Tsutomu; Sasaki, Moritosi; and Takura, Tomoji, 4,054,472, Cl. 106-52.000.
- Fuji Photo Film Co., Ltd.: See—
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Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reiichi; Kondo, Tokiharu, deceased; and Kondo, Yoshiharu, legal representative, 4,054,458, Cl. 96-107.000.
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- Fuji Xerox Co., Ltd.: See—
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- Fujibayashi, Toru, to Tokyo Shibaura Denki Kabushiki Kaisha; and Nippon Genshiryoku Jigyo Kabushiki Kaisha. Nuclear fuel rods. 4,054,487, Cl. 176-68.000.
- Fujimori, Toshiaki: See—
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- Fujimoto, Kazumi; and Ikeda, Kishio, to Sony Corporation. Storage receptacle for magnetic tape cassette. 4,054,344, Cl. 312-319.000.
- Fujinami, Akira: See—
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- Fujitsu Ltd.: See—
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Nishioka, Hideya, 4,054,824, Cl. 318-640.000.
- Fukaya, Hirokazu, to Nippon Electric Co., Ltd. Pulse oscillator circuit. 4,054,847, Cl. 331-111.000.
- Fukuda, Masumi, to Fujitsu Ltd. Semiconductor device with high frequency, high power output. 4,054,897, Cl. 357-36.000.
- Fukuoka, Kenji, to Olympus Optical Company Limited. Facsimile scanning conversion system. 4,054,914, Cl. 358-256.000.
- Funahashi, Takaji. Self-inking hand stamp. 4,054,093, Cl. 101-327.000.
- Furgal, Henry P., to Colgate-Palmolive Company. Apparatus and method for conditioning fibrous materials, utilizing and abrasible conditioning agent fastened to the interior of an automatic laundry dryer door. 4,053,992, Cl. 34-60.000.
- Furkert, Herbert, to Davy Powergas GmbH. Process for the manufacture of lactams. 4,054,562, Cl. 260-239.30A.
- Furnas Electric Company: See—
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Sakaguchi, Kahei; Minakata, Masaaki; Takamori, Shigeru; Furukawa, Jun-ichi; and Kono, Yoshinao, 4,054,713, Cl. 428-285.000.

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Gabriel, Edwin Zenith. Techniques for safely unloading externally-lung helicopter loads. 4,054,103, Cl. 114-258.000.

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Gillay, Maurice; and Fournier, Jacques, to Alstom-Savoisienne S.A.; and Delle-Alstom S.A. Connection between a device in a metallic sheath and a transformer. 4,054,351, Cl. 339-117.00R.

Gamage, Linda Pluta: See—
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Garner, Robert; and Petitpierre, Jean Claude, to Ciba-Geigy Corporation. Heat-sensitive recording material containing a malachite green color former. 4,054,718, Cl. 428-454.000.

Garuky, Victor M., to American Home Products Corporation. Cyclic dodecapeptide and intermediates therefor. 4,054,558, Cl. 260-112.50S.

Garth, Bruce Hollis, to Du Pont de Nemours, E. I., and Company. Mannich bases containing tertiary amines and fuel compositions containing said mannich bases. 4,054,422, Cl. 44-73.000.

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Bubniak, William C.; and Mitchell, Harry R., 4,054,621, Cl. 261-46.000.

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Craig, Gale M., 4,054,374, Cl. 350-279.000.

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Mock, Donovan L., 4,054,802, Cl. 307-38.000.

Pedersen, George H., 4,054,030, Cl. 60-262.000.

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Urbaitis, Vincas, 4,054,299, Cl. 280-163.000.

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General Portland, Inc.: See—
Thorn, Ernest B., Jr.; Grube, Charles W.; Rowe, Walter W.; and Schueler, Johann A., 4,054,464, Cl. 106-100.000.

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Gerberich, Harold Robert, Jr., to Celanese Corporation. Production of fatty acids. 4,054,590, Cl. 260-413.000.

Gerrish, Keith Gale, to Eastman Kodak Company. Non-contacting radio frequency power coupler for relative linear motion. 4,054,850, Cl. 333-24.00R.

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Gess, Diane Marlene. Educational device. 4,053,994, Cl. 35-9.00R.

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Giles, Richard F.: See—
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Gill, Lloyd T., to General Motors Corporation. Internal combustion engine. 4,054,108, Cl. 123-55.00R.

Gill, Robert A.; Latimer, Joseph J.; and Jordan, Arthur D., Jr., to Rohm and Haas Company. Mineral paper coating compositions containing latex and amphoteric polymer. 4,054,717, Cl. 428-452.000.

Gilmore, Thomas F.; and Hughey, John E., to Zurn Industries, Inc. Guillotine valve with improved sealing means. 4,054,261, Cl. 251-130.000.

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Terrell, James D.; and Giorgis, Richard O., 4,054,871, Cl. 343-7.700.

Giori, Gualtiero, to De la Rue Giori S.A. Method and apparatus for making wiping cylinder of steel engraving printing press. 4,054,685, Cl. 427-55.000.

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Marx, Arthur Friedrich; and Doodewaard, Jean, 4,054,595, Cl. 560-121.000.

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Globe Machine Manufacturing Company: See—
Steiling, Virgil, 4,054,070, Cl. 83-208.000.

Glocker, Edwin M.: See—
Lundsager, Christian Bent; and Glocker, Edwin M., 4,054,702, Cl. 428-167.000.

Glogolija, Miroslav; and Leuthauser, Charles Brook, to RCA Corporation. Transient and thermal protection. 4,054,845, Cl. 330-207.00P.

Glover, Ellis C. Bottle closure. 4,054,221, Cl. 215-235.000.

Goering, Kenneth J.: See—
Eslick, Robert F.; and Goering, Kenneth J., 4,054,671, Cl. 426-16.000.

Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Toy amusement arcade. 4,054,287, Cl. 273-101.000.

Goldmann, Gerd: See—
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Goldsmith, Henry J., to Catalyst Research Corporation. Isotope heated deferred action thermal batteries. 4,054,724, Cl. 429-5.000.

Goldstein, Seth R., to United States of America, Health, Education and Welfare. Magnetic fluid actuated control valve, relief valve and pump. 4,053,952, Cl. 3-1.100.

Goloff, Alexander: See—
Mangus, Ervin E.; and Goloff, Alexander, 4,054,400, Cl. 418-83.000.

Goncharova, Eleonora Viktorovna: See—
Belitsin, Mikhail Nikolaevich; Borik, Alexandr Gamsheevich; Kudryashova, Galina Akimovna; Kudryashov, Sergei Alexandrovich; Goncharova, Eleonora Viktorovna; Sadkova, Natalia Alexandrovna; Pavlov, Serafim Alexandrovich; Kulikov, Valentin Vladimirovich; Tolpygina, Galina Petrovna; Gotie, Tatyana Nikolaevna; Toropova, Elena Grigorievna; Ermolina, Nina Ivanovna; and Puchnin, Ivan Vasilievich, 4,054,709, Cl. 428-224.000.

Goodman, David Joel; and Steele, Raymond, to Bell Telephone Laboratories, Incorporated. Error detection and correction system. 4,054,863, Cl. 340-146.10R.

Goodren Products Corporation: See—
De Pinna, George, 4,054,001, Cl. 40-126.00A.

Goodrich, Robert S. Bottle-timer assembly. 4,054,026, Cl. 58-1.00R.

Goodyear Tire & Rubber Company, The: See—
Beers, Roger N.; and Conger, Marvin T., 4,054,168, Cl. 152-330.00L.

Gorokhov, Fedor Vasilievich: See—
Redko, Sergei Georgievich; Korolev, Albert Viktorovich; Maxjushin, Anatoly Fedorovich; Kreps, Moisei Solomonovich; and Gorokhov, Fedor Vasilievich, 4,054,009, Cl. 51-3.000.

Gotie, Tatyana Nikolaevna: See—
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Gould, Inc.: See—
Jacobs, Philip C., Jr., 4,054,858, Cl. 337-162.000.

Gould, Lawrence P. Apparatus and methods for sanitizing sewage effluent and compositions for use therein. 4,054,518, Cl. 210-61.000.

Graham Magnetics, Inc.: See—
Deffeyes, Robert J., 4,054,530, Cl. 252-62.540.

Graham, Scott Oliver: See—
Himics, Richard Joseph; Graham, Scott Oliver; and Ross, Daniel Louis, 4,054,454, Cl. 96-67.000.

Gram, Reginald Henry. Guide for hand held power saws. 4,054,077, Cl. 83-745.000.

Grauerholz, Norman LeRoy: See—
Vedova, Ronald; and Grauerholz, Norman LeRoy, 4,054,442, Cl. 75-2.000.

Gravelle, Raynald A.: See—
Facey, Robert A.; Gravelle, Raynald A.; and Sheffer, Harry, 4,054,405, Cl. 425-405.00R.

Grawey, Charles E., to Caterpillar Tractor Co. Rim constructions. 4,054,322, Cl. 301-35.0BJ.

Gribble, Joseph James: See—
Schmer, Robert Wayne; Gribble, Joseph James; Kampf, Julian Carl; and Tucker, James Thomas, 4,054,932, Cl. 361-31.000.

Grier, William R.; Shepard, Francis H., Jr.; and Arledge, Arthur L., to Realty & Industrial Corporation. Proportional spacing and electronic typographic apparatus. 4,054,948, Cl. 364-900.000.

Griffith, Jerry D.: See—
Benjamin, Robert E.; Anglea, James C.; Edging, Thomas E.; Griffith, Jerry D.; Patterson, A. J.; and Webster, Thelton A., 4,054,678, Cl. 426-653.000.

Griffith Laboratories, Inc., The: See—
Melcer, Irving; and Sair, Louis, 4,054,679, Cl. 426-656.000.

Grob, Robert Lee; and Rulon, Peter Wilson, to Villanova University. Gas chromatographic method for the multi-elemental microanalysis of organic materials. 4,054,414, Cl. 23-230.0PC.

Grobin, Allen W., Jr., to International Business Machines Corporation. Lippmann film with reflective layer. 4,054,453, Cl. 96-67.000.

Gross, Otto: See—
Parker, Bernard; Gross, Otto; and Buchler, Joseph, 4,054,151, Cl. 137-110.000.

Grosseau, Albert, to Societe Anonyme Automobiles CITROEN. Transmission mechanism for automobile vehicle. 4,054,181, Cl. 180-77.00R.

Grovesteen, William R.: See—
Le Boeuf, Albert R.; and Grovesteen, William R., 4,054,624, Cl. 264-1.000.

Growth Products, Inc.: See—
Buhler, Allen C., 4,054,670, Cl. 424-358.000.

Gruaz, Eric. Process for manufacturing plastic cartridge cases. 4,054,637, Cl. 264-296.000.

Grube, Charles W.: See—
Thorn, Ernest B., Jr.; Grube, Charles W.; Rowe, Walter W.; and Schueler, Johann A., 4,054,464, Cl. 106-100.000.

Gruber, Gerald W., to PPG Industries, Inc. Pigmented actinic light polymerizable coating compositions containing phenanthrenequinone. 4,054,683, Cl. 427-53.000.

Grunwell, Joyce Francis: See—
Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal; and Petrow, Vladimir, 4,054,651, Cl. 424-239.000.

Gruter, Hans: See—
Linder, Heinz; and Gruter, Hans, 4,054,485, Cl. 159-6.00W.

GTE Automatic Electric (Canada) Limited: See—
Norman, Stanley R. C., 4,054,745, Cl. 178-4.10R.

GTE Automatic Electric Laboratories Incorporated: See—
Lee, David Quon; and McLaughlin, Donald W., 4,054,755, Cl. 179-15.0AT.

Pachynski, Alvin L., Jr., 4,054,747, Cl. 178-69.100.

Zimmerman, Joseph J., 4,054,927, Cl. 360-74.000.

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GTE Sylvania Incorporated: See—
Parent, Edward D., 4,054,500, Cl. 204-181.000.

Wolfe, Robert Wade; and Messier, Russell Francis, 4,054,799, Cl. 250-486.000.

Guangorena, Jesus, to Barient Company. Three speed deck winch. 4,054,266, Cl. 254-150.00R.

Guenther, Heinz-Dieter: See—
Koethmann, Wolfgang; and Guenther, Heinz-Dieter, 4,054,872, Cl. 343-7.700.

Gugger, Robert E.; and Mozersky, Samuel M., to United States of America, Agriculture. Micro mixing apparatus and method. 4,054,270, Cl. 366-143.000.

Guillaume, Andre; and Poy, Guy, to Rhone-Poulenc Industries. Process for the preparation of flexible polyurethane foams. 4,054,545, Cl. 260-2.5AH.

Guinasso, Charles J.: See—
Klauber, Dieter H.; Sellstedt, John H.; and Guinasso, Charles J., 4,054,591, Cl. 260-465.00D.

Sellstedt, John H.; Guinasso, Charles J.; and Begany, Albert J., 4,054,657, Cl. 424-251.000.

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Gurr, Rolf. Cooling device for liquid cooling of thermoplastic extrusions and a calibrating device for thermoplastics extrusions incorporating such a cooling device. 4,054,148, Cl. 134-57.00R.

Gurwicz, David; and Sloan, Albert Everett, to Sevcon Limited. Pulse controllers. 4,054,817, Cl. 318-82.000.

Gute, Loren R., to General Motors Corporation. Energy absorber with internal pressure relief valve. 4,054,311, Cl. 293-70.000.

Guthoffnungshutte Sterkrade Aktiengesellschaft: See—
Hogner, Winfried, 4,054,274, Cl. 266-80.000.

Guyton, Glen B. Check valve. 4,054,153, Cl. 137-527.000.

Gyllenspetz, Jeffrey; and Renton, Stanley, to Albright & Wilson Ltd. Compositions for use in chromium plating. 4,054,494, Cl. 204-43.00T.

H. B. Fuller Company: See—
Franke, Willard A., 4,054,632, Cl. 264-145.000.

Hagenbach, Germain: See—
Valentin, Patrick; Hagenbach, Germain; Duran, Jean-Louis; and Fromager, Maurice, 4,054,430, Cl. 55-67.000.

Hagerman, Kenneth C., to Reynolds Metals Company. Rotary metal extrusion apparatus. 4,054,048, Cl. 72-262.000.

Hahn, Alvin J., to R. R. Donnelley & Sons Company. Plastic sheet with a surface treated to enhance adhesion and method of making such sheets. 4,054,701, Cl. 428-156.000.

Hahn & Clay: See—
Pechacek, Raymond E., 4,053,971, Cl. 29-252.000.

Pechacek, Raymond E., 4,054,224, Cl. 220-5.00A.

Hahn, Siegfried: See—
Bruning, Klaus; Sturm, Karl-Gunter; and Hahn, Siegfried, 4,054,681, Cl. 427-27.000.

Haigh, Daniel H.: See—
Hall, Richard H.; Haigh, Daniel H.; Lamson, Junior J.; and Yats, Larry D., 4,054,733, Cl. 526-293.000.

Hall, Fred V.: See—
Walker, Brooks; and Hall, Fred V., 4,054,110, Cl. 123-117.00A.

Hall, Herbert: See—
Wareing, Joseph Brian; and Hall, Herbert, 4,054,044, Cl. 72-38.000.

Hall, Richard H.; Haigh, Daniel H.; Lamson, Junior J.; and Yats, Larry D., to Dow Chemical Company. The Ar-halo-ar(alkyl)styrenes polymers. 4,054,733, Cl. 526-293.000.

Haller, Kurt H., to Babcock & Wilcox Company, The. Method of inhibiting deposition of internal corrosion products in tubes. 4,054,174, Cl. 165-1.000.

Halling, Horace P.: See—
Sadoff, Bernard J., Jr.; and Halling, Horace P., 4,054,306, Cl. 285-233.000.

Halstead, Raymond T.: See—
Raab, Andrew F.; and Halstead, Raymond T., 4,054,761, Cl. 200-16.00C.

Ham, William Edward, to RCA Corporation. Silicon-on-sapphire mesa transistor having doped edges. 4,054,895, Cl. 357-23.000.

Hamada, Osamu, to Sony Corporation. Amplifier with modulated power supply voltage. 4,054,843, Cl. 330-263.000.

Hamer, Merlin L., to Scheu, Louis O., Jr.; Kniss, Alvin C.; and Kleinert, Kurt & Lister, part interest to each. Auxiliary operating table for hand surgery and the like. 4,054,282, Cl. 269-328.000.

Hamill, Robert L.; Higgins, Calvin E.; and Hoehn, Marvin M., to Eli Lilly and Company. 7-(5-Amino-5-carboxyvaleramide)-7-methoxycephalosporanic acid. 4,054,564, Cl. 544-21.000.

Hamlin, Thomas J.: See—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,054,285, Cl. 271-186.000.

Hammann, Ingeborg: See—
Lorenz, Walter, deceased; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,054,650, Cl. 424-211.000.

Hamrah, Joseph J. Carpet binding tape. 4,054,698, Cl. 428-40.000.

Hancke, Gustav: See—
Berndt, Wolfgang; Wittkugel, Heinz; Wochnowski, Waldemar; and Hancke, Gustav, 4,054,145, Cl. 131-138.000.

Hanke, Leopold; Hoffmann, Guenther; and Schmeltz, Helmut, to Siemens Aktiengesellschaft. Ceramic dielectric material. 4,054,532, Cl. 252-63.500.

Hankison Corporation: See—
Foltz, Donald R., 4,054,428, Cl. 55-33.000.

Hanon, David O.: See—
Henderson, James G.; and Hanon, David O., 4,054,251, Cl. 242-57.100.

Hansberg, Julius. Device for the production of castings. 4,054,172, Cl. 164-168.000.

- Hansen, Albert L.: See—
Hansen, Jap F.; and Hansen, Albert L., 4,054,119, Cl. 124-24.00R.
Hansen, Jap F.; and Hansen, Albert L. Archery bow with adjustable arrow rest. 4,054,119, Cl. 124-24.00R.
Hara, Yoshiaki; Waki, Yasuo; Minai, Yasuo; and Nakamura, Katumi, to Yokohama Rubber Co., Ltd., The Method and apparatus for fabricating non-vulcanized pneumatic rubber fenders. 4,054,476, Cl. 156-191.000.
Hardesty, Edwin Charles, to Western Electric Company, Inc. Modular plug for terminating cord having non-planar array of conductors. 4,054,350, Cl. 339-99.00R.
Hardison, William G.: See—
Miller, Steven T.; and Hardison, William G., 4,054,418, Cl. 23-277.00C.
Hardt, Dietrich; Humme, Gert; Ott, Karl-Heinz; and Braese, Hans-Eberhard, to Bayer Aktiengesellschaft. High impact ternary blend PVC moulding compositions. 4,054,615, Cl. 260-876.00R.
Hardy, Paul W.: See—
Bulocca, Alfred E.; and Hardy, Paul W., 4,054,228, Cl. 220-268.000.
Harich, Franz P.: See—
Harich, Jakob; and Harich, Franz P., 4,054,647, Cl. 424-45.000.
Harich, Jakob; and Harich, Franz P., to Rush-Hampton, Inc. Method and composition for removing undesirable odors from air. 4,054,647, Cl. 424-45.000.
Harrel, Jack D., to Landis Tool Company. Regulated power supply. 4,054,830, Cl. 323-8.000.
Harris, Frank W.: See—
Taylor, Paul J.; and Harris, Frank W., 4,054,432, Cl. 55-386.000.
Hart, Louis I., Jr.; Schmidt-Collerus, Josef J.; and Burroughs, Larry R., to Western Oil Sands Ltd. Method of removing bitumen from tar sand for subsequent recovery of the bitumen. 4,054,505, Cl. 208-11.0LE.
Hart, Louis I., Jr.; Schmidt-Collerus, Josef J.; and Burroughs, Larry R., to Western Oil Sands Ltd. Method of removing bitumen from tar sand utilizing ultrasonic energy and stirring. 4,054,506, Cl. 208-11.0LE.
Hartmann, Joseph L.: See—
Ricciardi, Ronald J.; Ferrara, Angelo; and Hartmann, Joseph L., 4,054,784, Cl. 364-479.000.
Harwood, Leopold Albert; and Wittmann, Erwin Johann, to RCA Corporation. Automatic chrominance gain control system. 4,054,905, Cl. 358-27.000.
Haschke, Heinz; Schreyer, Gerd; Schwarze, Werner; and Suchsland, Helmut, to Deutsche Gold- und Silber-Scheideanstalt Vormal's Roessler. Process for the substitution of chlorine atoms of cyanuric chloride. 4,054,739, Cl. 544-208.000.
Haseleton, Frederick R. Submarine well drilling and geological exploration station. 4,054,104, Cl. 114-264.000.
Haskell, Donald M.; Hopper, Edward E.; and Munro, Bradley L., to Phillips Petroleum Company. Butadiene production and purification. 4,054,613, Cl. 260-680.00R.
Hausi-Werke Korber & Co., KG: See—
Bernadt, Wolfgang; Wittkugel, Heinz; Wochnowski, Waldemar; and Hancke, Gustav, 4,054,145, Cl. 131-138.000.
Hauer, Raimund: See—
Kittag, Gerd, 4,054,920, Cl. 360-3.000.
Hauemont, Jean-Claude Henri, to Societe Anonyme dite: Etude et Realisation de Chaines Automatiques ERCA. Stepwise drive mechanism. 4,054,202, Cl. 198-805.000.
Hawes, Roland C. Sample-background-signal autocancellation in fluid-sample analyzers, using symmetrical time-delay or time-averaging. 4,054,384, Cl. 356-51.000.
Hawkins, Joseph Charles: See—
Towner, Frank Richard; and Hawkins, Joseph Charles, 4,054,925, Cl. 360-71.000.
Hayashi, Masaki; and Ishihara, Atsunobu, to Ono Pharmaceutical Co., Ltd. Clathrate compounds of prostaglandins or their analogues with cyclodextrin. 4,054,736, Cl. 536-103.000.
Hayashi, Takao: See—
Shimizu, Akihiko; and Hayashi, Takao, 4,054,547, Cl. 260-29.7SQ.
Haybuster Manufacturing, Inc.: See—
Neukom, Chester G., 4,054,018, Cl. 53-124.00B.
Haynes, Paul Jeffries, to Haynes, Paul Jeffries. Device for automatic program selection on prerecorded magnetic tape. 4,054,926, Cl. 360-72.000.
Headway Research, Inc.: See—
Shipman, Vern D., 4,054,010, Cl. 51-55.000.
Hegerty, William Frederick; and Dillon, Luke, Jr., to RCA Corporation. Edgeless transistor. 4,054,894, Cl. 357-23.000.
Heck, Ronald M.: See—
Carrubba, Robert V.; Heck, Ronald M.; and Roberts, George W., 4,054,407, Cl. 431-10.000.
Heffner, George, to Rohr Industries, Inc. Mechanism for assembling multi-strate panel with plastic keys. 4,054,481, Cl. 156-389.000.
Heimbach, Paul: See—
Wilke, Gunther; and Heimbach, Paul, 4,054,610, Cl. 260-618.00R.
Hennaff, Jeannine Le Goff; Laine, Gilbert; and Carel, Michel France. Differential demodulators using surface elastic wave devices. 4,054,841, Cl. 329-118.000.
Henderson, Donald Max; and Lewandowski, Raymond F., to Oak Industries Inc. Hall effect rotary switch. 4,054,860, Cl. 338-32.00H.
Henderson, James G.; and Hanon, David O., to Henderson, James G. Displacement sensing and guide apparatus. 4,054,251, Cl. 242-57.100.
Hensel & Cie GmbH: See—
Blum, Helmut; and Worms, Karl-Heinz, 4,054,598, Cl. 260-502.500.
Henman, Terence John; and Williams, Graham, to Imperial Chemical Industries Limited. Polymer composition. 4,054,549, Cl. 260-42.150.
Hensley, Albert L., Jr., to Standard Oil Company (Indiana). Catalyst comprising ultrastable aluminosilicates and hydrocarbon-conversion processes employing same. 4,054,539, Cl. 252-455.00Z.
Hercules Incorporated: See—
Ziobrowski, Bernard George, 4,054,465, Cl. 106-298.000.
Herman Miller, Inc.: See—
Stumpf, William E., 4,054,317, Cl. 297-297.000.
Herrin, Ronald J.; and Pozniak, Donald J., to General Motors Corporation. Engine with variable valve overlap. 4,054,109, Cl. 123-90.160.
Herubel, Jean Frederic, to N. Schlumberger & Cie. Textile winding machine. 4,054,250, Cl. 242-18.0DD.
Hess, Michael R.: See—
Milton, A. Fenner; and Hess, Michael R., 4,054,797, Cl. 250-332.000.
Hetmanski, Casimir: See—
Bjelland, Ronald W.; Narwicz, Charles A.; and Hetmanski, Casimir, 4,054,226, Cl. 220-63.00R.
Heurtier, Antoine, to Etablissements Heurtier et Cie-Societe anonyme. Cinematic projector with integral take-up reel. 4,054,253, Cl. 242-205.000.
Hewlett-Packard Company: See—
Luo, Zong S., 4,054,330, Cl. 308-3.00R.
Maitland, David Steven; Chumbley, Sandy Lee; and Bradley, Havyn E., 4,054,788, Cl. 364-786.000.
Heyland, Gary. Prescription drug-dispensing apparatus. 4,054,343, Cl. 312-209.000.
Hibbs, Eugene B., Jr.; and Derem, Michael J. Bidirectional radio frequency amplifier with receiver protection. 4,054,837, Cl. 325-21.000.
Hickam, Jim, to Hunter Engineering Co., Inc. Apparatus for producing completely recrystallized metal sheet. 4,054,173, Cl. 164-428.000.
Higgins, Calvin E.: See—
Hamill, Robert L.; Higgins, Calvin E.; and Hoehn, Marvin M., 4,054,564, Cl. 544-21.000.
Higginbotham, Gordon John Spencer; and Wolverson, John, to Rolls-Royce Limited. Composite articles. 4,054,723, Cl. 428-678.000.
Higgins, David L., to Ag-MET, Inc. Portable metal recovery apparatus. 4,054,503, Cl. 204-271.000.
Higgins, Larry, to Leggett & Platt, Incorporated. Spring assembly. 4,053,956, Cl. 5-255.000.
Hill, Brian K.; and Kubik, Verna M., to Minnesota Mining and Manufacturing Company. Radiodiagnostic complexes employing fluorine-containing tin reducing agents. 4,054,645, Cl. 424-1.000.
Hill, Ralph W. Hydraulic actuated control valve. 4,054,155, Cl. 137-625.480.
Himics, Richard Joseph; Graham, Scott Oliver; and Ross, Daniel Louis, to RCA Corporation. Photosensitive copolymer on silicon support. 4,054,454, Cl. 96-67.000.
Hirai, Hironori: See—
Tsubata, Kazuo; and Hirai, Hironori, 4,054,024, Cl. 57-78.000.
Hirai, Yutaka; Miyata, Katsuharu; and Osawa, Tagui, to Mitsui Toatsu Chemicals Incorporated. Process for preparing 1-aminoanthraquinone having high purity. 4,054,586, Cl. 260-378.000.
Hiraki, Masahiro: See—
Aoki, Ksuke; Sotogoshi, Teruhito; and Hiraki, Masahiro, 4,054,559, Cl. 260-146.00T.
Hirigoyen, Christiane: See—
Lahourcade, Bernard; Hirigoyen, Christiane; Joulie, Maurice; Maillard, Gabriel; Lakah, Lucien; and Warolin, Christian, 4,054,669, Cl. 424-315.000.
Hitachi Chemical Co., Ltd.: See—
Kose, Ryoji; Saito, Syoichi; and Ogiwara, Masahito, 4,054,164, Cl. 144-28.700.
Hitachi Maxell, Ltd.: See—
Tuburaya, Yoshitane, 4,054,725, Cl. 429-29.000.
Hitomi, Nobuteru: See—
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 4,054,038, Cl. 64-21.000.
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 4,054,039, Cl. 64-21.000.
Hobart Corporation: See—
Kordes, Myron G., 4,053,972, Cl. 29-423.000.
Hoeg, Donald F.; and Tuzson, John J., to Borg-Warner Corporation. Hybrid magnetic fluid shaft seals. 4,054,293, Cl. 277-13.000.
Hoehn, Harvey H.: See—
Caddell, Jack R.; and Hoehn, Harvey H., 4,054,094, Cl. 101-467.000.
Hoehn, Marvin M.: See—
Hamill, Robert L.; Higgins, Calvin E.; and Hoehn, Marvin M., 4,054,564, Cl. 544-21.000.
Hoeman, Terry E.; and Fockler, Douglas D., to Babcock & Wilcox Company. The Insulated pipe structure. 4,054,158, Cl. 138-155.000.
Hoene, Ernst-Ludwig; Rech, Werner; and Zimlich, Josef, to Siemens Aktiengesellschaft. Circuit arrangement for igniting a gas discharge flash tube. 4,054,815, Cl. 315-241.00R.
Hoever, Franz; Teetz, Wolfgang; and Bretschneider, Jurgen, to Maschinenfabrik Carl Zangs Aktiengesellschaft. Embroidering machine. 4,054,098, Cl. 112-86.000.
Hoffman, John Ronald; and Marsland, Peter John, to American Cyanamid Company. Short-crimp surgical needle. 4,054,144, Cl. 128-339.000.
Hoffman, William A., III, to Celanese Corporation. Water soluble polyester coating compositions. 4,054,614, Cl. 260-850.000.

- Hoffmann, Guenther: See—
Hanke, Leopold; Hoffmann, Guenther; and Schmelz, Helmut, 4,054,532, Cl. 252-63.500.
Hoffmann-La Roche Inc.: See—
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,054,589, Cl. 260-408.000.
Field, George Francis, 4,054,740, Cl. 548-303.000.
Hogner, Winfried, to Gutehoffnungshutte Sterkrade Aktiengesellschaft. Method and apparatus for avoiding the emission of carbon monoxide from converter exhaust gases. 4,054,274, Cl. 266-80.000.
Holle, Werner; Bletz, Walter; and Magel, Rolf, to Ernest Leitz GmbH. Exposure control device for photographic cameras. 4,054,887, Cl. 354-24.000.
Holmboe, James A. Breakback form tie. 4,054,258, Cl. 249-214.000.
Holmgren, Jan-Anders: See—
Martensson, Kjell H.; Lothman, Stig A.; and Holmgren, Jan-Anders, 4,054,074, Cl. 83-622.000.
Homeyer, Bernhard: See—
Lorenz, Walter, deceased; Hammann, Ingeborg; Behrenz, Wolfgang; and Homeyer, Bernhard, 4,054,650, Cl. 424-211.000.
Honeywell Inc.: See—
Marshall, James F., 4,054,497, Cl. 204-129.650.
Honaker, Leland Robert; Jones, Gary Lee; and Wood, Walter Ernest, to Du Pont de Nemours, E. I., and Company. Process of making a laminated spinneret. 4,054,468, Cl. 148-11.50Q.
Hoogbeem, Thomas J., to General Electric Company. Thermal oxidatively stable polycarbonate. 4,054,552, Cl. 260-47.0XA.
Hooper, Robert E.: See—
Broshkevitch, Constantine P.; and Hooper, Robert E., 4,054,340, Cl. 308-217.000.
Hoopel, Gary R., to United States of America, Navy. Cavity antenna. 4,054,876, Cl. 343-789.000.
Hopkins, Gordon R.: See—
Byars, Edward F.; Tarnay, Thomas J.; and Hopkins, Gordon R., 4,054,129, Cl. 128-24.00R.
Hopper, Edward E.: See—
Haskell, Donald M.; Hopper, Edward E.; and Munro, Bradley L., 4,054,613, Cl. 260-680.00R.
Hori, Makoto: See—
Takahashi, Koji; Yamaguchi, Norishige; Hori, Makoto; and Turuta, Masamichi, 4,054,531, Cl. 252-63.200.
Horiike, Hideki: See—
Miki, Tamotsu; Narisawa, Shizuo; Ichikawa, Ichiro; and Horiike, Hideki, 4,054,616, Cl. 260-880.00B.
Horlitz, Karl Frederick, Jr., to Combustion Engineering, Inc. Marine waste heat steam generator. 4,054,107, Cl. 122-7.00B.
Hornbeck, Robert Lee; and Brozenick, Norman John, to Borg-Warner Corporation. Extruder with dual flighted extrusion screw. 4,054,403, Cl. 425-133.100.
Horton, Phineas E., III: See—
Bond, Ronald L.; Daughdrill, E. C.; Brice, Henry T.; and Horton, Phineas E., III, 4,054,301, Cl. 280-400.000.
Howlett, George H.; and Howlett, James W., to Conenco International Limited. Method of forming a concrete structure with a recess to receive an anchorage. 4,053,974, Cl. 29-452.000.
Howlett, James W.: See—
Howlett, George H.; and Howlett, James W., 4,053,974, Cl. 29-452.000.
Hoyt, Earl H., Jr. Adjustable mounting means for archery bow stabilizers. 4,054,121, Cl. 124-89.000.
Huber, Guenther; and Wiehler, Wolf, to Siemens Aktiengesellschaft. Electron beam collector. 4,054,811, Cl. 313-30.000.
Huebner, Charles Ferdinand, to Ciba-Geigy Corporation. 4-Piperidinobutyrophenones. 4,054,570, Cl. 260-293.800.
Huestis, Allan C.: See—
Clark, Ronald W.; and Huestis, Allan C., 4,054,444, Cl. 75-35.000.
Hughes Aircraft Company: See—
Barnoski, Michael K.; Friedrich, Howard R.; and Morrison, Robert J., 4,054,366, Cl. 350-96.00C.
Oltman, Henry G., Jr., 4,054,874, Cl. 343-700.0MS.
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Humme, Gert: See—
Hardt, Dietrich; Humme, Gert; Ott, Karl-Heinz; and Braese, Hans-Eberhard, 4,054,615, Cl. 260-876.00R.
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Los, Edward Joseph; and Humphreys, David Russell, 4,054,835, Cl. 324-109.000.
Hunter Engineering Co., Inc.: See—
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Husted, John M.: See—
Kaul, Pradman; Gabbard, Ova Gene; and Husted, John M., 4,054,753, Cl. 179-15.0BS.
Hutchinson, Peter James: See—
Law, Malcolm John; and Hutchinson, Peter James, 4,054,495, Cl. 204-49.000.
Hutson, Jearld L. Semiconductor switching devices utilizing nonohmic current paths across P-N junctions. 4,054,893, Cl. 357-15.000.
Hydrocarbon Research, Inc.: See—
Chervenak, Michael C.; and Johanson, Edwin S., 4,054,504, Cl. 208-10.000.
Hyre, Robert Warren; and Shook, Hal Coburn. Method for casting concrete tanks in water. 4,054,034, Cl. 61-86.000.
I-T-E Imperial Corporation Eficor Division: See—
Gajajiva, Padej; and Stokes, John, 4,054,305, Cl. 285-39.000.
Ichikawa, Ichiro: See—
Miki, Tamotsu; Narisawa, Shizuo; Ichikawa, Ichiro; and Horiike, Hideki, 4,054,616, Cl. 260-880.00B.
Ichiko, Takao; and Tsuji, Yusuke, to Nippon Electric Co., Ltd. Electronic computer capable of searching a queue in response to a single instruction. 4,054,945, Cl. 364-200.000.
Ichinyanagi, Toshikazu: See—
Kozuki, Susumu; Ichinyanagi, Toshikazu; Watanabe, Yoshiaki; Uchiyama, Takashi; and Sunouchi, Akio, 4,054,888, Cl. 354-50.000.
Ide, Allan R. Ladder carriage. 4,054,182, Cl. 182-68.000.
IDR, Inc.: See—
Fletcher, Maurice; and Winfield, Lenard, 4,054,911, Cl. 358-141.000.
Igea, Gilbert L.: See—
Devienne, Andre M.; and Igea, Gilbert L., 4,054,169, Cl. 152-337.000.
Iimura, Masahito: See—
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Ikeda, Kishio: See—
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Ikezaki, Muneyoshi; Irie, Kunihiko; Umino, Norihide; Ikezawa, Katsuo; and Sato, Masanori, to Tanabe Seiyaku Co., Ltd. 5,7 Dihydroxy-1-(trimethoxybenzyl)-1,2,3,4-tetrahydroisquinolines and use thereof. 4,054,659, Cl. 424-258.000.
Ikezawa, Katsuo: See—
Ikezaki, Muneyoshi; Irie, Kunihiko; Umino, Norihide; Ikezawa, Katsuo; and Sato, Masanori, 4,054,659, Cl. 424-258.000.
Image Analysing Computers Limited: See—
Weibel, Ewald Rudolph, 4,054,782, Cl. 364-555.000.
Imasco, Ltd.: See—
Rowell, Lorne A., 4,054,015, Cl. 53-26.000.
Imperial Chemical Industries Limited: See—
Brooks, John Langshaw; and Budziarek, Richard, 4,054,593, Cl. 560-12.000.
Henman, Terence John; and Williams, Graham, 4,054,549, Cl. 260-42.150.
Jamin, Guillaume Ward, 4,054,331, Cl. 308-3.500.
Reed, David Robert; and Stafford, Thomas Whitehead, 4,054,697, Cl. 428-40.000.
Indak Manufacturing Corporation: See—
Raab, Andrew F.; and Halstead, Raymond T., 4,054,761, Cl. 200-16.00C.
Industrie Pirelli S.p.A.: See—
Bottasso, Franco; and Pacciarini, Antonio, 4,054,475, Cl. 156-157.000.
Ingenito, Donald R.; and Walmet, Gunnar E., to General Electric Company. Cardiotomy reservoir with integral filter. 4,054,523, Cl. 210-188.000.
Inoue-Japax Research (IJR) Inc.: See—
Inoue, Kiyoshi; and Shima, Yoshinori, 4,054,672, Cl. 426-244.000.
Inoue, Kiyoshi; and Shima, Yoshinori, to Inoue-Japax Research (IJR) Inc. Preparation of frozen and defrosted foods. 4,054,672, Cl. 426-244.000.
Interdyne Company: See—
Lewis, Richard A., 4,054,923, Cl. 360-60.000.
International Business Machines Corporation: See—
Bolton, Ivor William; and George, Ian Charles, 4,054,931, Cl. 360-97.000.
Grobin, Allen W., Jr., 4,054,453, Cl. 96-67.000.
Jackson, Rory D.; and Rackl, Willi K., 4,054,951, Cl. 364-900.000.
Keidl, Steven Dennis, 4,054,816, Cl. 315-387.000.
Lin, Burn Jeng; Montesana, John Sebastian; Santy, William Godfrey; and Wilczynski, Janusz Stanislaw, 4,054,383, Cl. 355-91.000.
Owen, Theodore R., 4,054,389, Cl. 356-189.000.
Ruscitto, Paul Anthony, 4,054,882, Cl. 346-1.000.
Witcher, Leonard Dean, 4,054,235, Cl. 226-200.000.
International Computers Limited: See—
Foster, Alan, 4,054,820, Cl. 318-341.000.
International Packaging Corporation: See—
Knudsen, David S., 4,054,160, Cl. 140-93.00A.
International Paper Company: See—
Tuthill, Harlan L.; and Freeborn, John O., 4,053,979, Cl. 30-124.000.
International Pregnancy Advisory Services: See—
Kessel, Elton, 4,054,131, Cl. 128-130.000.
International Standard Electric Corporation: See—
LeJay, Augustin, 4,054,757, Cl. 179-18.0BC.
International Telephone and Telegraph Corporation: See—
Barber, Eugene, 4,054,870, Cl. 340-397.000.
Sawyer, Edgar W., Jr., 4,054,515, Cl. 210-27.000.
International Telephone and Telegraph Industries: See—
Saunders, Laurie A.; and Donnelly, Robert W., 4,054,353, Cl. 339-176.0MF.
Interstate Folding Box Company: See—
LaPierre, James F., 4,054,240, Cl. 229-17.00R.
Inui, Takayasu; and Kato, Masao, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for controlling bucket in tractor mounted loader. 4,054,216, Cl. 214-138.00R.

- Irie, Kunihiko: See—
Ikezaki, Muneyoshi; Irie, Kunihiko; Umino, Norihide; Ikezawa, Katsuo; and Sato, Masanori, 4,054,659, Cl. 424-258.000.
- Ironside, Donald S.: See—
Reynolds, Peter H.; Ironside, Donald S.; Barresi, Joseph F.; Scharle, Carl R.; Latham, Harry L.; and Saile, Charles, 4,054,832, Cl. 324-54.000.
- Isaev, Vladimir Sergeevich: See—
Kozlov, Alexandr Dmitrievich; Krylov, Boris Alexandrovich; Lagoda, Alexandr Vasilievich; Vetrov, Viktor Petrovich; Mikhailichenko, Valentin Markovich; and Isaev, Vladimir Sergeevich, 4,054,395, Cl. 404-79.000.
- Iscowitz, Sigmund: See—
Feinland, Raymond; Iscowitz, Sigmund; and Bil, Milos S., 4,054,413, Cl. 8-10.200.
- Iserberg, Arnold O.: See—
to Westinghouse Electric Corporation. Rechargeable high temperature electrochemical battery, 4,054,729, Cl. 429-112.000.
- Ishihara, Atsunobu: See—
Hayashi, Masaki; and Ishihara, Atsunobu, 4,054,736, Cl. 536-103.000.
- Ishii, Mitsuo: See—
Kojima, Takamoto; and Ishii, Mitsuo, 4,054,909, Cl. 358-13.000.
- Ishikawajima-Harima Jukogyo Kabushiki Kaisha: See—
Kumabe, Satoru, 4,054,076, Cl. 83-644.000.
- Ishikawakima-Harima Jukogyo Kabushiki Kaisha: See—
Ueno, Masayuki; and Sano, Fumiaki, 4,054,060, Cl. 73-421.50A.
- Ito, Mikiji; and Yosimura, Zyunziro, to Nippondenso Co., Ltd. Check valve, 4,054,152, Cl. 137-512.000.
- Ito, Shintaro: See—
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,054,900, Cl. 357-46.000.
- Itoh, Norio; and Omori, Masayuki, to Sony Corporation. Back projection apparatus, 4,054,907, Cl. 358-60.000.
- Itoh, Teruo: See—
Moriki, Juichi; Shioji, Masayoshi; and Itoh, Teruo, 4,054,806, Cl. 310-318.000.
- Iwasa, Mitsuhiro: See—
Mimaki, Kosuke; Takase, Tsutomu; Iwasa, Mitsuhiro; and Yamamoto, Tomitaka, 4,054,611, Cl. 260-626.00R.
- Iwata, Tomoji; Moriguchi, Saneki; and Abe, Hiroshi, to Nippon Kokan Kabushiki Kaisha. Method of removing nitrogen oxides from an exhaust, 4,054,640, Cl. 423-239.000.
- Izawa, Akio: See—
Agui, Hideo; Mitani, Toru; Nakashita, Mitsuo; Murayama, Eiichi; Okamura, Kousaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; and Eda, Yasuko, 4,054,568, Cl. 260-287.0CF.
- Izumi, Gaku; Sato, Makoto; and Shoji, Sakae, to Director-General of the Agency of Industrial Science and Technology. Method for selectively capturing metal ions, 4,054,516, Cl. 210-44.000.
- Jackson, Melvin R., to General Electric Company. Directionally solidified eutectic γ - β nickel-base superalloys, 4,054,469, Cl. 148-31.000.
- Jackson, Rory D.; and Rackl, Willi K., to International Business Machines Corporation. Data expansion apparatus, 4,054,951, Cl. 364-900.000.
- Jackson, William Barry; Gibson, Roger Charles; and Waggott, Ralph, to Electricity Council, The. Induction heating of strip and other elongate metal workpieces, 4,054,770, Cl. 219-10.61R.
- Jaco, Charles M., Jr., to Midrex Corporation. Method of preparing iron powder, 4,054,443, Cl. 75-5BA.
- Jacobi, Manfred: See—
Kuesters, Werner; Osterloh, Rolf; and Jacobi, Manfred, 4,054,682, Cl. 427-54.000.
- Jacobs, Philip C., Jr., to Gould, Inc. Electric fuse capable of interrupting small overload currents by series multibreaks, 4,054,858, Cl. 337-162.000.
- Jagers, Leopold. Machine for the cold-sawing of steel plates with horizontal feed movement, 4,054,072, Cl. 83-488.000.
- James G. Biddle Company: See—
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- Jamin, Guillaume Ward, to Imperial Chemical Industries Limited. Sealing means, 4,054,331, Cl. 308-3.500.
- Jarvis, William Joseph, to Coal Industry (Patents) Ltd. Track-mounted shoe-supported inclining mining machine, 4,054,321, Cl. 299-43.000.
- Jeanmart, Claude: See—
Cotel, Claude; Jeanmart, Claude; and Messer, Mayer Naoum, 4,054,654, Cl. 424-250.000.
- Jefferies, Michael J., to General Electric Company. Stator core end magnetic shield for large A.C. machines, 4,054,809, Cl. 310-256.000.
- Johanson, Edwin S.: See—
Chervenk, Michael C.; and Johanson, Edwin S., 4,054,504, Cl. 208-10.000.
- Johns-Manville Corporation: See—
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- Botsolas, Christos J., 4,054,711, Cl. 428-228.000.
- Johnson, Arthur F. Building structure for solar energy recovery and utilization, 4,054,246, Cl. 237-1.00A.
- Johnson, Calvin R. Waler-stiffback bracket, 4,054,259, Cl. 249-219.00W.
- Johnson, Charles M. Power unit, 4,054,031, Cl. 60-496.000.
- Johnson, Donald S., to General Electric Company. Method for making aromatic bis(ether dicarboxylic acid)s, 4,054,600, Cl. 260-520.00E.
- Johnson, Donald S.: See—
Relles, Howard M.; and Johnson, Donald S., 4,054,577, Cl. 260-326.00N.
- Johnson, Earl E.; and Gladoske, Calvin, to Giddings & Lewis, Inc. Tool support for tool interchange system, 4,053,968, Cl. 29-26.00A.
- Johnson, Gordon Carlton, to Union Carbide Corporation. Textile fiber having improved flame retardancy properties, 4,054,695, Cl. 427-390.00D.
- Johnson, James A.: See—
Edwards, Steven F.; Johnson, James A.; Jordan, William D.; and Pritchett, James D., 4,054,901, Cl. 357-81.000.
- Johnson, Lawrence P., to General Motors Corporation. Overrunning clutch cage, 4,054,192, Cl. 192-45.000.
- Johnson & Nephew (Non-Ferrous) Limited: See—
Wareing, Joseph Brian; and Hall, Herbert, 4,054,044, Cl. 72-38.000.
- Johnson, Richard Severn, to Sperry Rand Corporation. Motor angular velocity monitor circuit, 4,054,819, Cl. 318-269.000.
- Johnson, Robert N.; and Karol, Frederick J., to Union Carbide Corporation. π Allyl chromium complex catalyst and process for preparing same, 4,054,538, Cl. 252-428.000.
- Johnston, John O'Neal: See—
Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal; and Petrow, Vladimir, 4,054,651, Cl. 424-239.000.
- Jones, Gary Lee: See—
Honnaker, Leland Robert; Jones, Gary Lee; and Wood, Walter Ernest, 4,054,468, Cl. 148-11.50Q.
- Jones, Richard E.: See—
Teichert, Allen L.; and Jones, Richard E., 4,054,859, Cl. 337-309.000.
- Jonner, Wolf-Dieter: See—
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- Jordan, Arthur D., Jr.: See—
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- Jordan, William D.: See—
Edwards, Steven F.; Johnson, James A.; Jordan, William D.; and Pritchett, James D., 4,054,901, Cl. 357-81.000.
- Jos, Schneider & Co. Optische Werke Kreuznach: See—
Schroeder, Wolfgang, 4,054,372, Cl. 350-186.000.
- Joslin, Robert S.: See—
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- Joullie, Maurice: See—
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- Joy, David Charles: See—
Ferris, Stephen Duncan; Joy, David Charles; Leamy, Harry John; Longinotti, Louis David; and Schmidt, Paul Herman, 4,054,946, Cl. 313-346.00R.
- Juentgen, Harald: See—
Schroeter, Hans-Juergen; Knoblauch, Karl; Juentgen, Harald; and Kronauer, Peter, 4,054,427, Cl. 55-25.000.
- Juillard, Yves, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Picking method for a shuttleless weaving machine, 4,054,159, Cl. 139-450.000.
- Kabushiki Kaisha Daini Seikosha: See—
Ozone, Kiyoharu, 4,054,883, Cl. 346-140.00R.
- Terayama, Toshio, 4,054,807, Cl. 310-348.000.
- Kabushiki Kaisha Kawai Gakki Seisakusho: See—
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- Kabushiki Kaisha Komatsu Seisakusho: See—
Inui, Takayasu; and Kato, Masao, 4,054,216, Cl. 214-138.00R.
- Kalaus, Gyorgy: See—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, 4,054,571, Cl. 260-293.550.
- Kalopissis, Gregoire; Bugaut, Andre; and Estradier, Francoise, to L'Oreal. 4,4-Di-substituted diphenylamines in dye compositions for keratinic fibers, 4,054,147, Cl. 132-7.000.
- Kameda, Nobuyuki: See—
Kirino, Osamu; Oishi, Tadashi; Kameda, Nobuyuki; Kato, Toshiro; Fujinami, Akira; and Ozaki, Toshiaki, 4,054,668, Cl. 424-314.000.
- Kamm, Vernon C., to Data Automation Corporation. Electronic coordinate position digitizing system, 4,054,746, Cl. 178-19.000.
- Kamogawa, Toshiro; Teruchi, Yoshifumi; Matsumoto, Eiji; and Nishiyama, Akira, to Matsushita Electric Industrial Co., Ltd. Film scanning system providing automatic frame positioning, 4,054,918, Cl. 358-214.000.
- Kampf, Julian Carl: See—
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- Kao Soap Co., Ltd.: See—
Sakaguchi, Kahei; Minakata, Masaaki; Takamori, Shigeru; Furukawa, Jun-ichi; and Kono, Yoshinao, 4,054,713, Cl. 428-285.000.
- Kapitonov, Viktor Pavlovich: See—
Volkov, Gennady Ivanovich; Denisov, Vladilen Mikhailovich; Ermishin, Anatoly Efimovich; Zaozersky, Yuri Petrovich; Zozin, Vladimir Veniaminovich; Kapitonov, Viktor Pavlovich; Kikoin, Isak Kushelevich; Lebedev, Vladimir Alexandrovich; Lystov, Nikolai Markovich; Matveev, Leonid Ivanovich; Popov, Timofei Vasilievich; Ryabov, Vasily Andreevich; Sukhov, Albert Grigorievich; Sysoev, Vitaly Mikhailovich; Shishin, Alexandr Alexeevich; Shatalin, Nikolai Mikhailovich; Shes-

- terikov, Stanislav Alexeevich; Martynov, Sergei Petrovich, deceased; Martynova, Nina Fedorovna, administrator; Martynova, Olga Sergeevna, administrator; and Martynov, Alexandr Sergeevich, 4,054,243, Cl. 233-11.000.
- Karabtsov, Gennady Pavlovich: See—
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- Karakawa Fancy Plywood Works Ltd.: See—
Karakawa, Takuji, 4,054,165, Cl. 144-136.00R.
- Karakawa, Takuji, to Karakawa Fancy Plywood Works Ltd. Grooved sheet material, 4,054,165, Cl. 144-136.00R.
- Karol, Frederick J.: See—
Johnson, Robert N.; and Karol, Frederick J., 4,054,538, Cl. 252-428.000.
- Karpati, Egon: See—
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- Kasatkina, Tatyana Borisovna: See—
Zhdanova, Nelli Isaakovna; Evstjugov-Babaev, Lev Mikhailovich; Balitskaya, Roza Mitrofanovna; Sholin, Albert Fedorovich; Kasatkina, Tatyana Borisovna; and Kuznetsova, Natalya Nikolaevna, 4,054,489, Cl. 195-47.000.
- Kataoka, Mitsuru: See—
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- Kato, Masao: See—
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- Kato, Toshiro: See—
Kirino, Osamu; Oishi, Tadashi; Kameda, Nobuyuki; Kato, Toshiro; Fujinami, Akira; and Ozaki, Toshiaki, 4,054,668, Cl. 424-314.000.
- Kaufman, Harvey R. Process for deep frying of chicken, 4,054,673, Cl. 426-302.000.
- Kaul, Pradman; Gabbard, Ova Gene; and Husted, John M., to Digital Communications Corporation. Double sync burst TDMA system, 4,054,753, Cl. 179-15.0BS.
- Kawaguchi, Katsuyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Fuel combustion apparatus, 4,054,028, Cl. 60-39.230.
- Kawamura, Masao; Nishi, Tadaaki; Tsuchiya, Hiro; and Takagi, Syuzi, to Seitetsu Kagaku Co., Ltd. Process for producing 2-chloropyridine, 4,054,499, Cl. 204-158.0HA.
- Kay, Francis Xavier. Pressure gauge, 4,054,059, Cl. 73-407.00R.
- Keeton, Heidi. Compressed foam article, 4,054,204, Cl. 206-83.500.
- Keidl, Steven Dennis, to International Business Machines Corporation. Sweep circuit for cathode-ray tube display, 4,054,816, Cl. 315-387.000.
- Keller, Helmut: See—
Conzelmann, Gerhard; Nagel, Karl; and Keller, Helmut, 4,054,828, Cl. 322-28.000.
- Kelley, Charles S.; and Westlund, James A. Automatic grab crane, 4,053,999, Cl. 37-195.000.
- Kelly, James M.: See—
Papalos, John G.; and Kelly, James M., 4,054,617, Cl. 260-930.000.
- Kelly, Robert C.; and Nelson, Norman A., to Upjohn Company, The. Thromboxane B analogs, 4,054,737, Cl. 542-413.000.
- Kemanord AB: See—
Lindgren, Sven E., 4,054,491, Cl. 195-103.50M.
- Kendall Company, The: See—
Marshall, Preston F., 4,054,628, Cl. 264-89.000.
- Kessel, Elton, to International Pregnancy Advisory Services. Intrauterine contraceptive device, 4,054,131, Cl. 128-130.000.
- Ketterer, William B., executor: See—
Lesh, Nathan George, deceased; Ketterer, William B., executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,054,484, Cl. 156-652.000.
- Kienle Apparate GmbH: See—
Fichter, Manfred, 4,054,922, Cl. 360-56.000.
- Kikoin, Isak Kushelevich: See—
Volkov, Gennady Ivanovich; Denisov, Vladilen Mikhailovich; Ermishin, Anatoly Efimovich; Zaozersky, Yuri Petrovich; Zozin, Vladimir Veniaminovich; Kapitonov, Viktor Pavlovich; Kikoin, Isak Kushelevich; Lebedev, Vladimir Alexandrovich; Lystov, Nikolai Markovich; Matveev, Leonid Ivanovich; Popov, Timofei Vasilievich; Ryabov, Vasily Andreevich; Sukhov, Albert Grigorievich; Sysoev, Vitaly Mikhailovich; Shishin, Alexandr Alexeevich; Shatalin, Nikolai Mikhailovich; Shes-terikov, Stanislav Alexeevich; Martynov, Sergei Petrovich, deceased; Martynova, Nina Fedorovna, administrator; Martynova, Olga Sergeevna, administrator; and Martynov, Alexandr Sergeevich, 4,054,243, Cl. 233-11.000.
- Kikuchi, Yoshiki, to Fuji Xerox Co., Ltd. Conversion element and system utilizing magnetic bubbles, 4,054,866, Cl. 340-174.0TF.
- Kinder, George William, to Bell Telephone Laboratories, Incorporated. Photoelectric sensing system with light source compensating means, 4,054,795, Cl. 250-205.000.
- King, John O., Jr. Preload adapter, 4,053,970, Cl. 29-240.000.
- King, John O., Jr. Two-piece mandrel assembly for deforming, 4,054,045, Cl. 72-40.000.
- King, Leonard H.: See—
Bogner, Richard D.; and King, Leonard H., 4,054,877, Cl. 343-806.000.
- King, Peter F.; and Reghi, Gary A., to Oxy Metal Industries Corporation. Tannin treatment of aluminum, 4,054,466, Cl. 148-6.270.
- Kingswell, Henry. Back scrubber, 4,053,960, Cl. 15-104.920.
- Kirino, Osamu; Oishi, Tadashi; Kameda, Nobuyuki; Kato, Toshiro; Fujinami, Akira; and Ozaki, Toshiaki, to Sumitomo Chemical Com-

pany, Limited. N-substituted amino acid derivatives, 4,054,668, Cl. 424-314.000.

Kitamoto, Saburo: See—

Suzuki, Matsumi; and Kitamoto, Saburo, 4,054,749, Cl. 179-1.0SB.

Kitano, Noritoshi: See—

Morisawa, Yasuhiro; Kataoka, Mitsuru; Kitano, Noritoshi; and

Matsuzawa, Toshiaki, 4,054,663, Cl. 424-266.000.

Kittag, Gerd, to Vockenhuber, Karl; and Hauser, Raimund. Device for

storing electromagnetic control signals on magnetic strip material and

a sound film projector equipped therewith, 4,054,920, Cl. 360-3.000.

Kizu, Taisuke: See—

Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke,

4,054,038, Cl. 64-21.000.

Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke,

4,054,039, Cl. 64-21.000.

Klauber, Dieter H.; Sellstedt, John H.; and Guinasso, Charles J., to

American Home Products Corporation. 2-Cyano-3-or 4-(substituted

amino)oxanilic acid derivatives, 4,054,591, Cl. 260-465.00D.

Klaue, Hermann. Fully lined hydraulically actuated disc brakes,

4,054,189, Cl. 188-71.400.

Kleinert, Kurt & Lister: See—

Hamer, Merlin L., 4,054,282, Cl. 269-328.000.

Klink, Jerome P.; and Eisenberg, Arnold J., to Owens-Corning Fiber-

glas Corporation. Method and apparatus for packaging linear mate-

rial, 4,054,249, Cl. 242-18.00G.

Kluge, Douglas J., to Diatek, Inc. Temperature sensing probe and

disposable cover therefor, 4,054,057, Cl. 73-343.00R.

Knecht, George W., to Midland-Ross Corporation. Electrical connec-

tors, 4,054,762, Cl. 200-50.00B.

Kniss, Alvin C.: See—

Hamer, Merlin L., 4,054,282, Cl. 269-328.000.

Knoblauch, Karl: See—

Schroeter, Hans-Juergen; Knoblauch, Karl; Juentgen, Harald; and

Kronauer, Peter, 4,054,427, Cl. 55-25.000.

Knoos, Stellan. Solar radiation collection system, 4,054,124, Cl.

126-270.000.

Knop, Hans-Georg, to Dr.-Ing. Rudolf Hell GmbH. Apparatus for

improving sharpness when recording continuous-tone pictures,

4,054,916, Cl. 358-284.000.

Knudsen, David S., to International Packaging Corporation. Tying

machine, 4,054,160, Cl. 140-93.00A.

Kobayashi, Tadashi; and Toyoshima, Kiichiro, to Sony Corporation.

Cassette case, 4,054,206, Cl. 206-387.000.

Koethmann, Wolfgang; and Guenther, Heinz-Dieter, to Siemens Akti-

engesellschaft. Pulse doppler radar receiver having a moving curve

transit time filter, 4,054,872, Cl. 343-7.700.

Kohlbacher, Gerhard: See—

Borner, Manfred; and Kohlbacher, Gerhard, 4,054,851, Cl.

333-72.000.

Kojima, Takamoto; and Ishii, Mitsuo, to Fujitsu Ltd. Method and

system for bandwidth-compressed transmission of a video signal in

the NTSC system, 4,054,909, Cl. 358-13.000.

Kokusai Cable Ship Co., Ltd.: See—

Ezoe, Takuji, 4,053,998, Cl. 37-98.000.

Kollmann, Jan: See—

Kucera, Jaromir; Novacek, Jindrich; Voda, Gustav; Chladek,

Otokar; Kollmann, Jan; and Brada, Pavel, 4,054,041, Cl. 66-

50.00A.

Kollmorgen Technologies Corporation: See—

Leech, Edward J.; Polichette, Joseph; and Branigan, John G.,

4,054,693, Cl. 427-304.000.

Komatsu, Toshiaki: See—

Agui, Hideo; Mitani, Toru; Nakashita, Mitsuo; Murayama, Eiichi;

Okamura, Kousaku; Nakagome, Takenari; Komatsu, Toshiaki;

Izawa, Akio; and Eda, Yasuko, 4,054,568, Cl. 260-287.0CF.

Kondo, Masahiro; Takehara, Suguru; Mitsufoji, Tsutomu; Sasaki,

Moritosi; and Takura, Tomoji, to Fuji Fibre Glass Company, Ltd.

Alkali-resistant compositions for forming glass fibers, 4,054,472, Cl.

106-52.000.

Kondo, Nobuaki, to Kabushiki Kaisha Kawai Gakki Seisakusho. Auto-

matic arpeggio electronic musical instrument, 4,054,078, Cl. 84-1.240.

Kondo, Tokiharu, deceased: See—

Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reiichi; Kondo,

Tokiharu, deceased; and Kondo, Yoshiharu, legal representative,

4,054,458, Cl. 96-107.000.

Kondo, Yoshiharu, legal representative: See—

Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reiichi; Kondo,

Tokiharu, deceased; and Kondo, Yoshiharu, legal representative,

4,054,458, Cl. 96-107.000.

Kono, Yoshinao: See—

Sakaguchi, Kahei; Minakata, Masaaki; Takamori, Shigeru;

Furukawa, Jun-ichi; and Kono, Yoshinao, 4,054,713, Cl.

428-285.000.

Korasiak, Wolfgang: See—

Leiber, Heinz; Gerstenmeier, Jurgen; and Korasiak, Wolfgang,

4,054,328, Cl. 303-103.000.

Kordes, Myron G., to Hobart Corporation. Method of constructing

insulated door, 4,053,972, Cl. 29-423.000.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Com-

pany. 6-Methyl-8 β -hydroxymethyl-8- γ -substituted-9-ergolene com-

pounds, 4,054,567, Cl. 260-285.500.

Kornfeld, Edmund C.: See—

Clemens, James A.; Kornfeld, Edmund C.; and Bach, Nicholas J.,

4,054,660, Cl. 424-261.000.

Korolev, Albert Viktorovich: See—
Redko, Sergei Georgievich; Korolev, Albert Viktorovich; Maxjushin, Anatoly Fedorovich; Kreps, Moisei Solomonovich; and Gorokhov, Fedor Vasilievich, 4,054,009, Cl. 51-3.000.

Kose, Ryoichi; Saito, Syoichi; and Ogiwara, Masahito, to Hitachi Chemical Co., Ltd. Pencil sharpener, 4,054,164, Cl. 144-28.700.

Koshar, Robert J.; and Barber, Loren L., Jr., to Minnesota Mining and Manufacturing Company. Carboxy and carboxyhydroxy-substituted 1,1-bis(perfluoroalkylsulfonyl)propanes, 4,054,596, Cl. 260-150.000.

Kotcharian, Michel, to Technigaz. Method and device for regenerating an impure effluent fluid and product obtained thereby, 4,054,431, Cl. 25-70.000.

Kourimsky, Friedrich; and Nix, Lothar Heinrich Willi, to AMP Incorporated. Battery terminal, 4,054,355, Cl. 339-230.00C.

Kovacs, Bela V.: See—
Cole, Gerald S.; Kovacs, Bela V.; Sensoli, Robert A.; and Smartt, Herschel B., 4,054,275, Cl. 266-93.000.

Koyama, Mitsuo: See—
Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, 4,054,892, Cl. 354-252.000.

Kozlov, Alexandr Dmitrievich; Krylov, Boris Alexandrovich; Lagoda, Alexandr Vasilievich; Vetrov, Viktor Petrovich; Mikhailichenko, Valentin Markovich; and Isaev, Vladimir Sergeevich. Method of erecting mass concrete structures, 4,054,395, Cl. 404-79.000.

Kozlowski, John H.; Litzinger, Paul C.; and Steffes, Frank J., to Crown Zellerbach Corporation. Process for making fibers, 4,054,625, Cl. 264-13.000.

Kozuki, Susumu; Ichinagaki, Toshikazu; Watanabe, Yoshiaki; Uchiyama, Takashi; and Sunouchi, Akio, to Canon Kabushiki Kaisha. Motor driven photographing control circuit, 4,054,888, Cl. 354-50.000.

Kraai, Dwight A.; and Whiddon, Clifford R., to Allegheny Ludlum Industries, Inc. Ingot mold and method for pouring ingots, 4,054,170, Cl. 164-53.000.

Kramer, John J., to Rockwell International Corporation. Portable tool switch structure, 4,054,766, Cl. 200-157.000.

Krenzer, John: See—
Wu, Chin Ching; and Krenzer, John, 4,054,574, Cl. 260-306.80D.

Krepps, James E.: See—
Tarr, William A.; Krepps, James E.; and Opsahl, Thomas L., 4,054,853, Cl. 334-15.000.

Kreps, Moisei Solomonovich: See—
Redko, Sergei Georgievich; Korolev, Albert Viktorovich; Maxjushin, Anatoly Fedorovich; Kreps, Moisei Solomonovich; and Gorokhov, Fedor Vasilievich, 4,054,009, Cl. 51-3.000.

Krieg, Manfred; and Meyer, Armin, to Rohm GmbH. Color stabilized acrylonitrile polymers, 4,054,162, Cl. 260-45.9KB.

Krimm, Heinrich; Buysch, Hans-Josef; and Schnell, Hermann, to Bayer Aktiengesellschaft. Thiodiglycol polycarbonates, 4,054,597, Cl. 260-463.000.

Kritzer, Richard W. Respirators, 4,054,134, Cl. 128-208.000.

Kronauer, Peter: See—
Schroeter, Hans-Juergen; Knoblauch, Karl; Juentgen, Harald; and Kronauer, Peter, 4,054,427, Cl. 55-25.000.

Krueger, Hans; and Welsch, Wolfgang, to Siemens Aktiengesellschaft. Compound indicator device containing at least one liquid crystal cell, 4,054,368, Cl. 350-160.0LC.

Krump, Robert C.: See—
Bennetsen, Wayne J.; and Krump, Robert C., 4,054,245, Cl. 236-47.000.

Krylov, Boris Alexandrovich: See—
Kozlov, Alexandr Dmitrievich; Krylov, Boris Alexandrovich; Lagoda, Alexandr Vasilievich; Vetrov, Viktor Petrovich; Mikhailichenko, Valentin Markovich; and Isaev, Vladimir Sergeevich, 4,054,395, Cl. 404-79.000.

Kubik, Verna M.: See—
Hill, Brian K.; and Kubik, Verna M., 4,054,645, Cl. 424-1.000.

Kubitzek, Harry; Liedtke, Wolfgang; and Pelousek, Herbert, to Bayer Aktiengesellschaft. Process for the production of filament yarns with statistically distributed, broken individual filaments, 4,054,025, Cl. 57-157.0TS.

Kubo, Ryoichi: See—
Watanabe, Minoru; Kubo, Ryoichi; Nishimura, Toshio; and Yokota, Kazuto, 4,054,798, Cl. 250-483.000.

Kuboyama, Morio: See—
Nagasawa, Taro; Kuboyama, Morio; Ono, Joji; Saito, Minoru; Kudo, Tsutomu; Takahashi, Eiji; Doi, Kazuyoshi; and Nagata, Kazuhiro, 4,054,648, Cl. 424-105.000.

Kucera, Jaromir; Novacek, Jindrich; Voda, Gustav; Chladek, Otokar; Kollmann, Jan; and Brada, Pavel, to Elitex, Konecni textilniho strojrenstvi. Pattern wheel operated selecting jacks arms, 4,054,041, Cl. 66-50.00A.

Kudo, Tsutomu: See—
Nagasawa, Taro; Kuboyama, Morio; Ono, Joji; Saito, Minoru; Kudo, Tsutomu; Takahashi, Eiji; Doi, Kazuyoshi; and Nagata, Kazuhiro, 4,054,648, Cl. 424-105.000.

Kudryashov, Sergei Alexandrovich: See—
Belitsin, Mikhail Nikolaevich; Borik, Alexandr Gamsheevich; Kudryashova, Galina Akimovna; Kudryashov, Sergei Alexandrovich; Goncharova, Eleonora Viktorovna; Sadkova, Natalia Alexandrovna; Pavlov, Serafim Alexandrovich; Kulikov, Valentin Vladimirovich; Tolpygina, Galina Petrovna; Gotie, Tatyana Nikolaevna; Toropova, Elena Grigorievna; Ermolina, Nina Ivanovna; and Puchnin, Ivan Vasilievich, 4,054,709, Cl. 428-224.000.

Kudryashova, Galina Akimovna: See—
Belitsin, Mikhail Nikolaevich; Borik, Alexandr Gamsheevich; Kudryashova, Galina Akimovna; Kudryashov, Sergei Alexandrovich; Goncharova, Eleonora Viktorovna; Sadkova, Natalia Alexandrovna; Pavlov, Serafim Alexandrovich; Kulikov, Valentin Vladimirovich; Tolpygina, Galina Petrovna; Gotie, Tatyana Nikolaevna; Toropova, Elena Grigorievna; Ermolina, Nina Ivanovna; and Puchnin, Ivan Vasilievich, 4,054,709, Cl. 428-224.000.

Kuesters, Werner; Osterloh, Rolf; and Jacobi, Manfred, to BASF Aktiengesellschaft. Photopolymerizable composition containing a thioether sensitizer, 4,054,682, Cl. 427-54.000.

Kulikov, Valentin Vladimirovich: See—
Belitsin, Mikhail Nikolaevich; Borik, Alexandr Gamsheevich; Kudryashova, Galina Akimovna; Kudryashov, Sergei Alexandrovich; Goncharova, Eleonora Viktorovna; Sadkova, Natalia Alexandrovna; Pavlov, Serafim Alexandrovich; Kulikov, Valentin Vladimirovich; Tolpygina, Galina Petrovna; Gotie, Tatyana Nikolaevna; Toropova, Elena Grigorievna; Ermolina, Nina Ivanovna; and Puchnin, Ivan Vasilievich, 4,054,709, Cl. 428-224.000.

Kulka, Marshall: See—
Felauer, Ethel E.; Kulka, Marshall; Von Schmeling, Bogislav; and Davis, Robert A., 4,054,585, Cl. 260-347.300.

Kumabe, Satoru, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Rolling cut type shear, 4,054,076, Cl. 83-644.000.

Kuno, Akira; Shinoda, Yoshio; and Arai, Hiroshi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for instantaneously measuring and indicating fuel consumption rate, 4,054,781, Cl. 364-442.000.

Kunz, Harold Russell, to United Technologies Corporation. Method for making a fuel cell electrode, 4,054,687, Cl. 427-115.000.

Kupisiewicz, Janusz W., to Xerox Corporation. Paper anti-skew device, 4,054,284, Cl. 271-8.00R.

Kurahashi, Yutaka. Article delivery and unloading device, 4,054,215, Cl. 214-58.000.

Kurokawa, Fuminori; and Suzuki, Yasuhide, to Diesel Kiki Co., Ltd. Fuel injection governor, 4,054,112, Cl. 123-140.0MP.

Kurz, Georg: See—
Bergander, Armin; and Kurz, Georg, 4,054,886, Cl. 343-792.500.

Kuznetsova, Natalya Nikolaevna: See—
Zhdanova, Nelli Isaakovna; Evstjugov-Babaev, Lev Mikhailovich; Balitskaya, Roza Mitrofanovna; Sholin, Albert Fedorovich; Kasatkina, Tatyana Borisovna; and Kuznetsova, Natalya Nikolaevna, 4,054,489, Cl. 195-47.000.

Kwan, Okun, to Bunker Ramo Corporation. Magnetic head control assembly for a magnetic passbook printing system, 4,054,198, Cl. 197-127.00R.

La Cellophane: See—
Ceintrey, Claude; and Nicolle, Herve, 4,054,684, Cl. 427-54.000.

Ladin, Eli M., to Federal-Mogul Corporation. High impact bearing and method of making same, 4,054,339, Cl. 308-216.000.

Lagoda, Alexandr Vasilievich: See—
Kozlov, Alexandr Dmitrievich; Krylov, Boris Alexandrovich; Lagoda, Alexandr Vasilievich; Vetrov, Viktor Petrovich; Mikhailichenko, Valentin Markovich; and Isaev, Vladimir Sergeevich, 4,054,395, Cl. 404-79.000.

Lahourcade, Bernard; Hirigoyen, Christiane; Joulle, Maurice; Mailard, Gabriel; Lakah, Lucien; and Warolin, Christian, to Les Derives Resiniques et Terpeniques; and S.A. Joulle International. Phenolic methene derivatives, therapeutic composition containing same and their use as therapeutic compositions, 4,054,669, Cl. 424-315.000.

Laignel, Raymond A.; and Mommeja, Patrick F., to Constructions Metalliques de Provence. Cock having a rotating valve removable from above, 4,054,262, Cl. 251-367.000.

Lainey, Gilbert: See—
Henaff, Jeannine Le Goff; Lainey, Gilbert; and Carel, Michel France, 4,054,841, Cl. 329-118.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédes Georges Claude: See—
Buffiere, Jean-Pierre; and Vanderbussche, Gerard, 4,054,433, Cl. 62-13.000.

Lakah, Lucien: See—
Lahourcade, Bernard; Hirigoyen, Christiane; Joulle, Maurice; Mailard, Gabriel; Lakah, Lucien; and Warolin, Christian, 4,054,669, Cl. 424-315.000.

Lake Center Industries: See—
Wilke, Robert A., 4,054,779, Cl. 235-92.0PK.

Lamb, John T.: See—
Anderson, Carl L.; and Lamb, John T., 4,054,769, Cl. 219-10.55C.

Lampadarios, George V., to Atlantic Richfield Company. Process for catalytic conversion, 4,054,509, Cl. 208-148.000.

Lamson, Junior J.: See—
Hall, Richard H.; Haigh, Daniel H.; Lamson, Junior J.; and Yats, Larry D., 4,054,733, Cl. 526-293.000.

Landis Tool Company: See—
Harrel, Jack D., 4,054,830, Cl. 323-8.000.

Lanzillo, Ascanio, to Carle & Montanari S.p.A. Device for the working of candy dough hard and/or filled candies and a device for carrying out this proceeding, 4,054,271, Cl. 366-70.000.

LaPierre, James F., to Interstate Folding Box Company. Carton with integral pouring spout, 4,054,240, Cl. 229-17.00R.

Larson, Martin E.: See—
Borst, Gaylord M.; and Larson, Martin E., 4,054,102, Cl. 114-144.00R.

Latham, Harry L.: See—
Reynolds, Peter H.; Ironside, Donald S.; Barresi, Joseph F.; Scharle, Carl R.; Latham, Harry L.; and Saile, Charles, 4,054,832, Cl. 324-54.000.

Latimer, Joseph J.: See—
Gill, Robert A.; Latimer, Joseph J.; and Jordan, Arthur D., Jr., 4,054,717, Cl. 428-452.000.

Latona, Carmen J., Jr. Desiccating device for firearm, 4,054,002, Cl. 42-1.00N.

Lau, Edward H., to Redatron Corporation. Finger operated switching device, 4,054,944, Cl. 335-207.000.

Laughlin, Richard H.; and Sorensen, Peter, III, to Varo, Inc. Optical communications link, 4,054,794, Cl. 250-199.000.

Law, Malcolm John; and Hutchinson, Peter James, to Permalite Chemicals Limited. Electrodeposition of nickel, 4,054,495, Cl. 204-49.000.

Lawrence Peska Assoc.: See—
Ortiz, Jaime, Jr., 4,054,146, Cl. 131-170.00R.

Layer, Robert W., to B. F. Goodrich Company, The. Benzofuran-phenol stabilizers, 4,054,551, Cl. 260-45.80A.

Lazure, Frank S.; and Whitaker, William C., to Reynolds Metals Company. Package construction, 4,054,207, Cl. 206-486.000.

Leamy, Harry John: See—
Ferris, Stephen Duncan; Joy, David Charles; Leamy, Harry John; Longinotti, Louis David; and Schmidt, Paul Herman, 4,054,946, Cl. 313-346.00R.

Lear Siegler, Inc.: See—
Costin, Robert W., 4,054,318, Cl. 297-313.000.

Learnont, Robert P., to United States Steel Corporation. Method for the removal of radioactive waste during in-situ leaching of uranium, 4,054,320, Cl. 299-4.000.

Leask, John Wilson, to Engineering Dynamics Corporation. Methods of collimator fabrication, 4,054,800, Cl. 250-505.000.

Lebedev, Vladimir Alexandrovich: See—
Volkov, Gennady Ivanovich; Denisov, Vladilen Mikhailovich; Ermishin, Anatoly Efimovich; Zaozersky, Yuri Petrovich; Zozin, Vladimir Veniaminovich; Kapitonov, Viktor Pavlovich; Kikoin, Isaak Kuselevich; Lebedev, Vladimir Alexandrovich; Lystov, Nikolai Markovich; Matveev, Leonid Ivanovich; Popov, Timofei Vasilievich; Ryabov, Vasily Andreevich; Sukhov, Albert Grigorievich; Sysoev, Vitaly Mikhailovich; Shishin, Alexander Alexeevich; Shatalin, Nikolai Mikhailovich; Sheshterikov, Stanislav Alexeevich; Martynov, Sergei Petrovich; deceased; Martynova, Nina Fedorovna, administrator; Martynova, Olga Sergeevna, administrator; and Martynov, Alexander Sergeevich, 4,054,243, Cl. 233-11.000.

Le Boeuf, Albert R.; and Grovesten, William R., to Warner-Lambert Company. Preparing a hydrated contact lens, 4,054,624, Cl. 264-1.000.

Lee, David Quon; and McLaughlin, Donald W., to GTE Automatic Electric Laboratories Incorporated. Conference circuit for pulse coded modulated telephony, 4,054,755, Cl. 179-15.0AT.

Lee, Seung Joon; and Schreiner, Leon. Irrigator for body cavities, 4,054,137, Cl. 128-234.000.

Leech, Edward J.; Polichette, Joseph; and Branigan, John G., to Kollmorgen Technologies Corporation. Processes for the preparation of resinous bodies for adherent metallization comprising treatment with manganate/permanaganate composition, 4,054,693, Cl. 427-304.000.

Lefebvre, Claude; and Therond, Jean-Paul, to Commissariat a l'Energie Atomique. Nuclear reactor fail-safe unit having the function of control relay and current regulation, 4,054,486, Cl. 176-20.00R.

Leggett & Platt, Incorporated: See—
Higgins, Larry, 4,053,956, Cl. 5-255.000.

Le Goasoz, Vincent: See—
Audaire, Luc; Borel, Joseph; Le Goasoz, Vincent; and Poujois, Robert, 4,054,864, Cl. 340-173.00R.

LeGrives, Bernard: See—
Simon, Paul Rene; and LeGrives, Bernard, 4,053,977, Cl. 29-620.000.

Lehmann, Joseph L., to Sangamo Weston, Inc. Spectrum analyzer with multiple operational modes, 4,054,785, Cl. 364-726.000.

Leiber, Heinz; Gerstenmeier, Jurgen; and Korasiak, Wolfgang, to Teldix GmbH. Automatic antilock control system, 4,054,328, Cl. 303-103.000.

Leigh Products, Inc.: See—
Coopersmith, Leo, 4,054,310, Cl. 292-264.000.

LeJay, Augustin, to International Standard Electric Corporation. Conference circuit using PCM techniques, 4,054,757, Cl. 179-18.0BC.

Lemon, Robert William, to Borg-Warner Corporation. Multiple axle drive mechanism, 4,054,065, Cl. 74-711.000.

Lendi, Ulrich, to Mageba S.A., Firma. Plural vehicle parking device, 4,054,214, Cl. 214-16.10C.

Lerner, Martin L., to Zenith Radio Corporation. Hybrid implosion protection system for a flangeless faceplate color cathode ray tube and method of assembly thereof, 4,054,913, Cl. 358-246.000.

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- Martach, Edward P. Preservation of glucose in blood samples, 4,054,488, Cl. 195-1.800.
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- Martley, Raymond L.: See—
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- Mason, Richard K., to Textron Inc. Self monitoring redundant hydraulic control system, 4,054,154, Cl. 137-625.620.
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- Meade, James M. Steering vane, 4,054,101, Cl. 114-144.00C.
- Mecalis S.A.: See—
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- Mercer, Gerald D.: See—
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- Mercier, George E.: See—
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- Merrell, Richard L.: See—
Brown, Robert K., Jr.; and Merrell, Richard L., 4,054,163, Cl. 141-291.000.
- Messer, Mayer Naoum: See—
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- Messier, Russell Francis: See—
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- Metzger, Julio, to E. R. Squibb & Sons, Inc. Amphotericin complexes containing citric acid and calcium, 4,054,734, Cl. 536-17.000.
- Meyer, Armin: See—
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- Meyer, Willy: See—
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- Meyers, George Leroy; Mueller, David Charles; and Elliott, Edward Thayer, to American Can Company. Tapered octagonal tray, 4,054,241, Cl. 229-32.000.
- Meystre, Charles: See—
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- Mezzedimi, Vasco, to Nuovo Pignone S.P.A. Device for controlling the flow of fluids, particularly corrosive and polluting fluids, 4,054,260, Cl. 251-80.000.
- Miale, Joseph N.; and Olson, David H., to Mobil Oil Corporation. Activation of ferrierte and conversion of hydrocarbons therewith, 4,054,511, Cl. 208-120.000.
- Michalchik, Michael, to Dynacon Industries, Inc. Pressure sensitive resistance and process of making same, 4,054,540, Cl. 252-512.000.
- Michaud, Horst: See—
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- Michel, Max: See—
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- Micro-Circuits Company, Inc.: See—
Bradley, Robert F., 4,054,091, Cl. 101-129.000.
- Microwave and Electronic Systems Limited: See—
Owens, John Murry, 4,054,867, Cl. 340-274.00R.
- Midland-Ross Corporation: See—
Knecht, George W., 4,054,762, Cl. 200-50.00B.
- Popp, Roger C., 4,054,325, Cl. 303-7.000.
- Schrengenberger, Alex J., 4,053,993, Cl. 34-105.000.
- Suk, Eugene J., 4,054,222, Cl. 220-3.800.
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- Jaco, Charles M., Jr., 4,054,443, Cl. 75-5BA.
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- Mikelsons, Valdis, to Minnesota Mining and Manufacturing Company. Method of coating aluminum substrates, 4,054,467, Cl. 148-6.300.
- Mikhailichenko, Valentin Markovich: See—
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- Milan, Albert R.; and Markley, Raymond L. Endometrial sampling instrument. 4,054,127, Cl. 128-2.00B.
- Miller, Robert L.: See—
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- Millward, John David; and Wright, John, to Rank Organisation Limited. The film scanner with compensation for film shrinkage. 4,054,912, Cl. 358-216.000.
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- Minai, Yasuo: See—
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- Minakata, Masaaki: See—
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- Minka, Floyd M. Fluid flow measurement apparatus. 4,054,054, Cl. 73-113.000.
- Minneapolis Mining and Manufacturing Company: See—
Hill, Brian K.; and Kubik, Verna M., 4,054,645, Cl. 424-1.000.
- Koshar, Robert J.; and Barber, Loren L., Jr., 4,054,596, Cl. 560-150.000.
- Mikelsons, Valdis, 4,054,467, Cl. 148-6.300.
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- Yasukuni, Mitsuo, 4,054,371, Cl. 350-184.000.
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- Mitchell, Harry R.: See—
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- Mitsubishi Gas Chemical Company, Inc.: See—
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- Mitsubishi Jidosha Kogyo Kabushiki Kaisha: See—
Yamanaka, Akira, 4,054,314, Cl. 296-35.00R.
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- Yamaji, Hiroshi; and Furukawa, Kiyoshi, 4,053,989, Cl. 33-174.0PC.
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- Mitsui Toatsu Chemicals Incorporated: See—
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- Miyazaki, Takao: See—
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- Mizuguchi, Takashi: See—
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- Mobil Oil Corporation: See—
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- Milstein, Donald; and Fischer, Ronald H., 4,054,508, Cl. 208-89.000.
- Raich, Henry, 4,054,694, Cl. 427-352.000.
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- Molina, Orlando G., to Rockwell International Corporation. Variable sensitivity water washable dye penetrant. 4,054,535, Cl. 252-301.190.
- Mommeja, Patrick F.: See—
Laignel, Raymond A.; and Mommeja, Patrick F., 4,054,262, Cl. 251-367.000.
- Mommaron, Jean, to Mecalex S.A. Method of impregnating and drying materials and installations for carrying out this method. 4,054,692, Cl. 427-296.000.
- Monsanto Company: See—
Richardson, John C., 4,054,633, Cl. 264-184.000.
- Monsanto Limited: See—
Parker, Frederick John; and Sen, Durgacharan, 4,054,550, Cl. 264-45.300.
- Montedison S.p.A.: See—
Garberi, Angelo; Geddo, Agostino; and Marziano, Gian Lorenzo, 4,054,639, Cl. 423-140.000.
- Montgomery, Ralph; and Bowe, Richard E. Full range rotatable speaker housing with oppositely directed speakers. 4,054,750, Cl. 179-1.00E.
- Moore, John O., to Sprayrite Manufacturing Company. Row-crop tillage and treating device. 4,054,007, Cl. 47-1.700.
- Morabito, Joseph Michael: See—
Lesh, Nathan George, deceased; Ketterer, William B., executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,054,484, Cl. 156-652.000.
- Moreau, Christian: See—
Boirat, Robert; Davila, Claude; and Moreau, Christian, 4,054,834, Cl. 324-96.000.
- Morgan Construction Company: See—
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- Morgen, Dennis Howard, to Bell Telephone Laboratories, Incorporated. Remote testing of telephone loops. 4,054,760, Cl. 179-175.20B.
- Mori, Toshikazu; and Wakui, Mitsuru, to Nippon Electric Glass Company, Limited. Method for agglomerating hygroscopic dust and moisture-containing coarser particles. 4,054,631, Cl. 264-117.000.
- Moriguchi, Sanseki: See—
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- Moriki, Juichi; Shioji, Masayoshi; and Itoh, Teruo, to Matsushita Electric Industrial Co., Ltd. Drive circuit for piezoelectric high voltage generating device. 4,054,806, Cl. 310-318.000.
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- Morris, James B., Sr., to American Microsystems, Inc. Combined semiconductor device and printed circuit board assembly. 4,054,938, Cl. 361-401.000.
- Morrison, Robert J.: See—
Barnoski, Michael K.; Friedrich, Howard R.; and Morrison, Robert J., 4,054,366, Cl. 350-96.00C.
- Morrow, Scott L., to United States of America, Army. Process for electroless metal coating of nitrocellulose base propellants, and article. 4,054,095, Cl. 102-39.000.
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- Moseley, Kemper N. Lumber stacking apparatus and method. 4,054,211, Cl. 214-6.00M.
- Moss, Dan E. Mouth prop. 4,053,984, Cl. 32-33.000.
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- Mouissie, Bob, to Du Pont de Nemours, E. I., and Company. Contact assembly. 4,054,347, Cl. 339-75.00M.
- Mozerky, Samuel M.: See—
Gugger, Robert E.; and Mozerky, Samuel M., 4,054,270, Cl. 366-143.000.
- Mueller, Daniel L.: See—
Donohue, James M.; Carter, Ronald J.; Fiske, Kenton W.; Mueller, Daniel L.; Post, Donald S.; Reehil, Edward G.; and Steiner, Edward L., 4,054,380, Cl. 355-14.000.
- Mueller, David Charles: See—
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- Muller, Jacques. Pressurized water treatment bottle. 4,054,526, Cl. 210-245.000.
- Munch, John H.: See—
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- Murayama, Eiichi: See—
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- Murphy, Kevin P.; and Stahl, Richard F., to Allied Chemical Corporation. Constant boiling mixtures of 1,1,2-trichlorotrifluoroethane and cis-1,1,2,2-tetrafluorocyclobutane. 4,054,036, Cl. 62-114.000.
- Murphy, Richard J., to Xerox Corporation. Fusing device. 4,054,410, Cl. 432-60.000.
- Myers, William P., to Bendix Corporation. The control for a demand cannula. 4,054,133, Cl. 128-142.200.
- N L Industries, Inc.: See—
Wright, Alan C.; and Rupert, Joseph Paul, 4,054,537, Cl. 252-317.000.
- N. Schlumberger & Cie: See—
Herubel, Jean Frederic, 4,054,250, Cl. 242-18.0DD.

- Nadelson, Jeffrey, to Sandoz, Inc. Substituted pyrido[3,4-e]oxazine diones and their therapeutic use. 4,054,653, Cl. 424-248.570.
- Naf, Ferdinand, to Firmenich SA. Process for the preparation of ketone derivatives. 4,054,606, Cl. 260-586.00C.
- Nagasawa, Taro; Kuboyama, Morio; Ono, Joji; Saito, Minoru; Kudo, Tsutomu; Takahashi, Eiji; Doi, Kazuyoshi; and Nagata, Kazuhiro, to Morinaga Milk Industry Co., Ltd. Process for preparing a therapeutic agent. 4,054,648, Cl. 424-105.000.
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- Nagel, Karl: See—
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- Naito, Motohiro, to Nihon Denshi Kabushiki Kaisha. Mass spectrometer with superimposed electric and magnetic fields. 4,054,796, Cl. 250-294.000.
- Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, to Seiko Koki Kabushiki Kaisha. Slit shutter blade stabilizing device for cameras. 4,054,892, Cl. 354-252.000.
- Nakagome, Takenari: See—
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- Nakahama, Kazushi, to Tokyo Aircraft Instrument, Co., Ltd. Aircraft instrument with acceleration compensation device. 4,054,052, Cl. 73-430.000.
- Nakai, Masanori: See—
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- Nakamura, Katumi: See—
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- Nakamura, Shigeharu: See—
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- Nakashita, Mitsuo: See—
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- Nakazawa, Toshio: See—
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- Nalco Chemical Company: See—
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- Nara Sewing Machine Industrial Co., Ltd.: See—
Yanagi, Osamu, 4,054,099, Cl. 112-299.000.
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- Nasstrom, Nils: See—
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- National Defence of Canada: See—
Facey, Robert A.; Gravelle, Raynald A.; and Sheffer, Harry, 4,054,405, Cl. 425-405.00R.
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Skultchi, Martin M.; Ray-Chaudhuri, Dilip K.; and Catena, William J., 4,054,480, Cl. 156-331.000.
- National Steel Corporation: See—
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- Naumann, Wilhelm, to PMD Entwicklungswerk fur Kunststoffmaschinen GmbH & Co. KG. Apparatus for production of a bottle-shaped container, filled, sealed and ready for shipment. 4,054,017, Cl. 53-112.00A.
- Natron Corporation: See—
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- NCR Corporation: See—
Boone, James G., 4,054,950, Cl. 364-900.000.
- Stroupe, John R.; and Shooter, Kenneth L., 4,054,348, Cl. 339-91.00R.
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- Nelson, Norman A.: See—
Kelly, Robert C.; and Nelson, Norman A., 4,054,737, Cl. 542-413.000.
- Nelson, Peter H.; Untch, Karl G.; and Dunn, James P., to Syntex (U.S.A.) Inc. Intermediates in the process for the preparation of 2-(5H-dibenzo[a,d]cyclohepten-5-on-2-yl)acetic, propionic and butyric acids. 4,054,579, Cl. 260-340.90R.
- Nelson, Richard L., to Exxon Research and Engineering Company. Facsimile copy medium. 4,054,884, Cl. 346-134.000.
- Nelson, Wray H. Apparatus for cleaning and storing a recreational vehicle sewer hose assembly. 4,054,149, Cl. 134-167.00C.
- Nercessian, Sarkis, to Forbro Design Corporation. Power supply turn-on and turn-off transient elimination circuits. 4,054,831, Cl. 323-22.00V.
- Networks Electronic Corporation: See—
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- Neukom, Chester G., to Haybuster Manufacturing, Inc. Bag filling apparatus. 4,054,018, Cl. 53-124.00B.
- Neuman, Clayton L., to A-1 Engineering, Inc. Dispersion apparatus for injection molding filter. 4,054,273, Cl. 366-69.000.
- Neuman, Don E., to Dovey Manufacturing Company. Quick release locking device. 4,054,394, Cl. 403-344.000.
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- Nicolai, Van O., to United States of America, Navy. Solid state blue-green laser with high efficiency laser pump. 4,054,852, Cl. 331-94.50G.
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- Ichiko, Takao; and Tsuji, Yusuke, 4,054,945, Cl. 364-200.000.
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- Nippon Electric Glass Company, Limited: See—
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- Iwata, Tomoji; Moriguchi, Sanseki; and Abe, Hiroshi, 4,054,640, Cl. 423-239.000.
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- Kuno, Akira; Shinoda, Yoshio; and Arai, Hiroshi, 4,054,781, Cl. 364-442.000.
- Nippon Tsu Shin Kogyo K.K.: See—
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- Nippondenso Co., Ltd.: See—
Ito, Mikiji; and Yoshimura, Zyuziro, 4,054,152, Cl. 137-512.000.
- Nishi, Tadaaki: See—
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- Nishi, Yoshio: See—
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- Nishimura, Toshio: See—
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- Nishioka, Hideya, to Fujitsu Ltd. Wire bonding unit using infra-red ray detector. 4,054,824, Cl. 318-640.000.
- Nishiyama, Akira: See—
Kamogawa, Toshiro; Teruuchi, Yoshifumi; Matsumoto, Eiji; and Nishiyama, Akira, 4,054,918, Cl. 358-214.000.

Nissan Motor Company, Limited: See—
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 4,054,038, Cl. 64-21.000.
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 4,054,039, Cl. 64-21.000.
Nix, Lothar Heinrich Willi: See—
Kourimsky, Friedrich; and Nix, Lothar Heinrich Willi, 4,054,355, Cl. 339-230.000.
Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Method of making hologram lenses. 4,054,356, Cl. 350-3.500.
Noguchi, Masaru, to Fuji Photo Film Co., Ltd. Beam scanning device with line image formed by and reflected to optical element. 4,054,361, Cl. 350-7.000.
Noguchi, Takanobu: See—
Yagi, Yoshiharu; Yasui, Seimei; Sato, Hiroshi; Noguchi, Takanobu; and Yamamoto, Michio, 4,054,612, Cl. 260-669.00P.
Noranda Mines Limited: See—
Alberts, Russell, 4,054,280, Cl. 269-34.000.
Norman, Stanley R. C., to GTE Automatic Electric (Canada) Limited. Motor control device for data terminals. 4,054,745, Cl. 178-4.10R.
Norris Industries, Inc.: See—
Choate, Paul V.; and Papoulias, Thomas, 4,054,087, Cl. 100-53.000.
Nee, Michael A., 4,054,088, Cl. 100-214.000.
Northeast Utilities Service Company: See—
Reynolds, Peter H.; Ironside, Donald S.; Barresi, Joseph F.; Scharle, Carl R.; Latham, Harry L.; and Saile, Charles, 4,054,832, Cl. 324-54.000.
Northern Telecom Limited: See—
McGrath, Ronald George; and Wright, George Howard, 4,054,759, Cl. 179-175.30R.
Novacek, Jindrich: See—
Kucera, Jaromir; Novacek, Jindrich; Voda, Gustav; Chladek, Otokar; Kollmann, Jan; and Brada, Pavel, 4,054,041, Cl. 66-50.00A.
Nu-Pak Corporation: See—
Linnon, Robert C., 4,054,478, Cl. 156-242.000.
Nuovo Pignone S.P.A.: See—
Mezzedimi, Vasco, 4,054,260, Cl. 251-80.000.
Oak Industries Inc.: See—
Henderson, Donald Max; and Lewandowski, Raymond F., 4,054,860, Cl. 338-32.00H.
Markison, William C., 4,054,861, Cl. 338-32.00H.
Occidental Petroleum Corporation: See—
Longanbach, James R., 4,054,420, Cl. 44-1.00R.
Occidental Research Corporation: See—
Robinson, Leon; and Sass, Allan, 4,054,421, Cl. 44-1.00F.
Ocean van der Grinten N.V.: See—
Schoustra, Bauke; and Roncken, Hubertus W. H. M., 4,054,450, Cl. 96-1.00R.
O'Doherty, George O. P., to Eli Lilly and Company. Certain ethers of certain di and trihalo-1-hydroxy-2-(fluoroalkyl)1H-imidazo(4,5-b)pyridine derivatives. 4,054,573, Cl. 260-296.00H.
Ogiwara, Masahito: See—
Kose, Ryoji; Saito, Syoichi; and Ogiwara, Masahito, 4,054,164, Cl. 144-28.700.
Oguri, Kenro, to Nippon Gakki Seizo Kabushiki Kaisha. Amplifying system. 4,054,844, Cl. 330-155.000.
Ohga, Akihiro: See—
Oosaka, Shigenori; and Ohga, Akihiro, 4,054,360, Cl. 350-7.000.
Ohi, Reichi, to Fuji Photo Film Co., Ltd. Process for producing 2,2,4-trimethyl-6-hydroxy-7-substituted chromans. 4,054,580, Cl. 260-345.500.
Ohi, Reichi: See—
Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reichi; Kondo, Tokiharu, deceased; and Kondo, Yoshiharu, legal representative, 4,054,458, Cl. 96-107.000.
Ohkubo, Kinji: See—
Tsubota, Motohiko; Nishimura, Taiichi; and Ohkubo, Kinji, 4,054,456, Cl. 96-91.00R.
Ohlsted, Burl B., to Ameron, Inc. Method for sealing joints in plastic lined pipes. 4,054,473, Cl. 156-71.000.
Ohawa, Mitsuo, to Sony Corporation. Balanced synchronous detector circuit. 4,054,839, Cl. 329-50.000.
Ohta, Koji: See—
Yamamoto, Eiji; Ohta, Koji; Sekiguchi, Koji; and Fujimori, Toshiaki, 4,054,053, Cl. 73-67.80S.
Ohtani, Katsuhiko; Nakajima, Yosuke; Ohi, Reichi; Kondo, Tokiharu, deceased; and by Kondo, Yoshiharu, legal representative, to Fuji Photo Film Co., Ltd. Gelatin silver halide photosensitive material. 4,054,458, Cl. 96-107.000.
Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,054,252, Cl. 242-199.000.
Oishi, Katsuhiko, to Copal Company Limited. Line printer. 4,054,089, Cl. 101-99.000.
Okamura, Koussaku: See—
Agui, Hideo; Mitani, Toru; Nakashita, Mitsuo; Murayama, Eiichi; Okamura, Koussaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; and Eda, Yasuko, 4,054,568, Cl. 260-287.0CF.
Olender, Walter K., to General Electric Company. Polyphenylene oxide process. 4,054,553, Cl. 260-47.0ET.
Ollrich, Otto; and Brand, Wilhelm, to Siemens Aktiengesellschaft. Method of making a self-supporting wire coil. 4,053,975, Cl. 29-596.000.

Olschewski, Armin: See—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,054,336, Cl. 308-233.000.
Olson, David H.: See—
Miale, Joseph N.; and Olson, David H., 4,054,511, Cl. 208-120.000.
Oltman, Henry G., Jr., to Hughes Aircraft Company. Microstrip-dipole antenna elements and arrays thereof. 4,054,874, Cl. 343-700.0MS.
Oltmann, Hans Heinrich, to Dorr-Oliver Incorporated. Sedimentation apparatus with flocculating feed well. 4,054,514, Cl. 210-20.000.
Olympus Optical Company Limited: See—
Fukuoka, Kenji, 4,054,914, Cl. 358-256.000.
Omori, Masayuki: See—
Itoh, Norio; and Omori, Masayuki, 4,054,907, Cl. 358-60.000.
O'Nan, Thomas Charles; and Ciliberti, Frank L., to P.R. Mallory & Co. Inc. Battery with an agent for converting hydrogen to water and a second agent for retaining formed water. 4,054,727, Cl. 429-86.000.
Onda, Eiichi; and Watanabe, Masanori, to Seiko Koki Kabushiki Kaisha. Driving device for a camera shutter. 4,054,891, Cl. 354-246.000.
Onda, Eiichi: See—
Nakagawa, Tadashi; Koyama, Mitsuo; and Onda, Eiichi, 4,054,892, Cl. 354-252.000.
Ono, Joji: See—
Nagasawa, Taro; Kuboyama, Morio; Ono, Joji; Saito, Minoru; Kudo, Tsutomu; Takahashi, Eiji; Doi, Kazuyoshi; and Nagata, Kazuhiro, 4,054,648, Cl. 424-105.000.
Ono Pharmaceutical Co., Ltd.: See—
Hayashi, Masaki; and Ishihara, Atsunobu, 4,054,736, Cl. 536-103.000.
Ooishi, Tadashi: See—
Kirino, Osamu; Ooishi, Tadashi; Kameda, Nobuyuki; Kato, Toshiro; Fujinami, Akira; and Ozaki, Toshiaki, 4,054,668, Cl. 424-314.000.
Oosaka, Shigenori; and Ohga, Akihiro, to Fuji Photo Film Co., Ltd. Apparatus for removing the scanning error due to an error in parallelism of a rotary polyhedral mirror. 4,054,360, Cl. 350-7.000.
Oppenheim, Frank C. Releasable mechanical joints. 4,054,392, Cl. 403-174.000.
Opsahl, Thomas L.: See—
Tarr, William A.; Krepps, James E.; and Opsahl, Thomas L., 4,054,853, Cl. 334-15.000.
Orban, Stefano. Process for preparing vegetal proteinic concentrates, products thereby obtained, and milk substituting feeds containing said concentrates. 4,054,677, Cl. 426-602.000.
Orion-Yhtymä Oy-Orion Diagnostica: See—
Vesterberg, Olof Alfred Yngve, 4,054,490, Cl. 195-103.50K.
Ortiz, Jaime, Jr., to Lawrence Peska Assoc. Cigarette perforator box. 4,054,146, Cl. 131-170.00R.
Osawa, Tagui: See—
Hirai, Yutaka; Miyata, Katsuharu; and Osawa, Tagui, 4,054,586, Cl. 260-378.000.
Oshima, Hideji: See—
Marubashi, Kiyonobu; Oshima, Hideji; and Sakano, Yasuaki, 4,054,731, Cl. 526-75.000.
Osterloh, Rolf: See—
Kuesters, Werner; Osterloh, Rolf; and Jacobi, Manfred, 4,054,682, Cl. 427-54.000.
Ostojic, Nedeljko; and Boscak, Vladimir G., to Geo. A. Hormel & Co. Method and apparatus for solvent recovery. 4,054,429, Cl. 55-48.000.
Osugi, Minoru; and Uchiyama, Takako, to Mitsubishi Gas Chemical Company, Inc. Process for the preparation for formaldehyde. 4,054,609, Cl. 260-603.00R.
Ott, Karl-Heinz: See—
Hardt, Dietrich; Humme, Gert; Ott, Karl-Heinz; and Braese, Hans-Eberhard, 4,054,615, Cl. 260-876.00R.
Ouska, Michael. Cooling system. 4,054,623, Cl. 261-151.000.
Outboard Marine Corporation: See—
Borst, Gaylord M.; and Larson, Martin E., 4,054,102, Cl. 114-144.00R.
Carpenter, Eugene C., 4,054,023, Cl. 56-202.000.
Poehlman, Arthur G., 4,053,980, Cl. 30-381.000.
Wick, Gerald H., 4,054,022, Cl. 56-11.300.
Outokumpu Oy: See—
Makiirtti, Simo Antero Iivari, 4,054,446, Cl. 75-76.000.
Owen, Theodore R., to International Business Machines Corporation. Spectrophotometer with photodiode array. 4,054,589, Cl. 356-189.000.
Owens-Corning Fiberglass Corporation: See—
Klink, Jerome P.; and Eisenberg, Arnold J., 4,054,249, Cl. 242-18.00G.
Strauss, Carl R.; Roberts, Michael G.; and Bolen, Charles E., 4,054,561, Cl. 260-22.00D.
Owens-Illinois, Inc.: See—
Mueller, Martin, 4,054,212, Cl. 214-8.50A.
Owens, John Murry, to Microwave and Electronic Systems Limited. Detecting damage to bulk material. 4,054,867, Cl. 340-274.00R.
Ownby, Paul Darrell. Dense chromium sesquioxide. 4,054,627, Cl. 264-63.000.
Oxford Laboratories Inc.: See—
Branham, Doug Roger, 4,054,062, Cl. 73-425.600.
Oxy Metal Industries Corporation: See—
King, Peter F.; and Reghi, Gary A., 4,054,466, Cl. 148-6.270.
Ozaki, Toshiaki: See—
Kirino, Osamu; Ooishi, Tadashi; Kameda, Nobuyuki; Kato, Toshiro; Fujinami, Akira; and Ozaki, Toshiaki, 4,054,668, Cl. 424-314.000.

Ozone, Kiyoharu, to Kabushiki Kaisha Daini Seikosha. Ink pen device. 4,054,883, Cl. 346-140.0R.
P.R. Mallory & Co. Inc.: See—
O'Nan, Thomas Charles; and Ciliberti, Frank L., 4,054,727, Cl. 429-86.000.
Pacciarini, Antonio: See—
Bottasso, Franco; and Pacciarini, Antonio, 4,054,475, Cl. 156-157.000.
Pachynski, Alvin L., Jr., to GTE Automatic Electric Laboratories Incorporated. Data buffer. 4,054,747, Cl. 178-69.100.
Palmer, Howard J.; and Bechard, James R. Oil pressure failure protection device for internal combustion engines. 4,054,117, Cl. 123-198.00D.
Palmer, William Francis. Fire and smoke free system for high rise building stairways. 4,054,084, Cl. 98-39.000.
Pangburn Co., The: See—
Strobe, Carl J., 4,054,242, Cl. 229-71.000.
Pannell, Otis R. Rope stop and holding device. 4,054,188, Cl. 188-65.300.
Papalos, John G.; and Kelly, James M., to Diamond Shamrock Corporation. Phenol-alkylphenol phosphates. 4,054,617, Cl. 260-930.000.
Papoulias, Thomas: See—
Choate, Paul V.; and Papoulias, Thomas, 4,054,087, Cl. 100-53.000.
Paradisi, Remo Santi; and Rogaski, Robert William. Starter strip for metal siding. 4,054,012, Cl. 52-544.000.
Parent, Edward D., to GTE Sylvania Incorporated. Method of making refractory metal-ceramic crucible. 4,054,500, Cl. 204-181.000.
Parent, Guy, to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A. Device for forming channels. 4,054,873, Cl. 343-113.00R.
Parker, Bernard; Gross, Otto; and Buchler, Joseph, to Buchler Instruments, Division of Searle Diagnostics Inc. Concentrating vortex shaker. 4,054,151, Cl. 137-110.000.
Parker, Frederick John; and Sen, Durgacharan, to Monsanto Limited. Process for producing cigarette filters. 4,054,550, Cl. 264-45.300.
Parker, Howard E.: See—
Steinberg, Walter A.; and Parker, Howard E., 4,054,822, Cl. 318-573.000.
Parker, Paul Thomas, to Exxon Research and Engineering Company. Selective conversion of normal paraffins. 4,054,510, Cl. 208-120.000.
Paschedag, Theodor, to Westfalia Separator AG. Centrifuge drum equipped with discharge valves. 4,054,244, Cl. 233-20.00A.
Patejak, Jerzy F., to Aetna-Standard Engineering Company. Flying saw with movable work shifter. 4,054,071, Cl. 83-306.000.
Patrichi, Mihai D., to Networks Electronic Corporation. Explosive actuated pin puller. 4,054,032, Cl. 60-632.000.
Patterson, A. J.: See—
Benjamin, Robert E.; Angles, James C.; Edging, Thomas E.; Griffith, Jerry D.; Patterson, A. J.; and Webster, Thelton A., 4,054,678, Cl. 426-653.000.
Paul, Vincent James, Jr.: See—
Butler, John Charles; Cahill, Lysle Dwight; Drumm, Ernest Warren; Fife, Arnold Leroy; and Paul, Vincent James, Jr., 4,054,928, Cl. 360-79.000.
Pavlov, Serafim Alexandrovich: See—
Belitsin, Mikhail Nikolaevich; Borik, Alexandr Gamsheevich; Kudryashova, Galina Akimovna; Kudryashov, Sergei Alexandrovich; Goncharova, Eleonora Viktorovna; Sadkova, Natalia Alexandrovna; Pavlov, Serafim Alexandrovich; Kulikov, Valentin Vladimirovich; Tolpygina, Galina Petrovna; Gotie, Tatyana Nikolaevna; Toropova, Elena Grigorievna; Ermolina, Nina Ivanovna; and Puchnin, Ivan Vasilevich, 4,054,709, Cl. 428-224.000.
Paxton, Gerald C., to SWF Machinery, Inc. Machine for nailing slats on stringers. 4,054,236, Cl. 227-45.000.
Pearce, Norman Henry: See—
Wilson, Murray Vincent; and Pearce, Norman Henry, 4,053,961, Cl. 16-84.000.
Pechacek, Raymond E., to Hahn & Clay. Wrapping machine for layered vessels. 4,053,971, Cl. 29-252.000.
Pechacek, Raymond E., to Hahn & Clay. Vessel assembly. 4,054,224, Cl. 220-5.00A.
Pedersen, George H., to General Motors Corporation. Variable cycle gas turbine engine. 4,054,030, Cl. 60-262.000.
Pedigree Petfoods Limited: See—
Barker, David; Burrows, Ian Edward; and Buckley, Keith, 4,054,674, Cl. 426-326.000.
Peek, Henry L.; and Weatherly, Douglas B., to Allis-Chalmers Corporation. Pin-joint coupling for three or more interrelated components. 4,054,765, Cl. 200-148.00F.
Peerts, Fernand: See—
Buchet, Jean H.; and Peerts, Fernand, 4,054,460, Cl. 106-89.000.
Peiffer, Robert William, to Du Pont de Nemours, E. I., and Company. Additive process for producing printed circuit elements using a self-supported photosensitive sheet. 4,054,479, Cl. 156-280.000.
Peiffer, Robert William, to Du Pont de Nemours, E. I., and Company. Additives process for producing plated holes in printed circuit elements. 4,054,483, Cl. 156-632.000.
Pelousek, Herbert: See—
Kubitzek, Harry; Liedtke, Wolfgang; and Pelousek, Herbert, 4,054,025, Cl. 57-157.0TS.
Pennish, John S.: See—
Carman, Justice N., 4,054,641, Cl. 423-337.000.
Penny, Robert Noel, to Caterpillar Tractor Co. Centrifugal compressor or centripetal turbine. 4,054,398, Cl. 415-211.000.

Pera, John D.: See—
Buckman, John D.; Buckman, Stanley J.; Mercer, Gerald D.; and Pera, John D., 4,054,542, Cl. 260-2.0BP.
Permalite Chemicals Limited: See—
Law, Malcolm John; and Hutchinson, Peter James, 4,054,495, Cl. 204-49.000.
Perrin, Marc Auguste, to Cycles Peugeot. Guard for a chain and chain wheel transmission in particular for the transmission of a cycle or the like. 4,054,063, Cl. 74-611.000.
Perrine, Ronald E., Sr. Foam plastic archery target with internal frame. 4,054,288, Cl. 273-102.00S.
Perry, Thomas W.: See—
Carella, Richard F.; and Perry, Thomas W., 4,054,307, Cl. 292-50.000.
Petersen, Rudolf Theodor; and Fleck, Wolfgang, to Beiersdorf Aktiengesellschaft. Phenoxalkylamine containing pyridines having blood pressure reducing properties. 4,054,662, Cl. 424-263.000.
Petitpierre, Jean Claude: See—
Garner, Robert; and Petitpierre, Jean Claude, 4,054,718, Cl. 428-454.000.
Petrolite Corporation: See—
Burks, Rudolf S.; and Munch, John H., 4,054,554, Cl. 260-59.0EP.
Petrov, Vladimir: See—
Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal; and Petrov, Vladimir, 4,054,651, Cl. 424-239.000.
Pfizer Inc.: See—
Robba, William A.; and Froberg, Robert W., 4,054,708, Cl. 428-220.000.
Philip Morris Incorporated: See—
Devliss, Roy Joseph, 4,054,020, Cl. 53-128.000.
Phillips Petroleum Company: See—
Bartley, Thomas M.; and Giles, Richard F., 4,054,780, Cl. 364-106.000.
Haskell, Donald M.; Hopper, Edward E.; and Munro, Bradley L., 4,054,613, Cl. 260-680.00R.
Phillips, Richard Edwin, to R. E. Phillips Limited. Automatic door opening arrangement. 4,054,008, Cl. 49-31.000.
Picker, Amos; and Feist, Wolfgang M., to Raytheon Company. Semiconductor heterojunction television imaging tube. 4,054,896, Cl. 357-31.000.
Pickett, John H.: See—
Mandelcorn, Lyon; Miller, Robert L.; Mercier, George E.; Pickett, John H.; and Dakin, Thomas W., 4,054,937, Cl. 361-319.000.
Pielkenrood, Jacob, to Pulkenrood-Vinitex B.V. Device for treating a suspension. 4,054,529, Cl. 210-521.000.
Pilosio, Roberto, to Pilosio, S.p.A. Retaining panel. 4,054,033, Cl. 61-41.00A.
Pilosio, S.p.A.: See—
Pilosio, Roberto, 4,054,033, Cl. 61-41.00A.
Pine, Lloyd A.: See—
Segura, Marnell A.; Aldridge, Clyde L.; Riley, Kenneth L.; and Pine, Lloyd A., 4,054,644, Cl. 423-655.000.
Pinkerton, Harry. Apparatus for exposing a fluid to a negative pressure. 4,054,522, Cl. 210-188.000.
Pitto, Ernesto; and Borneto, Giuseppe. Metal beam system for steel-concrete structures. 4,054,013, Cl. 52-641.000.
Plant, William J.: See—
Wright, John W.; Plant, William J.; and Schuler, Dale L., 4,054,879, Cl. 343-5.0SA.
PMD Entwicklungswerk für Kunststoff-maschinen GmbH & Co. KG.: See—
Naumann, Wilhelm, 4,054,017, Cl. 53-112.00A.
Poehlman, Arthur G., to Outboard Marine Corporation. Chain saw including an overtorque releasing clutch. 4,053,980, Cl. 30-381.000.
Poincenot, Rene P., to Ratier-Forest. Broaching machines. 4,054,082, Cl. 90-96.000.
Poirier, Alain M.; Buchner, Georges; and Martel, Gilbert Francois. Videotelephone conference system. 4,054,908, Cl. 358-85.000.
Polaroid Corporation: See—
Eloranta, Vaito K., 4,054,231, Cl. 222-102.000.
Polderman, Pieter Aart, to Stork Amsterdam B.V. Device for transforming a plurality of disorderly advanced containers into a single row. 4,054,199, Cl. 198-452.000.
Poletto, John Frank: See—
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,054,604, Cl. 260-557.00R.
Polichette, Joseph: See—
Leech, Edward J.; Polichette, Joseph; and Branigan, John G., 4,054,693, Cl. 427-304.000.
Pollitt, Joseph F.: See—
Lloyd, Harold E.; and Pollitt, Joseph F., 4,054,238, Cl. 228-173.00R.
Popov, Timofei Vasilevich: See—
Volkov, Gennady Ivanovich; Denisov, Vladilen Mikhailovich; Ermishin, Anatoly Efimovich; Zaozersky, Jury Petrovich; Zozin, Vladimir Veniaminovich; Kapitonov, Viktor Pavlovich; Kikoin, Isak Kushelevich; Lebedev, Vladimir Alexandrovich; Lyustov, Nikolai Markovich; Matveev, Leonid Ivanovich; Popov, Timofei Vasilevich; Ryabov, Vasily Andreevich; Sukhov, Albert Grigorievich; Sysoev, Vitaly Mikhailovich; Shishin, Alexandr Alexeevich; Shatalin, Nikolai Mikhailovich; Sheterikov, Stanislav Alexeevich; Martynov, Sergei Petrovich, deceased; Martynova, Nina Fedorovna, administrator; Martynova, Olga Sergeevna, administrator; and Martynov, Alexandr Sergeevich, 4,054,243, Cl. 233-11.000.

- Popp, Roger C., to Midland-Ross Corporation. Pneumatically controlled hydraulic trailer brake system. 4,054,325, Cl. 303-7.000.
- Pos, Norman D., to United States of America, Navy. Apparatus for computing an arithmetically accumulated sequence of numbers. 4,054,787, Cl. 364-748.000.
- Post, Donald S.: See—
Donohue, James M.; Carter, Ronald J.; Fiske, Kenton W.; Mueller, Daniel L.; Post, Donald S.; Reehil, Edward G.; and Steiner, Edward L., 4,054,380, Cl. 355-14.000.
- Poujois, Robert: See—
Audaire, Luc; Borel, Joseph; Le Goasoz, Vincent; and Poujois, Robert, 4,054,864, Cl. 340-173.00R.
- Pouška, George A., to Marathon Oil Company. Dewatering water-wet particles and blending the particles in a liquid carrier. 4,054,507, Cl. 208-24.000.
- Povvy, Edmund H., to Doble Engineering Company. Transformer ratio-arm bridge with improved balancing means. 4,054,836, Cl. 324-140.00D.
- Poy, Guy: See—
Guillaume, Andre; and Poy, Guy, 4,054,545, Cl. 260-2.5AH.
- Pozniak, Donald J.: See—
Herrin, Ronald J.; and Pozniak, Donald J., 4,054,109, Cl. 123-90.160.
- PPG Industries, Inc.: See—
Gruber, Gerald W., 4,054,683, Cl. 427-53.000.
- Trevorrow, Thomas R., 4,054,436, Cl. 65-65.00A.
- Prang, Walter F., to United States of America, Energy Research and Development Administration. Saturating time-delay transformer for overcurrent protection. 4,054,933, Cl. 361-57.000.
- Prelicic, See—
Simon, Francois, 4,054,055, Cl. 73-133.00R.
- Pressure Science Incorporated: See—
Sadoff, Bernard J., Jr.; and Halling, Horace P., 4,054,306, Cl. 285-233.000.
- Presta, Claude, to Saint-Gobain Industries. Method and apparatus for curving sheets in the plastic state. 4,054,438, Cl. 65-107.000.
- Pritchett, James D.: See—
Edwards, Steven F.; Johnson, James A.; Jordan, William D.; and Pritchett, James D., 4,054,901, Cl. 357-81.000.
- Prohaska, Peter J. H. Lock for sliding closures. 4,054,308, Cl. 292-204.000.
- Propp, Carl F. Oil skimming apparatus. 4,054,525, Cl. 210-242.00S.
- Proza, John. Device for indicating direction of barometric pressure trends. 4,054,058, Cl. 73-386.000.
- Prudhomme, Marc: See—
Brevail, Marcel; and Prudhomme, Marc, 4,054,801, Cl. 250-551.000.
- Puchnin, Ivan Vasilievich: See—
Belitsin, Mikhail Nikolaevich; Borik, Alexandr Gamsheevich; Kudryashova, Galina Akimovna; Kudryashov, Sergei Alexandrovich; Goncharova, Eleonora Viktorovna; Sadkova, Natalia Alexandrovna; Pavlov, Serafim Alexandrovich; Kulikov, Valentin Vladimirovich; Tolpygina, Galina Petrovna; Gotie, Tatyana Nikolaevna; Toropova, Elena Grigorievna; Ermolina, Nina Ivanovna; and Puchnin, Ivan Vasilievich, 4,054,709, Cl. 428-224.000.
- Pulkenrood-Vinitex B.V.: See—
Pielkenrood, Jacob, 4,054,529, Cl. 210-521.000.
- Quambeck, Sherman H. Trip beam linkage. 4,054,177, Cl. 172-267.000.
- Quentin, Jean-Pierre, to Rhone-Poulenc Industries. Sulphonated poly-ether-sulphones and membranes thereof. 4,054,707, Cl. 428-213.000.
- R. A. Jones & Co. Inc.: See—
Weichand, Robert J.; and Adams, Charles W., 4,054,019, Cl. 53-124.00D.
- R. E. Phillips Limited: See—
Phillips, Richard Edwin, 4,054,008, Cl. 49-31.000.
- R. R. Donnelley & Sons Company: See—
Hahn, Alvin J., 4,054,701, Cl. 428-156.000.
- Raab, Andrew F.; and Halstead, Raymond T., to Indak Manufacturing Corporation. Electrical switch combined with fluid control device. 4,054,761, Cl. 200-16.00C.
- Raab, Frederick H., to Austin Company, The. Remote object position locator. 4,054,881, Cl. 343-112.00R.
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- Raich, Henry, to Mobil Oil Corporation. Method for applying fatigue-resistant surface coating. 4,054,694, Cl. 427-352.000.
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- Rammner, Roland; and Weiss, Hans-Jurgen, to Metallgesellschaft Aktiengesellschaft. Process for treating bituminous or oil-containing material using dry distillation. 4,054,492, Cl. 201-12.000.
- Rank Organisation Limited, The: See—
Millward, John David; and Wright, John, 4,054,912, Cl. 358-216.000.
- Rapoport, Henry; and Barber, Randy B., to University of California, The Regents of the. Process for converting neopinone to codeinone. 4,054,566, Cl. 260-285.000.
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- Rausch, Gunter, to Rollei-Werke Franke & Heidecke. Case for photographic cameras. 4,054,167, Cl. 150-52.00J.
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- Rayfield, Harry F., to Data Products Corporation. Fan fold form stacker. 4,054,283, Cl. 270-79.000.
- Raymond Lee Organization, Inc., The: See—
Blank, George, 4,054,067, Cl. 81-58.100.
- Sullins, Lloyd, 4,054,296, Cl. 280-11.200.
- Raytheon Company: See—
Backman, William R., Jr., 4,054,862, Cl. 340-3.00R.
- Pickler, Amos; and Feist, Wolfgang M., 4,054,896, Cl. 357-31.000.
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- Glogolija, Miroslav; and Leuthausen, Charles Brook, 4,054,845, Cl. 330-207.00P.
- Ham, William Edward, 4,054,895, Cl. 357-23.000.
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- Heagerty, William Frederick; and Dillon, Luke, Jr., 4,054,894, Cl. 357-23.000.
- Himics, Richard Joseph; Graham, Scott Oliver; and Ross, Daniel Louis, 4,054,454, Cl. 96-67.000.
- Lurie, Michael Jay, 4,054,357, Cl. 350-3.500.
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- Rebek, Dennis C. Apparatus for developing photographic prints. 4,054,902, Cl. 354-329.000.
- Rebenstorf, Vernon A., to Caterpillar Tractor Co. Air brake system with line pressure loss protection. 4,054,327, Cl. 303-84.00R.
- Rech, Werner: See—
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Lau, Edward H., 4,054,944, Cl. 335-207.000.
- Redko, Sergei Georgievich; Korolev, Albert Viktorovich; Maxjushin, Anatoly Fedorovich; Kreps, Moisei Solomonovich; and Gorokhov, Fedor Vasilievich. Machine for surface grinding. 4,054,009, Cl. 51-3.000.
- Reed, David Robert; and Stafford, Thomas Whitehead, to Imperial Chemical Industries Limited. Decorative sheet material. 4,054,697, Cl. 428-40.000.
- Reed, Hugh T. Gas humidifier. 4,054,122, Cl. 126-113.000.
- Reed Tool Company: See—
Bassinger, Grey, 4,054,180, Cl. 173-136.000.
- Reehil, Edward G.: See—
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- Regan, John J. Multi-layered mattress. 4,053,957, Cl. 5-355.000.
- Reggi, Gary A.: See—
King, Peter F.; and Reggi, Gary A., 4,054,466, Cl. 148-6.270.
- Reid, Luther J. Apparatus for measuring the crush strength of solid particles. 4,054,050, Cl. 73-94.000.
- Reimers, Eberhart, to United States of America, Army. Voltage boost circuit for DC power supply. 4,054,827, Cl. 363-28.000.
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- Renton, Stanley: See—
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- Research Corporation, The: See—
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- Ressorts du Nord S.A.: See—
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- Rexnord, Inc.: See—
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- Reynolds Metals Company: See—
Arfert, Horst F. W., 4,054,229, Cl. 220-288.000.
- Farquhar, Melville T., 4,054,203, Cl. 206-45.140.
- Hagerman, Kenneth C., 4,054,048, Cl. 72-262.000.
- Lazure, Frank S.; and Whitaker, William C., 4,054,207, Cl. 206-486.000.
- Reynolds, Peter H.; Ironside, Donald S.; Barresi, Joseph F.; Scharle, Carl R.; Latham, Harry L.; and Sate, Charles, to James G. Biddle Company; and Northeast Utilities Service Company. System and

- method of measurement of insulation qualities of three-phase power equipment. 4,054,832, Cl. 324-54.000.
- Rhone-Poulenc Industries: See—
Daumas, Jean-Claude; Dupuy, Georges; and Michel, Max, 4,054,642, Cl. 423-574.00R.
- Guillaume, Andre; and Poy, Guy, 4,054,545, Cl. 260-2.5AH.
- Quentin, Jean-Pierre, 4,054,707, Cl. 428-213.000.
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Yoder, Michael C., 4,054,037, Cl. 62-224.000.
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- Ricciardi, Ronald J.; Ferrara, Angelo; and Hartmann, Joseph L. Weigh feeder system. 4,054,784, Cl. 364-479.000.
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Bauer, Siegfried, 4,054,143, Cl. 128-303.170.
- Richardson, John C., to Monsanto Company. Process for continuously preparing shaped articles of aromatic oxadiazole or aromatic oxadiazole/N-alkylhydrazide polymers from monomer solutions. 4,054,633, Cl. 264-184.000.
- Richardson-Merrell Inc.: See—
Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal; and Petrov, Vladimir, 4,054,651, Cl. 424-239.000.
- Richter Gedeon Vegyeszeti Gyar Rt.: See—
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- Ricoh Company, Ltd.: See—
Suzuki, Koichi; and Suzuki, Tomoaki, 4,054,230, Cl. 222-1.000.
- Riebs, Richard E., to RTE Corporation. Solid state inverse overcurrent relay. 4,054,934, Cl. 361-93.000.
- Rietveld, Frank P. Nail setting tool. 4,054,237, Cl. 227-147.000.
- Riley, Kenneth L.: See—
Segura, Marnell A.; Aldridge, Clyde L.; Riley, Kenneth L.; and Pine, Lloyd A., 4,054,644, Cl. 423-655.000.
- Rineman, Harold J.: See—
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- Rineman, R. Lynn: See—
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- Risberg, Robert L. Solid state current source polyphase inverter induction motor drive. 4,054,818, Cl. 318-227.000.
- Rival Manufacturing Company: See—
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- Rixon, Inc.: See—
Tretter, Steven Alan, 4,054,838, Cl. 325-323.000.
- Robba, William A.; and Froberg, Robert W., to Pfizer Inc. Film of pyrolytic graphite having bi-directional reinforcing properties. 4,054,708, Cl. 428-220.000.
- Robert Bosch GmbH: See—
Conzelmann, Gerhard; Nagel, Karl; and Keller, Helmut, 4,054,828, Cl. 322-28.000.
- Streit, Klaus; Staiger, Karl; Conzelmann, Gerhard; Seiler, Hartmut; and Nagel, Karl, 4,054,898, Cl. 357-36.000.
- Roberts, George W.: See—
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- Roberts, Michael G.: See—
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- Robertshaw Controls Company: See—
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- Teichert, Allen L.; and Jones, Richard E., 4,054,859, Cl. 337-309.000.
- Robinson, Leon; and Sass, Allan, to Occidental Research Corporation. Method for desulfurizing char by acid washing and treatment with hydrogen gas. 4,054,421, Cl. 44-1.00F.
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Elliott, William S., 4,054,842, Cl. 329-133.000.
- Ervin, Guy, Jr., 4,054,126, Cl. 126-271.000.
- Kramer, John J., 4,054,766, Cl. 200-157.000.
- Molina, Orlando G., 4,054,535, Cl. 252-301.190.
- Webster, Walter C., III; and Allen, Frank L., Jr., 4,054,690, Cl. 427-240.000.
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- Rodgers, Kenneth J.: See—
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- Rogaski, Robert William: See—
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- Rohling, Bernd Holger, to Girling Limited. Hydraulic braking systems for vehicles. 4,054,326, Cl. 303-24.00A.
- Rohm GmbH: See—
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- Rohm and Haas Company: See—
Clovis, James S.; and Sullivan, Francis R., 4,054,618, Cl. 260-968.000.
- Gill, Robert A.; Latimer, Joseph J.; and Jordan, Arthur D., Jr., 4,054,717, Cl. 428-452.000.
- Rohr Industries, Inc.: See—
Heffner, George, 4,054,481, Cl. 156-389.000.
- Rokach, Joshua: See—
Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., 4,054,652, Cl. 424-246.000.
- Rokore Concepts Associates Ltd.: See—
Rose, William J., 4,054,868, Cl. 340-337.000.
- Rollei-Werke Franke & Heidecke: See—
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- Roller, Paul S. Method and apparatus for converting saline water to fresh water. 4,054,493, Cl. 203-7.000.
- Rollinger, Gary J., to Rexnord, Inc. Luggage sortation device. 4,054,201, Cl. 198-455.000.
- Rolls-Royce Limited: See—
Higginbotham, Gordon John Spencer; and Wolverson, John, 4,054,723, Cl. 428-678.000.
- Romanelli, Frances. Vehicle safety light. 4,054,789, Cl. 362-80.000.
- Roncken, Hubertus W. H. M.: See—
Schoustra, Bauke; and Roncken, Hubertus W. H. M., 4,054,450, Cl. 96-1.00R.
- Rooney, Clarence S.; Rokach, Joshua; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Dihydro- and tetrahydro- iminotiazines. 4,054,652, Cl. 424-246.000.
- Rose, William J., to Rokore Concepts Associates Ltd. Electronic musical scale and chord display apparatus. 4,054,868, Cl. 340-337.000.
- Rosebrock, Theodore L., to General Motors Corporation. Regenerative-filter-incinerator device. 4,054,417, Cl. 23-277.00C.
- Rosenstein, Abraham J. Combined pocket flask and denture case with removable cup portion. 4,054,220, Cl. 215-6.000.
- Ross, Daniel Louis: See—
Himics, Richard Joseph; Graham, Scott Oliver; and Ross, Daniel Louis, 4,054,454, Cl. 96-67.000.
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- Rossi, Pietro Paolo: See—
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- Rothgordt, Ulf, to U.S. Philips Corporation. Electrostatic recording device. 4,054,885, Cl. 346-154.000.
- Rowe, Walter W.: See—
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- Rowell, Lorne A., to Imasco, Ltd. Chip packing apparatus and method. 4,054,015, Cl. 53-26.000.
- RTE Corporation: See—
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- Rudin, Marvin B. Electrical power take-off unit for cigarette lighter socket of vehicle. 4,054,352, Cl. 339-154.00A.
- Ruegg, Edwin, to Maschinenfabrik und Giesserei Netstal AG. Hydraulic ejector operating mechanism. 4,054,406, Cl. 425-444.000.
- Ruegg, Rudolf: See—
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- Rupert, Joseph Paul: See—
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- Ruscitto, Paul Anthony, to International Business Machines Corporation. Non-sequential ink jet printing. 4,054,882, Cl. 346-1.000.
- Rush-Hampton, Inc.: See—
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- Rutledge, James E. Hard-shelled crustacean meat recovery process. 4,053,964, Cl. 17-48.000.
- Ryabov, Vasily Andreevich: See—
Volkov, Gennady Ivanovich; Denisov, Vladilen Mikhailovich; Ermishin, Anatoly Efimovich; Zozersky, Jury Petrovich; Zozin, Vladimir Veniaminovich; Kapitonov, Viktor Pavlovich; Kikoin, Isaak Kushelevich; Lebedev, Vladimir Alexandrovich; Lystov, Nikolai Markovich; Matveev, Leonid Ivanovich; Popov, Timofei Vasilievich; Ryabov, Vasily Andreevich; Sukhov, Albert Grigorievich; Sysoev, Vitaly Mikhailovich; Shishin, Alexandr Alexeevich; Shatalin, Nikolai Mikhailovich; Shesterikov, Stanislav Alexeevich; Martynov, Sergei Petrovich; deceased; Martynova, Nina Fedorovna, administrator; Martynova, Olga Sergeevna, administrator; and Martynov, Alexandr Sergeevich, 4,054,243, Cl. 233-11.000.
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- Nikolaevna; Toropova, Elena Grigorievna; Ermolina, Nina Ivanovna; and Puchnin, Ivan Vasilievich, 4,054,709, Cl. 428-224.000.
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- Saile, Charles: See—
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- Saint Gobain Industries: See—
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- Ueberwolf, Heinz; and Siemonsen, Hans-Pieter, 4,054,437, Cl. 65-107.000.
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- Meli, Fausto, 4,053,973, Cl. 29-252.000.
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- Saito, Minoru: See—
- Nagasaki, Taro; Kuboyama, Morio; Ono, Joji; Saito, Minoru; Kodo, Tsutomu; Takahashi, Eiji; Doi, Kazuyoshi; and Nagata, Kazuhiro, 4,054,648, Cl. 424-105.000.
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- Sakaguchi, Shinji: See—
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- Sakane, Takashi; and Nakamura, Shigeharu, to Nippon Electric Glass Company, Limited. Method of crystallizing a two layer glass article. 4,054,435, Cl. 65-18.000.
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- Sand, Roger D., to General Motors Corporation. Internal combustion engine electronic ignition spark timing system modulated by cylinder combustion pressure. 4,054,111, Cl. 123-117.00D.
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- Smith, Glen C.; and Sanders, Frederick W., 4,054,419, Cl. 23-288.00A.
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- Sasakyo Company Limited: See—
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- Sano, Fumiaki: See—
- Ueno, Masayuki; and Sano, Fumiaki, 4,054,060, Cl. 73-421.50A.
- Sano, Kazuo: See—
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- Sarnes, Myron C.: See—
- Dunn, William M.; and Sarnes, Myron C., 4,054,449, Cl. 75-208.00R.
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- Sass, Allan: See—
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- Sato, Makoto: See—
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- Sato, Masanori: See—
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- Sauer, Hans; and Spahr, Dieter, to Varta Batterie Aktiengesell-
- schaft. Galvanic primary element with air electrode. 4,054,726, Cl. 429-66.000.
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- Saunders, William T., to National Steel Corporation. Selective coating characteristic tinplated steel cans. 4,054,227, Cl. 220-64.000.
- Sav-Sol Drying Systems, Inc.: See—
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- Sawada, Takamasa: See—
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- Sbarro, Francesco. Wheel-braking device for motor vehicles. 4,054,187, Cl. 188-16.000.
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- Scharle, Carl R.: See—
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- Schaeufele, Eugen; and Trautwein, Hans Herman, to Firm of Eugen Schaeufele, The. Apparatus for receiving and storing empty bottles. 4,054,196, Cl. 194-4.00C.
- Schertz, Burton D.; and Aldridge, Fredrick A., to General Motors Corporation. Power amplifier protection circuit. 4,053,996, Cl. 361-98.000.
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- Sperry Rand Corporation: See—
Johnson, Richard Severn, 4,054,819, Cl. 318-269.000.

- Towner, Frank Richard; and Hawkins, Joseph Charles, 4,054,925,
Cl. 360-71.000.
- Spieth, Rudolf. Adjustable low friction bearing. 4,054,341, Cl. 308-
237.00R.
- Sprayrite Manufacturing Company: See—
Moore, John O., 4,054,007, Cl. 47-1.700.
- Square D Company: See—
Sehmer, Robert Wayne; Gribble, Joseph James; Kampf, Julian
Carl; and Tucker, James Thomas, 4,054,932, Cl. 361-31.000.
- Stabler, Karl. Fence posts. 4,054,269, Cl. 256-48.000.
- Stachli, Christopher P.: See—
Fogg, Robert K., Jr.; and Stachli, Christopher P., 4,054,319, Cl.
297-384.000.
- Stafford, Thomas Whitehead: See—
Reed, David Robert; and Stafford, Thomas Whitehead, 4,054,697,
Cl. 428-40.000.
- Stahl, Richard F.: See—
Murphy, Kevin P.; and Stahl, Richard F., 4,054,036, Cl. 62-114.000.
- Staiger, Karl: See—
Streit, Klaus; Staiger, Karl; Conzelmann, Gerhard; Seiler, Hartmut;
and Nagel, Karl, 4,054,898, Cl. 357-36.000.
- Standard Brands Incorporated: See—
Marsh, Mose Jackson, 4,054,404, Cl. 425-231.000.
- Standard Oil Company (Indiana): See—
Hensley, Albert L., Jr., 4,054,539, Cl. 252-455.00Z.
- Shanks, John L.; Cox, Everett L.; and Supernaw, John W.,
4,054,947, Cl. 364-900.000.
- Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano,
James R., to Xerox Corporation. Apparatus for registering and in-
verting sheets. 4,054,285, Cl. 271-186.000.
- Stanley, Willard H.: See—
Anderson, Wesley K.; and Stanley, Willard H., 4,054,767, Cl.
200-293.000.
- Staudinger, Gernot; and van der Burgt, Maarten J., to Shell Interna-
tional Research Maatschappij B.V. Process for quenching product gas
of slagging coal gasifier. 4,054,424, Cl. 48-210.000.
- Stauffer Chemical Company: See—
Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E.,
4,054,576, Cl. 260-326.50E.
- Benjamin, Robert E.; Angles, James C.; Edging, Thomas E.; Grif-
fith, Jerry D.; Patterson, A. J.; and Webster, Thelton A.,
4,054,678, Cl. 426-653.000.
- Felix, Raymond A., 4,054,667, Cl. 424-278.000.
- Stebbins, Russell T. Electronic switching device. 4,054,805, Cl.
307-251.000.
- Stedman, Robert N., to Caterpillar Tractor Co. Mast control mecha-
nism. 4,054,185, Cl. 187-9.00E.
- Steele, Raymond: See—
Goodman, David Joel; and Steele, Raymond, 4,054,863, Cl. 340-
146.10R.
- Steffen, Sylvester L. Automatic control for maintaining equilibrium
temperature/moisture between stored grain and atmosphere.
4,053,991, Cl. 34-54.000.
- Steffes, Frank J.: See—
Kozlowski, John H.; Litzinger, Paul C.; and Steffes, Frank J.,
4,054,625, Cl. 264-13.000.
- Stehlin, Robert A.; and Cashion, William F., to Texas Instruments
Incorporated. Process for fabricating monolithic circuits having
matched complementary transistors and product. 4,054,899, Cl.
357-44.000.
- Steiling, Virgil, to Globe Machine Manufacturing Company. Panel saw
mechanism. 4,054,070, Cl. 83-208.000.
- Steinberg, Walter A.; and Parker, Howard E., to Autonumerics, Inc.
Contouring control system employing ramp staircasing of position
points. 4,054,822, Cl. 318-573.000.
- Steiner, Edward L.: See—
Donohue, James M.; Carter, Ronald J.; Fiske, Kenton W.; Mueller,
Daniel L.; Post, Donald S.; Reehil, Edward G.; and Steiner,
Edward L., 4,054,380, Cl. 355-14.000.
- Stokes, John: See—
Gajajiva, Padej; and Stokes, John, 4,054,305, Cl. 285-39.000.
- Stone, Kenneth Ray, to Southwire Company. Method and apparatus for
starting the continuous casting of a metal. 4,054,171, Cl. 164-87.000.
- Stone, Tyrus Hartel, to Union Carbide Corporation. Gas seal for
rotating grinding mill having peripheral discharge. 4,054,292, Cl.
277-12.000.
- Stork Amsterdam B.V.: See—
Polderman, Pieter Aart, 4,054,199, Cl. 198-452.000.
- Strader, James O., Jr., to General Motors Corporation. Telescoping
energy absorber with elastomeric pressure relief valve. 4,054,312, Cl.
293-70.000.
- Strauss, Carl R.; Roberts, Michael G.; and Bolen, Charles E., to Owens-
Corning Fiberglas Corporation. Thermoplastic additives for molding
compounds. 4,054,561, Cl. 260-22.00D.
- Streeter, Kenneth R., to Eaton Corporation. Fluid coupling device and
bimetal coil adjustment for use therein. 4,054,193, Cl. 192-58.00A.
- Streit, Klaus; Staiger, Karl; Conzelmann, Gerhard; Seiler, Hartmut; and
Nagel, Karl, to Robert Bosch GmbH. Switching system to short-cir-
cuit a load with minimum residual voltage. 4,054,898, Cl. 357-36.000.
- Strobe, Carl J., to Pangburn Co., The. Novelty package. 4,054,242, Cl.
229-71.000.
- Stroupe, John R.; and Shooter, Kenneth L., to NCR Corporation.
Electrical connector. 4,054,348, Cl. 339-91.00R.
- Stude, Duane L., to Dow Chemical Company, The. Method of cement-
ing. 4,054,462, Cl. 106-90.000.
- Studiengesellschaft Kohle m.b.H.: See—
Wilke, Gunther; and Heimbach, Paul, 4,054,610, Cl. 260-618.00R.
- Stuller, Howard E.; and Walser, Glenn E., to Clark Equipment Com-
pany. Scraper elevator with lower drive sprockets. 4,053,997, Cl.
37-8.000.
- Stumpf, William E., to Herman Miller, Inc. Chair construction.
4,054,317, Cl. 297-297.000.
- Sturm, Karl-Gunter: See—
Bruning, Klaus; Sturm, Karl-Gunter; and Hahn, Siegfried,
4,054,681, Cl. 427-27.000.
- Suchsland, Helmut: See—
Haschke, Heinz; Schreyer, Gerd; Schwarze, Werner; and Suchs-
land, Helmut, 4,054,739, Cl. 544-208.000.
- Suddesche Kalkstickstoff-Werke Aktiengesellschaft: See—
Metz, Ulrich; and Michaud, Horst, 4,054,601, Cl. 260-535.00R.
- Suematsu, Yasuharu, to Tokyo Institute of Technology. Multi-hetero-
structure waveguide type optical integrated circuitry. 4,054,563, Cl.
350-96.0WG.
- Sugden, Basil H.: See—
Coop, Vernon W., 4,054,069, Cl. 82-57.000.
- Sugihara, Yasumasa, to General Corporation, The. Color television
camera. 4,054,915, Cl. 358-41.000.
- Suk, Eugene J., to Midland-Ross Corporation. Cover for electrical floor
boxes. 4,054,222, Cl. 220-3.800.
- Sukhov, Albert Grigorievich: See—
Volkov, Gennady Ivanovich; Denisov, Vladilen Mikhailovich;
Erishin, Anatoly Efimovich; Zaozersky, Jury Petrovich; Zo-
zin, Vladimir Veniaminovich; Kapitonov, Viktor Pavlovich;
Kikoin, Isaak Kushelevich; Lebedev, Vladimir Alexandrovich;
Lytssov, Nikolai Markovich; Ryabov, Vasily Andreevich; Suk-
hovich, Timofei Vasilievich; Ryabov, Vasily Andreevich; Suk-
hov, Albert Grigorievich; Sysoev, Vitaly Mikhailovich; Shishin,
Alexandr Alexeevich; Shatalin, Nikolai Mikhailovich; Shes-
terikov, Stanislav Alexeevich; Martynov, Sergei Petrovich;
deceased; Martynova, Nina Fedorovna, administrator; Mar-
tynova, Olga Sergeevna, administrator; and Martynov, Alexandr
Sergeevich, 4,054,243, Cl. 233-11.000.
- Sullins, Lloyd, to Raymond Lee Organization, Inc., The, a part interest.
Skateboard brake. 4,054,296, Cl. 280-11.200.
- Sullivan, Francis R.: See—
Clovis, James S.; and Sullivan, Francis R., 4,054,618, Cl.
260-968.000.
- Sumitomo Chemical Company, Limited: See—
Agui, Hideo; Mitani, Toru; Nakashita, Mitsuo; Murayama, Eiichi;
Okamura, Kousaku; Nakagome, Takenari; Komatsu, Toshiaki;
Izawa, Akio; and Eda, Yasuko, 4,054,568, Cl. 260-287.0CF.
- Kirino, Osamu; Oishi, Tadashi; Kameda, Nobuyuki; Kato, To-
shiro; Fujinami, Akira; and Ozaki, Toshiaki, 4,054,668, Cl.
424-314.000.
- Miki, Tamotsu; Narisawa, Shizuo; Ichikawa, Ichiro; and Horike,
Hideki, 4,054,616, Cl. 260-880.00B.
- Yagi, Yoshiharu; Yasui, Seimei; Sato, Hiroshi; Noguchi, Takanobu;
and Yamamoto, Michio, 4,054,612, Cl. 260-669.00P.
- Sundberg, Erik; and Andersson, John, to Aktiebolaget Tudor. Appar-
atus for producing tubular sheath-like coverings for electrodes.
4,054,402, Cl. 425-3.000.
- Sundstrand Corporation: See—
Linscott, Phillip S., Jr., 4,054,856, Cl. 336-84.00M.
- Sunouchi, Akio: See—
Kozuki, Susumu; Ichiyangi, Toshikazu; Watanabe, Yoshiaki;
Uchiyama, Takashi; and Sunouchi, Akio, 4,054,888, Cl.
354-50.000.
- Suntech, Inc.: See—
Desmond, Margaret M., 4,054,643, Cl. 423-634.000.
- Supernaw, John W.: See—
Shanks, John L.; Cox, Everett L.; and Supernaw, John W.,
4,054,947, Cl. 364-900.000.
- Surh, Philip C.: See—
Seligson, David; Wardlaw, Stephen Clark; and Surh, Philip C.,
4,054,415, Cl. 23-253.00R.
- Suzuki, Akiyoshi, to Canon Kabushiki Kaisha. Apparatus for determin-
ing mutual positional relationship of plural patterns in a single view-
ing field. 4,054,386, Cl. 356-153.000.
- Suzuki, Koichi; and Suzuki, Tomoaki, to Ricoh Company, Ltd. Method
of detecting a toner concentration. 4,054,230, Cl. 222-1.000.
- Suzuki, Matsumi; and Kitamoto, Saburo, to Fuji Xerox Co., Ltd.
Method for verifying identity or difference by voice. 4,054,749, Cl.
179-1.0SB.
- Suzuki, Osamu: See—
Oishi, Kengo; and Suzuki, Osamu, 4,054,252, Cl. 242-199.000.
- Suzuki, Tomoaki: See—
Suzuki, Koichi; and Suzuki, Tomoaki, 4,054,230, Cl. 222-1.000.
- Suzuki, Yasuhide: See—
Kurokawa, Fuminori; and Suzuki, Yasuhide, 4,054,112, Cl. 123-
140.0MP.
- Svensson, Sven-Hakan: See—
Rossel, Karl Ulf; and Svensson, Sven-Hakan, 4,054,080, Cl.
89-38.000.
- Swacars, Inc.: See—
Bond, Ronald L.; Daughdrill, E. C.; Brice, Henry T.; and Horton,
Phineas E., III, 4,054,301, Cl. 280-400.000.
- Swearingen, Judson S. Geothermal power system. 4,054,175, Cl.
165-45.000.
- SWF Machinery, Inc.: See—
Paxton, Gerald C., 4,054,236, Cl. 227-45.000.

Sybron Corporation: See—
McGivern, Robert F., 4,054,520, Cl. 210-122.000.
Sylvan R. Shemitz Associates, Inc.: See—
Shemitz, Sylvan R., 4,054,793, Cl. 362-127.000.
Syntex (U.S.A.) Inc.: See—
Nelson, Peter H.; Untch, Karl G.; and Dunn, James P., 4,054,579, Cl. 260-340.90R.
Sysoyev, Vitaly Mikhailovich: See—
Volkov, Gennady Ivanovich; Denisov, Vladilen Mikhailovich; Ermishin, Anatoly Efimovich; Zaozersky, Jury Petrovich; Zozin, Vladimir Veniaminovich; Kapitonov, Viktor Pavlovich; Kikoin, Isak Kuselevich; Lebedev, Vladimir Alexandrovich; Lystsov, Nikolai Markovich; Matveev, Leonid Ivanovich; Popov, Timofei Vasilievich; Ryabov, Vasily Andreevich; Sukhov, Albert Grigorievich; Sysoev, Vitaly Mikhailovich; Shishin, Alexandr Alexeevich; Shatalin, Nikolai Mikhailovich; Sheshterikov, Stanislav Alexeevich; Martynov, Sergei Petrovich, deceased; Martynova, Nina Fedorovna, administrator; Martynova, Olga Sergeevna, administrator; and Martynov, Alexandr Sergeevich, 4,054,243, Cl. 233-11.000.
System Development Corporation: See—
Magenheim, Bertram, 4,054,255, Cl. 244-134.00F.
Szabo, Lajos: See—
Szantay, Csaba; Szabo, Lajos; Kalas, Gyorgy; Karpati, Egon; and Szpony, Laszlo, 4,054,571, Cl. 260-293.550.
Szantay, Csaba; Szabo, Lajos; Kalas, Gyorgy; Karpati, Egon; and Szpony, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Nitrogen-containing polycyclic compounds and a process for the preparation thereof, 4,054,571, Cl. 260-293.550.
Szpony, Laszlo: See—
Szantay, Csaba; Szabo, Lajos; Kalas, Gyorgy; Karpati, Egon; and Szpony, Laszlo, 4,054,571, Cl. 260-293.550.
T.I. (Group Services) Limited: See—
Marsh, David Malcolm; and Slater, Richard Daniel, 4,054,388, Cl. 356-172.000.
Takagi, Syuzi: See—
Kawamura, Masao; Nishi, Tadaaki; Tsuchiya, Hiro; and Takagi, Syuzi, 4,054,499, Cl. 204-158.0HA.
Takahashi, Eiji: See—
Nagasawa, Taro; Kuboyama, Morio; Ono, Joji; Saito, Minoru; Kudo, Tsutomu; Takahashi, Eiji; Doi, Kazuyoshi; and Nagata, Kazuhiro, 4,054,648, Cl. 424-105.000.
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, to Nissan Motor Company, Limited. Sliding constant velocity universal joint, 4,054,038, Cl. 64-21.000.
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, to Nissan Motor Company, Limited. Sliding constant velocity universal joint, 4,054,039, Cl. 64-21.000.
Takahashi, Koji; Yamaguchi, Norishige; Hori, Makoto; and Turuta, Masamichi, to TDK Electronics Co., Ltd. Ceramic dielectric composition, 4,054,531, Cl. 252-63.200.
Takamori, Shigeru: See—
Sakaguchi, Kahei; Minakata, Masaaki; Takamori, Shigeru; Furukawa, Jun-ichi; and Kono, Yoshinao, 4,054,713, Cl. 428-285.000.
Takase, Tsutomu: See—
Mimaki, Kouke; Takase, Tsutomu; Iwasa, Mitsuhiro; and Yamamori, Tomitaka, 4,054,611, Cl. 260-626.00R.
Takehara, Suguru: See—
Kondo, Masahiro; Takehara, Suguru; Mitsufoji, Tsutomu; Sasaki, Moritosi; and Takura, Tomoji, 4,054,472, Cl. 106-52.000.
Takekaka, Yoshiharu: See—
Buck, Elwood W., Jr.; Shiroma, Thomas M.; Amos, Charles E.; and Takekaka, Yoshiharu, 4,054,256, Cl. 248-96.000.
Takezoe, Fumihiko, to Fuji Electric Company Ltd. Stagnation prevention apparatus in an information transmission system, 4,054,949, Cl. 364-900.000.
Takura, Tomoji: See—
Kondo, Masahiro; Takehara, Suguru; Mitsufoji, Tsutomu; Sasaki, Moritosi; and Takura, Tomoji, 4,054,472, Cl. 106-52.000.
Talleri, Ettore. Snap-locking coupler, 4,054,393, Cl. 403-174.000.
Tanabe Seiyaku Co., Ltd.: See—
Ikezaki, Muneyoshi; Irie, Kunihiko; Umino, Norihide; Ikezawa, Katsuo; and Sato, Masanori, 4,054,659, Cl. 424-258.000.
Matsuoka, Manabu; and Seko, Hiroyasu, 4,054,607, Cl. 260-600.00R.
Tanaka, Tohiharu, to Matsushita Electric Industrial Co., Ltd. Vibration detecting device having a piezoelectric ceramic plate and a method for adapting the same for use in musical instruments, 4,054,808, Cl. 310-323.000.
Tanaka, Yuji, to Nippon Tau Shin Kogyo K.K.; and TIE/Communications, Inc. Bipolar charging and discharging circuit, 4,054,804, Cl. 307-246.000.
Tani, Kenroku: See—
Anai, Yasuhiro; Mifune, Hideo; and Tani, Kenroku, 4,054,936, Cl. 361-257.000.
Tanimura, Masayuki: See—
Tennyo, Gennosuke; Tanimura, Masayuki; and Nakazawa, Toshio, 4,054,447, Cl. 75-124.000.
Tappan Company, The: See—
Anderson, Carl L.; and Lamb, John T., 4,054,769, Cl. 219-10.55C.
Tarnay, Thomas J.: See—
Byars, Edward F.; Tarnay, Thomas J.; and Hopkins, Gordon R., 4,054,129, Cl. 128-24.00R.
Tarr, James Philip. Adapter for coffee brewer, 4,054,085, Cl. 99-284.000.
Tarr, William A.; Krepps, James E.; and Opsahl, Thomas L., to Sarkes

Tarzan, Inc. UHF television tuner with electrical fine tuning, 4,054,853, Cl. 334-15.000.
Tarwid, Wesley Albion, to American Can Company. White photopolymerizable epoxide compositions, 4,054,498, Cl. 204-159.110.
Tatami, Mitsushige, to Sony Corporation. Automatic time-base error correction system, 4,054,921, Cl. 360-27.000.
Taylor, Leland Z. Surface preparation machine, 4,053,958, Cl. 15-93.00R.
Taylor, Paul J.; and Harris, Frank W., to Wright State University. Polymer lined capillary column and method for producing same, 4,054,432, Cl. 55-586.000.
Taylor, Thomas N.: See—
Shogren, David K.; and Taylor, Thomas N., 4,054,359, Cl. 350-6.000.
TDK Electronics Co., Ltd.: See—
Takahashi, Koji; Yamaguchi, Norishige; Hori, Makoto; and Turuta, Masamichi, 4,054,531, Cl. 252-63.200.
Technigaz: See—
Kotcharian, Michel, 4,054,431, Cl. 55-70.000.
Tector Limited: See—
Race, John Philip Adrian, 4,054,917, Cl. 358-104.000.
Teeter, Dorothy M. Method for attaching a portable urinary system, 4,054,142, Cl. 128-295.000.
Teetz, Wolfgang: See—
Hoever, Franz; Teetz, Wolfgang; and Bretschneider, Jurgen, 4,054,098, Cl. 112-86.000.
Teichert, Allen L.; and Jones, Richard E., to Robertshaw Controls Company. Flame probe, 4,054,859, Cl. 337-309.000.
Tel-E-Tel, Inc.: See—
Chou, Wayne W.; and Erett, Richard, 4,054,910, Cl. 358-86.000.
Teldix GmbH: See—
Leiber, Heinz; Gerstenmeier, Jurgen; and Korasiak, Wolfgang, 4,054,328, Cl. 303-103.000.
Muller, Hans; Wupper, Hans-Herbert; and Jonner, Wolf-Dieter, 4,054,329, Cl. 303-106.000.
Temple, Davis L., Jr., to Mead Johnson & Company. Thieno[2,3-d]pyrimidine antiallergic agents, 4,054,656, Cl. 424-251.000.
Tennyo, Gennosuke; Tanimura, Masayuki; and Nakazawa, Toshio. Steel resistant to intergranular stress corrosion cracking, 4,054,447, Cl. 75-124.000.
Terada, Takehiro, to Matsushita Electric Industrial Co., Ltd. Cassette-type magnetic tape player, 4,054,930, Cl. 360-96.000.
Terayama, Toshio, to Kabushiki Kaisha Daini Seikosha. Quartz oscillator mountings, 4,054,807, Cl. 310-348.000.
Terrell, James D.; and Giorgis, Richard O., to United States of America, Navy. Electromagnetic intrusion sensor, 4,054,871, Cl. 343-7.700.
Teruuchi, Yoshifumi: See—
Kamogawa, Toshiro; Teruuchi, Yoshifumi; Matsumoto, Eiji; and Nishiyama, Akira, 4,054,918, Cl. 358-214.000.
Tessenderlo Chemie S.A.: See—
Bucht, Jean H.; and Peerts, Fernand, 4,054,460, Cl. 106-89.000.
Texaco Development Corporation: See—
Watts, Lewis William, Jr.; and Brader, Walter Howe, Jr., 4,054,605, Cl. 260-584.00R.
Texaco Trinidad, Inc.: See—
Shuttleworth, Henry; and Ali, Wahid R., 4,054,599, Cl. 260-513.00R.
Texas Instruments Incorporated: See—
Brevai, Marcel; and Prudhomme, Marc, 4,054,801, Cl. 250-551.000.
Stehlin, Robert A.; and Cashion, William F., 4,054,899, Cl. 357-44.000.
Tetron Inc.: See—
Mason, Richard K., 4,054,154, Cl. 137-625.620.
Matt, Richard J.; and Thompson, Richard T., 4,054,337, Cl. 308-238.000.
Thermalloy, Inc.: See—
Edwards, Steven F.; Johnson, James A.; Jordan, William D.; and Pritchett, James D., 4,054,901, Cl. 357-81.000.
Therond, Jean-Paul: See—
Lefebvre, Claude; and Therond, Jean-Paul, 4,054,486, Cl. 176-20.00R.
Thomas, Dalton A. Apparatus for cleaning a cooling system, 4,054,150, Cl. 134-169.00A.
Thomas, John. Combination garment hanger, 4,054,234, Cl. 223-91.000.
Thomas, John Henry, III: See—
Lesh, Nathan George, deceased; Ketterer, William B., executor; Morabito, Joseph Michael; and Thomas, John Henry, III, 4,054,484, Cl. 156-652.000.
Thomas, John Stuart; and Mason, Allan Frank, to Fibreglass Limited. Production of glass fibres, 4,054,434, Cl. 65-2.000.
Thompson, Richard T.: See—
Matt, Richard J.; and Thompson, Richard T., 4,054,337, Cl. 308-238.000.
Thomson-CSF: See—
Buchy, Francois; Merenda, Pierre; and D'Haensens, Jean Pierre, 4,054,940, Cl. 361-435.000.
Cachier, Gerard, 4,054,875, Cl. 343-701.000.
Thorn, Ernest B., Jr.; Grube, Charles W.; Rowe, Walter W.; and Schueler, Johann A., to General Portland, Inc. Method for making cement using aragonite, 4,054,464, Cl. 106-100.000.
TIE/Communications, Inc.: See—
Tanaka, Yuji, 4,054,804, Cl. 307-246.000.
Timmer, Hendrikus Jacobus Maria, to SKF Industrial Trading and Development Company B.V. Castor wheel, 4,054,335, Cl. 308-191.000.

Todd, Joseph L.: See—
Brummett, John F.; and Todd, Joseph L., 4,054,412, Cl. 8-158.000.
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, to Tokyo Shibaura Electric Co., Ltd. I.L. with region connecting base of double diffused injector to substrate/emitter of switching transistor, 4,054,900, Cl. 357-46.000.
Tokyo Aircraft Instrument Co., Ltd.: See—
Nakahama, Kazushi, 4,054,052, Cl. 73-430.000.
Tokyo Institute of Technology: See—
Suematsu, Yasuharu, 4,054,363, Cl. 350-96.0WG.
Tokyo Keiki Co., Ltd.: See—
Yamamoto, Eiji; Ohta, Koji; Sekiguchi, Koji; and Fujimori, Toshiaki, 4,054,053, Cl. 73-67.80S.
Tokyo Shibaura Denki Kabushiki Kaisha: See—
Fujibayashi, Toru, 4,054,487, Cl. 176-68.000.
Tokyo Shibaura Electric Co., Ltd.: See—
Tokumaru, Yukuya; Nakai, Masanori; Shinozaki, Satoshi; Nakamura, Junichi; Ito, Shintaro; and Nishi, Yoshio, 4,054,900, Cl. 357-46.000.
Watanabe, Minoru; Kubo, Ryoichi; Nishimura, Toshio; and Yokota, Kazuto, 4,054,798, Cl. 250-483.000.
Tolpygina, Galina Petrovna: See—
Belitsin, Mikhail Nikolaevich; Borik, Alexandr Gamsheevich; Kudryashova, Galina Akimovna; Kudryashov, Sergei Alexandrovich; Goncharova, Eleonora Viktorovna; Sadkova, Natalia Alexandrovna; Pavlov, Serafim Alexandrovich; Kulikov, Valentin Vladimirovich; Tolpygina, Galina Petrovna; Gotie, Tatyana Nikolaevna; Toropova, Elena Grigorievna; Ermolina, Nina Ivanovna; and Puchnin, Ivan Vasilievich, 4,054,709, Cl. 428-224.000.
Tomari, Seiji: See—
Nagashima, Shinichiro; Tsuchiya, Kaichi; Sakamoto, Yoshihiro; Yamakami, Hiroshi; and Tomari, Seiji, 4,054,712, Cl. 428-262.000.
Tomita, Mikio; Iimura, Masahito; and Ueno, Atsumi, to Meisei Chemical Works, Ltd. Flame retardant polyester article, method for the production of the same and compositions for retarding the flammability of polyester article, 4,054,720, Cl. 428-480.000.
Topfl, Rosemarie, to Ciba-Geigy Corporation. Preparations of reaction products obtained from epoxides, fatty amines and reaction products which contain carboxyl groups, process for their manufacture and their use, 4,054,716, Cl. 428-413.000.
Toropova, Elena Grigorievna: See—
Belitsin, Mikhail Nikolaevich; Borik, Alexandr Gamsheevich; Kudryashova, Galina Akimovna; Kudryashov, Sergei Alexandrovich; Goncharova, Eleonora Viktorovna; Sadkova, Natalia Alexandrovna; Pavlov, Serafim Alexandrovich; Kulikov, Valentin Vladimirovich; Tolpygina, Galina Petrovna; Gotie, Tatyana Nikolaevna; Toropova, Elena Grigorievna; Ermolina, Nina Ivanovna; and Puchnin, Ivan Vasilievich, 4,054,709, Cl. 428-224.000.
Towner, Frank Richard; and Hawkins, Joseph Charles, to Sperry Rand Corporation. Endless loop recorder having temperature compensated tensioning, 4,054,925, Cl. 360-71.000.
Toyo Soda Manufacturing Co., Ltd.: See—
Shimizu, Akihiko; and Hayashi, Takao, 4,054,547, Cl. 260-29.7SQ.
Toyoshima, Kiichiro: See—
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Toyota Jidosha Kogyo Kabushiki Kaisha: See—
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Treiber, Kenneth L. Self-cleaning strainer or filter, 4,054,528, Cl. 210-355.000.
Trelease, Stephen W., to American Air Filter Company, Inc. Ventilation air tempering device, 4,054,035, Cl. 62-83.000.
Tretter, Steven Alan, to Rixon, Inc. QAM phase jitter and frequency offset correction system, 4,054,838, Cl. 325-323.000.
Trevorrow, Thomas R., to PPG Industries, Inc. Contaminant diverting threshold for delivering molten sheet glass to a glass forming chamber and method thereof, 4,054,436, Cl. 65-65.00A.
Trust, Harold Solomon: See—
Solomon, Archie, 4,054,209, Cl. 211-208.000.
Trust, Jonathan Solomon: See—
Solomon, Archie, 4,054,209, Cl. 211-208.000.
Trust, Lisa Solomon: See—
Solomon, Archie, 4,054,209, Cl. 211-208.000.
Trust, Mark Solomon: See—
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Trust, Susan Solomon: See—
Solomon, Archie, 4,054,209, Cl. 211-208.000.
Trust, Wendy Solomon: See—
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Tsubata, Kazuo; and Hirai, Hironori, to Hirai, Hironori. Apparatus for stopping and restarting the operation of an open-end spinning system, 4,054,024, Cl. 57-78.000.
Tsubota, Motohiko; Nishimura, Taiichi; and Ohkubo, Kinji, to Fuji Photo Film Co., Ltd. Diazo photographic materials containing 2-hydroxy 3-naphthylidene coupler, 4,054,456, Cl. 96-91.00R.
Tsuchiya, Hiro: See—
Kawamura, Masao; Nishi, Tadaaki; Tsuchiya, Hiro; and Takagi, Syuzi, 4,054,499, Cl. 204-158.0HA.

Tsuchiya, Kaichi: See—
Nagashima, Shinichiro; Tsuchiya, Kaichi; Sakamoto, Yoshihiro; Yamakami, Hiroshi; and Tomari, Seiji, 4,054,712, Cl. 428-262.000.
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Ichiko, Takao; and Tsuiji, Yusuke, 4,054,945, Cl. 364-200.000.
Tsujimoto, Kayoshi, to Minolta Camera Kabushiki Kaisha. Motor-driven apparatus for camera, 4,054,889, Cl. 354-83.000.
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Schmer, Robert Wayne; Gribble, Joseph James; Kampf, Julian Carl; and Tucker, James Thomas, 4,054,932, Cl. 361-31.000.
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Tuthill, Harlan L.; and Freeborn, John O., to International Paper Company. Suture cutter, 4,053,979, Cl. 30-124.000.
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Uchida, Kazuo: See—
Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, 4,054,735, Cl. 536-28.000.
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Uchiyama, Takashi: See—
Kozuki, Susumu; Ichinagaki, Toshikazu; Watanabe, Yoshiaki; Uchiyama, Takashi; and Sunouchi, Akio, 4,054,888, Cl. 354-50.000.
Ueberwolf, Heinz; and Siemonsen, Hans-Pieter, to Saint-Gobain Industries. Method and apparatus for curving sheets of glass and the like, 4,054,437, Cl. 65-107.000.
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Ueno, Masayuki; and Sano, Fumiaki, to Ishikawakima-Harima Jukogyo Kabushiki Kaisha. Device for sampling furnace gases, 4,054,060, Cl. 73-421.50A.
Umino, Norihide: See—
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Union Carbide Corporation: See—
Johnson, Gordon Carlton, 4,054,695, Cl. 427-390.00D.
Johnson, Robert N.; and Karol, Frederick J., 4,054,538, Cl. 252-428.000.
Stone, Tyrus Hartsel, 4,054,292, Cl. 277-12.000.
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Agriculture: See—
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Army: See—
Morrow, Scott L., 4,054,095, Cl. 102-39.000.
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Health, Education and Welfare: See—
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Milton, A. Fenner; and Hess, Michael R., 4,054,797, Cl. 250-332.000.
Nicolai, Van O., 4,054,852, Cl. 331-94.50G.
Pos, Norman D., 4,054,787, Cl. 364-748.000.
Sherwood, Theodore R., 4,054,345, Cl. 339-17.00M.
Terrell, James D.; and Giorgis, Richard O., 4,054,871, Cl. 343-7.700.
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Rothgordt, Ulf, 4,054,885, Cl. 346-154.000.
United States Steel Corporation: See—
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Utch, Karl G.: See—
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Ujohn Company, The: See—
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Mundt, Johann, 4,054,943, Cl. 318-166.000.

Urbatis, Vincas, to General Motors Corporation. Step member for tractor, 4,054,298, Cl. 280-163.000.

Urbatis, Vincas, to General Motors Corporation. Step member for tractors, 4,054,299, Cl. 280-163.000.

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Duffy, Richard J.; and Rodden, Philip J., 4,054,688, Cl. 427-183.000.

Uthne, Knut Oivind: See—
Sievertson, Hans Uno; Fryklund, Linda; and Uthne, Knut Oivind, 4,054,557, Cl. 260-112.00R.

Uter, Robert Eugene, to Caterpillar Tractor Co. Dual lever control mechanism, 4,054,083, Cl. 91-413.000.

v. Habsburg-Lothringen, Leopold. Miniature internal combustion engine, 4,054,115, Cl. 123-193.0CP.

Valencia, Flavio A.: See—
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Valentin, Patrick; Hagenbach, Germain; Duran, Jean-Louis; and Fromager, Maurice, to Societe Nationale Elf Aquitaine. Method for separating the constituents of a gas mixture by making use of a rapid selective adsorbent, 4,054,430, Cl. 55-67.000.

Valentino, Frank Joseph: See—
Fegley, Charles Robert; and Valentino, Frank Joseph, 4,054,814, Cl. 315-71.000.

Valt, Alfredo. Graduated pipette equipped with a lateral suction squirt, 4,054,061, Cl. 73-425.600.

van der Burg, Willem Jacob, to Akzona Incorporated. Hexahydro pyridine [1,2d] dibenz [b,f] (1,4)-diazepines, 4,054,572, Cl. 260-293.550.

van der Burgt, Maarten J.: See—
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van der Lely, Cornelia. Methods of erecting prefabricated buildings and equipment employed in such methods, 4,054,014, Cl. 52-745.000.

Van Geest, Klaas Burtel: See—
Ensink, Gerardus Johannes; and Van Geest, Klaas Burtel, 4,054,011, Cl. 52-66.000.

Van Gulick, Norman Martin, to Du Pont de Nemours, E. I., and Company. Polyurethanes cured with derivatives of 2,4-diamino-benzoic acid, 4,054,556, Cl. 260-75.0NH.

van Huisen, Allen T. Multiple-completion geothermal energy production systems, 4,054,176, Cl. 165-45.000.

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Varo, Inc.: See—
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Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Process for decorating coatings produced by heat-stable polymer compositions, 4,054,705, Cl. 428-201.000.

Vedova, Ronald; and Grauerholz, Norman LeRoy, to Union Carbide Corporation. Method for recovering scheelite from tungsten ores by flotation, 4,054,442, Cl. 75-2.000.

Velsicol Chemical Corporation: See—
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Wu, Chin Ching; and Krenzer, John, 4,054,574, Cl. 260-306.80D.

Yesterberg, Olof Alfred Yngve, to Orion-Yhtymä Oy-Orion Diagnostica. Method for investigating microorganisms, 4,054,490, Cl. 195-103.50K.

Vetrov, Viktor Petrovich: See—
Kozlov, Alexandr Dmitrievich; Krylov, Boris Alexandrovich; Lagoda, Alexandr Vasilievich; Vetrov, Viktor Petrovich; Mikhailichenko, Valentin Markovich; and Isaev, Vladimir Sergeevich, 4,054,395, Cl. 404-79.000.

Vickers Instruments, Inc.: See—
Whittome, James, 4,054,387, Cl. 356-156.000.

Vida, Julius A.; and Samour, Carlos M., to Bristol-Myers Company.

Process for preparing N-mono(alkoxymethyl) phenobarbitals, 4,054,565, Cl. 260-257.000.

Villa, Alvaro J., to Walt Disney Productions. Light gun having selectable modulated infrared output, 4,054,290, Cl. 273-101.100.

Villanova University: See—
Grob, Robert Lee; and Rulon, Peter Wilson, 4,054,414, Cl. 23-230.0PC.

Vincent, Allen E., to United States of America, Navy. Running average computer, 4,054,786, Cl. 364-575.000.

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Voda, Gustav: See—
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Volkov, Gennady Ivanovich; Denisov, Vladilen Mikhailovich; Ermishin, Anatoly Efimovich; Zozersky, Yuri Petrovich; Zozin, Vladimir Veniaminovich; Kapitonov, Viktor Pavlovich; Kikoin, Isaak Kuselevich; Lebedev, Vladimir Alexandrovich; Lystsov, Nikolai Markovich; Matveev, Leonid Ivanovich; Popov, Timofei Vasilievich; Ryabov, Vasily Andreevich; Sukhov, Albert Grigorievich; Sysoev, Vitaly Mikhailovich; Shishin, Alexandr Alexeevich; Shatalin, Nikolai Mikhailovich; Shesterikov, Stanislav Alexeevich; Martynov, Sergei Petrovich, deceased; by Martynova, Nina Fedorovna, administrator; by Martynova, Olga Sergeevna, administrator; and Martynov, Alexandr Sergeevich. Preparation-making ultracentrifuge, 4,054,243, Cl. 233-11.000.

Von Schmeling, Bogislav: See—
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von Zeppelin, Dieter. Cannula for the introduction of a catheter, 4,054,136, Cl. 128-214.400.

W. R. Grace & Co.: See—
Lundsager, Christian Bent; and Glocker, Edwin M., 4,054,702, Cl. 428-167.000.

Waggott, Ralph: See—
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Wagner, Gerhard: See—
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Wahl, John F., to Mallard Manufacturing Corporation. Roller conveyor, 4,054,195, Cl. 193-35.00R.

Wahlquist, Stanley L. Tape and apron dispensing apparatus, 4,054,482, Cl. 156-523.000.

Wahlstrom, Sven E. Method and apparatus for charging batteries using variable capacitors, 4,054,826, Cl. 320-61.000.

Wain, Harry C. Three-way vise, 4,054,279, Cl. 269-154.000.

Waki, Yusaku: See—
Hara, Yoshiaki; Waki, Yusaku; Minai, Yasuo; and Nakamura, Katumi, 4,054,476, Cl. 156-191.000.

Wakui, Mitsuru: See—
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Walker, Brooks. Multisided guard, 4,054,064, Cl. 74-612.000.

Walker, Brooks; and Hall, Fred V., to Walker, Brooks. Engine spark timing device, 4,054,110, Cl. 123-117.00A.

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Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E., 4,054,576, Cl. 260-326.50E.

Walmet, Gunnar E.: See—
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Walser, Glenn E.: See—
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Walt Disney Productions: See—
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Walter, Lothar: See—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,054,336, Cl. 308-233.000.

Wang, James Chi-Hwi; Belivakici, Ilie Mila; and Young, Robert Richard, to American Can Company. Transfer blow molding technique, 4,054,629, Cl. 264-97.000.

Wang, James Chi-Hwi, to American Can Company. Hot pin parison injection molding technique, 4,054,630, Cl. 264-97.000.

Wardlaw, Stephen Clark: See—
Seligson, David; Wardlaw, Stephen Clark; and Surh, Philip C., 4,054,415, Cl. 23-253.00R.

Wareham, Richard C. Method and apparatus for heating eyeglass frames, 4,054,376, Cl. 351-178.000.

Wareing, Joseph Brian; and Hall, Herbert, to Electricity Council, The; and Johnson & Nephew (Non-Ferrous) Limited. Seals for the passage of wire between regions of different pressure, 4,054,044, Cl. 72-38.000.

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Le Boeuf, Albert R.; and Grovesteen, William R., 4,054,624, Cl. 264-1.000.

Warolin, Christian: See—
Lahourcade, Bernard; Hirigoyen, Christiane; Joulle, Maurice; Maillard, Gabriel; Lakah, Lucien; and Warolin, Christian, 4,054,669, Cl. 424-315.000.

Watanabe, Masanori: See—
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Watanabe, Minoru; Kubo, Ryoichi; Nishimura, Toshio; and Yokota, Kazuto, to Tokyo Shibaura Electric Co., Ltd. X-ray conversion screens, 4,054,798, Cl. 250-483.000.

Watanabe, Yoshiaki: See—
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Watkin, David Anthony, to Watkin Elliott Systems Engineers Limited. Control apparatus for manufacturing systems, 4,054,823, Cl. 318-603.000.

Watkin Elliott Systems Engineers Limited: See—
Watkin, David Anthony, 4,054,823, Cl. 318-603.000.

Watkins, Thomas I.; and Weighton, David M., to Boots Company Limited, The. Triazole insecticides, 4,054,664, Cl. 424-269.000.

Watson, James J., Jr., to Carrier Corporation. Process for fabricating a heat exchanger, 4,054,239, Cl. 228-183.000.

Watson, William David, to Dow Chemical Company, The. Heat transfer fluids having low freeze points, 4,054,533, Cl. 252-73.000.

Watts, Lewis William, Jr.; and Brader, Walter Howe, Jr., to Texaco Development Corporation. Unsaturated amino alcohols, 4,054,605, Cl. 260-584.00R.

Weatherhead Company, The: See—
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Weatherly, Douglas B.: See—
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Webster, Thelton A.: See—
Benjamin, Robert E.; Angles, James C.; Edging, Thomas E.; Griffith, Jerry D.; Patterson, A. J.; and Webster, Thelton A., 4,054,678, Cl. 426-653.000.

Webster, Walter C., III; and Allen, Frank L., Jr., to Rockwell International Corporation. Acrylic modified urethane bobbin finish, 4,054,690, Cl. 427-240.000.

Webster, Willard P., to United States of America, Navy. Apparatus for transmitting light through Cassegrain optics, 4,054,364, Cl. 350-96.00B.

Wegstedt, Lars; and Lindblad, Bengt, to LKB-Produkter AB. Calorimetry probe, 4,054,056, Cl. 73-190.00R.

Wehrli, Hansuli: See—
Anner, Georg; Marxer, Adrian; Meystre, Charles; and Wehrli, Hansuli, 4,054,563, Cl. 260-239.55R.

Weibel, Ewald Rudolph, to Image Analysing Computers Limited. Device for counting and calculating, 4,054,782, Cl. 364-555.000.

Weichand, Robert J.; and Adams, Charles W., to R. A. Jones & Co. Inc. Articulated tamper and confiner, 4,054,019, Cl. 53-124.00D.

Weighton, David M.: See—
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Weinschenker, Ned M.; and Dale, James A., to Dynapol. Edible with polymeric hydroquinone antioxidant, 4,054,676, Cl. 426-546.000.

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Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,054,604, Cl. 260-557.00R.

Weissman, Bernard. Dental anchor, 4,053,982, Cl. 32-15.000.

Wells, Royzell F. Secure tool gripping chuck, 4,054,294, Cl. 279-44.000.

Wells, Thomas R.; and Dahlen, Theodore E., to Bell & Howell Company. Selector interlock for microfiche cartridge, 4,054,378, Cl. 353-27.00R.

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Western Oil Sands Ltd.: See—
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Hart, Louis I., Jr.; Schmidt-Collerus, Josef J.; and Burroughs, Larry R., 4,054,506, Cl. 208-11.0LE.

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White, Gerald W. Thin film treated drilling bit cones, 4,054,426, Cl. 51-309.00R.

Whiteley, Eric, to General Electric Company. Speed responsive switching device, 4,054,764, Cl. 200-61.460.

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Lin, Burn Jeng; Montesana, John Sebastian; Santy, William Godfrey; and Wilczynski, Janusz Stanislaw, 4,054,383, Cl. 355-91.000.

Wiley, Corless W. Brush for teeth and gums, 4,053,959, Cl. 15-106.000.

Wilke, Gunther; and Heimbach, Paul, to Studiengesellschaft Kohle m.b.H. 1-Phenyl-but-3-ene-ol, 4,054,610, Cl. 260-618.00R.

Wilke, Robert A., to Lake Center Industries. Counting device, 4,054,779, Cl. 235-92.0PK.

Wilkes, Donald F., to Decoto Aircraft Inc. Mechanical Braking Apparatus, 4,054,190, Cl. 188-67.

Will Ross, Inc.: See—
Budic, Kenneth A., 4,053,988, Cl. 33-174.00Q.

Willcox, Dale F., to Furnas Electric Company. Pressure switch and gauge, 4,054,763, Cl. 200-56.00R.

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Williams, Frank J., III, to General Electric Company. Method for making bis(thioether anhydride)s, 4,054,584, Cl. 260-346.300.

Williams, Graham: See—
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Williamson, Dennis Francis, to General Electric Company. D-C motor drive system with field current flow reversal upon transition between motoring and retarding modes, 4,054,821, Cl. 318-375.000.

Wilson, Hugh R. Firearm safety device, 4,054,003, Cl. 42-70.00F.

Wilson, Kermit H.; Carlson, Ronald R.; and Bue, Richard C., to Sico Incorporated. Mobile elevationally adjustable stage, 4,054,096, Cl. 108-113.000.

Wilson, Murray Vincent; and Pearce, Norman Henry. Apparatus for holding open a door or the like, 4,053,961, Cl. 16-84.000.

Wilson, Norman A., to Morgan Construction Company. Process and apparatus for cooling hot rolled steel rod, 4,054,276, Cl. 266-106.000.

Winchell, Frank J., to General Motors Corporation. Cambering vehicle with trailing arms interconnected by geared stabilizer and equalizer mechanism, 4,054,300, Cl. 280-278.000.

Windle, William, to English Clays Lovering Pochin & Company Limited. Magnetic separation, method and apparatus, 4,054,513, Cl. 209-214.000.

Wintfeld, Lenard: See—
Fletcher, Maurice; and Wintfeld, Lenard, 4,054,911, Cl. 358-141.000.

Winzen, John P., to Brunswick Corporation. Indexing mechanism, 4,054,521, Cl. 210-137.000.

Wisconsin Alumni Research Foundation: See—
Seireg, Ali A.; and Baz, Amr M. S., 4,054,783, Cl. 364-418.000.

Witcher, Leonard Dean, to International Business Machines Corporation. Continuous forms sheet separator, 4,054,235, Cl. 226-200.000.

Witco Chemical Corporation: See—
Mausner, Marvin L.; and Benson, Albert, 4,054,541, Cl. 252-532.000.

Witte, John C., to Xerox Corporation. Specular reflectance microdensitometer, 4,054,391, Cl. 356-209.000.

Witte, Sammie S.: See—
Smith, Gerald D.; and Witte, Sammie S., 4,054,869, Cl. 340-384.00E.

Wittkugel, Heinz: See—
Berndt, Wolfgang; Wittkugel, Heinz; Wochnowski, Waldemar; and Hancke, Gustav, 4,054,145, Cl. 131-138.000.

Wittmann, Erwin Johann: See—
Harwood, Leopold Albert; and Wittmann, Erwin Johann, 4,054,905, Cl. 358-27.000.

Wochnowski, Waldemar: See—
Berndt, Wolfgang; Wittkugel, Heinz; Wochnowski, Waldemar; and Hancke, Gustav, 4,054,145, Cl. 131-138.000.

Wolfe, Robert Wade; and Messier, Russell Francis, to GTE Sylvania Incorporated. X-ray phosphor composition and x-ray intensifying screen employing same, 4,054,799, Cl. 250-486.000.

Wollich, Ferid, to M & M Enterprises, Inc. Solid state electronic oven control system, 4,054,778, Cl. 219-413.000.

Wolverson, John: See—
Higginbotham, Gordon John Spencer; and Wolverson, John, 4,054,723, Cl. 428-678.000.

Wood, Obert Reeves, II: See—
Smith, Peter William; and Wood, Obert Reeves, II, 4,054,846, Cl. 331-94.50G.

Wood, Walter Ernest: See—
Honnaker, Leland Robert; Jones, Gary Lee; and Wood, Walter Ernest, 4,054,468, Cl. 148-11.50Q.

Worms, Karl-Heinz: See—
Blum, Helmut; and Worms, Karl-Heinz, 4,054,598, Cl. 260-502.500.

Wright, Alan C.; and Rupert, Joseph Paul, to N L Industries, Inc. Process for synthesizing compositions containing smectite-type clays and gellants produced thereby, 4,054,537, Cl. 252-317.000.

- Wright, George Howard: See—
McGrath, Ronald George; and Wright, George Howard, 4,054,759, Cl. 179-175.30R.
- Wright, John: See—
Millward, John David; and Wright, John, 4,054,912, Cl. 358-216.000.
- Wright, John W.; Plant, William J.; and Schuler, Dale L., to United States of America, Navy. Dual-frequency, remote ocean-wave spectrometer. 4,054,879, Cl. 343-5.05A.
- Wright, Roger N., to Allegheny Ludlum Industries, Inc. Duplex ferritic-martensitic stainless steel. 4,054,448, Cl. 75-126.00B.
- Wright State University: See—
Taylor, Paul J.; and Harris, Frank W., 4,054,432, Cl. 55-386.000.
- Wu, Chin Ching; and Krenzer, John, to Velsicol Chemical Corporation. 1-Benzothiazolyl-5-amino-imidazolidinones. 4,054,574, Cl. 260-306.80D.
- Wupper, Hans-Herbert: See—
Muller, Hans; Wupper, Hans-Herbert; and Jonner, Wolf-Dieter, 4,054,329, Cl. 303-106.000.
- Wutke, Rudolph A., to General Electric Company. Apparatus for establishing multi-point electrical contact with an insulated conductor. 4,054,349, Cl. 339-99.00R.
- Xerox Corporation: See—
Angelini, Dominic J., 4,054,534, Cl. 252-158.000.
- Bernhard, John S., 4,054,381, Cl. 355-15.000.
- Donohue, James M.; Carter, Ronald J.; Fiske, Kenton W.; Mueller, Daniel L.; Post, Donald S.; Reehil, Edward G.; and Steiner, Edward L., 4,054,380, Cl. 355-14.000.
- Kupisiewicz, Janusz W., 4,054,284, Cl. 271-8.00R.
- Murphy, Richard J., 4,054,410, Cl. 432-60.000.
- Shogren, David K.; and Taylor, Thomas N., 4,054,359, Cl. 350-6.000.
- Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,054,285, Cl. 271-186.000.
- Witte, John C., 4,054,391, Cl. 356-209.000.
- Yagi, Yoshiharu; Yasui, Seimei; Sato, Hiroshi; Noguchi, Takanobu; and Yamamoto, Michio, to Sumitomo Chemical Company, Limited. Process for producing liquid polymer. 4,054,612, Cl. 260-669.00P.
- Yahner, Joseph A.: See—
Beck, James R.; and Yahner, Joseph A., 4,054,603, Cl. 260-551.00S.
- Yale University: See—
Seligson, David; Wardlaw, Stephen Clark; and Surh, Philip C., 4,054,415, Cl. 23-253.00R.
- Yamada, Takaaki, to Sony Corporation. Signal compression/expansion apparatus. 4,054,849, Cl. 333-14.000.
- Yamaguchi, Norishige: See—
Takahashi, Koji; Yamaguchi, Norishige; Hori, Makoto; and Turuta, Masamichi, 4,054,531, Cl. 252-63.200.
- Yamaji, Hiroshi; and Furukawa, Kiyoshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Co-ordinates measuring apparatus for an exclusive propeller processing machine. 4,053,989, Cl. 33-174.0PC.
- Yamakami, Hiroshi: See—
Nagashima, Shinichiro; Tsuchiya, Kaichi; Sakamoto, Yoshihiro; Yamakami, Hiroshi; and Tomari, Seiji, 4,054,712, Cl. 428-262.000.
- Yamamoto, Tomitaka: See—
Mimaki, Kosuke; Takase, Tsutomu; Iwasa, Mitsuhiro; and Yamamoto, Tomitaka, 4,054,611, Cl. 260-626.00R.
- Yamamoto, Eiji; Ohta, Koji; Sekiguchi, Koji; and Fujimori, Toshiaki, to Tokyo Keiki Co., Ltd. Automatic weld flaw detector. 4,054,053, Cl. 73-67.80S.
- Yamamoto, Michio: See—
Yagi, Yoshiharu; Yasui, Seimei; Sato, Hiroshi; Noguchi, Takanobu; and Yamamoto, Michio, 4,054,612, Cl. 260-669.00P.
- Yamanaka, Akira, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Motor truck. 4,054,314, Cl. 296-35.00R.
- Yamanaka, Seisuke, to Sony Corporation. Solid state color camera. 4,054,906, Cl. 358-43.000.
- Yamanashi Shoyu Kabushiki Kaisha: See—
Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, 4,054,735, Cl. 536-28.000.
- Yanagi, Osamu, to Nara Sewing Machine Industrial Co., Ltd. Thread cutting mechanism for a sewing machine. 4,054,099, Cl. 112-299.000.
- Yang, Kuo S., to Eli Lilly and Company. Sodium cefamandole crystalline forms. 4,054,738, Cl. 544-26.000.
- Yasui, Seimei: See—
Yagi, Yoshiharu; Yasui, Seimei; Sato, Hiroshi; Noguchi, Takanobu; and Yamamoto, Michio, 4,054,612, Cl. 260-669.00P.
- Yasukuni, Mitsuo, to Minolta Camera Kabushiki Kaisha. Compact varifocal lens system capable of macrophotography. 4,054,371, Cl. 350-184.000.
- Yats, Larry D.: See—
Hall, Richard H.; Haigh, Daniel H.; Lamson, Junior J.; and Yats, Larry D., 4,054,733, Cl. 526-293.000.
- Yoder, Michael C., to Rhyne, Paul C., Jr., a part interest. Portable apparatus for sequentially cooling a plurality of containers of beverages and the like. 4,054,037, Cl. 62-224.000.
- Yokelson, Bernard Julius: See—
Comella, William Kirk; and Yokelson, Bernard Julius, 4,054,756, Cl. 179-18.00B.
- Yokohama Rubber Co., Ltd., The: See—
Hara, Yoshiaki; Waki, Yasaku; Minai, Yasuo; and Nakamura, Katumi, 4,054,476, Cl. 156-191.000.
- Yokota, Kazuto: See—
Watanabe, Minoru; Kubo, Ryoichi; Nishimura, Toshio; and Yokota, Kazuto, 4,054,798, Cl. 250-483.000.
- Yoshida, Takashi; and Sakaguchi, Shinji, to Fuji Photo Film Co., Ltd. Acyloxy substituted acrylate timing layers for color diffusion transfer. 4,054,722, Cl. 428-522.000.
- Yoshino, Hiroshi: See—
Motoki, Goro; Uchida, Kazuo; and Yoshino, Hiroshi, 4,054,735, Cl. 536-28.000.
- Yosimura, Zyunziro: See—
Ito, Mikiji; and Yosimura, Zyunziro, 4,054,152, Cl. 137-512.000.
- Young, Robert Richard: See—
Wang, James Chi-Hwi; Belivakici, Ilie Mila; and Young, Robert Richard, 4,054,629, Cl. 264-97.000.
- Young, S. Albert: See—
Rineman, Richard Lynn, 4,054,100, Cl. 114-39.000.
- Young, William C.; and Frazer, John S., to Beatrice Foods. Drainable container base. 4,054,219, Cl. 215-1.00C.
- Zaozersky, Jury Petrovich: See—
Volkov, Gennady Ivanovich; Denisov, Vladilen Mikhailovich; Ermishin, Anatoly Efimovich; Zaozersky, Jury Petrovich; Zozin, Vladimir Veniaminovich; Kapitonov, Viktor Pavlovich; Kikoin, Isaak Kuselevich; Lebedev, Vladimir Alexandrovich; Lystsov, Nikolai Markovich; Matveev, Leonid Ivanovich; Popov, Timofei Vasilievich; Ryabov, Vasily Andreevich; Sukhov, Albert Grigorievich; Sysoev, Vitaly Mikhailovich; Shishin, Alexandr Alexeevich; Shatalin, Nikolai Mikhailovich; Sheshterikov, Stanislav Alexeevich; Martynov, Sergei Petrovich, deceased; Martynova, Nina Fedorovna, administrator; Martynova, Olga Sergeevna, administrator; and Martynov, Alexandr Sergeevich, 4,054,243, Cl. 233-11.000.
- Zenith Radio Corporation: See—
Lerner, Martin L., 4,054,913, Cl. 358-246.000.
- Zhdanova, Nelli Isaakovna; Evstjugov-Babaev, Lev Mikhailovich; Balitskaya, Roza Mitrofanovna; Sholin, Albert Fedorovich; Kasatkina, Tatyana Borisovna; and Kuznetsova, Natalya Nikolaevna. Method of preparing l-glutamic acid and its sodium salt. 4,054,489, Cl. 195-47.000.
- Zimlich, Josef: See—
Hoene, Ernst-Ludwig; Rech, Werner; and Zimlich, Josef, 4,054,815, Cl. 315-241.00R.
- Zimmerman, Joseph J., to GTE Automatic Electric Laboratories Incorporated. Telephone answering apparatus with control in response to segment of the endless tape loop. 4,054,927, Cl. 360-74.000.
- Zimmermann, Joseph J., to GTE Automatic Electric Laboratories Incorporated. Variable message recorder employing single tape loop having fast reset. 4,054,924, Cl. 360-71.000.
- Ziobrowski, Bernard George, to Hercules Incorporated. Lead chromate pigments. 4,054,465, Cl. 106-298.000.
- Zozin, Vladimir Veniaminovich: See—
Volkov, Gennady Ivanovich; Denisov, Vladilen Mikhailovich; Ermishin, Anatoly Efimovich; Zaozersky, Jury Petrovich; Zozin, Vladimir Veniaminovich; Kapitonov, Viktor Pavlovich; Kikoin, Isaak Kuselevich; Lebedev, Vladimir Alexandrovich; Lystsov, Nikolai Markovich; Matveev, Leonid Ivanovich; Popov, Timofei Vasilievich; Ryabov, Vasily Andreevich; Sukhov, Albert Grigorievich; Sysoev, Vitaly Mikhailovich; Shishin, Alexandr Alexeevich; Shatalin, Nikolai Mikhailovich; Sheshterikov, Stanislav Alexeevich; Martynov, Sergei Petrovich, deceased; Martynova, Nina Fedorovna, administrator; Martynova, Olga Sergeevna, administrator; and Martynov, Alexandr Sergeevich, 4,054,243, Cl. 233-11.000.
- Zurn Industries, Inc.: See—
Gilmore, Thomas F.; and Hughey, John E., 4,054,261, Cl. 251-130.000.

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF OCTOBER, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- Alexander, Robert H., to Rockwell International Corporation. Fastener tool. Re. 29,444, Cl. 173-12.000.
- Anand, Satish K.: See—
Goldsby, Arthur F.; Haberl, Frank J.; and Anand, Satish K., Re. 29,450, Cl. 340-150.000.
- Baermann, Max. Light colored magnetic rubber. Re. 29,451, Cl. 335-303.000.
- Brown, Gaylord W.; Rise, Donald J.; and Johnson, Robert T., to Koehring Company. Method and apparatus for assembling and joining thermoplastic container sections by friction welding. Re. 29,448, Cl. 156-73.500.
- Cole, John Barrington: See—
Farrow, Roger M.; Kimber, Anthony B.; Cole, John Barrington; Miles, John Walter; and Griffiths, Graham Ernest, Re. 29,447, Cl. 210-232.000.
- Ebert, Jurgen: See—
Nusser, Hermann; van Eeden, Hendricus; and Ebert, Jurgen, Re. 29,445, Cl. 417-366.000.
- Farrow, Roger M.; Kimber, Anthony B.; Cole, John Barrington; Miles, John Walter; and Griffiths, Graham Ernest, to Whatman Reeve Angel Limited. Self-sealing filter tube. Re. 29,447, Cl. 210-232.000.
- Goldsby, Arthur F.; Haberl, Frank J.; and Anand, Satish K., to Martin Marietta Corporation. Machine operating condition monitoring system. Re. 29,450, Cl. 340-150.000.
- Gorgens, Richard A., to Incoterm Corporation. Card reader. Re. 29,449, Cl. 235-61.11E.
- Griffiths, Graham Ernest: See—
Farrow, Roger M.; Kimber, Anthony B.; Cole, John Barrington; Miles, John Walter; and Griffiths, Graham Ernest, Re. 29,447, Cl. 210-232.000.
- Guthuber, Johann: See—
Sonnleitner, Max; Wolf, Karl Hermann; and Guthuber, Johann, Re. 29,446, Cl. 425-297.000.
- Haberl, Frank J.: See—
Goldsby, Arthur F.; Haberl, Frank J.; and Anand, Satish K., Re. 29,450, Cl. 340-150.000.
- Incoterm Corporation: See—
Gorgens, Richard A., Re. 29,449, Cl. 235-61.11E.
- Johnson, Robert T.: See—
Brown, Gaylord W.; Rise, Donald J.; and Johnson, Robert T., Re. 29,448, Cl. 156-73.500.
- Kimber, Anthony B.: See—
Farrow, Roger M.; Kimber, Anthony B.; Cole, John Barrington; Miles, John Walter; and Griffiths, Graham Ernest, Re. 29,447, Cl. 210-232.000.
- Koehring Company: See—
Brown, Gaylord W.; Rise, Donald J.; and Johnson, Robert T., Re. 29,448, Cl. 156-73.500.
- Martin Marietta Corporation: See—
Goldsby, Arthur F.; Haberl, Frank J.; and Anand, Satish K., Re. 29,450, Cl. 340-150.000.
- Miles, John Walter: See—
Farrow, Roger M.; Kimber, Anthony B.; Cole, John Barrington; Miles, John Walter; and Griffiths, Graham Ernest, Re. 29,447, Cl. 210-232.000.
- Nusser, Hermann; van Eeden, Hendricus; and Ebert, Jurgen, to Robert Bosch GmbH. Pump and electric drive motor unit. Re. 29,445, Cl. 417-366.000.
- Riley, William A.: See—
Stolkin, Walter J.; Riley, William A.; and Sejda, Henry J., Re. 29,442, Cl. 93-49.00R.
- Rise, Donald J.: See—
Brown, Gaylord W.; Rise, Donald J.; and Johnson, Robert T., Re. 29,448, Cl. 156-73.500.
- Robert Bosch GmbH: See—
Nusser, Hermann; van Eeden, Hendricus; and Ebert, Jurgen, Re. 29,445, Cl. 417-366.000.
- Rockwell International Corporation: See—
Alexander, Robert H.; Re. 29,444, Cl. 173-12.000.
- Sejda, Henry J.: See—
Stolkin, Walter J.; Riley, William A.; and Sejda, Henry J., Re. 29,442, Cl. 93-49.00R.
- Sonnleitner, Max; Wolf, Karl Hermann; and Guthuber, Johann, to Thyssen Plastik Anger. Apparatus for shaping the end of a tube. Re. 29,446, Cl. 425-297.000.
- Stolkin, Walter J.; Riley, William A.; and Sejda, Henry J., to Stolmar Corporation. Apparatus for producing cartons. Re. 29,442, Cl. 93-49.00R.
- Stolmar Corporation: See—
Stolkin, Walter J.; Riley, William A.; and Sejda, Henry J., Re. 29,442, Cl. 93-49.00R.
- Thyssen Plastik Anger: See—
Sonnleitner, Max; Wolf, Karl Hermann; and Guthuber, Johann, Re. 29,446, Cl. 425-297.000.
- van Eeden, Hendricus: See—
Nusser, Hermann; van Eeden, Hendricus; and Ebert, Jurgen, Re. 29,445, Cl. 417-366.000.
- Vaughn, Charles O. Fireplace assembly for mobile homes. Re. 29,443, Cl. 126-120.000.
- Whatman Reeve Angel Limited: See—
Farrow, Roger M.; Kimber, Anthony B.; Cole, John Barrington; Miles, John Walter; and Griffiths, Graham Ernest, Re. 29,447, Cl. 210-232.000.
- Wolf, Karl Hermann: See—
Sonnleitner, Max; Wolf, Karl Hermann; and Guthuber, Johann, Re. 29,446, Cl. 425-297.000.

LIST OF PLANT PATENTEEES

- Duffett, William E.: See—
Egan, William H.; Meek, Jack M.; and Duffett, William E., 4,131, Cl. 75.000.
- Jessel, Walter H., Jr.; and Duffett, William E., 4,128, Cl. 74.000.
- Jessel, Walter H., Jr.; and Duffett, William E., 4,129, Cl. 74.000.
- Jessel, Walter H., Jr.; and Duffett, William E., 4,130, Cl. 78.000.
- Egan, William H.; Meek, Jack M.; and Duffett, William E., to Egan, William H. Chrysanthemum plant. 4,131, 10-18-77, Cl. 75.000.
- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,128, 10-18-77, Cl. 74.000.
- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,129, 10-18-77, Cl. 74.000.
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- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,130, 10-18-77, Cl. 78.000.
- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,131, 10-18-77, Cl. 75.000.
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- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,129, 10-18-77, Cl. 74.000.
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- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,128, 10-18-77, Cl. 74.000.
- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,129, 10-18-77, Cl. 74.000.
- Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,130, 10-18-77, Cl. 78.000.
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ISSUED OCTOBER 18, 1977

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CLASS 24	745 4,054,014	611 4,054,063	86 4,054,098	CLASS 141	4,054,168	CLASS 180
20 TT 4,053,965	CLASS 53	612 4,054,064	299 4,054,099	12 4,054,161	4,054,169	77 R 4,054,181
163 R 4,053,966	26 4,054,015	711 4,054,065	CLASS 114	28.7 4,054,164	4,054,170	CLASS 182
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98 4,053,967	112 A 4,054,017	2 4,054,442	144 C 4,054,101	CLASS 144	4,054,172	142 4,054,183
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157.3 D 4,053,969	128 4,054,020	49 4,054,445	264 4,054,104	CLASS 148	4,054,175	CLASS 187
240 4,053,970	236 4,054,021	76 4,054,446	CLASS 116	6.27 4,054,466	4,054,176	9 E 4,054,185
252 4,053,971	CLASS 55	124 B 4,054,447	129 T 4,054,105	6.3 4,054,467	4,054,177	CLASS 188
423 4,053,972	25 4,054,427	208 R 4,054,449	CLASS 119	11.5 Q 4,054,468	4,054,178	1 B 4,054,186
452 4,053,973	33 4,054,428	CLASS 81	51.5 4,054,106	31 4,054,469	4,054,179	16 4,054,187
596 4,053,974	48 4,054,429	58.1 4,054,067	CLASS 122	112 4,054,471	4,054,180	65.3 4,054,188
599 4,053,975	67 4,054,430	CLASS 82	7 B 4,054,107	CLASS 150	4,054,181	71.4 4,054,189
620 4,053,976	70 4,054,431	36 R 4,054,066	CLASS 123	52 J 4,054,167	4,054,182	CLASS 190
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381 4,053,980	CLASS 57	306 4,054,071	117 D 4,054,111	337 4,054,169	4,054,186	58 A 4,054,193
419 4,053,981	78 4,054,024	488 4,054,072	140 MP 4,054,112	CLASS 156	4,054,187	CLASS 193
CLASS 32	157 TS 4,054,025	599 4,054,073	148 CC 4,054,113	71 4,054,473	4,054,188	10 4,054,194
15 4,053,982	CLASS 58	622 4,054,074	148 DS 4,054,114	73.5 Re.29,448	4,054,189	35 R 4,054,195
27 4,053,983	1 R 4,054,026	633 4,054,075	193 CP 4,054,115	86 4,054,474	4,054,190	CLASS 194
33 4,053,984	CLASS 60	644 4,054,076	198 D 4,054,117	157 4,054,475	4,054,191	4 C 4,054,196
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1 N 4,053,985	39.23 4,054,028	CLASS 84	CLASS 124	197 4,054,477	4,054,193	CLASS 195
17 R 4,053,986	253 4,054,029	1.24 4,054,078	23 R 4,054,118	242 4,054,478	4,054,194	1.8 4,054,488
81 4,053,987	262 4,054,030	423 4,054,079	24 R 4,054,119	280 4,054,479	4,054,195	47 4,054,489
174 PC 4,053,989	496 4,054,031	CLASS 89	62 4,054,120	331 4,054,480	4,054,196	103.5 K 4,054,490
174 Q 4,053,988	632 4,054,032	38 4,054,080	89 4,054,121	389 4,054,481	4,054,197	103.5 M 4,054,491
CLASS 34	CLASS 61	CLASS 90	CLASS 126	523 4,054,482	4,054,198	CLASS 197
23 4,053,990	41 A 4,054,033	11 C 4,054,081	113 4,054,122	632 4,054,484	4,054,199	127 R 4,054,198
54 4,053,991	86 4,054,034	96 4,054,082	120 Re.29,443	CLASS 159	4,054,199	CLASS 198
60 4,053,992	CLASS 62	413 4,054,083	137 4,054,123	6 W 4,054,485	4,054,200	452 4,054,199
105 4,053,993	13 4,054,433	CLASS 93	270 4,054,124	CLASS 164	4,054,201	455 4,054,201
CLASS 35	83 4,054,035	49 R Re.29,442	271 4,054,125	53 4,054,170	4,054,202	774 4,054,200
9 R 4,053,994	114 4,054,036	CLASS 96	CLASS 128	168 4,054,172	4,054,203	805 4,054,202
CLASS 36	224 4,054,037	1 R 4,054,450	2 B 4,054,127	428 4,054,173	4,054,204	CLASS 200
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CLASS 37	21 4,054,038	67 4,054,452	87 R 4,054,130	1 4,054,174	4,054,206	50 B 4,054,762
8 4,053,997	23 4,054,040	86 P 4,054,453	004 4,054,131	45 4,054,175	4,054,207	56 R 4,054,763
98 4,053,998	CLASS 65	91 R 4,054,454	142 R 4,054,132	CLASS 172	4,054,208	61.46 4,054,764
195 4,053,999	2 4,054,434	107 4,054,455	208 4,054,133	267 4,054,177	4,054,209	148 F 4,054,765
CLASS 40	18 4,054,435	4,054,456	214.4 4,054,136	374 4,054,178	4,054,210	157 4,054,766
124.5 4,054,000	65 A 4,054,436	4,054,457			4,054,211	293 4,054,767
126 A 4,054,001	107 4,054,437	4,054,458				

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12	4,054,492	91	4,054,234	47 ET	4,054,553	71	4,054,814	5 SA	4,054,879
7	4,054,493	200	4,054,235	47 XA	4,054,552	241 R	4,054,815	7.7	4,054,871
43	4,054,494	45	4,054,236	59 EP	4,054,554	387	4,054,816	11 R	4,054,872
49	4,054,495	147	4,054,237	75 NH	4,054,556	82	4,054,817	112 R	4,054,878
129	4,054,496	173 R	4,054,238	112 S	4,054,557	166	4,054,818	113 R	4,054,880
158	4,054,497	183	4,054,239	146 T	4,054,558	227	4,054,819	700 MS	4,054,881
159	4,054,498	47	4,054,240	239.3 A	4,054,559	269	4,054,820	701	4,054,875
181	4,054,500	17 R	4,054,241	239.35 R	4,054,560	341	4,054,821	789	4,054,876
186	4,054,501	32	4,054,242	257	4,054,562	375	4,054,822	792.5	4,054,886
228	4,054,502	71	4,054,243	285.5	4,054,563	573	4,054,823	806	4,054,877
271	4,054,503	11	4,054,244	287 CF	4,054,565	603	4,054,824	CLASS 346	
45	4,054,203	20 A	4,054,245	287 P	4,054,566	640	4,054,825	1	4,054,882
83	4,054,204	61.11 E	Re.29,449	293.55	4,054,567	663	4,054,826	134	4,054,884
217	4,054,205	92 PK	4,054,247	293.55	4,054,568	61	4,054,827	140 R	4,054,883
387	4,054,206	47	4,054,248	293.55	4,054,569	28	4,054,828	154	4,054,885
486	4,054,207	1 A	4,054,249	293.55	4,054,570	6	4,054,829	3.5	4,054,356
537	4,054,208	349	4,054,250	293.55	4,054,571	163	4,054,830	6	4,054,357
10	4,054,504	88	4,054,251	293.55	4,054,572	278	4,054,831	7	4,054,358
11	4,054,505	18 DD	4,054,252	293.55	4,054,573	400	4,054,832	96 B	4,054,361
24	4,054,506	57.1	4,054,253	293.55	4,054,574	477	4,054,833	96 C	4,054,362
89	4,054,507	199	4,054,254	293.55	4,054,575	689	4,054,834	96 WG	4,054,363
120	4,054,508	205	4,054,255	293.55	4,054,576	757	4,054,835	150	4,054,367
148	4,054,509	321	4,054,256	293.55	4,054,577	39	4,054,836	160 LC	4,054,368
309	4,054,512	134 F	4,054,257	293.55	4,054,578	233	4,054,837	175 E	4,054,370
214	4,054,513	96	4,054,258	293.55	4,054,579	50	4,054,838	175 ML	4,054,369
20	4,054,514	97	4,054,259	293.55	4,054,580	204	4,054,839	184	4,054,371
44	4,054,515	214	4,054,260	293.55	4,054,581	216	4,054,840	186	4,054,372
45	4,054,516	219 W	4,054,261	293.55	4,054,582	264	4,054,841	241	4,054,373
61	4,054,517	199	4,054,262	293.55	4,054,583	70	4,054,842	279	4,054,374
104	4,054,518	321	4,054,263	293.55	4,054,584	53.5	4,054,843	307	4,054,375
122	4,054,519	96	4,054,264	293.55	4,054,585	35 R	4,054,844	178	4,054,376
137	4,054,521	97	4,054,265	293.55	4,054,586	153	4,054,845	27 R	4,054,378
188	4,054,522	214	4,054,266	293.55	4,054,587	207 P	4,054,846	24	4,054,887
195	4,054,523	219 W	4,054,267	293.55	4,054,588	263	4,054,847	50	4,054,888
232	4,054,524	199	4,054,268	293.55	4,054,589	313	4,054,848	83	4,054,889
242	4,054,525	321	4,054,269	293.55	4,054,590	384	4,054,849	227	4,054,890
245	4,054,526	96	4,054,270	293.55	4,054,591	4	4,054,850	246	4,054,891
321	4,054,527	97	4,054,271	293.55	4,054,592	43	4,054,851	252	4,054,892
355	4,054,528	214	4,054,272	293.55	4,054,593	111	4,054,852	329	4,054,902
521	4,054,529	321	4,054,273	293.55	4,054,594	116 R	4,054,853	14	4,054,849
208	4,054,209	96	4,054,274	293.55	4,054,595	35 BJ	4,054,854	24 R	4,054,850
25	4,054,210	97	4,054,275	293.55	4,054,596	37 AT	4,054,855	72	4,054,851
6 M	4,054,211	214	4,054,276	293.55	4,054,597	56	4,054,856	15	4,054,853
5 A	4,054,212	321	4,054,277	293.55	4,054,598	7	4,054,857	15	4,054,853
10	4,054,213	96	4,054,278	293.55	4,054,599	24 A	4,054,858	51	4,054,884
141 C	4,054,214	97	4,054,279	293.55	4,054,600	84 R	4,054,859	138	4,054,885
58	4,054,215	214	4,054,280	293.55	4,054,601	103	4,054,860	153	4,054,886
138 R	4,054,216	321	4,054,281	293.55	4,054,602	106	4,054,861	156	4,054,887
392	4,054,217	96	4,054,282	293.55	4,054,603	38	4,054,862	172	4,054,888
306	4,054,218	97	4,054,283	293.55	4,054,604	218	4,054,863	189	4,054,889
1	4,054,219	214	4,054,284	293.55	4,054,605	246	4,054,864	199	4,054,890
233	4,054,220	321	4,054,285	293.55	4,054,606	251	4,054,865	206	4,054,891
4	4,054,221	96	4,054,286	293.55	4,054,607	309	4,054,866	209	4,054,892
10	4,054,222	97	4,054,287	293.55	4,054,608	3 R	4,054,867	15	4,054,893
141 C	4,054,223	214	4,054,288	293.55	4,054,609	3.5	4,054,868	23	4,054,894
58	4,054,224	321	4,054,289	293.55	4,054,610	4 A	4,054,869	31	4,054,895
138 R	4,054,225	96	4,054,290	293.55	4,054,611	6 C	4,054,870	36	4,054,896
392	4,054,226	97	4,054,291	293.55	4,054,612	187.1	4,054,871	44	4,054,897
306	4,054,227	214	4,054,292	293.55	4,054,613	191	4,054,872	46	4,054,898
1	4,054,228	321	4,054,293	293.55	4,054,614	216	4,054,873	81	4,054,901
233	4,054,229	96	4,054,294	293.55	4,054,615	217	4,054,874	8	4,054,903
4	4,054,230	97	4,054,295	293.55	4,054,616	233	4,054,875	13	4,054,904
10	4,054,231	214	4,054,296	293.55	4,054,617	237 R	4,054,876	22	4,054,905
58	4,054,232	321	4,054,297	293.55	4,054,618	238	4,054,877	27	4,054,915
138 R	4,054,233	96	4,054,298	293.55	4,054,619	256	4,054,878	41	4,054,906
392	4,054,234	97	4,054,299	293.55	4,054,620	318	4,054,879	60	4,054,907
306	4,054,235	214	4,054,300	293.55	4,054,621	323	4,054,880	85	4,054,908
1	4,054,236	321	4,054,301	293.55	4,054,622	348	4,054,881	86	4,054,910
10	4,054,237	96	4,054,302	293.55	4,054,623	209	4,054,882	104	4,054,911
58	4,054,238	97	4,054,303	293.55	4,054,624	250	4,054,883	141	4,054,912
138 R	4,054,239	214	4,054,304	293.55	4,054,625	319	4,054,884	148	4,054,913
392	4,054,240	321	4,054,305	293.55	4,054,626	15	4,054,885	214	4,054,914
306	4,054,241	96	4,054,306	293.55	4,054,627	30	4,054,886	246	4,054,915
1	4,054,242	97	4,054,307	293.55	4,054,628	44	4,054,887	256	4,054,916
10	4,054,243	214	4,054,308	293.55	4,054,629	198	4,054,888	284	4,054,917
58	4,054,244	321	4,054,309	293.55	4,054,630	256	4,054,889		
138 R	4,054,245	96	4,054,310	293.55	4,054,631	318	4,054,890		
392	4,054,246	97	4,054,311	293.55	4,054,632	323	4,054,891		
306	4,054,247	214	4,054,312	293.55	4,054,633	348	4,054,892		
1	4,054,248	321	4,054,313	293.55	4,054,634	209	4,054,893		
10	4,054,249	96	4,054,314	293.55	4,054,635	250	4,054,894		
58	4,054,250	97	4,054,315	293.55	4,054,636	319	4,054,895		
138 R	4,054,251	214	4,054,316	293.55	4,054,637	15	4,054,896		
392	4,054,252	321	4,054,317	293.55	4,054,638	30	4,054,897		
306	4,054,253	96	4,054,318	293.55	4,054,639	44	4,054,898		
1	4,054,254	97	4,054,319	293.55	4,054,640	81	4,054,899		
10	4,054,255	214	4,054,320	293.55	4,054,641	117 R	4,054,900		
58	4,054,256	321	4,054,321	293.55	4,054,642	154 A	4,054,901		
138 R	4,054,257	96	4,054,322	293.55	4,054,643	176 MF	4,054,902		
392	4,054,258	97	4,054,323	293.55	4,054,644	205	4,054,903		
306	4,054,259	214	4,054,324	293.55	4,054,645	230 C	4,054,904		
1	4,054,260	321	4,054,325	293.55	4,054,646	174 TF	4,054,905		
10	4,054,261	96	4,054,326	293.55	4,054,647	274 R	4,054,906		
58	4,054,262	97	4,054,327	293.55	4,054,648	337	4,054,907		
138 R	4,054,263	214	4,054,328	293.55	4,054,649	384 E	4,054,908		
392	4,054,264	321	4,054,329	293.55	4,054,650	397	4,054,909		
306	4,054,265	96	4,054,330	293.55	4,054,651		4,054,910		
1	4,054,266	97	4,054,331	293.55	4,054,652		4,054,911		
10	4,054,267	214	4,054,332	293.55	4,054,653		4,054,912		
58	4,054,268	321	4,054,333	293.55	4,054,654		4,054,913		
138 R	4,054,269	96	4,054,334	293.55	4,054,655		4,054,914		
392	4,054,270	97	4,054,335	293.55	4,054,656		4,054,915		
306	4,054,271	214	4,054,336	293.55	4,054,657		4,054,916		
1	4,054,272	321	4,054,337	293.55	4,054,658		4,054,917		
10	4,054,273	96	4,054,338	293.55	4,054,659		4,054,918		
58	4,054,274	97	4,054,339	293.55	4,054,660		4,054,919		
138 R	4,054,275	214	4,054,340	293.55	4,054,661		4,054,920		
392	4,054,276	321	4,054,341	293.55	4,054,662		4,054,921		

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PATENTS

1 :	4,054,029	4,054,420	4,054,337	4,054,212	4,054,701	4,054,624
	4,054,030	4,054,421	4,054,413	4,054,225	4,054,738	4,054,628
	4,054,130	4,054,473	4,054,415	4,054,228	4,054,768	4,054,688
	4,054,261	4,054,481	4,054,429	4,054,286	4,054,786	4,054,690
	4,054,696	4,054,488	4,054,514	4,054,293	4,054,802	4,054,800
5 :	4,054,007	4,054,503	4,054,543	4,054,315	4,054,833	4,054,833
	4,054,142	4,054,521	4,054,687	4,054,322	4,054,869	4,054,835
6 :	4,053,963	4,054,535	4,054,781	4,054,327	4,054,836	4,054,836
	4,053,974	4,054,540	4,054,793	4,054,346	4,054,858	4,054,858
	4,053,983	4,054,566	4,054,910	4,054,370	4,054,896	4,054,896
	4,054,000	4,054,576	4,054,418	4,054,375	4,054,842	Re.29,448
	4,054,026	4,054,579	4,054,422	4,054,378	4,053,958	4,053,966
	4,054,031	4,054,622	4,054,468	4,054,400	4,053,995	4,053,978
	4,054,032	4,054,626	4,054,556	4,054,401	4,054,006	4,054,006
	4,054,062	4,054,636	4,054,560	4,054,482	4,054,065	4,054,065
	4,054,064	4,054,641	4,054,580	4,054,498	4,054,091	4,054,100
	4,054,066	4,054,667	4,054,582	4,054,412	4,054,108	4,054,108
	4,054,068	4,054,673	4,054,705	4,054,536	4,054,109	4,054,109
	4,054,069	4,054,675	4,054,493	4,054,574	4,054,116	4,054,116
	4,054,073	4,054,676	4,054,797	4,054,594	4,054,194	4,054,194
	4,054,101	4,054,744	4,054,003	4,054,623	4,054,644	4,054,644
	4,054,110	4,054,747	4,054,054	4,054,679	4,054,689	4,054,689
	4,054,117	4,054,750	4,054,268	4,054,755	4,054,755	4,054,755
	4,054,124	4,054,787	4,054,308	4,054,756	4,054,756	4,054,756
	4,054,126	4,054,805	4,054,633	4,054,761	4,054,761	4,054,761
	4,054,130	4,054,826	4,054,647	4,054,714	4,054,763	4,054,763
	4,054,132	4,054,837	4,054,752	4,054,767	4,054,767	4,054,767
	4,054,154	4,054,859	4,054,785	4,054,803	4,054,785	4,054,785
	4,054,173	4,054,874	4,054,880	4,054,856	4,054,856	4,054,856
	4,054,175	4,054,876	4,053,970	4,054,860	4,054,860	4,054,860
	4,054,176	4,054,882	4,054,045	4,054,861	4,054,861	4,054,861
	4,054,182	4,054,919	4,054,171	4,054,913	4,054,913	4,054,913
	4,054,184	4,054,923	4,054,209	4,054,933	4,054,933	4,054,933
	4,054,186	4,054,929	4,054,242	4,053,996	4,054,242	4,054,242
	4,054,235	4,054,938	4,054,251	4,054,030	4,054,251	4,054,251
	4,054,236	4,054,990	4,054,301	4,054,111	4,054,301	4,054,301
	4,054,254	8 : Re.29,430	4,054,404	4,054,349	4,054,404	4,054,404
	4,054,256	4,054,125	4,054,496	4,054,374	4,054,496	4,054,496
	4,054,266	4,054,149	Re.29,442	4,054,394	4,054,394	4,054,394
	4,054,282	4,054,218	4,053,955	4,054,439	4,054,439	4,054,439
	4,054,283	4,054,258	4,053,957	4,054,441	4,054,441	4,054,441
	4,054,284	4,054,330	4,053,985	4,054,463	4,054,463	4,054,463
	4,054,287	4,054,305	4,053,999	4,054,539	4,054,539	4,054,539
	4,054,290	4,054,306	4,054,022	4,054,552	4,054,552	4,054,552
	4,054,296	4,054,507	4,054,023	4,054,564	4,054,564	4,054,564
	4,054,297	4,054,788	4,054,102	4,054,567	4,054,567	4,054,567
	4,054,319	9 : 4,053,953	4,054,118	4,054,573	4,054,573	4,054,573
	4,054,345	4,054,107	4,054,134	4,054,581	4,054,581	4,054,581
	4,054,352	4,054,144	4,054,140	4,054,582	4,054,582	4,054,582
	4,054,364	4,054,151	4,054,166	4,054,583	4,054,583	4,054,583
	4,054,366	4,054,198	4,054,185	4,054,603	4,054,603	4,054,603
	4,054,384	4,054,279	4,054,191	4,054,636	4,054,636	4,054,636
	4,054,387	4,054,310	4,054,195	4,054,660	4,054,660	4,054,660

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4,054,120	4,054,614	4,054,359	4,054,240	4,054,474	4,054,605
4,054,139	4,054,617	4,054,369	4,054,249	4,054,484	4,054,772
4,054,273	4,054,629	4,054,380	4,054,292	4,054,538	4,054,780
4,054,317	4,054,630	4,054,381	4,054,295	4,054,591	4,054,790
4,054,320	4,054,635	4,054,383	4,054,298	4,054,618	4,054,794
4,054,467	4,054,653	4,054,389	4,054,299	4,054,643	4,054,893
4,054,497	4,054,665	4,054,391	4,054,311	4,054,655	4,054,899
4,054,596	4,054,694	4,054,396	4,054,312	4,054,657	4,054,901
4,054,632	4,054,698	4,054,416	4,054,340	4,054,658	4,054,939
4,054,645	4,054,710	4,054,423	4,054,348	4,054,661	49 : 4,053,984
4,054,779	4,054,711	4,054,448	4,054,419	4,054,666	4,054,819
4,054,816	4,054,719	4,054,453	4,054,432	4,054,683	50 : 4,054,881
4,054,765	4,054,721	4,054,457	4,054,517	4,054,708	51 : 4,053,962
4,054,870	4,054,728	4,054,465	4,054,520	4,054,717	4,054,020
4,053,956	4,054,732	4,054,469	4,054,531	4,054,729	4,054,048
4,053,972	4,054,734	4,054,477	4,054,551	4,054,799	4,054,157
4,053,981	4,054,740	4,054,485	4,054,561	4,054,814	4,054,183
4,054,086	4,054,743	4,054,522	4,054,561	4,054,821	4,054,188
4,054,121	4,054,751	4,054,523	4,054,561	4,054,830	4,054,203
4,054,160	4,054,760	4,054,534	4,054,574	4,054,832	4,054,207
4,054,161	4,054,768	4,054,535	4,054,575	4,054,894	4,054,229
4,054,245	4,054,784	4,054,565	4,054,577	4,054,937	4,054,528
4,054,280	4,054,789	4,054,577	4,054,584	4,054,977	4,054,548
4,054,534	4,054,791	4,054,584	4,054,592	4,054,777	44 : 4,054,397
4,054,627	4,054,845	4,054,592	4,054,592	4,054,795	45 : Re.29,444
4,054,926	4,054,846	4,054,600	4,054,592	4,054,827	4,054,634
4,054,671	4,054,863	4,054,604	4,054,604	4,054,942	4,054,871
4,054,204	4,054,895	4,054,620	4,054,620	4,054,944	4,054,852
4,054,619	4,054,905	4,054,646	4,054,646	4,054,955	47 : Re.29,443
4,053,954	4,054,941	4,054,680	4,054,680	4,054,955	53 : 4,054,049
4,053,992	4,054,946	4,054,693	4,054,693	4,054,961	4,054,070
4,053,993	4,054,948	4,054,695	4,054,695	4,054,961	4,054,106
4,054,027	4,054,979	4,054,706	4,054,706	4,054,967	4,054,179
4,054,095	4,054,985	4,054,727	4,054,727	4,054,969	4,054,477
4,054,103	4,054,986	4,054,730	4,054,730	4,054,971	4,054,542
4,054,205	4,053,976	4,054,762	4,054,762	4,054,971	4,054,542
4,054,221	4,053,979	4,054,822	4,054,822	4,054,971	4,054,542
4,054,246	4,053,982	4,054,831	4,054,831	4,054,971	4,054,542
4,054,338	4,053,986	4,054,850	4,054,850	4,054,971	4,054,542
4,054,357	4,053,994	4,054,868	4,054,868	4,054,971	4,054,542
4,054,358	4,054,001	4,054,877	4,054,877	4,054,971	4,054,542
4,054,365	4,054,036	4,054,884	4,054,884	4,054,971	4,054,542
4,054,407	4,054,084	4,054,944	4,054,944	4,054,971	4,054,542
4,054,451	4,054,135	4,054,951	4,054,951	4,054,971	4,054,542
4,054,452	4,054,138	4,054,951	4,054,951	4,054,971	4,054,542
4,054,454	4,054,140	4,054,951	4,054,951	4,054,971	4,054,542
4,054,455	4,054,178	4,054,131	4,054,131	4,054,971	4,054,542
4,054,478	4,054,226	4,054,211	4,054,211	4,054,971	4,054,542
4,054,480	4,054,232	4,054,237	4,054,237	4,054,971	4,054,542
4,054,483	4,054,233	4,054,237	4,054,237	4,054,971	4,054,542
4,054,488	4,054,234	4,054,237	4,054,237	4,054,971	4,054,542
4,054,490	4,054,263	4,054,237	4,054,237	4,054,971	4,054,542
4,054,508	4,054,285	4,054,237	4,054,237	4,054,971	4,054,542
4,054,511	4,054,305	4,054,237	4,054,237	4,054,971	4,054,542
4,054,538	4,054,313	4,054,237	4,054,237	4,054,971	4,054,542
4,054,541	4,054,323	4,054,237	4,054,237	4,054,971	4,054,542
4,054,570	4,054,334	4,054,237	4,054,237	4,054,971	4,054,542

DESIGN PATENTS

6 :	246,084	246,111	246,122	246,109	246,083	246,133
	246,085	246,129	246,121	246,120	246,090	246,134
	246,086	246,138	246,105	246,130	246,131	246,135
	246,087	246,080	246,096	246,140	246,113	246,136
	246,089	246,115	246,099	246,077	246,114	246,139
	246,092	246,076	246,101	246,110	246,123	42 : 246,078
	246,093	246,081	246,102	246,116	246,097	48 : 246,095
	246,100	246,103	246,106	246,079	246,132	53 : 246,088

PLANT PATENTS

39 :	4,128	4,129	4,130	41 :	4,131
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PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,592,760, Derick and Frosch, OXIDATION OF SEMICONDUCTIVE SURFACES FOR CONTROLLED DIFFUSION, filed July 2, 1976, D.C. Del. (Wilmington), Doc. 76-214, *Western Electric Company v. Advanced Memory Systems, Inc.* Same, filed July 2, 1976, D.C., N.D. Calif. (San Francisco), Doc. C76-1381-WHO, *Western Electric Company, Incorporated v. Micro Power Systems Incorporated.* Same, filed July 2, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76-2122-IH, *Western Electric Company, Inc. v. Frontier, Inc.* Same, filed July 2, 1976, D.C.N.J. (Newark), Doc. 76-1303, *Western Electric Company Incorporated v. Microwave Semiconductor Corporation.* Consent judgment dismissing the action in favor of plaintiff and against defendant, Feb. 10, 1977.

2,591,961, J. E. Lucas, OFF-SHORE DRILLING BARGE, filed May 17, 1976, D.C.N.J. (Newark), Doc. 76-903, *DeLong Corporation v. Raymond International, Inc.*

2,596,875, E. T. Molinaro, STATION SAMPLING RADIO, filed Dec. 20, 1973, D.C. Del. (Wilmington), Doc. 4780, *Anthony P. Catanzaro v. International Telephone & Telegraph, Radio Corp. of America; Motorola, Inc. and Masco Corp.* Final judgment, with respect to the complaint, defendant's motion for summary judgment on grounds of non-infringement is granted and judgment is entered in favor of defendant. Counterclaim does not infringe said patent, Apr. 12, 1977.

2,596,494, S. Uhl, BARBED WIRE SPIRAL, filed Apr. 23, 1976, D.C., S.D. Calif. (Los Angeles), Doc. CV76-1325-RJK, *Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft et al. v. Lindy's Industries, Inc.*

2,552,464, M. Stimler, SOUND TRACK SELECTION PHONOGRAPH, filed Apr. 7, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c184, *The Seeburg Corporation of Delaware v. B.S.R. (U.S.A.), Ltd. and Playback, Inc.* Same, filed June 3, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1978 (Case transferred from USDC, N.Y., Doc. 77-C-1748), *B.S.R. (U.S.A.) Ltd. v. The Seeburg Corporation of Delaware.*

2,596,718, D. H. Dave, METHOD FOR THE INSTALLATION OF REINFORCED CONCRETE FLOORS IN MULTI-STORIED BUILDINGS; 3,037,250, same, APPARATUS FOR THE INSTALLATION OF REINFORCED CONCRETE FLOORS IN MULTI-STORIED BUILDINGS, filed Apr. 6, 1976, D.C. Del. (Wilmington), Doc. 76-C-1574, *D. H. Dave v. The Ceco Corporation et al.* It is hereby stipulated by the parties that the complaint and counterclaim herein be dismissed with prejudice, Jan. 19, 1977.

3,332,345, J. H. Lemelson, TARGET GAME; 3,385,566, C. B. Dwyer, FENCE ASSEMBLY; 3,917,271, Lemelson and Elfman, BALL FOR TARGET GAMES; 4,017,076, H. S. Bai, TARGET GAME, filed May 6, 1977, D.C., S.D.N.Y., Doc. 77-C-2217, *Synergistics Research Corp. v. Henry S. Bai et al.*

3,037,250. (See 3,906,718.)

2,942,506, F. C. Bremer, ENVELOPE CONSTRUCTION, filed May 29, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1752, *Check Savers, Inc. v. Correction Systems, Inc.* By agreement order complaint and counterclaim dismissed with prejudice, Apr. 9, 1976.

3,163,645, De Stevens and Werner, DERIVATIVES OF 3,4-DIHYDRO-2-H-[1,2,4]-BENZOTHIADIAZINE-1,1-DIOXIDES, filed Sept. 27, 1976, D.C. Colo. (Denver), Doc. 76-W-957, *Ciba-Geigy Corporation v. Geneva Generics, Inc.* Same, filed Sept. 27, 1976, D.C., N.D. Ga. (Atlanta), Doc. C76-1569A, *Ciba-Geigy Corporation v. Reid-Provident Labs, Inc.* Same, filed Sept. 27, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76-3066, *Ciba-Geigy Corp. v. Towne, Paulsen & Co. Inc.* Same, filed Sept. 28, 1976, D.C., S.D. Fla. (Miami), Doc. 76-1683-C-PF, *Ciba-Geigy Corporation v. Kelvin Pharma-*

ceuticals, Inc. Plaintiff voluntarily dismissed this action against defendant without prejudice, Sept. 30, 1976. Same, filed Sept. 28, 1976, D.C., S.D. Fla. (Fort Lauderdale), Doc. (FL)76-6422-C-JE, *Ciba-Geigy Corporation v. Geneva Drug Corporation.* Same, filed Sept. 27, 1976, D.C. Colo. (Denver), Doc. 76-W-957, *Ciba-Geigy Corporation v. Geneva Generics, Inc.* Transferred under MDL Order to USDC, District of New Jersey on June 8, 1977. Same, filed June 3, 1977, D.C.N.J. (Newark), Doc. 77-1084, *Ciba-Geigy Corporation v. Geneva Generics, Inc.* Consent judgment for dismissal of action, June 13, 1977. Same, filed June 3, 1977, D.C.N.J. (Newark), Doc. 77-1085, *Ciba-Geigy Corporation v. Geneva Drug Corporation.* Consent judgment for dismissal of action, June 13, 1977. Same, filed June 7, 1977, D.C.N.J. (Newark), Doc. 77-1086, *Ciba-Geigy Corporation v. Reid Provident Labs, Inc.* Same, filed June 8, 1973, D.C.N.J. (Newark), Doc. C-806-73, *Ciba-Geigy Corporation v. Zenith Laboratories, Inc., Aberdeen Pharmaceuticals Corporation and Paramount Surgical Supply Corp.* Consent judgment for dismissal of action, June 13, 1977. Same, filed June 7, 1977, D.C.N.J. (Newark), Doc. 77-1088, *Ciba-Geigy Corporation v. Reid Provident Labs, Inc.* Consent judgment for dismissal of action, June 13, 1977. Same, filed June 8, 1973, D.C.N.J. (Newark), Doc. 73-73, *Ciba-Geigy Corporation v. Zenith Laboratories, Inc., Aberdeen Pharmaceuticals Corporation and Paramount Surgical Supply Corporation.* Judgment for dismissal of action, June 13, 1977. Same, filed June 3, 1977, D.C.N.J. (Newark), Doc. 77-1087, *Ciba-Geigy Corp. v. Towne, Paulsen & Co.* Consent judgment for dismissal of action, June 13, 1977. Same, filed Sept. 27, 1976, D.C.N.J. (Newark), Doc. C-76-1885, *Ciba-Geigy Corporation v. Barr Labs, Inc.* Consent judgment for dismissal of action, June 13, 1977.

3,241,876, W. S. Saunders, APPARATUS FOR REDUCING LINEAR AND LATERAL WIND RESISTANCE IN A TRACTOR-TRAILER COMBINATION VEHICLE; 3,309,131, same, MEANS FOR REDUCING LINEAR WIND RESISTANCE IN SINGLE CHASSIS TYPE VEHICLES, filed Apr. 8, 1974, D.C., N.D. Ind. (South Bend), Doc. 74-82, *W. Seiden Saunders v. I.R.C. & D Motor Freight, Inc.* Stipulation of dismissal without prejudice, Oct. 4, 1976.

3,268,636, R. G. Angell, Jr., METHOD AND APPARATUS FOR INJECTION MOLDING FOAMED PLASTIC ARTICLES, filed in the United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 75-2263, *Union Carbide Corporation v. Borg-Warner Corporation and Sund-Borg Machines Corporation.* The judgment of the district court that appellant's '636 patent is invalid for failure to disclose the best mode as required by 35 U.S.C. 112 is affirmed, Jan. 27, 1977.

3,293,405, R. J. Costanzo, ELECTRICALLY HEATED FOOTWEAR, filed Nov. 22, 1976, D.C. Conn. (Bridgeport), Doc. B-76-357, *Timely Products, Inc. and Benjamin M. Hines v. Raphael J. Costanzo.*

3,309,131. (See 3,241,876.)

3,313,545, J. R. Bartsch, UNITARY MOLDED GOLF BALL; 3,438,933, same, MOLDING PROCESS AND COMPOSITION, filed Dec. 21, 1976, D.C., S.D.N.Y., Doc. 76-C-5714(MP), *PCR Golf Ball Company, Inc. v. Ezim Sales Company.*

3,385,566. (See 3,032,345.)

3,438,933. (See 3,313,545.)

3,494,064, J. O. Hazen, VERTICALLY ADJUSTABLE UNDERFLOOR TRENCH AND METHOD OF ASSEMBLING AND INSTALLING THE SAME, filed Nov. 19, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2940, *H. H. Robertson Company v. Square D Company.* Ordered that the complaint and the counterclaim are dismissed with prejudice, May 2, 1977.

3,502,645, D. G. Carmichael, WATER-INSOLUBLE BENZOTHIAZOLE MONOAZO DYES, filed Mar. 15, 1977, D.C. Del. (Wilmington), Doc. 77-94, *Martin Marietta Corp. v. Kewanee Industries, Inc.*

OCTOBER 25, 1977

U. S. PATENT AND TRADEMARK OFFICE

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3,630,505, B. R. Mackay, SILVER RECOVERY; 3,692,291, M. T. Mackay, same; 3,744,995, B. R. Mackay, same, filed Mar. 28, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77-1128-WMB, *Byron R. Mackay et al. v. West Coast Silver Refining Corp.*

3,692,291. (See 3,630,505.)

3,730,937, Boggs and Miller, ELASTOMERIC CORROSION-INHIBITING COATING AND SEALING MATERIAL, filed Apr. 24, 1974, D.C. Del. (Wilmington), Doc. 74-81, *Products Research & Chemical Corporation v. Teledyne, Inc.* It is hereby ordered that the above civil action is dismissed with prejudice, Dec. 20, 1976.

3,733,309, Wyeth, Newman and Gay, BIAXIALY ORIENTED POLY(ETHYLENE TEREPHTHALATE) BOTTLE, filed Jan. 24, 1977, D.C. N.D. Ohio (Toledo), Doc. C77-39, *Owens-Illinois, Inc. et al. v. E. I. du Pont de Nemours & Co.*

3,737,666, R. H. Gruner, DATA STORAGE AND RETRIEVAL SYSTEM, filed June 7, 1973, D.C. Del. (Wilmington), Doc. 4674, *Data General Corporation v. Digital Computer Controls, Inc.* Pursuant to Rule 41(a)(1)(ii), by stipulation this action is hereby dismissed, Feb. 1, 1977.

3,744,995. (See 3,630,505.)

3,750,722, R. L. Nowak, FUNNEL, filed Oct. 23, 1974, D.C. Del. (Wilmington), Doc. 74-217, 75-174 consol., *Funnelcap Inc. v. Orion Industries, Inc. and Corporation Trust Company.* Judgment, the claim in said patent is invalid under 35 U.S.C. 102 as being anticipated, and even if not anticipated, is invalid under 35 U.S.C. 103 as being obvious in view of the prior art, Dec. 20, 1976. Same, filed Dec. 5, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV74-3571-WPG, consol. w/ C.A. 74-217, *Cal Custom Accessories, Inc. v. Funnelcap, Inc.* Judgment, claim in said patent is invalid under 35 U.S.C. 103 as being obvious in view of the prior art, Dec. 20, 1976.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,547,813, Re. S.N. 831,101, Filed Sept. 7, 1977, Cl. 210/7, BIOCHEMICAL OXIDATION WITH LOW SLUDGE RECYCLE, Ernest K. Robinson, et al., Owner of Record: *Union Carbide Corporation, New York, N.Y.* Attorney or Agent: Harrie M. Humphreys, et al., Ex. Gp.: 176

3,547,814, Re. S.N. 831,100, Filed Sept. 7, 1977, Cl. 210/7, BIO-OXIDATION WITH LOW SLUDGE YIELD, John R. McWhirter, Owner of Record: *Union Carbide Corporation, New York, N.Y.* Attorney or Agent: Harrie M. Humphreys, et al., Ex. Gp.: 176

3,547,815, Re. S.N. 831,102, Filed Sept. 7, 1977, Cl. 210/7, STAGED OXYGENATION OF BOD-CONTAINING

WATER, John R. McWhirter, Owner of Record: *Union Carbide Corporation, New York, N.Y.* Attorney or Agent: Harrie M. Humphreys, et al., Ex. Gp.: 176

3,697,939, Re. S.N. 815,518, Filed July 14, 1977, Cl. 340/15.5 TD, CORRECTIONS FOR SEISMIC DATA OBTAINED FROM EXPANDING-SPREAD, Albert W. Musgrave, Owner of Record: *Mobil Oil Corporation, New York, N.Y.* Attorney or Agent: Michael G. Gilman, et al., Ex. Gp.: 222

3,877,550, Re. S.N. 827,957, Filed Aug. 26, 1977, Cl. 188/106 P, COMBINATION SERVICE AND PARKING BRAKE, Emil H. Hahn, Owner of Record: *Lambert Brake Corporation, St. Joseph, Mich.* Attorney or Agent: Richard R. Trexler, et al., Ex. Gp.: 315

3,901,601, Re. S.N. 819,365, Filed July 27, 1977, Cl. 356/97, CHOPPER ARRANGEMENT FOR ATOMIC ABSORPTION SPECTROPHOTOMETER, Werner K. Lahmann, Owner of Record: *Inventor, Attorney or Agent: S. A. Giarratana, et al., Ex. Gp.: 257*

3,918,268, Re. S.N. 831,032, Filed Sept. 6, 1977, Cl. 62/150, HEAT PUMP WITH FROST-FREE OUTDOOR COIL, Otto J. Nussbaum, Owner of Record: *Halstead Industries, Inc., Scottsboro, Ala.* Attorney or Agent: T. H. Murray, Ex. Gp.: 344

3,978,350, Re. S.N. 829,321, Filed Aug. 31, 1977, Cl. 307/255, DUAL MODE SOLID STATE POWER SWITCH, Louis C. Maus, et al., Owner of Record: *The United States of America, as represented by the Administrator of the NASA, Washington, D.C.* Attorney or Agent: George J. Porter, et al., Ex. Gp.: 254

3,991,222, Re. S.N. 823,983, Filed Aug. 12, 1977, Cl. 426/550, DEHYDRATED POTATO PROCESSES, Roderick G. Beck, et al., Owner of Record: *American Potato Company, San Francisco, Calif.* Ex. Gp.: 172

4,030,881 Re. S.N. 827,775, Filed Aug. 25, 1977, Cl. 8/39 C, COLORATION PROCESS, Violet Boyd, et al., Owner of Record: *Imperial Chemical Industries Limited, London, England.* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 144

4,032,529, Re. S.N. 826,683, Filed Aug. 22, 1977, Cl. 260/293.54, AMINOMETHANOBENZAZOCINE INTERMEDIATES, Mark P. Wentland, et al., Owner of Record: *Sterling Drug Inc., New York, N.Y.* Attorney or Agent: B. Woodrow Wyatt, et al., Ex. Gp.: 121

PATENT NOTICES

Certificates of Correction for the Week of Oct. 25, 1977

Re. 29,242	4,016,148	4,031,768
D. 216,952	4,016,768	4,031,862
D. 217,895	4,017,134	4,032,003
D. 212,251	4,017,175	4,032,007
D. 214,300	4,017,398	4,032,104
3,111,889	4,017,481	4,032,198
3,820,001	4,017,876	4,032,276
3,833,068	4,018,091	4,032,466
3,854,338	4,018,274	4,032,533
3,904,443	4,018,460	4,032,815
3,901,885	4,018,482	4,032,847
3,921,380	4,018,493	4,032,929
3,931,234	4,018,728	4,032,944
3,934,369	4,018,846	4,033,011
3,941,908	4,019,229	4,033,021
3,941,227	4,021,547	4,033,135
3,951,239	4,021,739	4,033,314
3,961,238	4,022,630	4,033,494
3,961,625	4,022,756	4,033,831
3,961,674	4,023,077	4,033,846
3,961,972	4,023,124	4,033,896
3,971,760	4,023,182	4,033,909
3,971,849	4,023,416	4,033,971
3,971,132	4,023,432	4,034,077
3,981,301	4,023,985	4,034,108
3,981,055	4,024,254	4,034,181
3,981,385	4,024,611	4,034,278
3,981,401	4,024,877	4,034,345
3,981,565	4,025,001	4,034,377
3,981,667	4,025,317	4,034,399
3,981,680	4,025,437	4,034,493
3,981,336	4,026,113	4,034,588
3,981,066	4,027,015	4,034,696
3,981,055	4,027,458	4,034,700
3,981,203	4,028,382	4,034,827
3,981,303	4,028,539	4,034,832
3,981,976	4,028,566	4,034,879
4,000,110	4,028,585	4,035,191
4,000,889	4,029,012	4,035,197
4,001,339	4,029,107	4,035,232
4,002,688	4,029,509	4,035,292
4,006,160	4,029,567	4,035,304
4,006,892	4,029,577	4,035,372
4,007,334	4,029,625	4,035,377
4,008,179	4,029,697	4,035,444
4,008,325	4,029,729	4,035,469
4,008,333	4,029,988	4,035,627
4,008,980	4,030,040	4,035,715
4,011,201	4,030,059	4,035,743
4,011,276	4,030,092	4,035,761
4,012,636	4,030,241	4,036,040
4,012,784	4,030,366	4,036,052
4,012,759	4,030,504	4,036,104
4,013,643	4,031,014	4,036,132
4,013,684	4,031,212	4,036,143
4,014,248	4,031,246	4,036,165
4,014,394	4,031,279	4,036,177
4,014,593	4,031,317	4,036,212
4,014,682	4,031,330	4,036,215
4,015,598	4,031,354	4,036,224
4,015,865	4,031,563	4,036,242

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,445,398, E. Jungermann and D. Taber, SYN-
ERGISTIC ANTIBACTERIAL COMPOSITIONS, Interference
No. 98,060, decided September 30, 1975, claims 4 and 5.

Patent No. 3,473,297, Z. Tamura and Y. Hishinuma, METH-
OD AND APPARATUS FOR DESULFURIZING COMBUS-
TION WASTE GASES, Interference No. 99,022, decided June
28, 1977, claims 1 and 3.

Patent No. 3,488,852, Z. Tamura and Y. Hishinuma, PROC-
ESS AND APPARATUS FOR THE DESULFURIZATION OF
INDUSTRIAL WASTE GASES, Interference No. 99,023, de-
cided June 28, 1977, claims 1 and 2.

Patent No. 3,617,576, A. F. Kerst, METHODS OF SCALE
INHIBITION, Interference No. 98,787, decided June 3, 1977,
claims 1, 5, 6 and 12.

Patent No. 3,711,432, N. Shah, LOW SHRINK POLYESTER
RESIN SYSTEMS FORMED OF A MIXTURE OF UNSAT-
URATED POLYESTER RESIN, MONOMERIC COPOLYMER-
IZABLE COMPONENT AND CELLULOSE ORGANIC ES-
TER, Interference No. 98,607, decided July 21, 1977, claims
1, 3, 4, 5, 6, 7, 8, 10, 11 and 12.

Patent No. 3,801,623, J. Martel, E. Toromanoff and J.
Buendia, CYCLOPENTANONE DERIVATIVES, Interference
No. 98,819, decided June 9, 1977, claims 1 and 3.

Patent No. 3,924,905, V. M. Simmons, REMOVAL OF OB-
STRUCTING SNOW FROM WITHIN SNOWMOBILE TRACK
ENCLOSURES, Interference No. 99,398, decided July 11,
1977, claims 1-6.

Patent No. 3,958,038, D. O. Hitzman, RECOVERY OF
CELLULAR PROTEIN PRODUCTS FROM MICROBIOLOGI-
CAL SYNTHESIS MASSES, Interference No. 99,444, decided
July 11, 1977, claim 1.

Disclaimer

3,894,863.—Walter L. Lachman, Concord, Mass. Robert A.
Penty, Kennebunk, Maine and Paul F. Jahn, Chelmsford,
Mass. GRAPHITE COMPOSITE. Patent dated July 15,
1975. Disclaimer filed Aug. 18, 1977, by the assignee,
Fiber Materials, Inc.

Hereby enters this disclaimer to all claims of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 27, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director.....	8-30-76
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director.....	9-17-76
Heterocyclics; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director.....	6-1-76
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director.....	10-21-76
Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director..	10-6-76
Fertilizers; Food; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director....	7-26-76
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director.....	6-7-76
Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio- Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director.....	8-17-76
Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director..	3-8-77
Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director.....	6-25-76
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Net- works; Optics; Radiant Energy; Measuring.	
DESIGNS, GROUP 290—C. D. QUARFORTH, Director.....	1-18-76
Industrial Arts; Household, Personal and Fine Arts.	
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director.....	10-5-76
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Apparatuses; Brakes; Railways and Railway Equipment.	
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director.....	11-24-76
Manufacturing Processes; Assembling; Combined Machines; Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding; Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—C. M. FORLENZA, Director.....	9-3-76
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletary; Printing; Typewriters; Stationery; Information Dissemination.	
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director.....	9-16-76
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gear- ing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director.....	1-3-77
Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	

Expiration of patents: The patents within the range of numbers indicated below expire during August 1977, except those which may have
expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public
Law 619, 85th Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of
35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for
the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,947,001 to 2,951,248, inclusive
Plant Patents..... Numbers 1,963 to 1,969, inclusive

REISSUE PATENTS

GRANTED OCTOBER 25, 1977

ERRATA

For
CLASS

364-724

See
PATENT NO.
29,460

REISSUES

OCTOBER 25, 1977

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,452

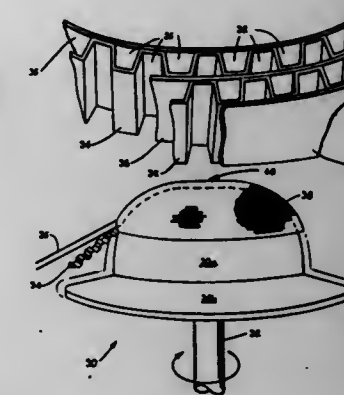
HEADWEAR CONSTRUCTION

Charles E. Townsend, Jr., 11 Ranch Road, Orinda, Calif. 94563
Original No. 3,811,130, dated May 21, 1974, Ser. No. 297,140,
Oct. 12, 1972. Continuation-in-part of Ser. No. 89,218, Nov.
13, 1970, abandoned. Application for reissue Dec. 30, 1974,
Ser. No. 537,792

Int. Cl.² A42B 1/18

U.S. Cl. 2—177

1 Claim



10. A headwear construction having a shaped crown comprising an arcuately contoured section of cellular honeycomb having compound curvature and disposed with the axes of its opened cells extending radially therethrough; each cell of said honeycomb having a substantially equal cross-sectional dimension; the thickness of the honeycomb measured in the direction of the cell axes and the nominal diameter of the cells being related to one another to limit the angle of incidence through which overhead sunrays can be transmitted through any given cell; the cumulative cross-sectional open cell areas of the crown amounting to at least 90 percent of the total surface area of the crown; the radius of curvature of the arcuately contoured honeycomb section in each compound direction being sufficiently tight to establish a progressive divergence of angularity between adjacent cell axes in each said direction whereby to limit direct sunray transmittal through the crown to a minor fractional area thereof at any given instant.

Re. 29,453

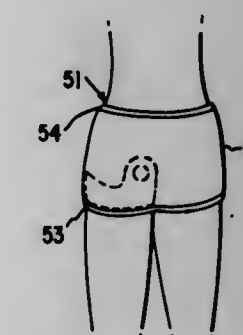
DRAINAGE BAG FOR HUMAN BODY

Rosemary B. Weddle, Grafton, Va., assignor to Marsan Manufacturing Company, Inc., Wausau, Wis.
Original No. 3,931,819, dated Jan. 13, 1976, Ser. No. 545,352,
Jan. 30, 1975. Continuation of Ser. No. 398,382, Sept. 18,
1973, abandoned. Application for reissue Oct. 6, 1976, Ser.
No. 730,267

Int. Cl.² A61F 5/44

U.S. Cl. 128—283

15 Claims



1. A drainage bag for attaching around a drainage opening in the human body and to be worn adjacent the skin comprising:

- a soft layer of the peripheral dimensions of the drainage bag and having an opening therein,
- a back plastic layer of the peripheral dimensions of the drainage bag and having an opening therein affixed to said soft layer to be coextensive therewith and having its opening coaxial with said soft layer opening,
- a front plastic layer of the peripheral dimensions of the drainage bag and sealed about its periphery to said back plastic layer on the side of said back plastic layer not [laminated] affixed to said soft layer,
- [a front plastic layer of the peripheral dimensions of the drainage bag and sealed about its periphery to said back plastic layer on the side of said back plastic layer not laminated to said soft layer,]
- a sealing washer on the back side of said drainage bag having an opening therein, and
- a seal between the area surrounding said seal washer opening and the area surrounding said back plastic layer opening.

Re. 29,454

METHOD FOR PRODUCING A GRADIENT ELUTION

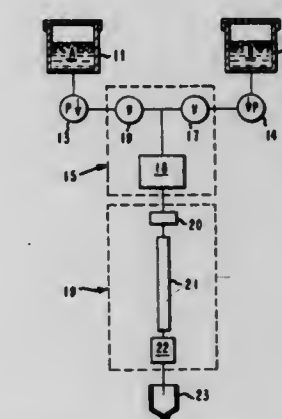
Howard L. Ashmead, Newark, Del.; Sydnor H. Byrne, Jr., La Canada, Calif., and John P. Wolf, III, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,799,396, dated Mar. 26, 1974, Ser. No. 265,995,
June 26, 1972. Division of Ser. No. 36,633, May 12, 1970, Pat.
No. 3,712,513. Application for reissue Feb. 20, 1976, Ser. No.
660,033

Int. Cl.² B01D 15/08

U.S. Cl. 222—1

3 Claims



1. A method of producing an eluent containing a time varying concentration of two liquids, comprising the steps of:
 - a. supplying a first liquid to a first operative portion of normally closed valving means;
 - b. supplying a second liquid to a second operative portion of said normally closed valving means;
 - c. alternately activating said first operative portion of said valving means for a first set period of time to allow a first set volume of said first liquid to enter a mixing region and then activating said second operative portion of said valving means for a second set period of time to allow a second set volume of said second liquid to enter said mixing region and mix with said first set volume of first liquid to form a mixture containing a set concentration of said first and second liquids, said first and second set periods of time being such that the volume of said first and second liquid entering said mixing region during each period when either operative portion of said valving means is activated is less than the volume of said mixing region;
 - d. allowing a portion of said mixture to leave said mixing region thereby producing an eluent having a concentration

tion of said first and second liquid, the instantaneous concentration of which is equal to the instantaneous concentration of said first and second liquids at the downstream end of said mixing region at the time said portion of said mixture leaves said mixing region; and

c. varying said first and second set periods of time during which said first and second operative portions of said valving means are respectively activated, whereby the concentrations of said first and second liquids in said mixture are gradually changed so that an eluent having a time varying concentration of said first and second liquids is produced.

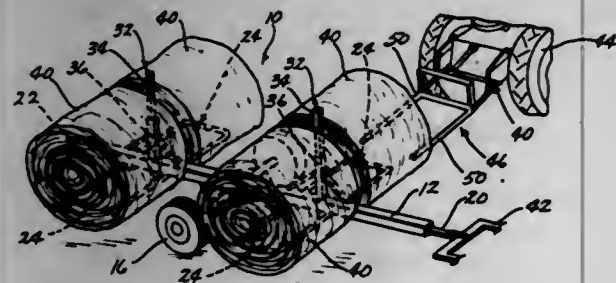
Re. 29,455
HAY BALE TRAILER

Darrell E. Slayton, Casey, Iowa, assignor to Dale E. Slayton, Casey, Iowa
Original No. 3,826,515, dated July 30, 1974, Ser. No. 420,265, Nov. 29, 1973. Application for reissue Nov. 28, 1975, Ser. No. 636,035

Int. Cl.² B62D 21/04

U.S. Cl. 280—106 T

15 Claims



12. A hay bale trailer comprising, an elongated longitudinally extending frame member having forward and rearward, an axle having wheels at opposite ends supportingly engaging said frame member intermediate its ends, a pair of bale supports extending laterally in opposite directions outwardly from said frame on opposite side thereof and longitudinally spaced from said axle and wheels, each of said supports having longitudinally spaced forward and rear hay support members extending transversely of said frame and each of said members having a transversely extending open area adjacent one side and extending substantially the length thereof whereby a fork having a pair of spaced apart teeth may register with said support members in side-by-side relationship therewith and move vertically above and below the plane of said support members without engaging an obstruction when loading or unloading hay onto each of said supports, and an upstanding stop means on said frame member between the bale supports of said pair of supports to separate bales of hay on said supports.

Re. 29,456

PUMPS WITH SERVO-TYPE ACTUATION FOR CHEEK PLATE UNLOADING

Gilbert H. Drutchas, Birmingham, Mich., and George A. Berma, Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio
Original No. 3,822,965, dated July 9, 1974, Ser. No. 303,115, Nov. 2, 1972. Application for reissue July 8, 1976, Ser. No. 700,372

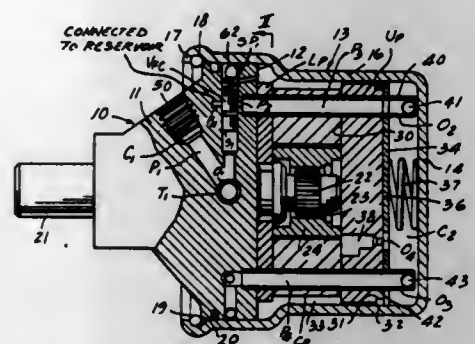
Int. Cl.² F04B 49/02

U.S. Cl. 417—53

21 Claims

9. In combination, a pump having housing means forming a pumping chamber having inlet and outlet portions, a fluid displacement means in said pumping chamber for moving the fluid at increased pressure from the inlet to the outlet portions,

a cheek plate adjacent said pumping chamber having a sealing face for sealing the inlet and outlet portions during operation of the pump, means including said housing forming a static pressure control chamber behind said cheek plate and having an orificed metering passage to load said cheek plate with fluid at pump-generated pressure, a seal between said cheek plate and said housing blocking flow into said cavity except through said orificed metering passage, means including said housing forming a pumping circuit including an outlet line and a return line for said pump



receiving said spent fluid returned to the pump, means forming an orifice in said pumping circuit, and a servo valve controlling a venting passage in said housing venting said pressure control chamber to a zone at lower pressure and having actuating means responsive to the pressure drop across said orifice, thereby valving the cheek plate in servo ratio proportion with the servo valve and directly by-passing the outlet portions of the pump to the inlet portions adjacent the sealing face of the cheek plate to modulate pump flow output.

Re. 29,457

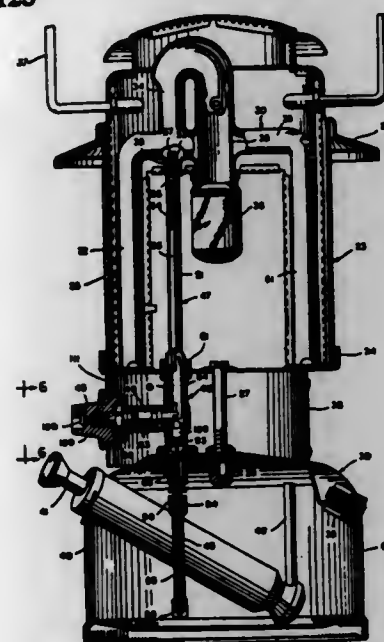
FUEL CONTROL MEANS FOR BURNERS

Thomas C. Hastings, Willowdale, Canada, assignor to The Coleman Company, Inc., Wichita, Kans.
Original No. 3,807,938, dated Apr. 30, 1974, Ser. No. 378,710, July 12, 1973. Application for reissue Mar. 29, 1976, Ser. No. 671,284

Int. Cl.² F23D 11/38, 13/28

U.S. Cl. 431—123

8 Claims



13. In a fuel burning apparatus having a fuel tank, fuel burning means, and means for pressurizing fuel within the fuel tank, an improved fuel control means for supplying fuel from the fuel tank to the fuel burning means comprising fuel conduit means extending from the fuel tank toward the fuel burning means, the fuel conduit means having a first end provided with a fuel inlet opening

positioned within the fuel tank and a second end provided with a fuel outlet orifice for supplying fuel to the fuel burning means, valve means within the fuel conduit means movable between a closed position in which fuel flow through the fuel conduit means is prevented and an open position in which the fuel flow through the fuel conduit means is permitted, inlet restricting means movable within the fuel conduit means with the valve means for restricting the fuel inlet orifice of the conduit means, outlet cleaning means mounted within the fuel conduit means for movement into and out of the fuel outlet orifice of the fuel conduit means, a single control member movably mounted on the apparatus, and means operably connecting the control member with the valve means and the outlet cleaning means for moving the valve means and the outlet cleaning means in response to movement of the control member, the control member being movable between:

- a first or off position in which the connecting means maintains the outlet cleaning means out of the fuel outlet orifice and maintains the valve means in the closed position,
- a second or cleaning position in which the connecting means maintains the outlet cleaning means in the fuel outlet orifice and maintains the valve means in the closed position,
- a third or light position in which the connecting means maintains the outlet cleaning means out of the fuel outlet orifice and maintains the valve means in the open position and the inlet restricting means in the fuel inlet orifice, and
- a fourth or run position in which the connecting means maintains the outlet cleaning means out of the fuel outlet orifice and maintains the valve means in the open position and the inlet restricting means out of the fuel inlet orifice whereby the fuel outlet orifice is cleaned by the outlet cleaning means twice during each cycle in which the control member is turned from the off position to the run position and back to the off position and whereby fuel within the fuel conduit means between the valve means and the fuel outlet orifice can escape through the fuel outlet orifice when the control member is returned to the off position.

Re. 29,458

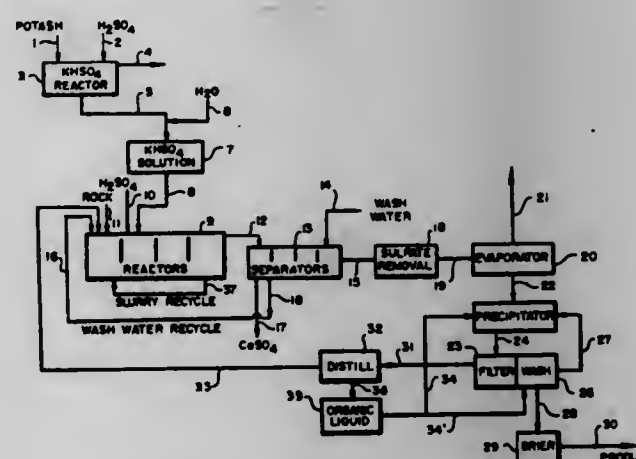
POTASSIUM PHOSPHATE MANUFACTURE

Erhart K. Drechsel, Houston, Tex.; John B. Sardisco, and James R. Stewart, Jr., both of Shreveport, La., assignors to Pennzoil Company, Shreveport, La.
Original No. 3,697,246, dated Oct. 10, 1972, Ser. No. 81,280, Oct. 16, 1970. Application for reissue July 18, 1975, Ser. No. 597,180

Int. Cl.² C05B 7/00

U.S. Cl. 71—34

11 Claims



9. A process for the precipitation of potassium dihydrogen phosphate which comprises:

- (1) contacting phosphate rock or a solubilized form thereof with a sufficient excess of sulfuric acid to drive the reaction to completion at a temperature of about 40° to 90° C. in a main reactor;
- (2) reacting potassium chloride and sulfuric acid in a separate reactor at a temperature of 250° to 300° C. with re-

moval of the dry hydrogen chloride evolved and dissolving the resulting potassium hydrogen sulfate with water to form a 10-50% aqueous solution;

- (3) adding said 10-50% aqueous solution of potassium hydrogen sulfate to said main reactor in sufficient amount to form a reaction mixture containing ions of potassium dihydrogen phosphate and at a rate so as to minimize the formation of insoluble salts of KHSO_4 and CaSO_4 and under such conditions that the concentration of dissolved solids in the reaction mixture does not exceed about 60%;
- (4) maintaining the reaction mixture under these conditions for formation of an easily filterable solid, calcium sulfate precipitate;
- (5) removing the solid calcium sulfate from the reaction mixture to provide a filtrate;
- (6) contacting said filtrate with a calcium-bearing material selected from the group consisting of phosphate rock, tricalcium phosphate, dicalcium phosphate, calcium oxide and mixtures thereof, alternatively or successively, at a temperature of 40°-90° C. to precipitate additional sulfate ion and partially neutralize the mixture and removing the precipitated solids to provide a filtrate lower in sulfate ion and containing potassium dihydrogen phosphate;
- (7) recovering the solid potassium dihydrogen phosphate from the filtrate to provide a phosphoric acid mother liquor; and
- (8) recycling the mother liquor to the main reactor.

Re. 29,459

EQUILIBRATION OF LOWER ALKYL SUBSTITUTED POLYALKYL AROMATIC HYDROCARBONS WITH REDUCED DISPROPORTIONATION

John J. Brodbeck, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Original No. 3,647,898, dated Mar. 7, 1972, Ser. No. 2,948, Jan. 14, 1970. Application for reissue Dec. 5, 1974, Ser. No. 529,304

Int. Cl.² C07C 15/08

U.S. Cl. 260—668 A

9 Claims

1. The process for the catalytic isomerization of an alkyl substituted polyalkyl aromatic hydrocarbon feed which comprises contacting the feed with a silica-alumina isomerization catalyst at a temperature in the range from about 700° F. to 1000° F., at a liquid hourly space velocity in the range from about 0.1 to 10, and at a pressure below about 200 p.s.i.g., wherein said catalyst consists essentially of a silica and alumina composite having a surface area in the range from about 250 to 400 square meters per gram, wherein at least 40 percent of the catalyst pore volume is from pores [have] having a radius greater than about 45 Å., said feed having an aromatic carbocyclic carbon atom content below about 13, and having from 2 to about 4 of the same or different lower alkyl substituent groups; and said composite having a silica to alumina weight ratio in the range from about 70-90 to about 10-30, respectively.

Re. 29,460

PCM TONE RECEIVER USING OPTIMUM STATISTICAL TECHNIQUE

Jeffrey P. Mills, Forest Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Original No. 3,961,167, dated June 1, 1976, Ser. No. 490,450, July 22, 1974. Application for reissue Feb. 28, 1977, Ser. No. 772,391

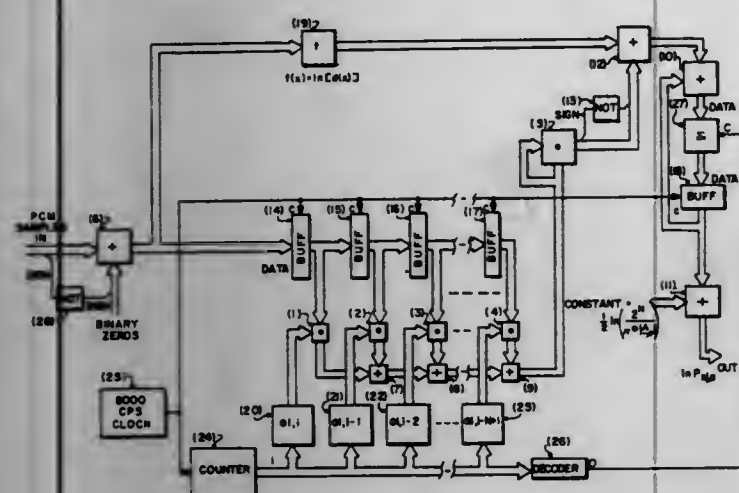
Int. Cl.² G06F 15/36; H04Q 11/00

U.S. Cl. 364—724

8 Claims

1. A pulse code modulation (PCM) tone receiver for determining the probability that a particular combination of audio frequencies was transmitted by monitoring PCM samples, said PCM tone receiver comprising: means for storing N PCM samples as received, where N is an integer, c₁ through c_N representing a quantization of the analog voltage waveform sampled;

first means for multiplying said N samples represented by c_i through c_N by a set of fixed predetermined constants a_{i1} through a_{iN} , where i is a fixed point binary number ranging from 1 to N and where a_{i1} through a_{iN} are determined from the covariance matrix of the process represented by the particular tone combination to be detected, said first multiplying means including means for storing said fixed predetermined constants a_{i1} through a_{iN} , said first multi-



plier means operating on said stored output of said storage means;
means for combining said multiplied products of samples c_i through c_N and constants a_{i1} through a_{iN} according to the equation

$$w_i = \sum_{k=1}^N a_{ik} c_k$$

means for squaring said resulting combined w_i term;
means for accumulating the resulting w_i^2 term as each of said N PCM samples are received;
second means for multiplying said accumulated samples by a [set of] fixed [constants] constant related to the covariance matrix with the resulting product representing the probability that the specific combination of audio frequencies was transmitted.

Re. 29,461 HOLOGRAM GRAPHIC DATA TABLET APPARATUS USING A VERNIER

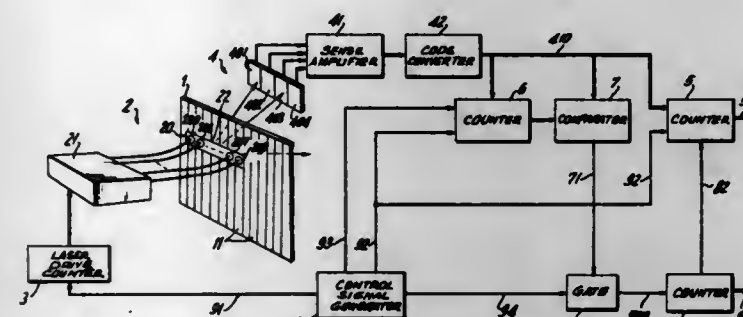
Masahiro Moriwaki; Mitsuhiro Sakaguchi, and Yoshinari Mita, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan
Original No. 3,906,465, dated Sept. 16, 1975, Ser. No. 499,975, Aug. 23, 1974. Application for reissue Oct. 4, 1976, Ser. No. 729,186

Claims priority, application Japan, Aug. 31, 1973, 48-98656; Aug. 31, 1973, 48-98664; Sept. 5, 1973, 48-99930; Sept. 5, 1973, 48-99931

Int. Cl.² G02B 27/00

U.S. Cl. 340—173 LM

5 Claims



1. A hologram graphic data tablet apparatus comprising a hologram plate having a plurality of position-representing mini-holograms recorded thereon, a reference laser, an array of n or $(n-1)$ vernier lasers arranged at an interval of $(n-1)/n$ of the width of one of said mini-holograms, means for energizing said reference and said vernier lasers in a predetermined time sequence, means for detecting the light rays emitted by said lasers and diffracted at said mini-holograms forming a reconstructed image, and means for processing the output of said detecting means to produce a positional code having a greater number of bits than the positional code obtained directly from said mini-holograms depending on whether the output codes from said detecting means are the result of irradiation by said reference laser or by said vernier laser array.

PLANT PATENTS

GRANTED OCTOBER 25, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,132

WALNUT TREE

Olan R. Genn, Modesto, Calif., assignor to Olan R. Genn and Fern F. Genn, both of Modesto, Calif.

Filed Jan. 4, 1977, Ser. No. 757,053

Int. Cl.² A01H 5/03

U.S. Cl. Plt.—32

1 Claim

1. A new and distinct variety of English walnut tree, substantially as illustrated and described, which is of medium size, vigorous, spreading densely foliated with large, early season, elliptic leaves, very early and abundant in flowering, and a regular, very early bearer, with medium productivity, of small, round, uniform, thin and soft-shelled, well-sealed, well-filled nuts having relatively large, plump kernels, the nuts—which drop off early—having hulls which often split so that the nuts drop free; the tree being especially characterized by its resistance to extreme cold without serious damage.

4,133

CHRYSANTHEMUM

Norman Mock, 1363 Murphy Ave., San Jose, Calif. 95131

Filed Oct. 26, 1976, Ser. No. 735,149

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct cultivar of chrysanthemum, substantially as described and pictured herein, characterized by its very large velvety yellow blooms, vigorous growth and 9 week response.

4,134

CHRYSANTHEMUM

Norman Mock, 1363 Murphy Ave., San Jose, Calif. 95131

Filed Oct. 26, 1976, Ser. No. 735,156

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct cultivar of chrysanthemum characterized particularly in uniqueness when compared to the parent cultivar Red Rover by its deeper red petal coloration, shorter petals, increased resistance to fading, smaller blooms and greater convexity of the individual petals.

4,135

CHRYSANTHEMUM

Norman Mock, 1363 Murphy Ave., San Jose, Calif. 95131

Filed Oct. 26, 1976, Ser. No. 735,323

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—74

1 Claim

1. A new and distinct cultivar of chrysanthemum, substantially as described and pictured herein, characterized by its velvety yellow blooms, vigorous growth, 9 week response and persistence.

4,136

COLEONEMA PULCHRUM PLANT

Juris Edgar Schutz, and Murdoch Niall McIntosh, both of Sydney, Australia, assignors to Juris E. Schutz; Juris E. Schutz, by said Murdoch N. McIntosh; Solveiga M. Schutz; Peteris Kepitis and Elga Kepitis, by said Juris E. Schutz, all of Sydney, Australia, part interest to each

Filed Sept. 8, 1976, Ser. No. 721,543

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—54

1 Claim

1. A new and distinct cultivar of *Coleonema pulchrum* referred to by the cultivar name Sunset Gold and particularly characterized as to uniqueness by its dwarf growth form, golden color foliage and its generally pink flower color.

4,137

CHRYSANTHEMUM NAMED IMPERIAL YELLOW

Takaaki Peter Kashima, 923 Woodside Road, Redwood City, Calif. 94061

Filed Jan. 10, 1977, Ser. No. 758,339

Int. Cl.² A01H 5/00

U.S. Cl. Plt.—78

1 Claim

1. A new and distinct variety of chrysanthemum plant, substantially as herein shown and described, characterized by the large size of its blooms and their light yellow coloration, the greater plant height and the increased size, strength and length of its stems.

PATENTS

GRANTED OCTOBER 25, 1977

ERRATA

For CLASS	See PATENT NO.
005-009 R	4,054,956
407-108	4,054,977
219-390	4,055,219
180-132	4,055,232
085-001 SS	4,055,385
264-022	4,055,526
542-413	4,055,563
542-413	4,055,564
548-301	4,055,570
548-335	4,055,573
423-447.4	4,055,583
560-023	4,055,588
560-121	4,055,589
560-179	4,055,590
096-087 R	4,055,685
364-466	4,055,748
364-424	4,055,750
364-500	4,055,751
364-551	4,055,752
364-466	4,055,753
364-705	4,055,755
364-725	4,055,756
364-715	4,055,757
364-821	4,055,758
362-159	4,055,759
362-352	4,055,760

PATENTS

GRANTED OCTOBER 25, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,054,952

BELT ASSEMBLY

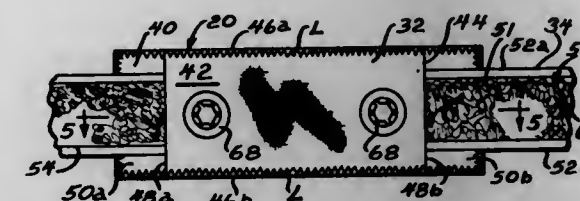
Roger T. Swallow, Crystal Lake, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Apr. 13, 1976, Ser. No. 676,607

Int. Cl.² A41F 9/00

U.S. Cl. 2—338

16 Claims



1. A belt assembly, comprising: elongated belt means having first surface means; housing means having tunnel means to receive a portion of the belt means and second surface means in the tunnel means facing the first surface means of the belt means, said second surface means being retained in the housing means to prevent substantial relative movement therethrough, with the size of the tunnel means relative the belt means being sufficiently small to maintain the first and second surface means in close engagement, said first and second surface means cooperating to provide substantial resistance against movement of the belt means in the tunnel means and normally retain the belt means at a selected position in the housing means, and said first and second surface means releasing sufficiently to permit movement of the belt means in the tunnel means relative the second surface means responsive to substantial forces applied against the belt means.

4,054,953

CRASH HELMET

Philippe De Barsy, 6, dreve des Etangs, Bousval, Belgium

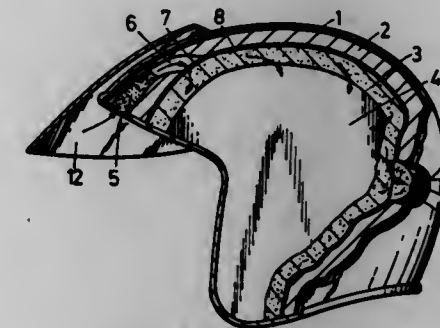
Filed Aug. 30, 1976, Ser. No. 718,474

Claims priority, application Belgium, Sept. 2, 1975, 832996

Int. Cl.² A42B 3/02

U.S. Cl. 2—414

3 Claims



1. A crash helmet, particularly for drivers and passengers of motor vehicles such as motorcycles, motorbikes, and the like, said crash helmet having a solid outer wall for covering the head, said wall being lined inside with means for cushioning impacts, said helmet comprising at least one air inlet provided in that helmet area over which sweeps the air and so arranged as to canalize the air inside the helmet, means to distribute the air inside the helmet and at least one opening provided in the helmet wall in that area thereof over which the air does not sweep, to let the air escape from said helmet,

said means for cushioning impacts comprising a first layer of compressible material including expanded polystyrene, which lines the helmet inner wall and a second material layer lining said first layer, which is an open-cell foam, said means for distributing the air inside the helmet com-

prising a duct provided in said first material layer from said air inlet to said second material layer, the air flowing out from said duct being distributed inside the helmet through the open cells of said second material layer.

4,054,954

METHOD OF PROVIDING HAIR AT THE SCALP

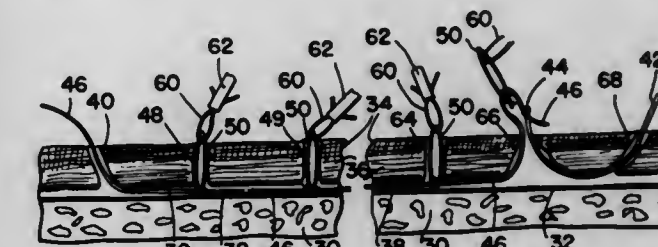
Taisuke Nakayama, and Sokichi Nakajima, both of Tokyo, Japan, assignors to Tokyo Gihatsu Seikei Company Limited, Tokyo, Japan

Filed May 24, 1976, Ser. No. 689,490

Int. Cl.² A61F 1/00; A61B 17/00

U.S. Cl. 3—1

9 Claims



1. In the method of providing hair at the scalp wherein a preformed hairpiece is attached to an anchoring suture in the scalp, the improvement comprising the steps of:
 - a. inserting a needle having an eye at the free end thereof in said scalp at a first point;
 - b. passing said needle under the exterior surface of said scalp and out of said scalp at a reference point spaced from said first point;
 - c. threading a suture filament through said eye at said free end of said needle and withdrawing said needle from said scalp drawing said suture filament into said scalp at said reference point, under the exterior surface of said scalp and out of said scalp at said first point;
 - d. reinserting said needle in said scalp at a second point spaced from said first point;
 - e. passing said needle under the exterior surface of said scalp and out of said scalp at said first point;
 - f. threading a first ring on said suture filament at said first point and then threading said suture filament through said eye at said free end of said needle at said first point;
 - g. again withdrawing said needle from said scalp drawing said suture filament into said scalp at said first point, under the exterior surface of said scalp and out of said scalp at said second point, whereby said first ring is pulled into said scalp at said first point, and
 - h. attaching a hairpiece to said first ring at the exterior surface of said scalp.

4,054,955

ORTHOPAEDIC ENDOAPPARATUS DESIGNED TO GROW A NEW LIVE SHOULDER AND HIP JOINT, TO RECONSTRUCT A DEFORMED JOINT OR TO RESTORE A PATHOLOGICALLY DYSPLASTIC AND CONGENITALLY LUXATED JOINT

Arnold Ivanovich Seppo, ulitsa Taara 4, Tallin, U.S.S.R.

Filed Jan. 29, 1976, Ser. No. 653,544

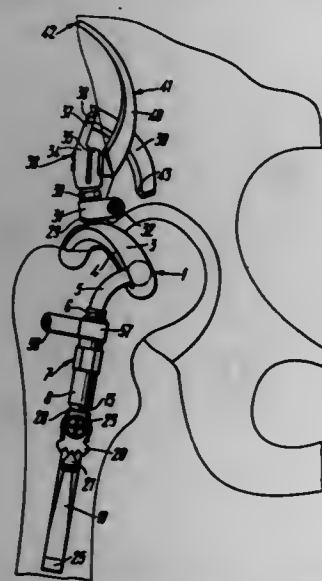
Int. Cl.² A61F 1/24, 5/00

U.S. Cl. 3—1.91

6 Claims

1. An orthopaedic endoapparatus designed to grow a new live shoulder or hip joint, to reconstruct a deformed joint or to restore a pathologically dysplastic and congenitally luxated joint, including: a figured hinge designed to be placed upon the bone close to a provisional joint created by milling; said figured hinge having a spherical knob and a curved guiding

member having a hollow interior in which said spherical knob is located, said hollow interior being of a circular cross section, corresponding to the shape and size of said spherical knob and ensuring restricted rotation of said spherical knob, its position on the rotation axis of the caput in one plane, and of its sliding along said guiding member along an arc with its radius from the rotation axis of the caput in another plane; a curved rod having one end to which said spherical knob is fastened; an expandable connecting turnbuckle having one end connected with a second end of said curved rod; an anchor-like pair of separably crosswise interconnected members, separably and controllably linked with a second end of said expandable connecting turnbuckle and designed to be fixed to the hip-bone or shoulder-bone so as to form there three support areas upon the compact layer of opposite walls inside the bone tube; a second



rod, one end of which is firmly fixed to an outer side of said guiding member; an anchor-like member for fixation to the pelvis or the scapula and clavicle, fixed separably and controllably to a second end of the second rod; said anchor-like fixation member having curved members separably crosswise interconnected, designed for fixation to the pelvis or the scapula and clavicle; as a result of which when fixing the apparatus to the bones forming the joint, the joint ends of the bone are established in a position making possible purposeful active movements within the joint around a definite point or axis, indispensable for the respective joint in accordance with the predetermined form and function, ensuring the maintenance of a clearance between the faciae articularis as being necessary for their natural congruent and complementary conjunctive growth, coming to term by covering the faciae articularis with support-giving hyaline cartilage.

4,054,956

FOLDABLE BUNK BED ASSEMBLY

Howard M. Quakenbush, 308 Maple St., Apple River, Ill. 61001

Filed Aug. 6, 1975, Ser. No. 602,205

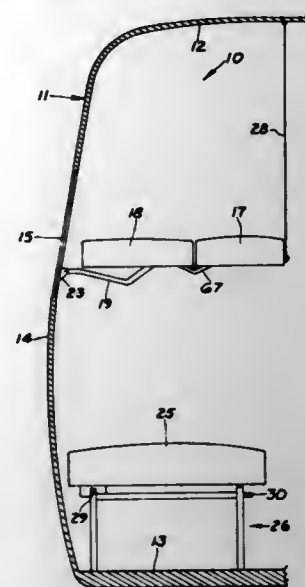
Int. Cl.² A47C 17/40

U.S. Cl. 5—9 R

9 Claims

1. In a folding bunk assembly for installation in an enclosure including a generally vertical wall, a floor and a ceiling, a pair of horizontally spaced arms means each arranged for connection at one end to the wall for pivotal movement about a common horizontal axis close to the wall, said pair of arm means being pivotal between first positions extending downwardly from said axis along the wall to second positions projecting generally horizontally outwardly from said wall, cushion means supported on said pair of arm means to be positioned close to the wall in said first position of said arm means and to project horizontally outwardly from the wall in said second position of said arm means to provide a bed, and vertical support means providing vertical support for said arm and cushion means in said second positions of said arm means, said cushion means including first and second cushion sections and a hinge connection between said first and second cushion sections for providing relative pivotal movement of said first and second

cushion sections about a horizontal axis, said first cushion section being positionable between said second cushion section and the wall in said first positions of said arm means and being arranged to project outwardly from said second cushion section in said second positions of said arm means, said vertical



support means being connectable to said first cushion section in said second positions of said arm means, and movement limiting means for limiting relative pivotal movement of said first and second cushion sections to maintain said first and second cushion sections in horizontal alignment in said second positions of said pair of arm means.

4,054,957

USER-FORMED URINATION TROUGH

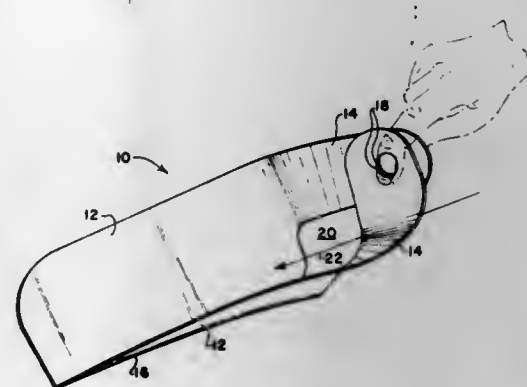
Harry Diamond, 340 Verona Ave., Elizabeth, N.J. 07208

Filed June 18, 1976, Ser. No. 697,561

Int. Cl.² E03D 13/00; B65G 11/02; B67C 11/02

U.S. Cl. 4—110

2 Claims



1. An open-top V-shaped urination trough constituted by a single sheet of flexible material, having a pair of sidewalls extending from a central fold line of said sheet upwardly away from each other, and having a pair of tabs extending from a common end of said walls, respectively, at regions of said walls spaced from said central fold line, each tab being bent to extend upwardly and inwardly of the respective walls into overlapping engagement to define a trough with a hole at one end embraced by said tabs.

4,054,958

TOILET OF COMPOST TYPE

Ernest G. Widham, 247 Shaw St., New London, Conn. 06320

Filed Jan. 16, 1976, Ser. No. 649,709

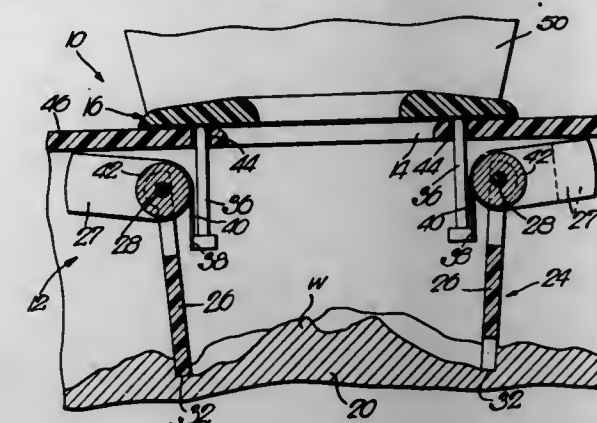
Int. Cl.² A47K 11/02, 13/00

U.S. Cl. 4—144

2 Claims

1. In a compost toilet, the combination with a longitudinal waste receptacle and a seat with an opening to and centered on the receptacle therebeneath, of a gate in said receptacle providing hinged companion leaves for their swinging movement into

open and closed gate positions, with said leaves having parting sides and being in closed gate position substantially continuous with each other at said parting sides, said parting sides being disposed substantially horizontally and extending longitudinally and substantially midway of said waste receptacle in closed gate position, and said leaves being located in said



receptacle to be in and out of vertical alignment with said seat opening in closed and open gate positions, respectively, with said leaves slanting upwardly to said parting sides in said closed gate position, and having restricted urine leakage paths therethrough scattered in transverse directions within the vertical confines of said seat opening in said closed gate position.

4,054,959

INVALID BED ARRANGEMENT

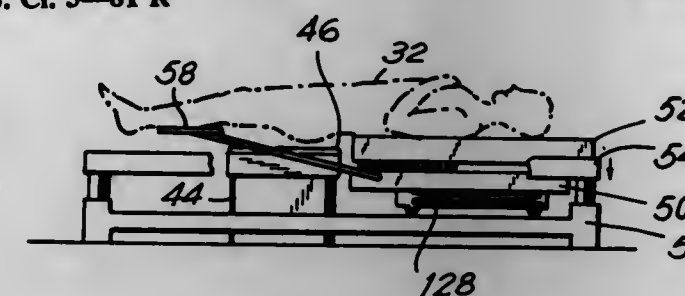
Paul L. DiMatteo, Huntington, and Henry V. Diaferia, Brentwood, both of N.Y., assignors to Dynell Electronics Corporation, Melville, N.Y.

Continuation-in-part of Ser. No. 544,710, Jan. 28, 1975, Pat. No. 4,016,005. This application May 11, 1976, Ser. No. 685,415

Int. Cl.² A61G 7/02

U.S. Cl. 5—81 R

13 Claims



1. An apparatus for transferring a person from a reclined position to an upright seated position comprising means for supporting the back side of the person with the person's posterior at a first location; means for raising the calves of the person and bending the knees of said person; means for feeding substantially the posterior of said person, the weight of said person being directed away from said posterior during freeing thereof; means for returning the person to a reclined position and lowering said person onto a seating member so that the posterior of said person is directly in contact with said seating member.

4,054,960

INFLATABLE BODY SUPPORT CUSHION, PARTICULARLY TO SUPPORT A WOMAN DURING PREGNANCY

John E. Pettit, and Dorothy E. Pettit, both of 18219 46th Place South, Seattle, Wash. 98188

Filed June 25, 1976, Ser. No. 699,894

Int. Cl.² A61G 07/02

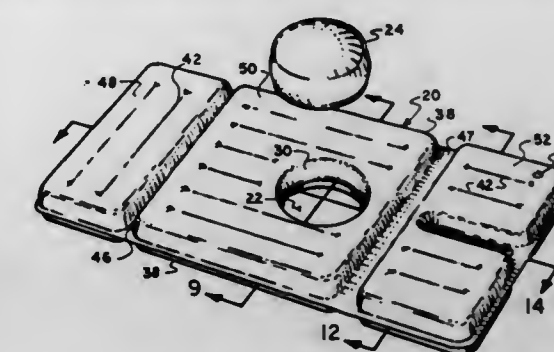
U.S. Cl. 5—357

1 Claim

1. A resting support cushion for a pregnant woman, being fully collapsible, which is selectively inflated to degrees of firmness to directly support her throughout her body, except

for the indirect support of her expanded abdomen, her enlarged breasts, and her central face, comprising:

- a continuous surrounding central web portion positioning three otherwise separated inflatable portions of this resting support of full body length;
- a head supporting inflatable portion at the commencement of the continuous surrounding central web portion having two interconnected inflatable portions spaced apart along a portion of the center line of this resting support, thereby creating a breathing space for a pregnant woman resting in a face down position;
- a central body supporting inflatable portion positioned by



the continuous surrounding central web at a reasonably wide transverse spacing from the head supporting inflatable portion, thereby creating a space between them to accommodate the enlarged breasts of a pregnant woman resting in a face down position, and this central body supporting inflatable portion having a circular opening therethrough, thereby creating a space to accommodate the expanded abdomen of a pregnant woman; and

- a feet and legs supporting inflatable portion positioned by the continuous surrounding central web at a narrow transverse spacing from the central body supporting inflatable portion, thereby completing the overall comfortable resting support of a pregnant woman.

4,054,961

STABILIZING DEVICE FOR AN INFLATABLE RAFT
Walter Tengen, Oslo, Norway, assignor to Gewako S.A., Luxembourg Ville, Luxembourg

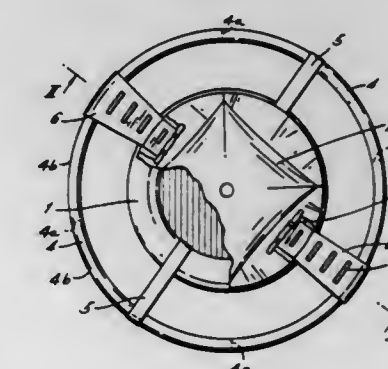
Filed Oct. 17, 1975, Ser. No. 623,392

Claims priority, application Norway, Oct. 18, 1974, 74.3779

Int. Cl.² B63B 7/08

U.S. Cl. 9—11 A

5 Claims



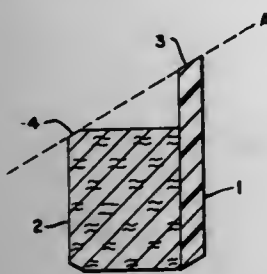
1. An inflatable life raft comprising an inflatable body having a predetermined depth and being capable of floating on a body of water and being of sufficient dimension to support a human being therewithin, an inflatable hose surrounding said body at a spaced distance from the outer circumference thereof, said hose having a depth less than said predetermined depth and likewise being capable of floating on the body of water, pairs of oppositely disposed, flexible straps tightly interconnecting said hose with a top surface of said body whereby said straps each slope toward said hose outwardly of said body.

4,054,962

WAX APPLICATOR FOR SKIS

Robert W. Janke, 820 Kewin St., Altoona, Wis. 54720
 Filed Jan. 5, 1976, Ser. No. 645,736
 Int. Cl.² A63C 11/08; B05C 17/10
 U.S. Cl. 15—105

1 Claim



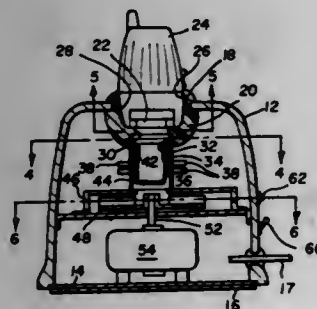
1. A wax applicator for skis comprised of a block of cork and a sheet of relatively hard material such as an acrylic plastic secured face-to-face, the sheet extending beyond one side of the block, the edge of the projecting portion of the sheet and an edge of the said one side of the block being beveled to provide spaced flat surfaces lying in a common plane, the beveled cork edge serving to spread the wax and the beveled edge of the relatively hard material serving to smoothen the same.

4,054,963

ELECTRIC SHAVER HEAD CLEANING DEVICE

Clarence R. Taylor, 28 Woodside Drive, Penfield, N.Y. 14526
 Filed Feb. 23, 1976, Ser. No. 660,616
 Int. Cl.² A47L 7/00
 U.S. Cl. 15—310

7 Claims



6. An electric shaver head cleaning device comprising: a housing having an opening; a duct in said housing; a flexible cup-shaped seat mounted in said opening in said housing and connected to one end of said duct for receiving the head of an electric shaver, the inner periphery of one end of said seat corresponding to the outer shape of the shaver head and being provided with at least one groove for allowing air from the exterior of said housing to enter the head of the shaver, said seat further having a seat opening in the opposite end thereof in register with the shaver head; and vacuum forming means mounted within said housing and connected to the opposite end of said duct for removing hair clippings from the shaver head.

4,054,964

DETACHABLE LUGGAGE CASTER ROLLER

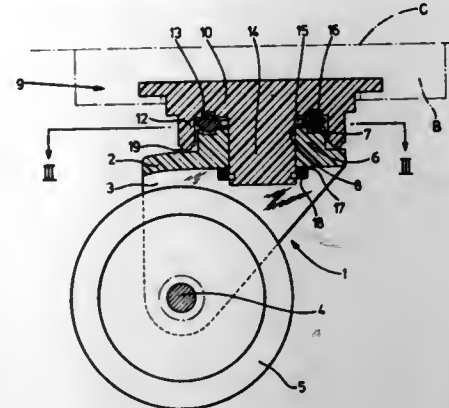
Katsuyoshi Kaneko, Tokyo, Japan, assignor to Maruwa Echo Co., Ltd., Tokyo, Japan
 Filed Oct. 24, 1975, Ser. No. 625,877
 Int. Cl.² B60B 33/00

U.S. Cl. 16—20

6 Claims

1. A detachable luggage caster roller comprising a base plate formed of synthetic resin, means to secure said base plate detachably to a piece of luggage, the base plate including a cylindrical female member having a sliding surface, a roller support bracket formed of synthetic resin and including a

cylindrical male member that extends up into said female member, a post connecting said male and female members for rotation relative to each other about their common axes, said male member including a sliding surface directly or indirectly opposed to and rotatably engaged with said sliding surface of said



female member through point and line contacts in a thrust or radial direction, and a roller mounted rotatably in said roller support bracket whereby said roller is enabled to freely swivel about said common axis, the axis of rotation of the roller being perpendicular to and spaced from said common axis.

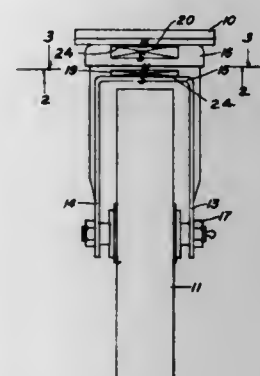
4,054,965

SELF ALIGNING MAGNETIC LOCKING DEVICE FOR MODULE SWIVEL CASTER ASSEMBLY

Satinder K. Vig, Edinboro; Harold J. Koester, and William H. Berg, Jr., both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.
 Filed May 4, 1976, Ser. No. 682,985
 Int. Cl.² B60B 33/00

U.S. Cl. 16—35 D

10 Claims



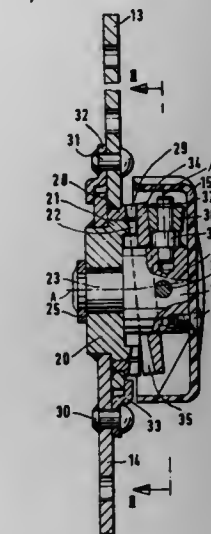
3. A caster comprising, a fixed member adapted to be supported on a vehicle and a caster fork having a wheel therein, pivot means pivotally connecting said fork to said fixed member, said fixed member having magnetic means producing a magnetic field thereon, said fork having second magnetic means thereon, adapted to be attracted by said magnetic field, whereby said caster fork is urged to swing to a predetermined position.

4,054,966

LOCKABLE, ADJUSTABLE HINGE FOR MOTOR-VEHICLE SEAT

Ulrich Putsch, Rockenhausen, and Gerd Klingelhöfer, Remscheid, both of Germany, assignors to Keiper K.G., Remscheid-Hasten, Germany
 Filed Mar. 1, 1976, Ser. No. 662,846
 Claims priority, application Germany, Mar. 1, 1975, 2509074
 Int. Cl.² E05D 11/10; A47C 1/025; B60N 1/06
 U.S. Cl. 16—143

13 Claims



1. An adjustably lockable hinge comprising: first and second adjacent hinge elements; a pintle between said elements defining a pivot axis therefor; a first arcuate row of equispaced first abutments fixed on said first element spaced from and centered on said axis and facing axially in one direction; a body having a second arcuate row of equispaced second abutments facing axially from said body opposite to said one direction and axially aligned with said first row, said abutments of said second row being centered on a precession axis intersecting said pivot axis and being spaced apart by a distance different from the spacing between said first abutments, whereby said rows can precess and only a limited number of said second abutments can mesh at one time with said first abutments; means rotationally linking said body with said second element to permit for joint angular movement about said pivot axis; and means rotatable about said pivot axis relative to said elements and engageable with said body to cause said second abutments to roll on said first abutments to produce precession of said second row on said first row.

4,054,967

FOOD PATTY MOLDING MACHINE

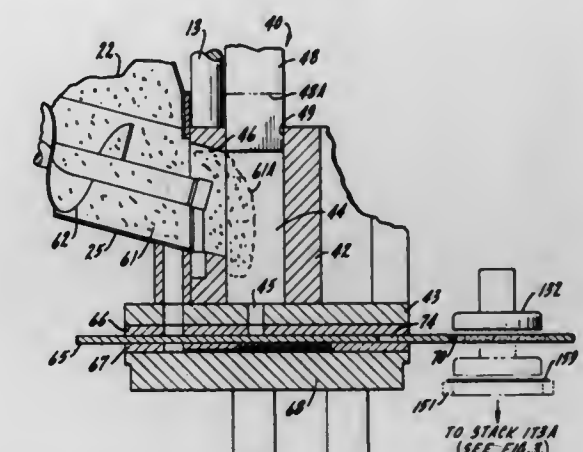
Glenn A. Sandberg, Lockport; Louis R. Richards, Mokena, and James W. Stoub, Oak Forest, all of Ill., assignors to Formax, Inc., Mokena, Ill.
 Filed Oct. 20, 1975, Ser. No. 623,986
 Int. Cl.² A22C 7/00

U.S. Cl. 17—32

16 Claims

1. A food patty molding machine comprising: a pump housing enclosing a tall, narrow, elongated pump chamber having an outlet port extending longitudinally of one edge of the chamber and an access port extending longitudinally of one side of the chamber, the access port having a height greater than the width of the pump chamber; a mold plate including a plurality of mold cavities; a mold plate drive for cyclically moving the mold plate between a fill position, in which the mold cavities are aligned with the outlet port, and a discharge position, in which the mold cavities are displaced from the outlet port, with a dwell interval at each position;

supply means for continuously maintaining a supply of food product completely covering the access port; a plunger projecting into the pump chamber through the edge opposite the outlet port and movable between an intake position, in which the plunger is displaced from the outlet port to a point clear of the access port, and a range of pressure positions, in which the plunger extends past and completely closes the access port; plunger drive means driving the plunger to maintain food product under essentially uniform pressure when the plunger is in its pressure position range, the plunger drive means comprising a reversible fluid pressure motor con-



ected to the plunger and fluid pressure means for supplying fluid, under pressure, to the motor; and control means for actuating the plunger drive means through an operating cycle synchronized with the mold plate cycle, moving the plunger from its pressure position range to its intake position and back into its pressure position range during a period in which the mold plate is displaced from its fill position, the plunger moving toward its intake position at a speed sufficient to develop a partial vacuum in the chamber and thereby draw food product from the supply means a short distance through the access port with no appreciable external impetus.

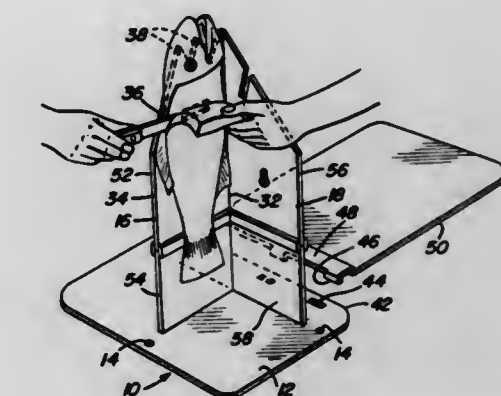
4,054,968

SMALL GAME HOLDER

Wilbert A. Statz, 1913 Skeels Ave., Eau Claire, Wis. 54701
 Filed Oct. 22, 1975, Ser. No. 624,936
 Int. Cl.² A22C 25/00

U.S. Cl. 17—44.2

4 Claims



1. A game holder including an upstanding panel member, said panel member including at least an upper end portion tapering upwardly in width and terminating upwardly in a generally horizontal upper marginal edge portion provided with upwardly projecting teeth spaced therealong, said panel member including a lower portion having support means adapting said panel member to be supported from a stationary support structure, said panel member including upstanding opposite side edges, the upper end portion of one of side edges being inclined upwardly and inwardly toward the other side edge and defining said upwardly tapering upper end portion,

an upstanding plate including upstanding side edges, the other side edge of said panel member being secured to and extending upwardly along one side of said plate centrally intermediate the upstanding side edges thereof with said plate and panel member being disposed at generally right angles relative to each other, said panel member including a horizontal window opening formed in said upper end portion a spaced distance below said upper marginal edge portion.

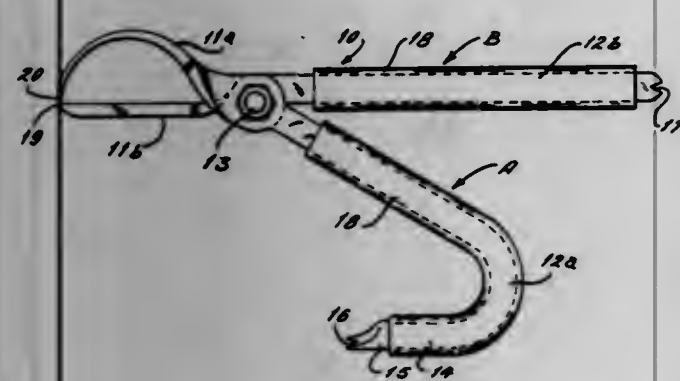
4,054,969 FISHING TOOL

James E. Vogt, 400 Friedens Road, St. Charles, Mo. 63301
Filed Jan. 8, 1976, Ser. No. 647,353

Int. Cl.² A22C 25/00

U.S. Cl. 17-68

7 Claims



1. A tool for removing skin from fish comprising
 - a. first and second members each having jaw and handle portions, and
 - b. pivot means connecting the two members intermediate the jaw and handle portions,
 - c. the first of said members having the jaw portion and handle portion in substantial alignment through the pivot,
 - d. the second of said members having a convexly curved jaw portion with a straight handle portion in substantial alignment and tangent to one end of the convexly curved jaw, the free end of said convexly curved jaw member engaging the free end of the first jaw member,
 - e. the handle portions being angularly diverging from the pivot whereby a rearward pull on the handles will urge the jaw members together,
 - f. said jaw members having substantial width to grip the skin of the fish in a substantial linear engagement at the said free ends.

4,054,970 APPARATUS FOR DEHEADING SHRIMP

Shirley Jean Metzger, 2025 S. Parkwood, Harlingen, Tex. 78550; James Walker Smith, 402 Del Mar, Corpus Christi, Tex. 78404, and Juan Castillo Leal, 801 S. "K" St., Harlingen, Tex. 78550

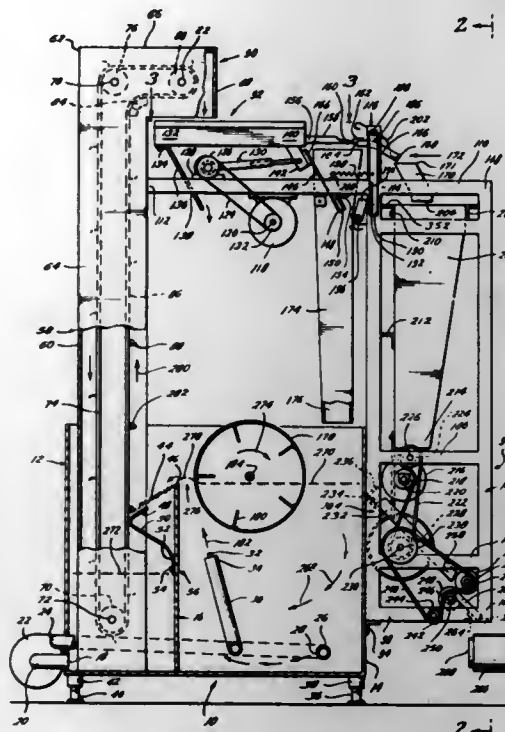
Filed June 7, 1976, Ser. No. 693,440
Int. Cl.² A22C 29/02

U.S. Cl. 17-71

8 Claims

1. An apparatus for orienting and dissecting a crustacean comprising:
 - orienting means comprising
 - at least one passageway of infundibuliform cross-section, said passageway being sized to receive a crustacean at one end, the taper of said infundibuliform passageway being adapted to prevent passage of said first portion of said crustacean's anatomy;
 - timing means operatively connected to said orienting means for controllable varying the taper of said infundibuliform passageway so the entire body of said crustacean can pass through said passageway after said first portion has been caught; and
 - dissecting means comprising:
 - transfer means responsive to said orienting means and said timing means for receiving and controllably manipulating

ing the orientation of said crustacean from the end of said passageway; and



gripping means adapted to receive said crustacean from said transfer means for selectively gripping said first portion of said crustacean and severing said first portion from said body.

4,054,971 CLASPING DEVICE

Akira Kawahara, Kagawa, Japan, assignor to Ryusyo Industrial Co., Ltd., Osaka, Japan

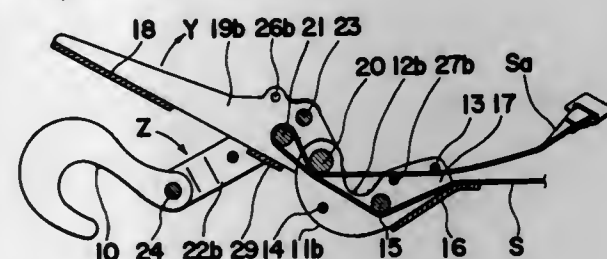
Filed June 14, 1976, Ser. No. 695,963

Claims priority, application Japan, July 26, 1975, 50-103613[U]

Int. Cl.² B66F 3/00

U.S. Cl. 24-68 CD

13 Claims



1. A clamping device comprising:
 - a body comprised of a pair of plate members connected to each other in a spaced relationship, said pair of plate members having a first end and a second end opposite said first end and said first end having a clearance there-through;
 - manipulatable lever means pivotally mounted on said second end of said body for pivotal movement on said body toward and away from said first end of said body, said lever means comprised of a pair of lever members connected to each other in a spaced relationship;
 - first and second pin members in spaced relation to each other positioned between said spaced plate members, said first pin member positioned through and connecting said lever means to said body;
 - a third pin member positioned between said spaced lever members;
 - a flexible strap having first and second ends and extending from said first end through said clearance in said first end of said body, past and in contact with said first pin member, around said third pin member and back past and in contact with said second pin member and back out said

clearance when said manipulatable lever means is pivoted away from said body, said strap between said second and third pin members being turned around said first pin member in contact with said strap portion contacting said first pin member when said lever means is pivoted toward said body; and

pulling force receiving means pivotally coupled to said manipulatable lever means for receiving an external pulling force acting in a direction substantially counter to the direction of said second end of said strap.

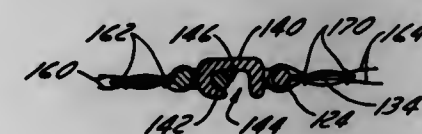
4,054,972 BRASSIERE FASTENER

Ross Fredrick Rowell, 5361 Belmore, Montreal, Canada
Filed Apr. 27, 1976, Ser. No. 680,712

Int. Cl.² A44B 13/00

U.S. Cl. 24-201 HE

1 Claim



1. A fastener suitable for use in a front fastening brassiere, said fastener comprising first and second fastening members, both formed of a resilient plastic material;
 - said first fastening member comprising a frame surrounding an elongated aperture adapted to receive one strap of said brassiere to be passed around a first side of said frame and a first imperforate stiffening flange integral with said first side of said frame, said first stiffening flange being planar and extending outwardly a substantial distance in the plane of said frame from said first side of said first frame;
 - said second fastening member comprising a second frame surrounding an elongated aperture adapted to receive a second strap of said brassiere to be passed around a first side of said frame and a second imperforate stiffening flange integral with a first side of said second frame, said second stiffening flange being planar and extending outwardly a substantial distance in the plane of said frame from said first side of said second frame and further including a generally U-shaped hook portion having a first arm thereof integral with a second side of said frame, and a second arm shorter than said first arm terminating in a spaced-apart relationship with respect to said second side of said frame to form a gap therebetween, said gap being sized to be of a width substantially equal to the width of a second side of said first member, said second arm being of a length greater than the aperture width between said first and second sides of said first hook member, both of said stiffening flanges being thinner than the frames with which they are integral and being of a thickness which is penetrable by a means for securing a brassiere strap to each of said stiffening members having an area sufficient to provide a surface for gripping said fastening members between the fingers of a person manipulating said fastener to open or close the same.

4,054,973
SLIDE FASTENER CHAIN WITH WIDE GAP AND METHOD AND APPARATUS FOR MANUFACTURE
George B. Moertel, Conneautville, and James R. Johnston, Meadville, both of Pa., assignors to Textron Inc., Providence, R.I.

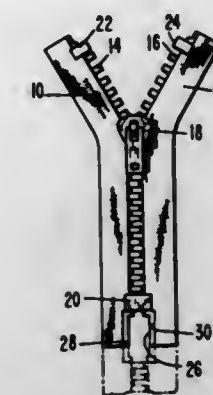
Filed May 24, 1976, Ser. No. 689,415
Int. Cl.² A44B 19/02

U.S. Cl. 24-205 R

15 Claims

1. A chain for a slide fastener comprising
 - a pair of textile carrier tapes containing thermoplastic threads,

a pair of rows of interlocking fastening elements secured to inner longitudinal edge portions of the respective tapes, a gap formed by cutting out a section of the inner longitudinal edge portions and corresponding attached fastening elements including several of the fastening elements of each row,



said carrier tapes having respective bands bordering said gap including the ends of the gap, said bands of the tapes being reduced in cross section relative to the remaining portions of the tapes, and said bands further having the thermoplastic threads therein fused together.

4,054,974 APPARATUS TO MANUFACTURE A CUT LOOP PILE FABRIC HAVING AN IMPROVED SELVEDGE DETECTOR AND GUIDE

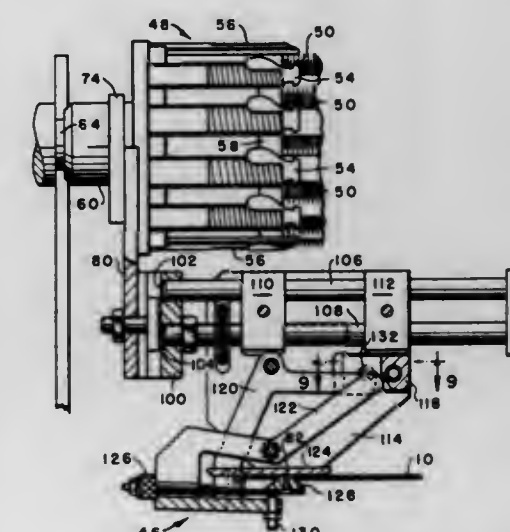
Walter Engels, Tryon, N.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 11, 1976, Ser. No. 713,394

Int. Cl.² D06C 13/08

U.S. Cl. 26-9

3 Claims



1. Apparatus to provide a cut loop pile fabric comprising: a rotor, a plurality of rows of cutting means in said rotor, means to rotate said rotor, means to supply a loop pile fabric with a selvedge thereon into contact with said rotor with the loops of the fabric in contact with said cutting means, selvedge protection means on at least one end of said rotor between each of said rows of cutting means to hold the selvedge of the fabric out of contact with said cutting means and means operably associated with said apparatus to automatically maintain said selvedge protection means in a predetermined position by sensing the edge of the pile in the fabric when the fabric selvedge is greater than a certain width and sensing the edge of the selvedge of the fabric when the selvedge is less than a predetermined width.

4,054,975

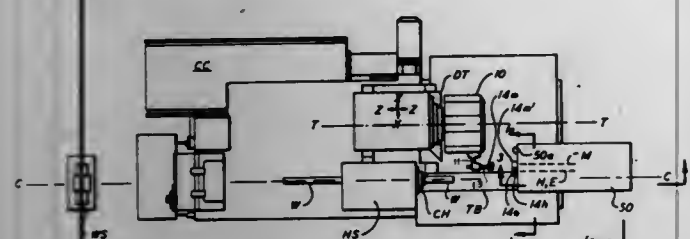
TURRET LATHE APPARATUS

Carl William Lundstrom, 48 Larchmont Road, Binghamton, N.Y. 13903

Filed Mar. 6, 1975, Ser. No. 555,856
Int. Cl.² B23B 3/18, 39/20

U.S. Cl. 29—27 C

40 Claims



1. In a turret lathe having a machine base, headstock means carried on said base for rotating a workpiece about a first axis, a turret rotatably indexable about a second axis to a plurality of discrete index positions to selectively present successive tools carried on said turret to said workpiece, means for indexing said turret about said second axis, and means for translating said turret relative to said base in a first coordinate direction parallel to said first axis, the combination of: a first detachable power-coupling device carried on said turret and connected to power a first tool carried on said turret, and a power-coupling assembly mounted on said base, said assembly including a second detachable power-coupling device, means for detachably supporting said second detachable power-coupling device in a first predetermined location relative to said machine base, and flexible means for connecting power to said second detachable power-coupling device during movement of said second detachable power-coupling device in said first coordinate direction away from said first predetermined location, said first and second detachable power-coupling devices being adapted to be connected to and disconnected from each other by translation of said turret with said turret in a first one of said index positions to move said first detachable power-coupling device along a first predetermined line to a reference position having a predetermined coordinate in said first direction.

4,054,976

COMBINED PRECISION BORING AND BURNISHING TOOL

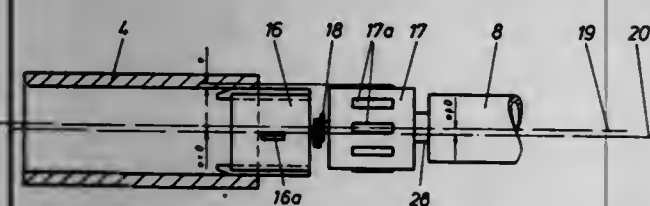
Nis-Friedrich Ewald, Monchen-Gladbach-Rheindahler, and Hans-Georg Augustin, Erkelenz, both of Germany, assignors to Wilhelm Hegenscheldt GmbH, Erkelenz, Germany

Filed Apr. 20, 1976, Ser. No. 678,716

Claims priority, application Germany, Apr. 24, 1975, 2518170
Int. Cl.² B24B 39/00

U.S. Cl. 29—90 R

9 Claims



1. A combined tool for precision boring and burnishing of a tubular workpiece comprising, in combination, bore head means; burnishing head means arranged rearwardly of the bore head means; feed tube means for feeding said bore head means and said burnishing head means into a workpiece to be machined; first connection means for rigidly connecting two of the three first-mentioned means substantially aligned along a common axis; and second connection means for transmitting a moment to the third of the three first-mentioned means from at least one of the two other means while permitting limited deviation of said third means relative to said common axis.

4,054,977

BLOCK TYPE CUTTING TOOL WITH POSITIVE CLAMP FOR INSERT BLADES

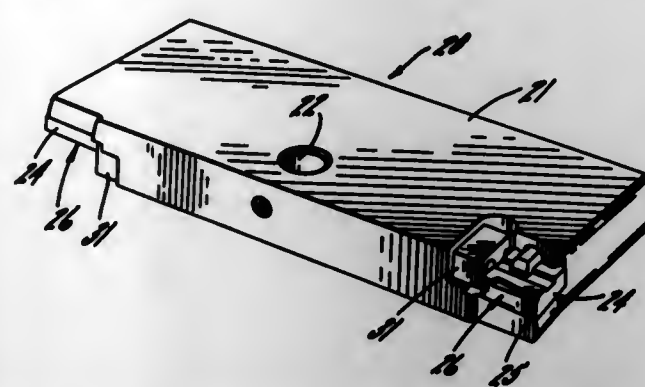
Harvey R. Plummer, Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed May 3, 1976, Ser. No. 682,464

Int. Cl.² B26D 1/00

U.S. Cl. 407—108

8 Claims



1. A block type cutting tool with insert type cutter blade comprising in combination, a holder block having a blade receiving pocket with an inclined supporting surface and an upstanding locating surface, an insert type cutter blade having generally parallel upper and lower surfaces and flat sides, a groove in at least one of the parallel surfaces of said blade having a planar floor and upstanding lips, the blade being mounted in the pocket so that one of said parallel surfaces rests on said supporting surface, one of said sides abuts said locating surface and said groove faces upwardly and runs generally parallel to said locating surface, clamp means having a lower surface narrower than said groove and an upstanding shoulder generally parallel to a lip of said groove, said clamp means including adjusting means for drawing the lower surface thereof into engagement with the floor of said groove to progressively wedge the blade into the pocket ultimately bringing said upstanding shoulder into engagement with the lip of said groove, thereby to positively clamp said blade to said locating surface and to provide a perceptible clamping stop.

4,054,978

METHOD FOR REPAIR OF VALVES

John W. Freeman; Thomas M. Jones, and Harold D. Reagan, all of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 548,308, Feb. 10, 1975, abandoned. This application May 17, 1976, Ser. No. 687,262

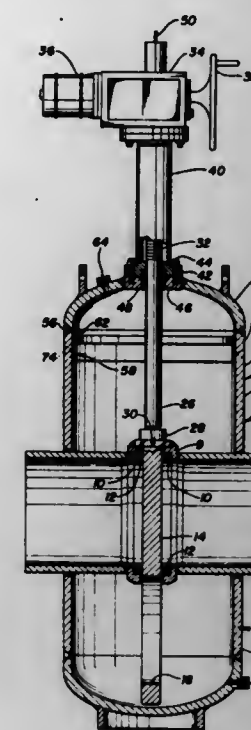
Int. Cl.² B23P 7/00, 15/00; F16K 27/10

U.S. Cl. 29—157.1 R

3 Claims

1. A method of repairing a valve structure having an upper body portion with a bonnet thereon and a sleeve secured to the inner surface of the upper body portion spaced from said inner surface a predetermined distance; said method comprising the following steps:
first cutting the upper valve body portion about a perimeter laterally spaced from the sleeve to permit removal of an upper bonnet portion from a lower bonnet portion with the sleeve shielding the interior of the valve body from the cutting operation and lapping the upper and lower bonnet portions;
then repairing the defective element; and

thereafter welding the bonnet portions together independent of the sleeve at a position laterally spaced from the sleeve



and with the sleeve shielding the interior of the valve body from the welding operation.

4,054,979

VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Arie F. Massey, Jr., Lenoir City, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

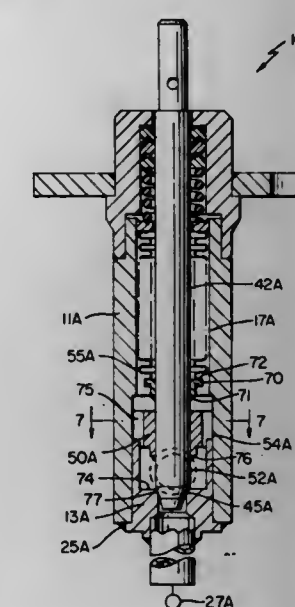
Division of Ser. No. 490,589, July 22, 1974, Pat. No. 3,990,680.

This application Aug. 19, 1976, Ser. No. 715,927

Int. Cl.² B23P 15/00; F16K 27/02

U.S. Cl. 29—157.1 R

2 Claims



1. A method of making a valve construction comprising the steps of forming a housing means with an inlet and an outlet interconnected together by a valve seat of said housing means, disposing a movable valve member in said housing means for opening and closing said valve seat, forming said valve member with an elongated and integral valve stem extending from one side thereof whereby said valve member and said valve stem are one-piece, forming said housing means with axially spaced guide means to provide the sole means for guiding axial movement of said valve stem, disposing a guide collar means on said valve stem closely adjacent said valve member to cooperate with one of said guide means of said housing means, forming said guide collar means to extend radially outwardly from said valve stem and be larger than said valve member, forming said guide collar means and said one guide means of said housing means with limiting means that permits axial

movement of said guide collar means relative to said one guide means while preventing rotational movement therebetween, forming said limiting means of said guide collar means as a plurality of slots in said guide collar means, forming said limiting means of said one guide means as a plurality of spline members to be respectively received in said slots of said guide collar means, forming said valve seat as a separate valve seat member carried by said housing means, and forming said valve seat member to carry said spline members.

4,054,980

PROCESS FOR MANUFACTURING MODULAR ELEMENTS AND A TUBE NEST FOR HEAT EXCHANGERS

Carlo Roma, Rome, Italy, assignor to Square S.A., Switzerland

Division of Ser. No. 343,196, March 21, 1973, Pat. No.

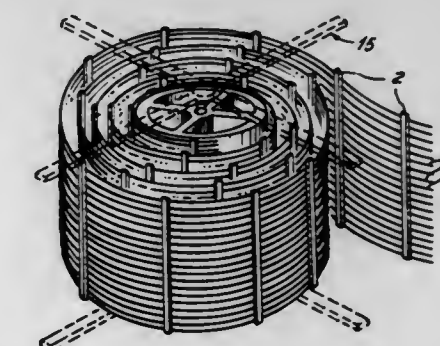
4,030,540. This application Dec. 2, 1976, Ser. No. 746,892

Claims priority, application Italy, Apr. 20, 1972, 49783/72

Int. Cl.² B23P 15/26

U.S. Cl. 29—157.3 R

10 Claims



1. A process for making a tubular assembly which forms modular elements for tube nests comprising the steps of:
a. providing a supply of flexible thermoplastic tubes in parallel alignment;
b. pulling the thermoplastic tubes from the supply;
c. spacing the thermoplastic tubes a uniform distance from one another;
d. providing in guide means a supply of upper half element spacers to one side of the thermoplastic tubes and a supply of lower half element spacers in guide means to the other side of the thermoplastic tubes, said spacers having seating grooves;
e. mating the upper and lower half element spacers so as to capture and space the thermoplastic tubes in the seating grooves; and
f. winding the tubing assembly of thermoplastic tubes with spacers in a roll.

4,054,981

HEAT EXCHANGER FOR SOLAR ENERGY

James Earl Bridgegum, Canyon Country, Calif., assignor to Mor-Flo Industries, Inc., Santa Monica, Calif.

Division of Ser. No. 677,748, April 16, 1976, abandoned. This application Feb. 17, 1977, Ser. No. 769,413

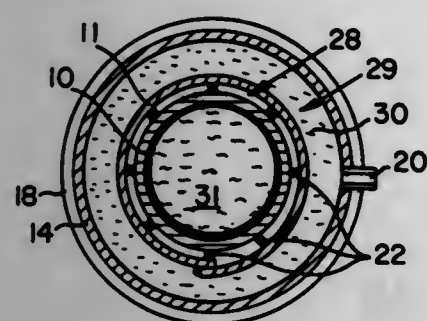
Int. Cl.² B23P 15/26

U.S. Cl. 29—157.3 R

2 Claims

1. A method of manufacturing a heat exchanger for solar energy wherein heat is exchanged between a solar heated fluid and water in a cylindrical storage tank, including the steps of:
a. wrapping a sheet of metal around said cylindrical storage tank;
b. drawing the left and right sides of the sheet past each other in overlapping relationship so that said sheet snugly engages the tank but still defines a narrow annular space between the inner wall surface of said sheet and the exterior of said tank;
c. welding the overlapped portions of said sheet in a continu-

- ous weld along a direction parallel to the axis of said cylindrical storage tank;
- d. spot welding portions of the sheet adjacent to opposite ends of the tank to said tank at circumferentially spaced points so that there is communication between said narrow annular space and the exterior between said spot welds;
- e. surrounding said sheet with an outer cylinder;
- f. rolling the opposite ends of said outer cylinder to taper the diameter of the safe to fully engage over 360° the outer surface of said sheet adjacent to said opposite ends of said outer cylinder to define with the outer wall of said sheet a



- substantially wider annular space than said narrow annular space;
- g. welding the engaging portions of said opposite ends of said outer cylinder over 360° to said outer surface of said sheet to seal and render fluid tight said wider annular space; and,
- h. providing entrance and exit ports for said wider annular space so that said solar heated fluid can be circulated therethrough to heat water in said tank, any leaks in the inner wall defining said wider annular space resulting in said heated fluid passing to the exterior through said narrow annular space so that the risk of contamination of said water in said tank by said heated fluid is minimized.

4,054,982

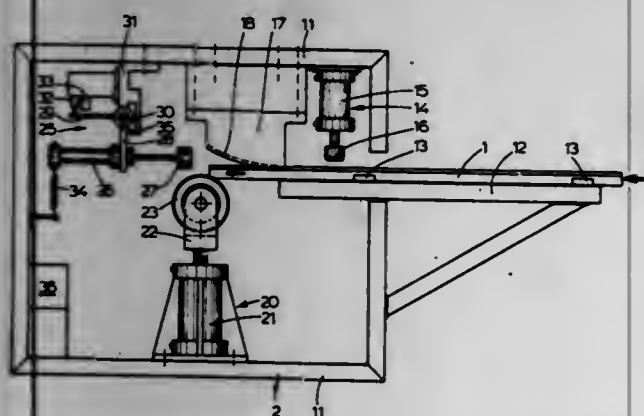
METHOD OF FORMING CIRCULARLY BENT ARTICLES, IN PARTICULAR WHEEL RIMS, FROM A STRAIGHT METAL PROFILE STRIP AND APPARATUS FOR PERFORMING THE METHOD

Cornelis Christiaan Damman, Diemen, Netherlands, assignor to Holland Mechanics B.V., Diemen, Netherlands

Filed Nov. 17, 1976, Ser. No. 742,679

Claims priority, application Netherlands, Nov. 21, 1975, 7513654; Mar. 12, 1976, 7602645

Int. Cl.² B21H 1/06; B21K 1/04; B21D 5/01, 7/14
U.S. Cl. 29—159.1 6 Claims



1. A method of forming circularly bent ring members from elongated metal profiled strip material, particularly for making rims of spoke wheels, such as bicycle wheels, comprising the steps of

cutting from said strip material strip pieces of a length equal

to the circumferential length corresponding to the selected radius of the ring member to be formed;

forming at each end of said strip pieces a curved end portion having a radius of curvature substantially corresponding to said selected radius;

feeding said strip piece with one of said curved end portions into a three-roll ring rolling apparatus of the type including two outer forming rolls and a middle forming roll adjustable with respect to said outer rolls,

said middle forming roll of said rolling apparatus having been set to bend said strip piece to a ring of said selected radius;

passing said strip piece through said rolling apparatus at least up to the other, trailing curved end portion thereof; and

shifting the middle forming roll of the rolling apparatus from said set position towards the outer forming rolls into a predetermined position corresponding to a substantially bending-free passage of the part of the strip piece already bent to said selected radius; and

passing said curved trailing end portion through said forming rolls in said shifted position of the latter.

4,054,983

HELICAL SPRING RETRACTING TOOL

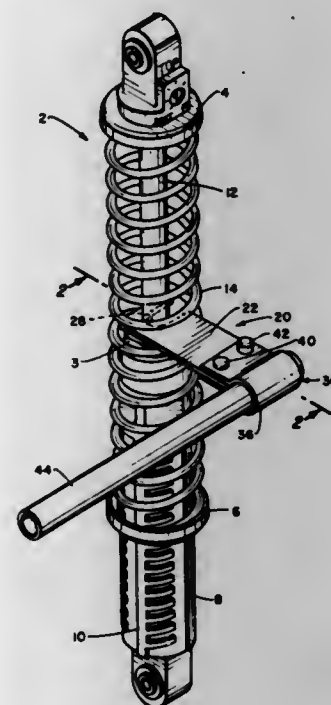
Arnold Cowan, 5330 Yarmouth Ave., Apt. 112, Encino, Calif. 91316

Filed May 20, 1976, Ser. No. 688,160

Int. Cl.² B23P 19/04

U.S. Cl. 29—227

5 Claims



1. A helical spring retracting tool comprising a laterally extending plate-like member of uniform cross-sectional thickness having a first end and opposed second end, said first end having a U-shaped slot near the terminus thereof, said U-shaped slot being oriented substantially perpendicular to the longitudinal axis of said plate-like member and adapted to receiveably accommodate in retained position a shaft or the like and integral, curvilinear-configured knuckle means on said end for receiving a leverage handle whereby said plate-like member may be rotated about an axis lying in said U-shaped slot intermediate adjacent windings of a helical spring to thereby compress or decompress said helical spring, the thickness of said plate-like member being sufficient to carry relatively heavy loads subjected upon it during the helical spring compression; and a handle member carried by said means on said second end for receiving a leverage handle, said integral, curvilinear-configured knuckle means for receiving a leverage handle being an integral knuckle-like member having opposed lateral plate sections and being pivotally secured to said plate-like member.

4,054,984

TOOL FOR JOINING AND SEPARATING PLASTIC PIPE JOINTS

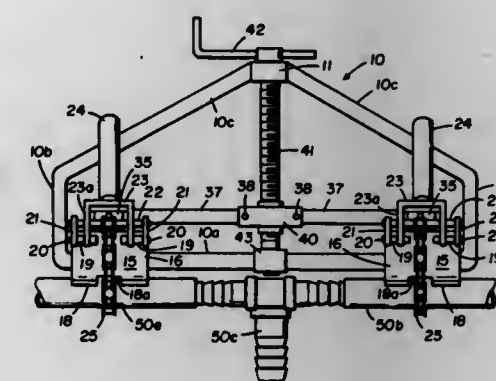
Dorothy P. Ball, 1/01 W. Second St., Ottumwa, Iowa 52501, and Charles E. Ball, 1630 G Ave., Fort Madison, Iowa 52617

Filed Dec. 30, 1976, Ser. No. 755,731

Int. Cl.² B23P 19/04

U.S. Cl. 29—237

5 Claims



1. A tool for joining or separating plastic pipe sections comprising: an open, generally planar frame bounded by perimeter defining members including a rectilinear member; a pair of clamp members attached to and slidable toward and away from each other on the rectilinear frame member, each of the clamp members having means to releasably secure pipe sections thereto outside of the frame perimeter but in axial alignment with each other and parallel to the rectilinear frame member; and a toggle linkage, the toggle linkage including a pair of toggle bars pivotally connected at corresponding ends to respective ones of the clamp members and at their other corresponding ends to opposite ends of a toggle block, the toggle bars and block being disposed within the frame perimeter and all of said pivotal connections providing for movement of the toggle bars and block in the plane of the frame, the toggle block having an internally threaded bore between said pivotal connections thereto whose axis is normal to the rectilinear frame member and intersects the same between the clamp members, and an externally threaded crankshaft rotatably carried in the frame and located against axial movement relative thereto, the shaft threadedly engaging the toggle block bore.

4,054,985

METHOD FOR THE APPLICATION OF A PROTECTION COVER AROUND HEAT OR COOL INSULATED TUBE BENDS

Sven Goran Aleniusson, Valberg, Sweden, assignor to Isolerings Aktiebolaget Isenta, Orebor, Sweden

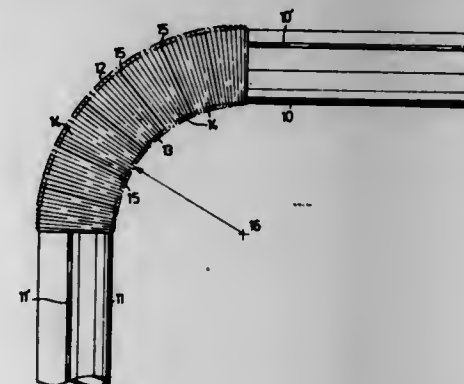
Filed June 3, 1976, Ser. No. 692,377

Claims priority, application Sweden, June 30, 1975, 7507466

Int. Cl.² B23P 17/00

U.S. Cl. 29—416

13 Claims



1. A method of applying a protective covering around insulated pipe bends comprising the steps of:
- providing a protective tube made from a spirally wound, band-form material, each turn of the spirally wound,

band-form material being secured to an adjacent turn by a self-binding lap and being corrugated by at least one corrugation wave running in the longitudinal direction of the band-form material forming said turn;

cutting said protective tube along its length to form at least two parts;

shaping said protective tube to conform to the shape of an insulated pipe bend;

positioning said two parts of said protective tube around said insulated tube bend with the cut edges thereof in adjacency; and

joining together said cut edges to form a protective covering around said insulated pipe bend.

4,054,986

METHOD OF MOUNTING A WHEEL RETAINING RING ON A WHEEL SUPPORT SHAFT

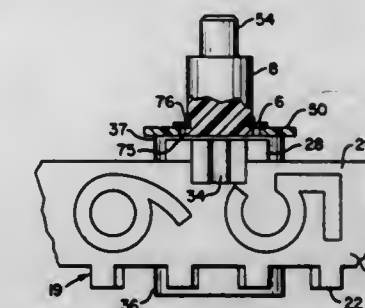
George Marres, Riverton, and Loreto B. D'Alesandris, West Hartford, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Aug. 23, 1976, Ser. No. 716,590

Int. Cl.² B23P 19/00

U.S. Cl. 29—434

8 Claims



1. A method of mounting a grip ring at a selected axial position along one generally cylindrical end section of a wheel support shaft of a wheel and shaft assembly comprising a said wheel support shaft, a bank of coaxial wheels mounted on the shaft for rotatable and axial movement thereon, and retaining means at the other end of the shaft for limiting the axial movement of the bank of wheels thereon in one axial direction, the grip ring being mounted on said one generally cylindrical end section of the shaft for limiting the axial movement of the bank of wheels thereon in the opposite axial direction and at a selected axial position along said one end section establishing a predetermined axial play of the bank of wheels thereon, comprising the steps of providing a said wheel and shaft assembly having a wheel support shaft of thermoplastic material at least at said one end section thereof, providing a radially expandable metal grip ring having an internal opening with the ring unexpanded which is slightly less than the diameter of said one generally cylindrical end section of the shaft, inserting the metal grip ring at a selected axial position along said one end section of the shaft establishing said predetermined axial play and with the metal grip ring expanded by the shaft and the ring firmly engaging the shaft, and heating the metal grip ring for heat softening a peripheral portion of the thermoplastic shaft material engaged by the metal grip ring sufficiently to permit the grip ring to contract into the heat softened peripheral portion of the shaft and positively lock the grip ring to the shaft at said selected axial position.

4,054,987

CONSTRUCTION METHOD

Nicholas G. Forlenza, Utica, N.Y., assignor to Mateflex/Mele Corporation, Utica, N.Y.

Filed Feb. 26, 1976, Ser. No. 661,725

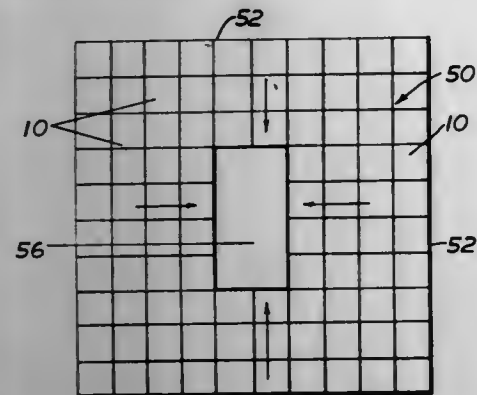
Int. Cl.² B21D 39/00

U.S. Cl. 29—452

2 Claims

1. In the method of constructing a recreational, ball-playing court surface from a plurality of square, unitary, elastic,

molded thermoplastic sheets having a plurality of support legs on the lower side thereof and means for interlocking said sheets together, disposed about the periphery of said sheets, said sheets being divided into secondary squares comprising gratings defining a plurality of square shaped openings through



said sheets, which comprises; interlocking said sheets together to form said court surface and anchoring the periphery of the surface formed to an underlying support surface, the improvement which comprises; tensioning said surface along its horizontal axes.

4,054,988

MACHINE FOR PROCESSING AND SECURING PARALLEL LEAD ELECTRONIC CIRCUIT ELEMENTS TO A PRINTED CIRCUIT BOARD

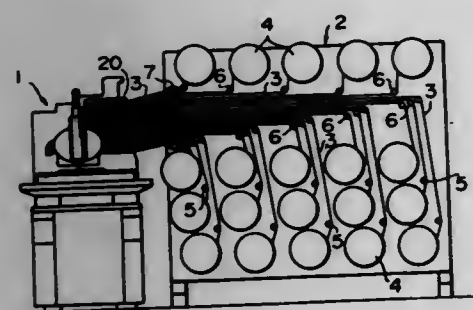
Sho Masuzima, Tetsuo Takahashi, Yoshinobu Taguchi, and Hisashi Fujita, all of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1976, Ser. No. 672,944

Claims priority, application Japan, Apr. 2, 1975, 50-39949
Int. Cl.² H05K 3/30

U.S. Cl. 29-564.6

22 Claims



1. A machine for processing and inserting parallel lead circuit elements into lead receiving openings in a circuit substrate comprising in combination;
supply means for selectively supplying one group of a plurality of distinct groups of parallel lead circuit elements to appropriate circuit element selection means and circuit element selection means for selecting one of said circuit elements from said selected group of circuit elements supplied thereto by said supply means;
transfer means for receiving from said circuit element selection means each circuit element selected thereby and for displacing same to a release position, said transfer means including chuck means for gripping said selected and supplied circuit element during receipt and displacement thereof to said release position;
insert means including release means operatively disposed to engage said chuck means and effect release of said circuit element gripped thereby when said chuck means is displaced to said release position, and plunger means adapted to engage said circuit element at said release position and displace said circuit element from said release position to an inserted position; and
board handling means for disposing said lead receiving openings in said circuit substrate in alignment with said circuit

element so that said parallel leads of said respective circuit elements are received in said receiving openings when same are displaced to said inserted position.

4,054,989

HIGH RELIABILITY, LOW LEAKAGE, SELF-ALIGNED SILICON GATE FET AND METHOD OF FABRICATING SAME

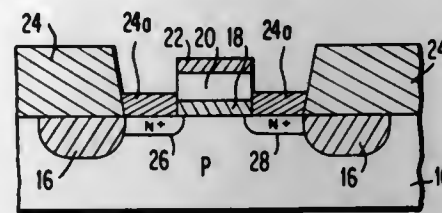
Irving T. Ho, and Jacob Riseman, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 521,423, Nov. 6, 1974, Pat. No. 3,943,542.
This application Nov. 6, 1975, Ser. No. 629,446

Int. Cl.² B01J 17/00

U.S. Cl. 29-571

4 Claims



1. A method of fabricating a field effect transistor comprising the steps of:
a. forming a thin layer of oxide on a wafer of monocrystalline silicon,
b. depositing a layer of conductive polycrystalline silicon on said thin layer of oxide,
c. forming a layer of silicon nitride on said polycrystalline layer,
d. within at least the area of said wafer where said field effect transistor is to be fabricated, removing portions of said silicon nitride layer to form a silicon nitride mask over said polysilicon layer, said mask in said area covering only the region to be the gate structure of said field effect transistor,
e. oxidizing all said polysilicon layer not covered by said silicon nitride mask to form a thick oxide layer thicker than said polysilicon layer,
f. opening holes within said thick oxide layer on opposite sides of said gate structure,
g. introducing impurities into the surface of said monocrystalline silicon layer exposed by said openings to form the drain and source regions of said field effect transistor, and
h. forming conductive contacts to said source and drain regions.

4,054,990

METHOD OF ARRANGING ELECTRODES OF STORAGE BATTERIES

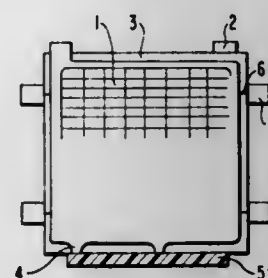
Anders Borjesson, Alvängen, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Oct. 15, 1976, Ser. No. 733,025

Claims priority, application Sweden, Nov. 16, 1975, 7511594
Int. Cl.² H01M 2/14

U.S. Cl. 29-623.1

4 Claims



1. A method for arranging the electrodes of an electrode set in the assemblage of an electric storage battery, comprising the

steps of providing an electrode set which contains at least one positive electrode and at least one negative electrode and at least one separator for separating the electrodes, and inserting cutting edges into said separator such that said cutting edges cut into said separator and contact said electrodes to locate said electrodes in predetermined position relative to said separator.

4,054,991

ADJUSTABLE HAIR-CLIPPING DEVICES

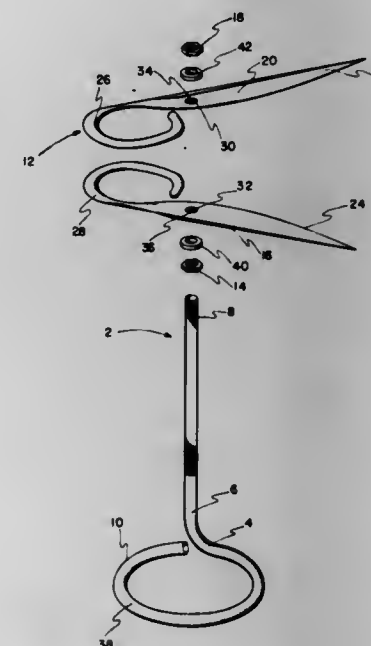
William J. Bahr, 1702 Ohio, Lawrence, Kans. 66044

Filed May 20, 1976, Ser. No. 688,308

Int. Cl.² B26B 13/24

U.S. Cl. 30-231

5 Claims



1. An adjustable hair clipping device comprising a curved base and a support member, said support member including means for positioning a cutting member a predetermined distance from said base, and a cutting member affixed to said support member at said predetermined position; and wherein said support member comprises a threaded shaft and said cutting member includes an internally threaded aperture by means of which said cutting member is affixed at said predetermined position; and wherein said cutting member is a pair of scissors and said aperture extends through each of the opposing blades of said scissors at the point where said blades are pivoted together; and wherein one end of said shaft has a looped configuration and forms said base.

4,054,992

ROTARY CUTTING ASSEMBLY

George C. Ballas, and Thomas N. Geist, both of Houston, Tex., assignors to Weed Eater, Inc., Houston, Tex.

Continuation of Ser. No. 474,713, May 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 347,997, April 5, 1973, Pat. No. 3,859,776, which is a continuation-in-part of Ser. No. 352,580, Jan. 8, 1973, Pat. No. 3,826,068, which is a continuation-in-part of Ser. No. 207,198, Dec. 31, 1971, Pat. No. 3,708,967. This application Dec. 18, 1975, Ser. No. 641,969

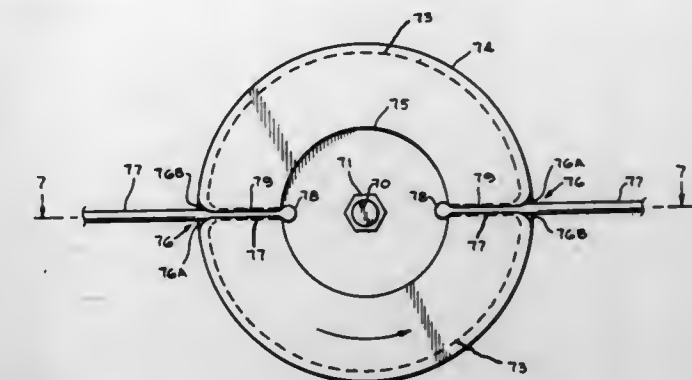
Int. Cl.² B26B 27/00

U.S. Cl. 30-276

17 Claims

1. Apparatus for cutting vegetation and the like comprising driving means having a rotatable shaft extending therefrom perpendicularly to a cutting plane, a head member fixedly mounted on said shaft and having a recess located therein to provide an opening extending inwardly from one side thereof and said head member further having at least one peripheral aperture providing in part a passageway communicating with said recess and said passageway residing within said head member, at least one non-metallic flexible line member slidably received in close confinement within the passageway and

extending from said recess radially outwardly and at least partially across said head member and through said peripheral aperture into said cutting plane, and



means on said head member for securing said line member against slidable movement from said aperture into the cutting plane but permitting selective withdrawal of said line member from said aperture.

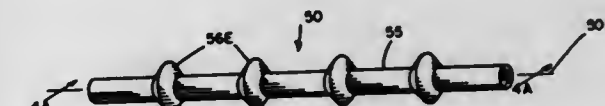
4,054,993

ROTARY CUTTING ASSEMBLY HAVING NOVEL FLAIL
Walter B. Kamp, 206 Bellevue Blvd. South; Richard L. Kimmel, 1403 Lawrence Lane,, both of Bellevue, Nebr. 68005, and Alvin L. P. Aagaard, III, 3623 Armbrust, Omaha, Nebr. 68124

Filed Sept. 20, 1976, Ser. No. 724,287
Int. Cl.² B26B 7/00

U.S. Cl. 30-276

8 Claims



1. Rotary cutting assembly for cutting vegetation with a rapidly whirling flail and comprising:

A. an elongate lineal shaft extending along a vertical-axis, the shaft having a bottom-end and a top-end, said shaft being powerably rotatable about its vertical-axis;
B. A base-plate co-rotatably associated with the shaft and located nearer the shaft bottom-end, said base-plate including a peripheral-edge lying within a horizontal plane and with the shaft vertical-axis at the substantial geometric center of the base-plate; and
C. at least one retainer means attached to the base-plate for removably securing a flail to the base-plate, said at least one retainer being located nearer the base-plate peripheral-edge than to the shaft vertical axis; and
D. An elongate horizontal flexible flail extending along a horizontal-axis extending radially outwardly from the shaft and continuing through the retainer means, said flail being wholly singularly constructed of tough resinous material and which comprises a central-core extending along the flail horizontal-axis, the flail also having an elongate external-contour surrounding the central-core and which flail external-contour is of regularly periodically varying cross-sectional size and shape along the entire flail length to provide numerous protuberances at regular intervals therealong, said multi-protuberances flail promoting efficacious vegetation cutting action as said horizontal flail rotates about the shaft vertical-axis.

4,054,994

KNIFE AND BREAD BOARD ATTACHMENT

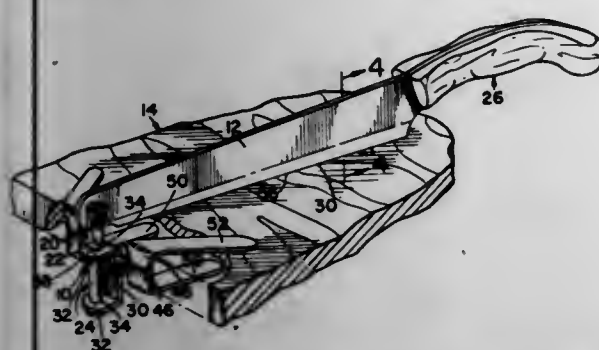
Milton J. Grossman, 10296 S. Mina, Whittier, Calif. 90605

Filed June 23, 1976, Ser. No. 699,063

Int. Cl.² B26B 11/00; A47G 21/14

U.S. Cl. 30—296 R

11 Claims



1. A knife and bread board attachment comprising: a clamping device for attachment to a board, said clamping device having an upper and lower clamping means for receiving an edge portion of a board therebetween; a knife having a blade; pivot means for pivotally connecting the forward end of the knife blade to said clamping device for vertical pivotal movements of said knife; said means pivotally connecting the forward end of the knife blade to the clamping device is a horizontal pivot; a vertical pivot for the clamping device carrying the horizontal pivot, whereby the knife blade may be swung horizontally as well as vertically; and the upper parts of this clamping means comprises a pair of upper arms, the inner facing edges of said arms being laterally spaced apart and between which the lower sharpened edge of the knife may move into a position closely adjacent the surface of a board to which the device is attached.

4,054,995

PIN WITH SLEEVE FOR MAKING DENTAL PROSTHESIS

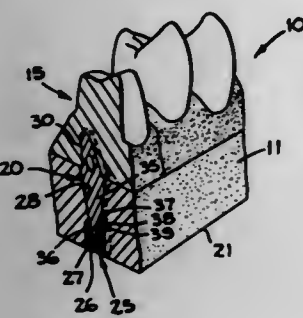
Harry Y. Yoshida, 5267 Eileen Drive, San Jose, Calif. 95129

Filed May 3, 1976, Ser. No. 682,202

Int. Cl.² A61C 13/00

U.S. Cl. 32—11

25 Claims



1. A dental prosthesis comprising:
 - a. a model;
 - b. a die removably positioned in said model;
 - c. a pin comprising:
 1. a stem embedded in said die; and
 2. a shank extending from said stem and projecting out of said die, said shank having a longer portion and a shorter portion defining a shoulder and a tip at the lower extremity of said shank;
 - d. a base supporting said model, said base being formed with a first wall confronting said die against which said die is disposed, said base being formed with an opening to receive said longer and shorter portions of said shank of said pin; and
 - e. a sleeve disposed in said base, said sleeve being formed with a bore therethrough aligned with said opening in said base in which to dispose the tip of the longer portion of said shank of said pin to provide a receptacle for the tip of

said shank, said sleeve being formed with a first wall confronting said die and surrounding said bore against which said shoulder of said shank of said pin abuts to limit the extent of the insertion of said shank into said base said sleeve extending only along entire length of said tip.

4,054,996

ORTHODONTIC APPLIANCE HAVING REPLACEABLE TOOTH ENGAGING MEMBER

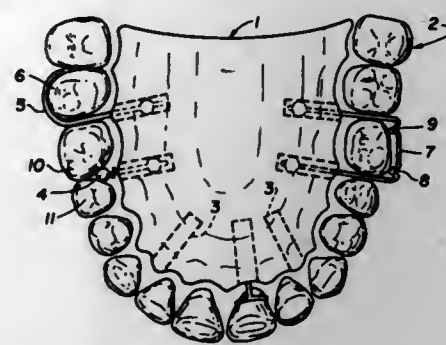
Melvin Wallshein, 8645 Bay Parkway, Brooklyn, N.Y. 11214

Filed July 26, 1976, Ser. No. 708,305

Int. Cl.² A61C 7/00

U.S. Cl. 32—14 B

30 Claims



1. An orthodontic appliance comprising: a first member adapted to be located in a mouth and in proximity to a tooth, said first member having means defining at least one opening therein which opens to the interior of said first member, said opening having a resilient and deformable inner surface portion; an elongated wire-type member having at least one end removably insertable in said at least one opening of said first member to engage said resilient and deformable inner surface portion, and further including means for cooperatively coupling same to at least one tooth; said at least one end of said elongated member having a contoured releasable cooperative engaging means for resiliently deforming said resilient and deformable inner surface portion of said opening defining means so that said resilient and deformable inner surface portion substantially conforms to at least a portion of the contour of said engaging means for lockingly and non-rotatably engaging said elongated wire-type member in said opening, whereby upon application of a removal force greater than the locking engaging force, said elongated wire-type member may be removed from said at least one opening to permit insertion of another elongated wire-type member therein.

4,054,997

ORTHODONTIC ELASTIC APPLIANCE

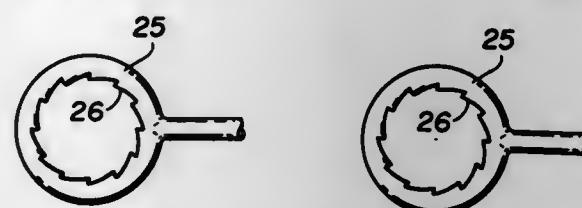
Melvin Wallshein, 8645 Bay Parkway, Brooklyn, N.Y. 11214

Continuation of Ser. No. 629,918, Nov. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 566,752, April 10, 1975, which is a continuation-in-part of Ser. No. 310,574, Nov. 29, 1974, Pat. No. 3,879,850. This application Sept. 2, 1976, Ser. No. 719,829

Int. Cl.² A61C 7/00

U.S. Cl. 32—14 A

92 Claims



1. An orthodontic elastic appliance for use with orthodontic bracket means mountable on teeth, said bracket means defining an opening of predetermined cross-sectional dimension

adapted to receive at least a portion of the orthodontic elastic appliance therein, the bracket opening defined by at least one of said bracket means having at least one engaging and retaining surface adjacent thereto,

said elastic appliance comprising:

a plurality of closed loops of elastic material;

at least one of the said elastic closed loops being adapted to at least partially pass through at least a portion of an opening of a bracket means and be mounted on the bracket means;

elastic connecting means coupled between adjacent closed loops for applying a force to said at least one elastic closed loop relative to a bracket means on which said at least one elastic loop is mounted, said force having a rotational component at least in the plane of said at least one elastic closed loop; and

at least one protuberance extending from a surface of at least one of said elastic loops, said at least one protuberance and said at least one elastic loop being dimensioned and shaped such that when said at least one elastic loop is stretched and is at least partially engaged in an opening defined by one of said bracket means, said at least one protuberance of said at least one elastic loop abuttingly engages at least a portion of said at least one engaging and retaining surface of said bracket means to substantially prevent said engaged elastic loop from shifting its position relative to the bracket means on which it is mounted under the influence of said rotational component of said applied force.

4,054,998

METHOD AND APPARATUS FOR DISINFECTING FLUID MEDIUM REMOVED FROM THE ORAL CAVITY OF A HUMAN BEING

Sven-Gunnar Hesselgren, Angsholmen, S-170 11 Drottningholm, Sweden

Filed May 12, 1975, Ser. No. 576,868

Claims priority, application Sweden, May 21, 1974, 7406728

Int. Cl.² A61C 17/04; A61L 1/00, 3/00

U.S. Cl. 32—33

10 Claims



1. A method for continuously disinfecting a fluid medium, removed from the infectious area defined by the oral cavity of a human being comprising the steps of withdrawing said fluid medium as a flowing aerosol in a path from said infectious area under suction directly past a treatment zone, locating a treatment composition containing at least a microbiocidal substance within said treatment zone, said treatment composition being arranged about the periphery of said flow path of said aerosol in communication with said flowing aerosol without impeding the withdrawal of said fluid medium under suction or modifying the flow of aerosol, said suction acting to cause withdrawal of said microbiocidal substance from said composition and subsequent contact of said microbiocidal substance with said aerosol.

5. Apparatus for continuously removing and disinfecting the infectious fluid medium from an infectious area defined by the oral cavity of a human being, comprising an axially open flow through tube, connection means at one end of said tube connected to means for insertion into and contact with the infectious area for the removal of said infectious fluid medium therefrom, means at the other end of said tube for connection to a source of suction, and a source of suction for removing said fluid medium in the form of a flowing aerosol, said tube being perforated along a section between its ends, said perforated section being surrounded by an enclosed housing secured at its ends to said tube, a treatment composition containing at least a microbiocidal substance arranged within said housing

about the outer peripheral surface of said tube free of the flow path of said aerosol, said composition to be subjected to a suction to release said microbiocidal substance through said perforations in contact with the flowing aerosol without impeding the application of suction to said infectious area or modifying the flow of aerosol.

4,054,999

ADJUSTING PROCESS FOR BEARINGS

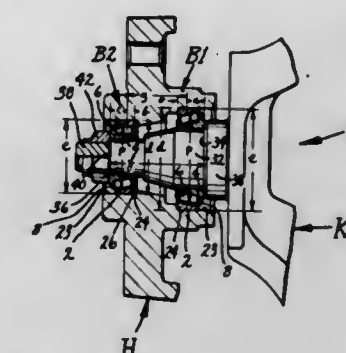
William E. Harbottle, North Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Nov. 3, 1975, Ser. No. 628,509

Int. Cl.² B23P 11/00

U.S. Cl. 33—181 AT

17 Claims



1. A process for assembling a bearing assembly capable of being used to mount a shaft within a housing, the assembled bearing assembly including an outer race in the housing and having inwardly presented raceways, a pair of inner races around the shaft and having outwardly presented raceways located opposite the raceways of the outer race, and rolling elements arranged in two rows between the raceways of the inner and outer races, the inner races being clamped together in fixed and determined relation with respect to each other in the axial direction and having front faces, the raceways of the inner and outer races and the rolling elements all being configured to enable the bearing assembly to take axial thrust loading as well as radial loading, said process comprising: measuring the spacing between the raceways of a plurality of outer races; measuring the axial location of the front faces of a plurality of inner races, each with respect to the outer surfaces of the rolling elements surrounding that inner race when the rolling elements are seated against the raceway of that inner race, the measurements of the inner races being conducted outside the outer races; and selecting from the plurality of measured inner and outer races a single outer race and two inner races, the measured front face locations of the selected inner races being such in relation to the measured spacing of the selected outer race that when inner races are inserted into the outer race and clamped together in the fixed and determined relation, a predetermined adjustment will exist in terms of end play or preload.

4,055,000

UNDERWATER SIGHT FOR A SPEAR GUN OR THE LIKE

Louie P. Cesin, 6220 SW. 20, Miami, Fla. 33155

Filed Apr. 28, 1976, Ser. No. 680,997

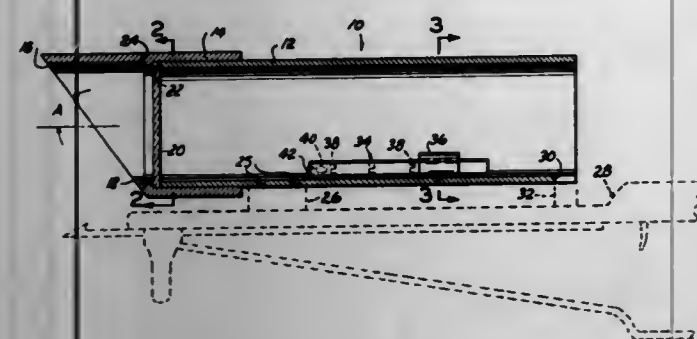
Int. Cl.² F41G 1/46, 1/34

U.S. Cl. 33—241

1 Claim

1. An underwater sight for a spear gun, or the like, comprising: an elongated tube having forward and rearward open ends and having means including sockets in its wall for connection with a spear gun; a transparent wall transversely dividing said tube adjacent one end portion for excluding water from the other end portion of said tube when said one end portion is immersed, the end surface of the immersed end of said tube being inclined at an acute angle with respect to the longi-

tudinal axis of the tube, said tube having a bleed hole in its walls adjacent and in front of said partition; and,



lamp means contained by said other end portion of said tube for illuminating a submersed target.

4,055,001

MICROWAVE DRYING PROCESS FOR SYNTHETIC POLYMERS

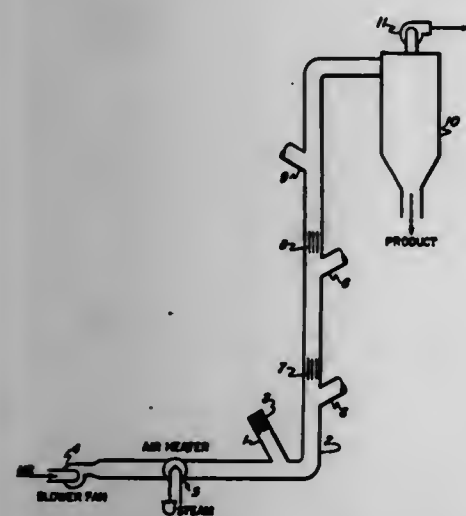
Eric O. Forster, Scotch Plains, and Peter J. Creighton, Mendham, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 200,257, Nov. 18, 1971, Pat. No. 3,977,089, which is a division of Ser. No. 9,247, Sept. 9, 1969, Pat. No. 3,771,234. This application Sept. 25, 1975, Ser. No. 616,773

Int. Cl.² F26B 3/34, 7/00

U.S. Cl. 34—1

2 Claims



1. In a process for preparing butyl rubber wherein a slurry of said rubber is formed in a diluent from which said rubber is separated by introducing said slurry into water, thereby forming a water slurry of butyl rubber, the steps which comprise:

- separating the rubber crumb from the water;
- reducing the water content of said crumb by mechanically dewatering, to about 6 to about 30 wt. %;
- transferring the dewatered crumb to a first transfer line resonating cavity operating at a frequency of 915 MHZ;
- conveying said crumb through said transfer line for a period of time sufficient to reduce the water content of the crumb to below 5 wt. %;
- transferring the partially dried crumb to a second transfer line resonating cavity operating at a microwave frequency of 2450 MHZ; and
- conveying said crumb through said transfer line for a period of time sufficient to reduce the water content below 5000 ppm.

4,055,002

PORTABLE FOOTBALL DRYER

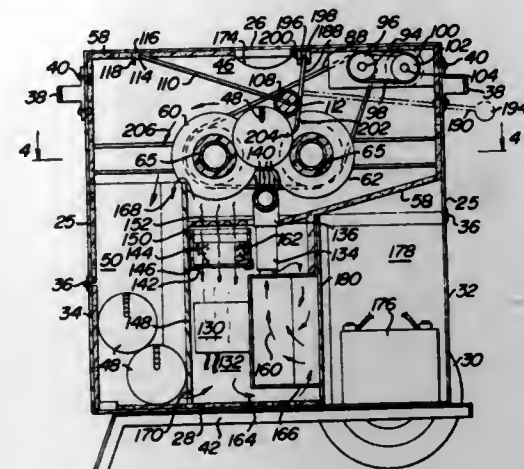
David M. Roberts, 1713 Robinhood Lane, and James A. Sever, 918 University Drive, both of Clearwater, Fla. 33516

Filed June 7, 1976, Ser. No. 693,674

Int. Cl.² F26B 25/00

U.S. Cl. 34—104

12 Claims



1. Apparatus for drying a wet football comprising a housing having a storage chamber for holding dried footballs therein, a drying chamber for receipt of a wet football, said drying chamber having a door to provide access to its interior and including a pair of drying rollers, a stabilizing roller and ejection means disposed within said drying chamber, each of said drying rollers having a concave, peripheral, moisture absorbing surface, said drying rollers being disposed parallel to each other and spaced by a sufficient distance such that a football can be placed within the space therebetween and and supported by said rollers, said stabilizing roller being disposed over said drying rollers and being pivotable from a retracted position enabling the football to be inserted within the space between the drying rollers when said door is open to a biased position to hold the football in said space when said door is closed, said rollers being rotated in the same direction by rotation means, with one of said drying rollers being rotated at a different speed than the other of said drying rollers, whereupon the frictional engagement between one of said drying rollers and the ball causes the ball to rotate at a different speed than the speed of rotation of the other of said drying rollers to effect a rubbing action between the ball and the other of said drying rollers, thereby wiping the surface of said ball, said ejection means serving to remove the football from the space between said drying rollers after it has dried and for causing the dried football to be inserted into the storage means.

4,055,003

METHOD AND APPARATUS FOR ALTERING THE RIGIDITY OF WEBS BY OSCILLATION

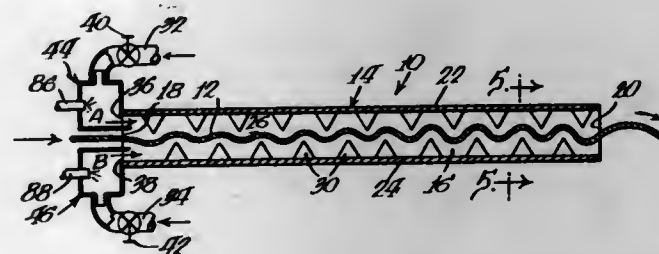
Georges H. Sack, Lisle, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 28, 1975, Ser. No. 608,426

Int. Cl.² F26B 13/20

U.S. Cl. 34—155

16 Claims



1. Apparatus suitable for treating a flexible web segment by oscillation so as to modify the properties of said segment which comprises

wall means defining an elongated tunnel adapted to receive a web segment having at least two substantially opposing wall surfaces, and having an inlet end and an outlet end; an array of spaced baffles positioned substantially transversely in said tunnel along each of said opposing wall surfaces;

first and second gas feed means only at said inlet end for introducing a pair of substantially concurrent gas streams into said tunnel;

said baffles in one array being positioned in a staggered relationship relative to the baffles in the other array, and said gas feed means being positioned to impinge a first gas stream against said one array and to impinge a second gas stream against said other array, said baffles deflecting the respective gas streams against said web segment such that said first gas stream deflects said web segment in a first direction and said second gas stream deflects said web segment in the opposite direction, with said web segment being alternately deflected in said opposite directions to oscillate the web segment with a severity and frequency sufficient to mechanically alter the properties thereof; and web feeding means for feeding said web segment through said apparatus between said opposing wall surfaces, said feeding means comprising said pair of gas streams.

4,055,004

FULL COLOR HYBRID DISPLAY FOR AIRCRAFT SIMULATORS

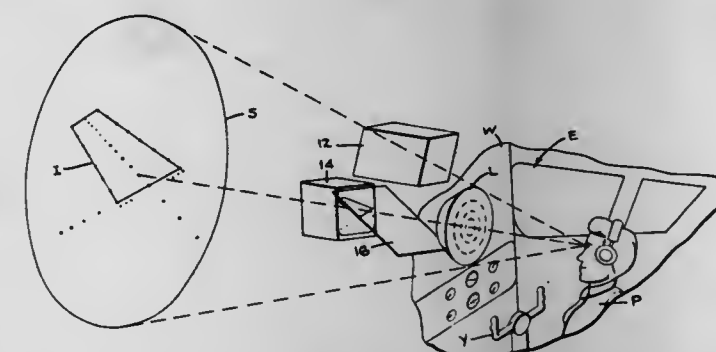
Wendell D. Chase, Saratoga, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 17, 1975, Ser. No. 623,536

Int. Cl.² G09B 9/08; H04N 7/18

U.S. Cl. 35—12 N

7 Claims



1. Apparatus for visually simulating to a pilot trainee a representation of an aircraft landing site having a number of light sources, said representation being in full-spectrum color, said apparatus comprising a color TV monitor; means connected to said monitor for producing an image on said monitor representative of said site; a cathode ray tube having a range of light intensity exceeding the range of light intensity of said color TV monitor by at least an order of magnitude; means connected to said cathode ray tube for generating a digital calligraphic monochromatic image representative of said light sources; means for converting said monochromatic calligraphic image to a full-color spectrum calligraphic image; said last means comprising a color wheel adjacent the face of said cathode ray tube having three transparent sector-shaped elements of different colors and one clear element, means for rotating said color wheel, and means for synchronizing the excitation of said cathode ray tube with the rotational position of said color wheel so that the color of each light source is accurately represented in the converted calligraphic image; means for superimposing and combining said color TV monitor image and said full-color spectrum calligraphic image; and optical means for enabling said trainee to observe the superimposed and combined images.

963 O.G.—45

4,055,005

COVER FOR BICYCLING SHOE TO PROVIDE A WALKING SURFACE

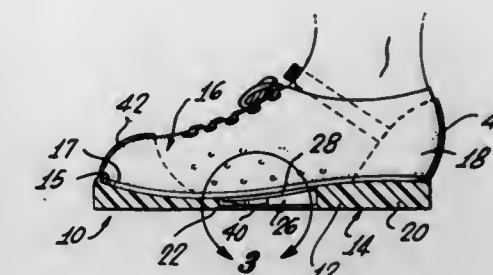
Robert H. Meinhart, 354 Wilbur Road, Thousand Oaks, Calif. 91360

Filed Oct. 29, 1976, Ser. No. 736,834

Int. Cl.² A43B 5/00

U.S. Cl. 36—135

3 Claims



1. For use with a bicycling shoe that has a cleat attached to its bottom surface to engage the pedal structure of a bicycle, a protective cover for adapting the bicycling shoe for walking comprising:

- a sole that provides a walking surface;
 - a toe cup attached to the toe end of said sole for receiving the toe of the bicycling shoe; and
 - an upstanding U-shaped wall extending from the heel end of said sole and opening toward the toe end of said sole for receiving the heel of the bicycling shoe;
- said sole being of substantially greater thickness than said cup and said wall and having a substantially greater thickness at the heel than under the ball of the foot;
- the upper surface of said sole defining a generally rectangular recess that extends from the portion of said sole corresponding to the ball of said foot into the arch area to receive the cleat of the bicycling shoe;
- said sole, cup and wall being integrally formed from a single piece of pliable, flexible, molded, natural or synthetic rubber that can be stretched to snugly engage the bicycle shoe.

4,055,006

DEEP-SEA ORE COLLECTING AND HOISTING APPARATUS

Jitsu Shibata, Tokyo, Japan, assignor to Mitsubishi Kaihatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 506,876, Sept. 17, 1974, abandoned.

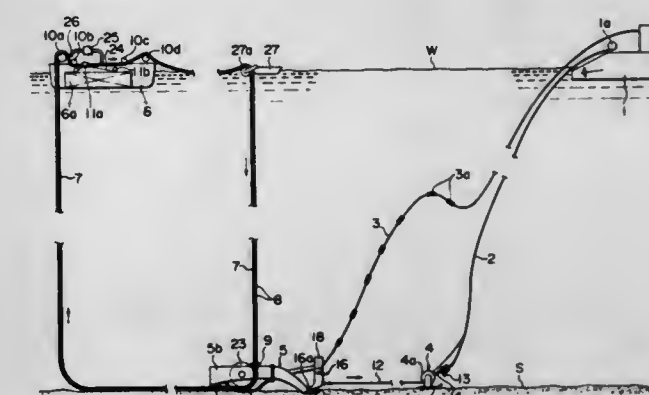
This application Apr. 5, 1976, Ser. No. 673,591

Claims priority, application Japan, Sept. 21, 1973, 48-106590; Oct. 3, 1973, 48-111111

Int. Cl.² E02F 3/08

U.S. Cl. 37—69

1 Claim



1. In combination: an apparatus for transporting ores from the bottom of a body of water to a level above the bottom of the body of water, said apparatus comprising a buoyant ore-collecting vessel

for collecting ore transported from the bottom of the body of water, a flexible endless rope-like member disposable in use within the body of water with a portion thereof disposed along the bottom of the body of water and with portions extending upwardly from the bottom of the body of water to the level to which the ore is to be transported and with a portion thereof extending along the length of said buoyant ore-collecting vessel and passing over said buoyant ore-collecting vessel, a plurality of baggy nets along the length of said flexible endless member for receiving ore therein and carrying the ore to the level to which the ore is to be transported as said flexible endless member is longitudinally advanced, drive means mounted on said ore-collecting vessel and cooperative with said flexible endless member for advancing said flexible endless member in a longitudinal direction thereof to transport ore contained within said baggy nets from the bottom of the body of water up to said buoyant ore-collecting vessel positioned within the body of water; and means for removing ore from within baggy nets transported up to said buoyant ore-collecting vessel and depositing the removed ore within said ore-collecting vessel; and

an ore collecting and filling apparatus disposable in use on the bottom of the body of water for retrieving ore therefrom and for filling with ore said baggy nets along flexible endless member at the bottom of the body of water, said ore-collecting and filling apparatus comprising ore-retrieving means for retrieving ore from the bottom of the body of water and for filling said baggy nets with the retrieved ore, and guide means coactive with said flexible endless member for guiding said flexible endless member into position as it is advanced so that said ore-retrieving means can fill said baggy nets along said flexible endless member; wherein said apparatus for transporting ores from the bottom of a body of water further comprises: a second buoyant vessel having means for guiding said flexible endless member toward the bottom of the body of water, said second buoyant vessel being positioned in use ahead of said buoyant ore-collecting vessel with the portion of said flexible endless member extending along the length of said buoyant ore-collecting vessel further extending to said means for guiding of said second buoyant vessel and thereafter extending to said ore-collecting and filling apparatus, whereby the separation between the upwardly extending portions of said endless flexible member is substantially determined by a distance between said buoyant ore-collecting vessel and said second buoyant vessel; a winch disposable in use on the bottom of the body of water on which said ore collecting and filling apparatus is disposed, said winch having a cable connected in use to said ore-collecting and filling apparatus and being operable to let out and recover the cable; and a power and towing vessel for alternatively towing said winch along the bottom of the body of water while letting out the winch cable to position said winch on the bottom of the body of water away from said ore-collecting and filling apparatus, and thereafter powering the winch to recover the winch cable to progressively pull said ore-collecting and filling apparatus along the bottom of the body of water toward said winch to collect ore from the bottom of the body of water as it is pulled along.

4,055,007

EARTH HANDLING APPARATUS

Bruce W. Johnson, 2602 Rte. No. 176, Crystal Lake, Ill. 60014
Filed Feb. 9, 1976, Ser. No. 656,422

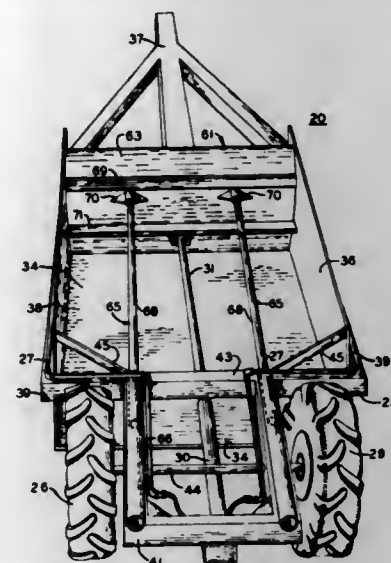
Int. Cl.² E02F 5/00

U.S. Cl. 37—126 AE

1 Claim

1. An earth handling apparatus for handling loaded earth materials comprising frame means, walled enclosure means having at least a bottom wall and a pair of oppositely disposed side walls extending perpendicularly to engage said bottom wall, said enclosure means having at least one open-ended portion disposed forwardly thereof, and said bottom wall

including cutter means adjacent to said open-ended portion, a movable end wall actuatable to move forwardly and rearwardly of said bottom wall and being supportably positioned for transverse extension between said side walls with the edge portions thereof depended in closely spaced relationship with and free of attachment and engagement with said side walls and bottom wall, means for actuating said end wall to move forwardly and rearwardly of said enclosure means, improved guide means supportably positioning said end wall and comprising pairs of telescopically engaged inner and outer post members, said outer post members thereof fixedly supported on said frame means in parallel spaced alignment with said side walls, said inner post members thereof being supportably received within



said outer post members, respectively, and slideably engaged thereby, said inner post members being supported solely by said outer post members during sliding engagement therewith, said inner post members including free end portions thereof, respectively, being attached to said end wall substantially interiorly of said edge portions thereof and being disposed on an opposite side of said end wall from loaded earth materials, both said inner and outer post member pairs being free of attachment to and spaced substantially interiorly of said side walls, and said end wall being supported solely by said inner post members with said end wall in both forward and rearward positions thereof, whereby said guide means are protected during the excavating of said earth materials.

4,055,008

ACCOUNT AND FILE BOOK

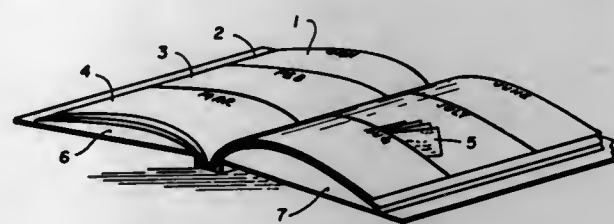
Heather Bell, Englewood, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 27, 1976, Ser. No. 662,114

Int. Cl.² G09F 7/00

U.S. Cl. 40—104.19

1 Claim



1. An account and file book, comprising a plurality of pages bound together to form a book, each of the pages having a plurality of non-overlapping open pockets for removably storing paper items, the pages and pockets having writing areas thereon for desired designations; front and back covers affixed to the pages, the front cover having an open pocket on the outside surface thereof for removably storing a writing implement; and an accordion pleated pocket affixed to the inside surface of the back cover for storing larger paper than the pockets of

the pages in greater numbers than said pockets, said accordion pleated pocket opening in the same direction as the pages and covers of the book.

4,055,009

ANIMAL BREEDING CHART

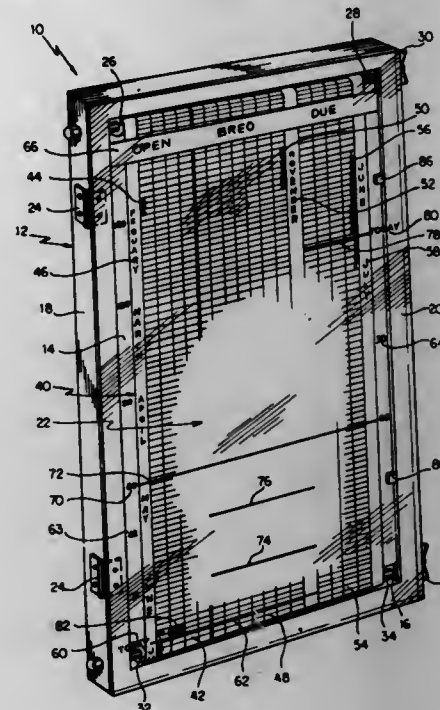
Rudolph W. Johanns, 104 S. Court St., Wampsville, N.Y. 13163

Filed Apr. 8, 1976, Ser. No. 674,982

Int. Cl.² G09D 3/00

U.S. Cl. 40—107

5 Claims



1. An animal breeding chart comprising: a housing; a roller means supported on the housing; a calendar supported on the roller means for movement relative to the housing, the calendar having a first column extending along the housing, the calendar having a second column substantially parallel to the first column; means dividing the first and second column into a series of days and months; a start indicator marked on the housing adjacent the first column; a number indicator marked on the housing adjacent the first column and spaced 60 days from the start indicator; a main indicator line marked on the housing in alignment with the number indicator and extends across the first column and the second column; and an animal indicator detachably placed in the first column in alignment with the start indicator and with a predetermined day and month for starting a breeding cycle for a particular animal, the animal indicator advances toward and reaches the main indicator line as the calendar moves relative to the housing at predetermined day increments for indicating breeding time for the particular animal, the animal indicator when moved from the first column and placed in alignment with the start indicator in the second column advances toward and reaches the main indicator line in the second column as the calendar advances at the predetermined day increments for indicating checking time for breeding conception of the particular animal.

4,055,010

MICRO FILM STORING DEVICE

Gösta Fridlund, Boul. Louis Mettewie 9-11 Apt. 16B, 1080 Brussels, Belgium, and Jan Jiveman, Stravagen No. 2, Jarfanna-Jakobsberg, Sweden

Filed Mar. 12, 1974, Ser. No. 450,408

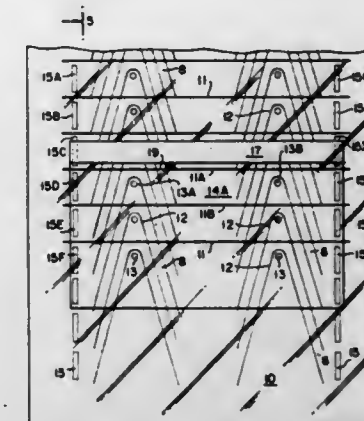
Int. Cl.² G09F 1/10

U.S. Cl. 40—124

3 Claims

1. A storage device having pockets for receiving filamentous material, said device being formed by a base sheet and a cover

sheet, said base sheet having formed therein at least one vertical row of arched cuts, said cover sheet having formed therein spaced horizontal cuts corresponding in number to each arched cut formed in said base sheet, said cover sheet being superposed over said base sheet and being secured thereto at at



least one point adjacent each peak of each of said arched cuts and between said horizontal cuts of said cover sheet to form pockets to receive filamentous material suitable for storage, and said device further including vertical welds between said base sheet and said superposed sheet and laterally of said arched cuts to form lateral boundaries to said formed pockets.

4,055,011

CALENDARS AND DISPLAY DEVICES

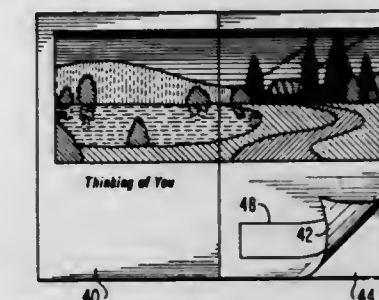
Lineaus W. Longenecker, R.D. 5, Manheim, Pa. 17545

Filed Sept. 18, 1975, Ser. No. 614,817

Int. Cl.² G09F 19/00

U.S. Cl. 40—124.1

5 Claims



1. A display device, comprising, a first base sheet provided with a picture thereon, a second base sheet provided with a picture thereon, an overlay sheet having a transparent area movable from a first position where one face thereof confronts and overlies the first base sheet to a second position where the opposite face thereof confronts and overlies the second base sheet, said overlay sheet having an opaque picture portion which registers with and obscures underlying areas of said base sheets, said opaque picture portion having a first surface which is exposed and visible when the overlay sheet is in its first position, said first surface being camouflaged to blend into and add no distinct pictorial element or outline to the picture on the first base sheet when the overlay sheet is in its first position, said opaque picture portion having a second surface which is exposed and visible when the overlay sheet is in its second position, said second surface presenting a visible pictorial element which adds to the picture on the second base sheet when the overlay sheet is in its second position over said second base sheet.

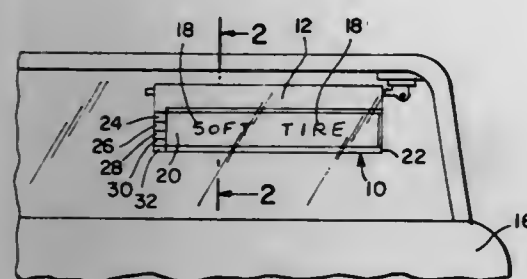
4,055,012

CARD APPARATUS

Donald F. Cote, 6 Hoover Road, Hingham, Mass. 02043
Filed Sept. 8, 1976, Ser. No. 721,183Int. Cl.² G09F 7/00

U.S. Cl. 40-129 C

8 Claims



1. A card apparatus comprising a hollow housing, the housing having a rectangular cross-section and a pair of elongated rectangular surfaces disposed in parallel spaced apart relationship to each other, the pair of elongated rectangular surfaces being fabricated from a transparent material, a rectangular opening in one end of the housing being disposed intermediate the pair of elongated rectangular surfaces, means to fixedly secure one of the pair of elongated rectangular surfaces to an interior surface of a motor vehicle, a plurality of board like rectangular signs, each of the plurality of signs being disposed in parallel relationship stored within the housing, each of the signs being slidably removable from within the housing by passing through the rectangular opening, indicia carried by each of the signs, means to individually identify each of the signs by a portion thereof extending outwardly of the housing passing through the rectangular opening, wherein said portion of said each of said signs comprises a handle-like tab whose thickness exceeds the thickness of the sign to which it is affixed, the lateral surfaces of the handle-like tab having corrugations disposed therein.

4,055,013

IDENTIFICATION DEVICE FOR VEHICLES

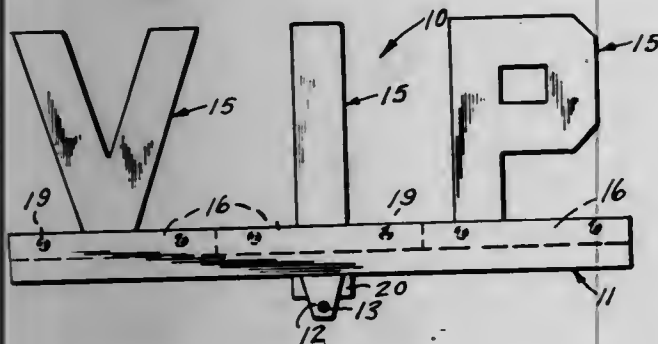
James A. Shields, 5537 Lydia, Kansas City, Mo. 64110

Filed Apr. 26, 1976, Ser. No. 680,430

Int. Cl.² G09F 07/08, 21/04

U.S. Cl. 40-129 C

1 Claim



1. An identification device for an automotive vehicle having a hood, said device including:
an elongate mounting plate having a top and bottom surface;
a groove formed in said top surface and extending longitudinally of the plate;
a hinged lug mounted on said bottom surface for swinging movement toward and away from the latter, said lug being adapted for securement on the hood of said vehicle;
a plurality of letter elements adapted for mounting on said plate in side-by-side relationship;
each of said elements being provided with a normally upright character portion and elongate base portion removably received within said groove,
said base portion extending a predetermined distance beyond the side edges of its respective character portion whereby endwise abutment of said base portion against the base

portion of an adjacent letter element provides preselected spacing between the respective character portion and the character portion of said adjacent element;
screw fastener means in said plate for releasably securing the base portion of each element within said groove; and
spring means yieldably biasing said lug toward said surface whereby, when said lug is mounted on said hood, said letter members may be deflected rearwardly when struck by a pedestrian.

4,055,014

LIGHTED GREETING CARDS

Terrance L. Schmidt, and Marion E. Thompson, both of Colorado Springs, Colo., assignors to The Maytronics Group, Inc., Colorado Springs, Colo.

Filed Mar. 25, 1976, Ser. No. 670,109

Int. Cl.² G09F 13/00

U.S. Cl. 40-152.2

9 Claims



1. A greeting card comprising
a. a backing of rigid polymeric foam or the like having front and rear spaced, substantially parallel faces,
b. a sheet material card having front and rear faces, said front face having indicia formed thereon and said rear face being adapted to be received by said backing front face,
c. means defining a card receiving formation on said front face of said backing,
d. a battery,
e. means defining a first opening in said backing rear face, said first opening for receiving said battery, and said first opening dimensioned so that when said battery is received thereby no portion of the battery protrudes exteriorly of said backing, but rather said battery is generally completely contained within said first opening,
f. means defining a second opening in said backing rear face, said second opening for receipt of said battery, and said second opening dimensioned so that when said battery is received thereby said battery extends outwardly from said backing rear face and supports said backing on a horizontal surface in a generally upright position,
g. means defining at least one opening in said sheet material card for receipt of a light emitting diode therein,
h. at least one light-emitting diode disposed in said card opening for receipt thereof, said diode being visible when viewing said card front face, and
i. circuitry means for releasably connecting said light emitting diode to said battery, said circuitry means not being visible when viewing said card front face.

4,055,015

PISTOL CHARGING DEVICE

Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Nov. 15, 1976, Ser. No. 741,715

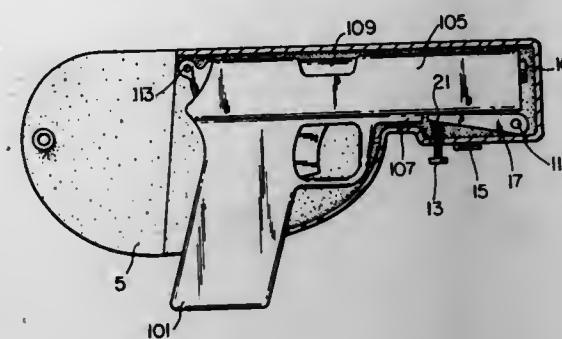
Int. Cl.² F41C 33/04

U.S. Cl. 42-1 R

11 Claims

1. A charging device for a pistol charged by relative motion between a frame and a slide comprising: a holster adapted for suspension from the person of a user and having an upper end and a lower end, said holster including means to support and

guide said pistol in a slideable relationship therewith; releasable blocking means in said holster positionally adapted for engaging said slide at a first position whereat it prevents movement of said slide toward said lower end, said blocking means



also being movable to a second position whereat it cannot prevent said movement; and means to permit a barrel to protrude from the front of said slide when said slide is engaged by said blocking means.

4,055,016

MODIFIABLE GUN STOCK

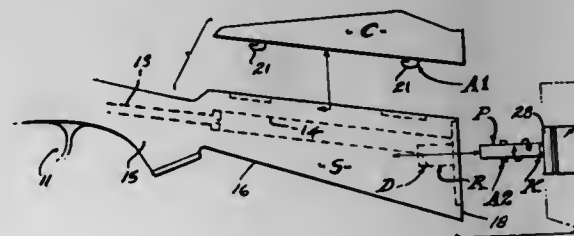
Philip K. Katsenes, 630 Idaho Ave., Apt. 105, Santa Monica, Calif. 90403

Filed July 28, 1976, Ser. No. 709,422

Int. Cl.² F41C 23/00

U.S. Cl. 42-71 R

9 Claims



1. A modifiable gun stock comprised of a permanent stock member and replaceable comb and butt members, the comb member being releasably secured in position to the stock member by anchor means, and the butt member being releasably secured to the stock member by anchor means comprising relatively rotatable plug and receptable means with a cam helix biasing a spring to forwardly couple the butt member into keyed engagement with the stock member to overlie and capture the comb member in its secured position.

4,055,017

MINI BENCH REST

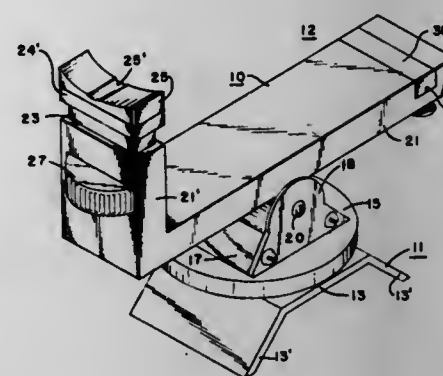
Harold Thompson, P.O. Box 8002, Boise, Idaho 83707

Filed Sept. 2, 1975, Ser. No. 609,277

Int. Cl.² F41C 29/00

U.S. Cl. 42-94

5 Claims



1. A bench rest, comprising:
a base including a mounting flange, an annular base ring mounted to the uppermost terminal side of said base flange to have a substantially horizontal orientation under nor-

mal mounting conditions; an annular collar journally mounted about the outer periphery of said ring, and a journal bracket issuing from the uppermost terminal side of said collar, said bracket carrying a journally mounted cylindrical shaft disposed along the horizontal plane with respect to said base; and

a bench assembly including an L-shaped beam having an upstanding leg and a generally horizontally disposed leg, said beam being mounted midway in the horizontal leg to said shaft of said base, the upstanding leg of said beam having a hollow polygonal cross-section, forming a cavity, a front support block subassembly including a block having the same exterior configuration as, and sliding closely in said cavity in said upstanding leg of said beam, the lowermost terminal end of said block having a dominantly projecting threaded shaft, and a thumbwheel disposed transversely through a window in said upstanding leg of said beam being engageable with said threaded shaft.

4,055,018

METHODS AND SYSTEMS RELATING TO UNDULATING MOTION

Esko Huhta-Koivisto, Saynavatie 4, 02170 Espoo 17, and Pekka Elis Piironen, Gunillankuja 5 D 22, 00840 Helsinki 84, both of Finland

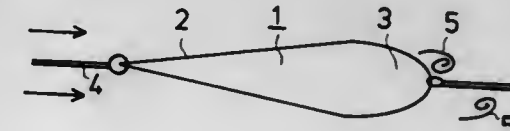
Filed Nov. 10, 1975, Ser. No. 630,498

Claims priority, application Finland, Jan. 28, 1975, 750225

Int. Cl.² A01K 85/00

U.S. Cl. 43-42.48

8 Claims



1. In a method for providing a regular undulating motion in a liquid for attracting aquatic creatures therein, the steps of situating a cylindrical body which has a predetermined cylinder axis in the liquid while there is a relative flow in a given direction between the body and the liquid and while positioning the body with its cylinder axis perpendicular to said direction of relative flow with the body having a configuration capable of producing Karman vortices in the fluid, the body having opposed ends which lead and trail with respect to the direction of relative liquid flow, attaching a line to the leading end of said body for trolling the latter in the liquid and attaching a hook to the trailing end of said body for catching fish attracted by the motion of said body, and supporting the body in the liquid at least in part by way of said line for free swinging movement about an axis parallel to the cylinder axis for providing for the body in the liquid an oscillating motion simulating the swimming of an aquatic creature which swims in an undulating manner.

4,055,019

CONSTRUCTIONAL TOY AND ELEMENT THEREFOR

Edward Henry Harvey, The Verne, Moor Common, Lane End, Buckinghamshire, England

Filed Jan. 19, 1973, Ser. No. 325,056

Claims priority, application United Kingdom, Feb. 3, 1972, 5126/72; Mar. 16, 1972, 12422/72

Int. Cl.² A63H 33/08

U.S. Cl. 46-30

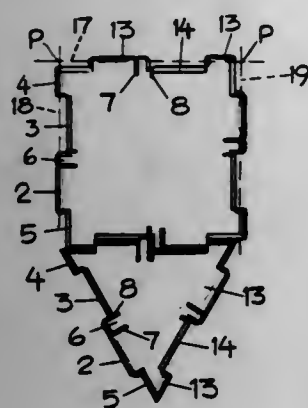
13 Claims

1. A substantially planar element for use in building-up a structure by hingedly and detachably connecting a plurality of such elements in edge-to-edge relationship, wherein

a. said element is of geometric shape having two margins at an angle to each other,

b. each said margin is formed with first and second projec-

- tions spaced apart by a recess of substantially the same width as one of the projections,
- the first projection is substantially at an end of the margin,
 - the second projection is spaced from the other end of that margin by a further recess, the width of which is substantially equal to the width of said first projection,
 - an end face of one projection is formed with a recessed hinge socket in the shape of a portion of a sphere,
 - an end face of the other projection is formed with a shallow protruding hinge pip also in the form of a portion of a sphere to mate with said socket,
 - the two recesses are adapted to receive and mate with the two projections of a complementary margin of another such element,
 - the arrangement is such that, in said mating, the hinge pip of each element can be sprung into the hinge socket of the other element,



- an end face of one of the projections is an abutment face mateable with an identical abutment face of another such element in a plane essentially perpendicular to the said margin, said abutment face located along said margin between said socket and said pip, and
- said projection having the abutment face including means for providing sufficient resiliency therein to maintain the hinge pip of each element in the hinge socket of the other element and to permit removal of both hinge pips from their respective sockets by resiliently moving the elements to move the abutment faces toward one another, said means for providing resiliency including a slot formed in one of the projections of each margin, providing a resilient tongue which, in said mating, allows the hinge pip of each element to be sprung into the hinge socket of the other element.

4,055,020

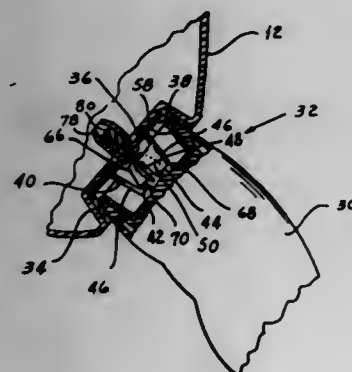
GAS-FILLED RESILIENT DOLL WITH MOVABLE HEAD AND LIMBS

Witold W. Kosicki, Columbia, and Charles M. Hollingsworth, West Columbia, both of S.C., assignors to Horsman Dolls Inc., Columbia, S.C.

Filed Mar. 22, 1976, Ser. No. 669,290
Int. Cl.² A63H 3/06, 3/46

U.S. Cl. 46-161

6 Claims



- In a doll assembly including a sealed, gas-filled hollow

body member formed by a soft and pliable gas-impervious skin, a joint member receiving recess in said skin, said recess having a wall including side and bottom portions and being formed with an opening in said wall for admitting gas under pressure into said body member, sealing means in said opening for sealing against the sides of said opening to retain gas under pressure in said body member, means for joining said body member to another part of said doll including a joint member formed of relatively rigid material, and means mounting said joint member in said recess over said sealing means.

4,055,021

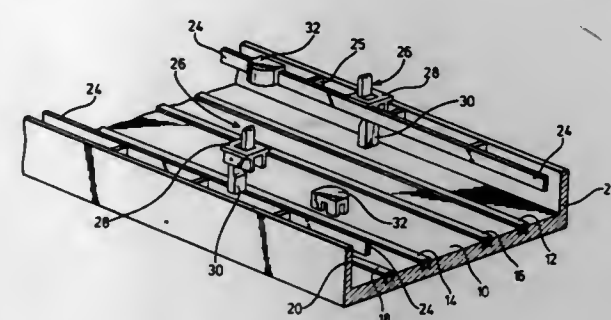
TOY CAR RACER WITH SELF-STEERING MECHANISM

Shozo Okamoto, Tokyo, Japan, assignor to Yonezawa Toys Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 676,797
Claims priority, application Japan, Apr. 18, 1975, 50-52760
Int. Cl.² A63H 18/16

U.S. Cl. 46-202

8 Claims



- A toy car racer in combination with a roadbed on which said toy car racer travels in random contacts with upright side guide walls provided along opposite marginal sides of the roadbed, the racer having a pair of driven wheels and a pair of steerable wheels, a slider mounted on the racer for sliding movement lengthwise of the racer to a rearwardly extended position in which said slider may be contacted by another racer from behind, and means interconnecting said slider and said steerable wheels to swing said steerable wheels upon forward sliding movement of said slider.

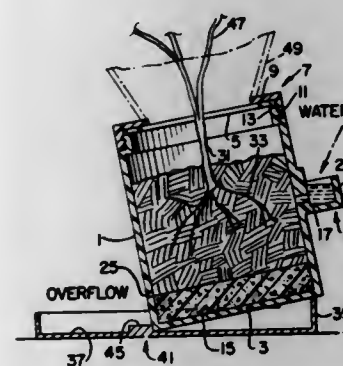
4,055,022
PLANTER

Sylvester J. Rowe, 1505 N. Pulaski, Chicago, Ill. 60651
Filed July 8, 1976, Ser. No. 703,521

Int. Cl.² A01G 38/00

U.S. Cl. 47-79

3 Claims



- Means to support a planter in a tilted position during the watering thereof, said means being independent of the planter during the watering operation, including in combination, a planter having a bottom and an upstanding wall fixed thereto, and structure provided on said means to support and raise a portion of the bottom and upstanding wall of the planter during the watering operation, a portion of the bottom of said planter adjacent the edge thereof being supported in raised position on said structure, the opposite portion of the bottom of

said planter resting on said means in position spaced from said structure and in a horizontal plane below said portion of the bottom of the planter which is supported on said structure, and said planter having a water intake opening in the raised portion of the upstanding wall of said planter and a water outlet opening in the opposite upstanding wall portion of said planter, said water outlet opening being oppositely disposed relative to said water inlet opening and being in a horizontal plane below the water inlet opening.

4,055,023

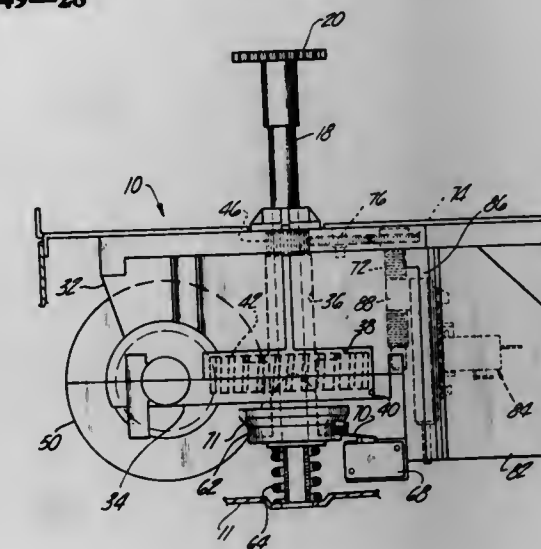
DOOR OPERATOR WITH INSTANT REVERSE FEATURE

Geoffrey H. Gatland, Walled Lake, Mich., and Kenneth L. Robitaille, Windsor, Canada, assignors to Vemco Products, Inc., Detroit, Mich.

Filed June 6, 1975, Ser. No. 584,620
Int. Cl.² E05F 15/12

U.S. Cl. 49-28

14 Claims



- In a door operator: a motor for moving the door between up and down limits; an operator body; an output shaft supported by said body for rotation relative thereto; means operated by said shaft for mechanical connection to the door to move the door as the shaft rotates; a first cam element non-rotatably disposed on the shaft and spaced from the operator body; a second cam element loosely rotatably disposed on the shaft for at least limited rotation relative thereto between the first cam element and the operator body and bearing against the operator body; drive means connecting the motor to the second cam element, said first and second cam elements being urged into complementary contact with one another to form a torque coupling between the motor and the shaft capable of transmitting torques less than a predetermined value and responsive to torques in excess of said value to cause said cam elements to slip relative to one another and to cause axial shift of the first cam element away from the second element and the body; and means carried by the body responsive to the axial shift of said first element to alter the operation of said motor, the operator further including limit means carried by the body for establishing said up and down limits of door travel, the limit means comprising a threaded shaft rotatably carried by the operator body, drive means connected between the second cam element and the threaded shaft to drive same, limit switch actuator means comprising traveler means threadably engaging the shaft and responsive to the rotation thereof to move axially therealong a distance related to shaft rotation, first and second switch means electrically connected to the motor for controlling actuation thereof in respectively opposite directions of rotation, said first and second switch means being arranged to be actuated by said traveler at respective positions thereof representing said limits of travel, said second cam element comprising an integrally molded worm wheel of first diameter and having peripheral teeth, a hollow cylindrical portion of second diameter less than the first extending axially from said worm wheel and terminating in a second peripher-

4,055,024

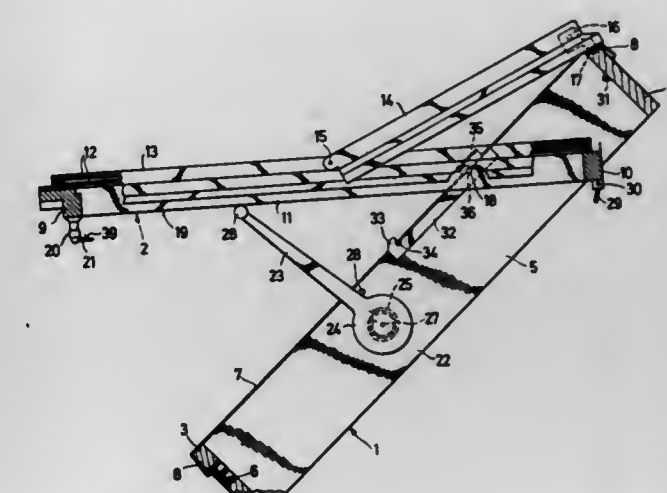
ROOF WINDOW ARRANGEMENT

Wilhelm Frank, Leinfelden, Germany, assignor to Wilh. Frank GmbH, Leinfelden, Germany

Filed May 3, 1976, Ser. No. 682,335
Claims priority, application Germany, May 3, 1975, 2519856
Int. Cl.² E05D 15/48

U.S. Cl. 49-153

12 Claims



- A window arrangement comprising:
 - a frame including a plurality of members jointly bounding an opening in said frame,
 - one of said members extending horizontally in the normal, installed condition of said frame, and
 - two other members extending downward from said one member in said condition and being separated by said opening;
 - a casement movable toward and away from a closing position in which said casement closes said opening;
 - elongated link means having a first end portion fastened to said frame for pivotal movement of said link means about a first axis fixed relative to said link means and to said frame, said first axis being adjacent said one member, said link means having a second end portion fastened to said casement for pivotal movement of said casement relative to said link means about a second axis spaced from said first axis and remote from said one member and parallel to said first axis, said second axis being fixed relative to said casement and to said links;
 - locking means for locking said casement to said link means for joint movement of said casement with said link means about said first axis toward and away from said closing position of said casement; and
 - two slide members on said casement respectively engaging said two other members of said frame for sliding movement on the engaged slide members toward and away from said one member during said pivotal movement of said casement about said second axis while said link means pivots about said first axis, said slide members abuttingly engaging said two members in said closing position of the casement and moving away from said two members during said joint movement of the casement away from said closing position.

4,055,025

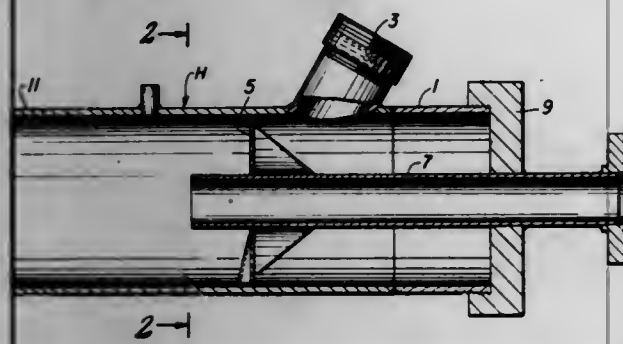
APPARATUS FOR IMPROVED CLEANING OF PIPELINE INLETS

Ray Bruce Seese, Conroe, and Bela Lee Watson, San Leon, both of Tex., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,601
Int. Cl.² B24C 3/04, 5/00

U.S. Cl. 51—411

3 Claims



1. An injection head for introducing an abrasive laden gas stream into a pipeline to be cleaned so as to improve the cleaning at the inlet of such pipeline comprising: a tubular head member having an inlet end and an outlet end and adapted at its outlet end to be secured to the inlet end of the pipeline to be cleaned; a gas inlet provided in the outer wall of said head member for introducing gas into said head in a radial direction so as to impact a swirling action to the gas; a quick connect closure member at the inlet end of said head member; a circular baffle plate of essentially the same diameter as the I.D. of the head member located in said head member downstream of the point of introduction of gas into said head member, said baffle plate being provided with a central opening surrounded by a plurality of vanes formed for directing gas passing through said vanes spirally to the head member walls and having a flow area equivalent to the flow area of the gas inlet; a single abrasive injection line passing through said closure member and said central opening in said baffle plate and extending beyond the baffle plate so that abrasive material is introduced into the head member downstream of said baffle plate, said injection line being secured to the baffle plate and the closure member so that the injection line and baffle plate may be removed as a unit with said closure member.

4,055,026

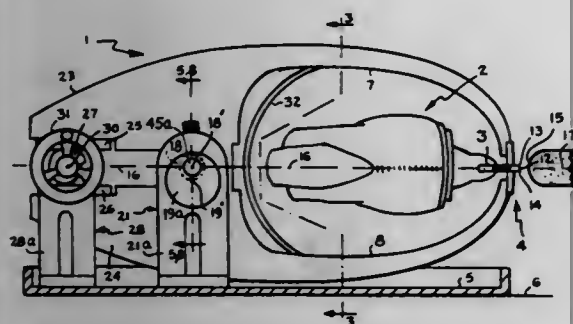
CLAMP FOR HOLDING ICE SKATE WHILE GRINDING BLADE

Homer A. Zwicker, Wing Road, Westford, Mass. 01886

Filed Dec. 30, 1974, Ser. No. 537,353
Int. Cl.² B24B 19/00

U.S. Cl. 51—228

8 Claims



1. A clamp for holding an ice skate by the skate blade while grinding the edge of the blade comprising, a base, first and second jaws, each pivotally attached to the base, means attached to the base for providing a pivot axle for both of said jaws, pivotally connecting the jaws together in spaced relationship to said base, opposed gripping ends of the jaws on one side of said pivot axle for holding the ice skate blade securely therebetween,

with the plane of the blade substantially parallel to the base, a yoke attached to the base at each end of the pivot axle, a disc eccentrically connected at each end of the pivot axle, the discs each being rotatably held by one of the yokes, rotatable on a common disc axis parallel to the axis of the axle, means for locking said discs in position in said yokes and means at the other side of said pivot axle for pivoting said jaws in opposite directions with respect to the base, whereby the gripping ends of the jaws close and grip the ice skate blade therebetween in readiness for grinding.

4,055,027

METHOD AND RELATIVE DEVICE FOR CHECKING THE WORKING CONDITIONS DURING THE GRINDING IN CENTERLESS GRINDERS

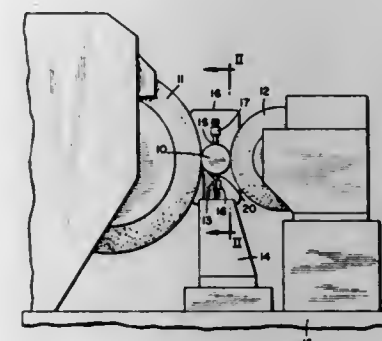
Tomaso Freddi, Bologna, Italy, assignor to Finike Italiana Marposs Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

Filed Feb. 11, 1974, Ser. No. 441,287

Claims priority, application Italy, Feb. 9, 1973, 3326/73
Int. Cl.² B24B 41/06

U.S. Cl. 51—238 GG

7 Claims



4. A device for checking the working conditions during the machining in centerless grinders in which the workpiece being machined is supported and driven in rotation on a surface of support means, comprising:

a measuring gauge head including a first movable arm coupled to a first position transducer and a second movable arm coupled to a second position transducer, the gauge being located in a position to keep said first arm in cooperation with the workpiece surface at a point close to said support means and to keep said second arm in cooperation with the workpiece surface at a point opposed to the preceding point;

gauge circuits connected to said first and second position transducers and including a first circuit for processing the signals of both the transducers to provide a signal responsive to the diameter of the workpiece and a second circuit connected to the first transducer to provide a signal responsive to the position of said support means surface.

4,055,028

REPLACEABLE, ONE PIECE, HINGE-TYPE, SLOT-ENGAGING PACK UNIT

James A. Belanger, Northville, Mich., assignor to Belanger, Inc., Northville, Mich.

Filed Apr. 28, 1976, Ser. No. 680,838
Int. Cl.² B24D 13/06

U.S. Cl. 51—334

26 Claims

1. A pack unit adapted to be replaceably mounted to a support structure having a quasi-cylindrical, key-hole-type, slot-defining means disposed parallel to the longitudinal axis of the support structure, the slot having a generally cylindrical inner portion opening radially outwardly through a restricted neck portion, said pack unit comprising a substantially solid, elongated,

gated, head-forming and pack reinforcing support element made from a resiliently firm yet flexible plastic material, said support element including a generally cylindrical, solid, bulb-like portion having a single, substantially flat, integral, solid fin portion of rectangular configuration extending radially outwardly therefrom, a first sheet of generally flexible material having one portion looped tightly over said elongated support element so as to conform closely to the contours thereof and a second portion extending outwardly from said support element, said looped portion having a first section closely overlying said bulb-like portion and second and third sections integrally contiguous with the respective opposite ends of said first section tightly overlying corresponding opposite sides of said

greater than said breadth; an abrasive layer on said upper scrubbing surfaces of said protuberances, said abrasive layer includes a particulate abrasive embedded in an adhesive.

4,055,030

GREENHOUSE

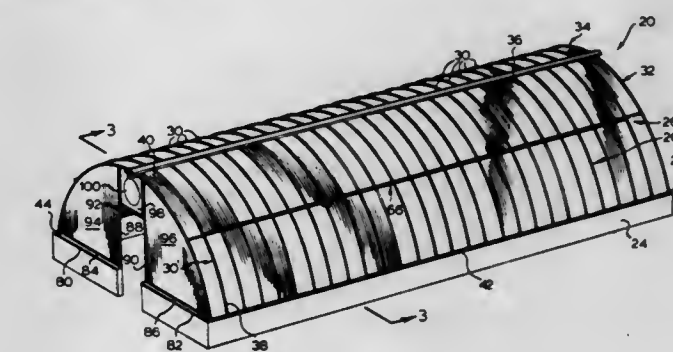
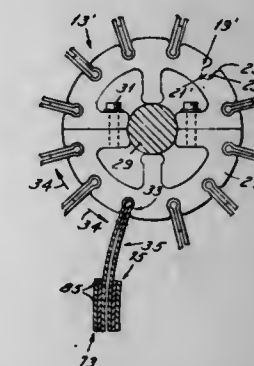
William Ferguson Earnshaw, Regina, Canada, assignor to Earnshaw Enterprises Ltd., Regina, Canada

Filed Apr. 26, 1976, Ser. No. 680,019

Claims priority, application Canada, Apr. 29, 1975, 226003
Int. Cl.² E04B 1/32, 1/00

U.S. Cl. 52—86

6 Claims



fin portion, fastening means extending completely through said second and third sections of the first portion of said first sheet and the fin portion of said support element for securing the looped portion of said first sheet to said elongated support element to prevent relative sliding movement therebetween and forming a generally cylindrical, flexible material covered, bulbous head and neck portion of said pack unit which is adapted to be telescopically received within said support slot for replaceably mounting said pack unit thereto, and a flap-like unit of finishing material having an inner portion adapted to be secured to the second portion of said first sheet and an outer portion adapted to engage a workpiece for performing a finishing operation thereon.

4,055,029

CLEANING, SCOURING AND/OR POLISHING PADS

Heinz Kalbow, Liechasse 46, D-5330 Königswinter-Stieldorf, Germany

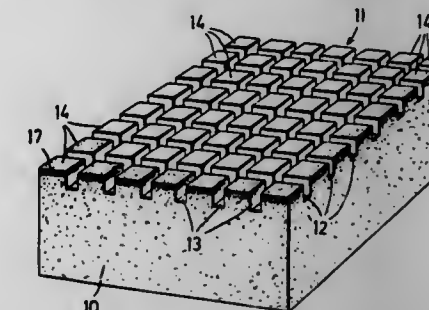
Filed Mar. 1, 1976, Ser. No. 662,349

Claims priority, application Germany, Mar. 7, 1975, 7507155[U]

Int. Cl.² B24D 15/04

U.S. Cl. 51—395

5 Claims



1. In a cleaning or polishing pad comprising a pliable flexible plastic body having open cells and a scrubbing surface, the improvement comprising: a plurality of protuberances on said scrubbing surface, each of said protuberances being defined by peripheral surfaces generally perpendicular to and forming generally sharp edges with an upper scrubbing surface of said protuberance; said sharp edges have given dimensions and said protuberances have a given height, with said dimensions being substantially greater than said height; said surface includes grooves between adjacent protuberances, each of said grooves having a depth and a breadth, said depth being substantially

1. A greenhouse which defines an enclosed growing area and which includes a structure covering said area, the structure comprising:

an external framework of convex shape in transverse vertical cross-section, the framework including: a plurality of curved members extending transversely of the structure in parallel longitudinally spaced positions and forming rafters of the structure, said rafters being arranged in two series extending along opposite sides of the structure and meeting at a longitudinal ridge area of the structure; a plurality of parallel elongate members extending longitudinally of the structure, the inner ends of the rafters in each of said series being coupled to one of said elongate members at said ridge area of the structure, and the outer ends of the rafters in each series being coupled to a further one of said elongate members at an outer side of the structure; and a capping element disposed at said ridge area of the structure and arranged to prevent ingress of moisture between the elongate members in said area; and,

a plurality of flexible light-transmitting panels arranged to form a covering inside the framework, said elongate members at the inner and outer ends of the rafters of each series defining opposed locating surfaces for respectively opposite ends of said panels, and each panel being fitted to the framework in a tensioned condition in which the panel bears against the inner sides of at least some of said rafters in the relevant one of said series, with its ends braced against the locating surfaces of said elongate members.

4,055,031

GASKET CONSTRUCTION

Taro Okawa, Tokyo, and Hideichi Takeda, Ichikawa, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 678,952

Claims priority, application Japan, Apr. 22, 1975, 50-54796; June 25, 1975, 50-89925

Int. Cl.² E04C 2/34

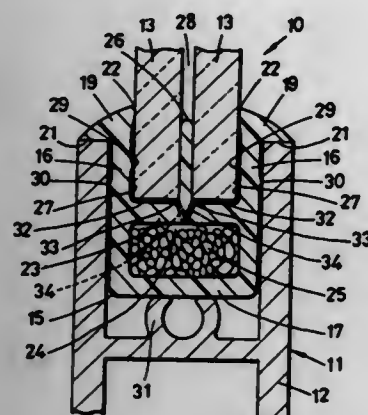
U.S. Cl. 52—172

7 Claims

1. A gasket construction for mounting a plurality of panel members within a rigid frame, said gasket construction comprising:

A one-piece flexible body having a pair of parallel spaced opposed sidewalls, and a peripheral wall interconnecting said sidewalls to define a continuous channel of substantially U-shaped cross-section, said flexible body having a partition wall extending transversely between said sidewalls in spaced apart substantially parallel relationship to

said peripheral wall to form a continuous opening for receiving dessicant, at least one peripheral spacer wall section extending integrally from said partition wall in parallel spaced relation to said sidewalls, so that a plurality of continuous peripheral grooves are provided for receiv-



ing the panel members in parallel closely spaced planes with an enclosed space formed therebetween, and passage means in said partition wall and said spacer wall section for communicating said continuous opening with the enclosed space.

4,055,032

PROCESS FOR FORMING SEALED LIQUID FILLED BAGS

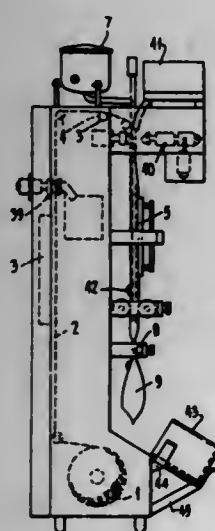
Michael George Ridler Hammond, Brunswick, Australia, assignor to A.C.I. Operations Pty. Ltd., Victoria, Australia
Continuation of Ser. No. 533,162, Dec. 16, 1974, abandoned.
This application Oct. 4, 1976, Ser. No. 728,914

Claims priority, application Australia, Dec. 20, 1973, 6063/73; May 24, 1974, 7655/74

Int. Cl.² B65B 9/12, 55/08, 61/00

U.S. Cl. 53—14

5 Claims



1. A process for continuously forming sealed liquid filled dispenser bags in a high speed automated operation from an elongate web of heat sealable plastics material comprising:
 - i. punching holes in said web along the length thereof at predetermined spaced intervals;
 - ii. orienting a plurality of dispensing closures relative to an orifice provided therein;
 - iii. feeding the dispensing closures in single file to a pick up position while maintaining said dispensing closures in said oriented configuration, said dispensing closures comprising attachment means having a spout with an annular flange, a diaphragm member mounted on said attachment means, said diaphragm member being manually deformable to allow flow of liquid through said spout and out of the orifice in said dispensing closure;
 - iv. moving dispensing closures singly from said pick up position into registry with each of said holes in said web such that a spout protrudes through each hole and the

- respective flange is brought into contact with the web immediately surrounding the respective hole;
- v. heat sealing each flange to said web;
- vi. forming said web into an upwardly directed tube by folding the web upon itself and heat sealing the overlapped portion formed thereby, whereby each flange which has been heat sealed to said web is disposed in the interior of said tube;
- vii. transversely sealing a portion of said tube;
- viii. separating the upper and lower portions of said tube at said heat seal during said heat sealing of said tube portion;
- ix. dispensing a metered amount of liquid into said upper tube portion;
- x. moving said upper tube portion containing liquid downwards; and
- xi. repeating steps (vii) and (viii) to form a sealed liquid filled bag having a dispensing closure secured thereto which is separated from said tube and an upper tube portion which is arranged to receive a further metered amount of liquid.

4,055,033

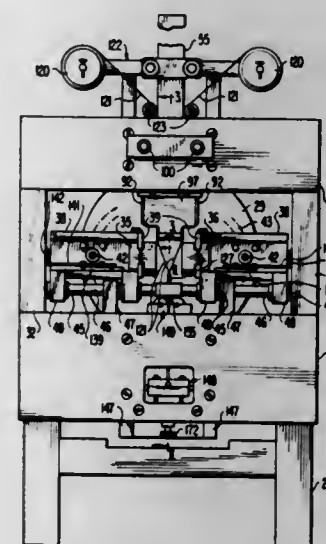
CAM OPERATED COMPRESSION MOLDING APPARATUS

Buford C. Garrett, 412 Brook Glenn Road, Taylors, S.C. 29687
Filed Dec. 20, 1976, Ser. No. 752,095

Int. Cl.² B65B 11/50, 63/02

U.S. Cl. 53—122

32 Claims



1. A molding apparatus comprising supporting means, a horizontal axis rotary cam plate on the supporting means, power drive means connected with said cam plate to rotate it at a predetermined speed of rotation, a pair of oppositely simultaneously oppositely horizontally movable mold halves on the supporting means, cam follower means connected with the mold halves and said cam plate whereby the latter directly drives the mold halves, a vertical moldable stock magazine on the supporting means at the center of the apparatus in relation to an inward molding position of said mold halves, horizontal movement means on the supporting means including a knife to cut off pieces of stock in the magazine near the lower end thereof, mechanism on the supporting means for converting rotational movement of said cam plate into horizontal reciprocatory motion of said horizontal movement means and including a cam follower driven by said cam plate, a vertically movable carrier having guided engagement with the supporting means and including a cam follower driven by said cam plate, mold charging and stock advancing means on said carrier and being vertically movable therewith and also adapted to shift horizontally in opposite directions relative to said carrier, a horizontal movement connection between said mold charging and stock advancing means and said horizontal movement means whereby horizontal movements of the latter can cause corresponding movements of the former in the same directions of movement but at different speeds and for different distances, and said horizontal movement means including differential

drive means for said mold charging and stock advancing means. the sterilized air and any entrained sealing liquid from the compressor, separating the entrained liquid from the sterilized

4,055,034

APPARATUS FOR COMPRESSING AND PACKAGING STACKS OF FLAT SUPERPOSED SHEET ARTICLES

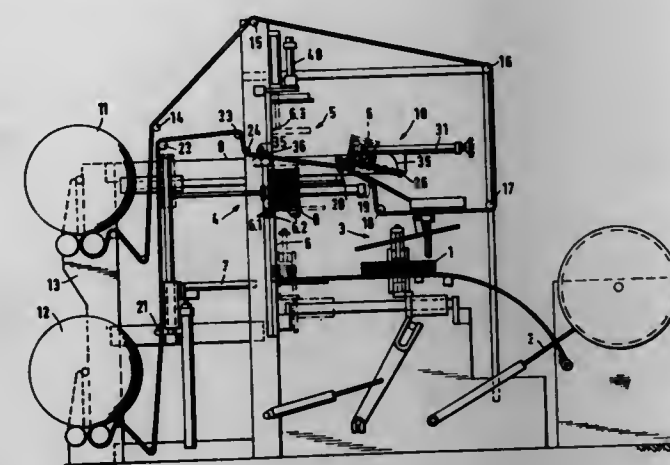
Friedhelm Brinkmeier, Ladbergen, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

Filed Feb. 7, 1977, Ser. No. 766,182

Int. Cl.² B65B 63/02

U.S. Cl. 53—124 C

6 Claims



1. Apparatus for compressing and packaging stacks of flat superposed sheet articles, comprising a pressure chamber having an inlet aperture, said stacks being successively insertable in said pressure chamber through said inlet aperture, a vertically reciprocable pressure ram for lifting each stack into said pressure chamber and pressing same against a removable backing member at the top of said chamber, means for spanning packaging film across said inlet aperture whereby said film is carried into said pressure chamber together with each lifted stack to cover the top and two sides of said stack, a transversely reciprocable push member disposed with one end adjacent said inlet aperture of said pressure chamber for covering the underside of said stack with said film on a forward stroke, whereby to envelop said stack with said film, said ram being laterally retractable along said underside as said push member executes said forward stroke, whereby said enveloped stack is supported by said push member on termination of said forward stroke, welding means for joining the ends of said enveloping film to form a sleeve upon termination of said forward stroke, said push member comprising a frame and a plurality of parallel rollers freely rotatably mounted in said frame, and means for lowering the other end of said push member during or after its return stroke, whereby said push member additionally acts as a roller ramp for withdrawing the enveloped stack supported thereby.

4,055,035

METHOD AND AN ARRANGEMENT FOR THE PURIFICATION OF AIR IN PACKING MACHINES

Uno Roland Sjöstrand, Flyinge, and Göran Karl Nils Johansson, Harlosa, both of Sweden; assignors to AB Ziristor, Lund, Sweden

Filed Mar. 25, 1976, Ser. No. 670,367

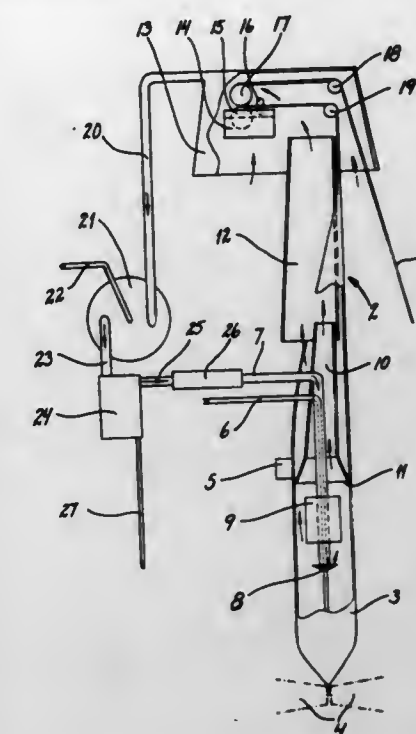
Claims priority, application Sweden, Apr. 7, 1975, 7503934

Int. Cl.² B65B 55/12

U.S. Cl. 53—167

2 Claims

1. A method for the purification of air mixed with a sterilizing agent in a machine for the manufacture of sterile packages in which a web of packaging material is sterilized by a sterilizing agent in vapor or liquid form comprising the steps of removing sterilized air mixed with a sterilizing agent from the packaging machine, supplying the sterilized air mixed with the sterilizing agent to a liquid sealed centrifugal compressor, mixing the sterilizing agent with the sealing liquid of the compressor while separating the sterilized air therefrom, removing



air and returning the sterilized air to the packaging machine for reuse.

4,055,036

MULTIPLE SPINDLE ROTARY MOWER

Earl H. Kidd, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

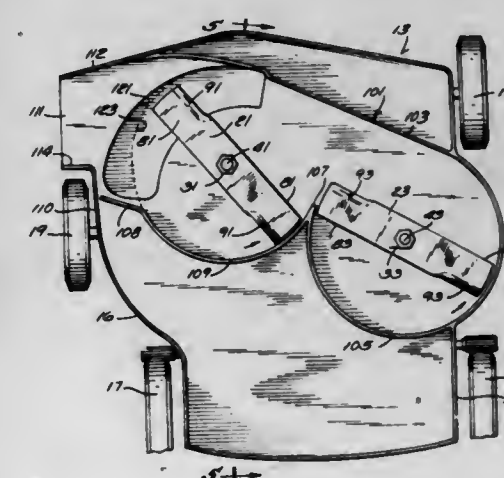
Continuation of Ser. No. 555,964, March 6, 1975, abandoned.

This application Aug. 26, 1976, Ser. No. 718,097

Int. Cl.² A01D 35/264

U.S. Cl. 56—13.6

24 Claims



1. A rotary lawn mower comprising a blade housing, means supporting said blade housing for travel in a forward direction in adjacent relation to the ground, a first rotary cutter blade supported for rotation within said blade housing about a forwardly located axis, and a second rotary cutter blade supported for rotation within said blade housing about an axis located in laterally rearwardly offset relation from said rotary axis of said forwardly located first cutter blade, said blade housing further including a grass clipping discharge outlet located, at least in part, forwardly of said rotary axis of said forwardly located first cutter blade, and diametrically opposite with respect to said rotary axis of said forwardly located first cutter blade from said rotary axis of said rearwardly located second cutter blade, and in adjacent relation to the rotary path of said forwardly located first cutter blade for discharging from said blade housing grass clippings delivered solely from said forwardly located first cutter blade, said blade housing further including a depending wall including a generally

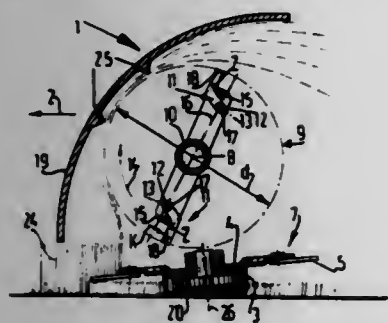
straight portion extending in adjacent relation to a tangent extending from the peripheries of the rotary paths of said cutter blades, a first arcuate portion merging with said straight portion and extending in the direction counter to the direction of rotation of said rearwardly located second cutter blade, whereby the grass clippings cut by said rearwardly located second cutter blade are delivered to the path of the forwardly located first cutter blade adjacent to said depending wall straight portion, and a second arcuate portion extending in adjacent relation to the rotary path of said forwardly located first cutter blade from said first arcuate portion in the direction counter to the direction of rotation of said forwardly located first cutter blade, whereby the grass clippings cut by said forwardly located first cutter blade and the grass clippings delivered to the path of the forwardly located first cutter blade from the rearwardly located second cutter blade are delivered from said blade housing through said discharge outlet.

4,055,037 MOWING DEVICE

Pieter Adriaan Oosterling, and Hendricus Cornelis van Stavereen, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B. V., Nieuw-Vennep, Netherlands
Filed Dec. 29, 1975, Ser. No. 644,861
Claims priority, application Netherlands, Jan. 13, 1975, 7500343

Int. Cl.² A01D 84/00

U.S. Cl. 56—16.4

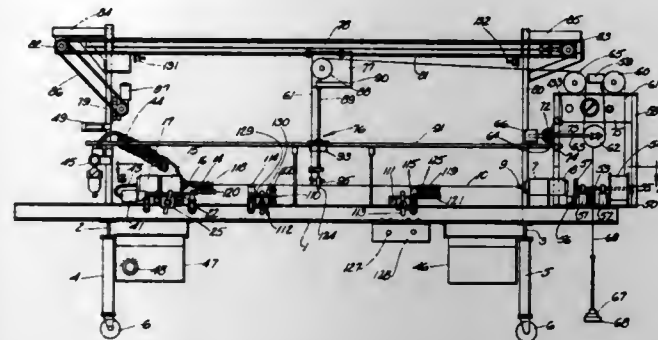


1. A mowing device comprising in combination: a frame adapted to be moved over the ground; cutter means carried by said frame for cutting a crop swath; and crop transporting means disposed above said cutter means for engaging and transporting cut crop rearwardly with respect to the direction in which said frame is moved over the ground, said crop transport means comprising a rotor journaled about a substantially horizontal axis transverse to said direction of frame movement; a plurality of crop-engaging members; pivot means pivotally connecting said crop-engaging members individually to said rotor so that said crop-engaging members are rotated by said rotor in generally vertical side-by-side planes extending in said direction of movement and are rotated about said pivot means by centrifugal force toward positions in which the centers of gravity of said crop-engaging members lie in a radial plane containing said substantially horizontal axis and the axis of said pivot means; and stop means, carried by said rotor and disposed in the path of rotation of said crop-engaging members about said pivot means, for individually preventing the crop-engaging members from reaching said positions, whereby said centers of gravity lie behind said radial plane and the paths swept by those portions of the crop-engaging members most remote from said pivot means are in predetermined spaced relation to said cutter means.

4,055,038 APPARATUS FOR WRAPPING STRINGS FOR MUSICAL INSTRUMENTS

Harold A. Conklin, Jr., Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio
Filed Mar. 1, 1976, Ser. No. 662,610
Int. Cl.² B65H 81/06; G10D 3/10
U.S. Cl. 57—11

37 Claims



1. In apparatus for applying a wrapping wire to a core wire, an elongated track member, a first head mounted toward one end of said track member, a second head mounted for movement lengthwise of said track member toward and away from said first head, means for releasably securing said second head in predetermined fixed position relative to said first head, a shaft rotatably journaled in each of said heads, said shafts facing each other and being in axial alignment, means for rotating said shafts in unison, means on said shafts for connecting the opposite ends of a core wire thereto, means associated with one of said heads for placing the core wire under tension, means for feeding a wrapping wire into contact with the core wire, adjustable means for establishing a predetermined approach angle at which the wrapping wire is fed into contact with the core wire, means for advancing said wrapping wire feeding means lengthwise of said track in timed relation to the formation of convolutions of wrapping wire around the core wire as the latter is rotated, means for applying a predetermined uniform tension to the wrapping wire as it is fed into contact with the core wire, and control means for rotating said shafts through a desired number of revolutions to form a like number of convolutions of wrapping wire on the core wire.

4,055,039 APPARATUS FOR OBTAINING SELF-TWISTED PRODUCT

Pavel Mikhailovich Movshovich, Pechatnikov pereulok, 3, kv. 8; Gennady Konstantinovich Maximov, Kaspiiskaya ulitsa, 20, korpus, 3, kv. 137, both of Moscow; Viktor Pavlovich Khavkin, Khimki, ulitsa Valutina, 11, kv. 4, Moskovskaya oblast; Lev Nikolaevich Ivanov, Kotelnicheskaya naberezhnaya 25/8, kv. 74, Moscow; Natalya Borisovna Babushkina, Chasovaya ulitsa, 5b, kv. 15, Moscow; Vladimir Konstantinovich Afanasiev, Galyanovsky proezd, 4a, kv. 219, Moscow; Tamara Nikolaevna Kudryavtseva, Davydovskaya ulitsa, 6, kv. 5, Moscow, and Sergei Vladimirovich Nezelenov, Kineshemskoe shosse, 8a, kv. 6, Kostroma, all of U.S.S.R.

Filed July 21, 1976, Ser. No. 707,212

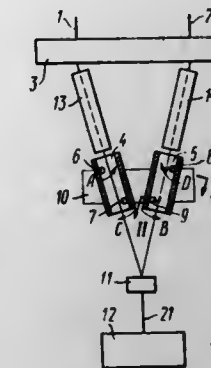
Claims priority, application U.S.S.R., July 29, 1975, 2164973
Int. Cl.² D02G 3/28

U.S. Cl. 57—34 AT

7 Claims

1. An apparatus for obtaining a self-twisted product from at least two strands, comprising: a plurality of swirl chambers, each having an inlet end and an outlet end; a mechanism for continuously feeding respective strands into said plurality of swirl chambers; at least two jet passages in each said swirl chamber, adapted to alternately produce in this chamber air swirls of opposite directions effecting the twisting of a respective strand; said jet passages in each said swirl chamber being relatively equally displaced longitudinally of this chamber; in each pair of the adjacent ones of said plurality of swirl chambers respective jet passages producing the air swirls of the

same direction being arranged one at the inlet end of its respective swirl chamber and the other one at the outlet end of its respective swirl chamber; an arrangement for supplying air



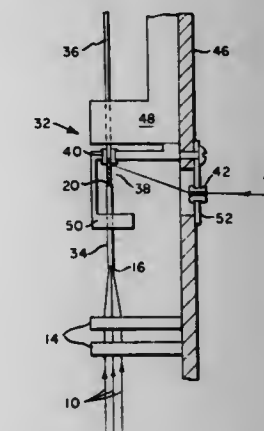
alternately into said jet passages to produce the air swirls; a device for uniting the strands issuing from said swirl chambers to form the product; a mechanism for winding this product.

4,055,040 ALTERNATELY TWISTED YARN ASSEMBLY AND METHOD FOR MAKING

Perry Han-Cheng Lin, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 13, 1976, Ser. No. 676,423
Int. Cl.² D02G 3/28, 3/38

U.S. Cl. 57—140 BY

13 Claims



1. In the method for making an alternate-twist, plied yarn including applying false-twist as alternate S and Z regions of twist repeatedly throughout the lengths of at least two, primary, separated, multifilament, textile strands, said regions of twist being separated by nodes of zero twist, converging the false-twisted strands without snubbing immediately downstream of the point at which the twist is applied, and snubbing the converged strands at a point downstream of the twisting point a distance less than the distance between nodes and greater than one-half the distance between nodes, and permitting the twisted regions of the converged strands to partially untwist and to ply-twist with one another while constraining the untwisting of the strands in the plying zone sufficiently to slow down but not prevent untwisting and plying of the strands, the improved method for incorporating a secondary strand into the plied yarn comprising converging a secondary strand with the primary strands at a point in the constrained, plying zone downstream of the convergence point of the primary strands, and permitting the secondary strand to ply with and alternately twist around the primary strands.

12. An improved unitary, twist-stable yarn including a plurality of alternately-twisted, multifilament strands which are plied about one another by alternating S and Z regions of twist repeatedly throughout the length of the yarn, each of the S and Z regions comprising at least two primary strand segments whose direction of twist is opposite to that of the region, and with zero twist nodes between each S and Z region, wherein the improvement comprises a secondary strand plied with and alternately-twisted around the primary strands, the node inter-

val of the secondary strand being substantially the same as that of the primary strands, the nodes of the secondary strand being displaced with respect to the nodes of the primary strands, and the twist level between nodes for the secondary strand being less than that of the primary strands and wherein the primary strands are bulked, continuous filament, carpet yarns and the secondary strand is antistatic and at least some of the secondary strand nodes are formed by wrapping of the secondary strand around only one of the primary strands in a portion of a primary node.

4,055,041 INTEGRATED GAS TURBINE ENGINE-NACELLE

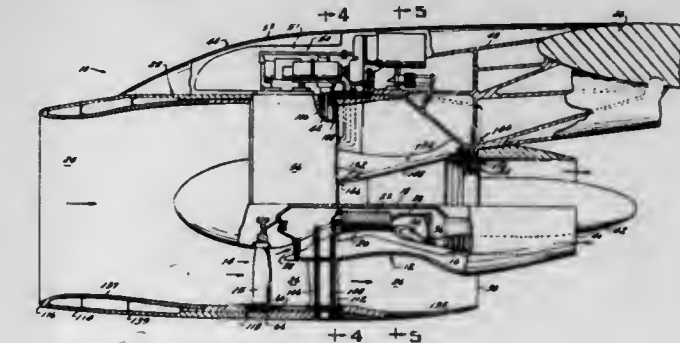
Arthur P. Adamson; Donald F. Sargisson, both of Cincinnati, and Charles L. Stotler, Jr., Fairfield, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 522,108, Nov. 8, 1974. This application Nov. 3, 1975, Ser. No. 628,221

Int. Cl.² F02C 7/20; F02K 3/04

U.S. Cl. 60—226 R

6 Claims



1. An integrated propulsion system comprising: a pylon; a gas turbofan engine including a core engine for rotatably driving a fan stage to pressurize a motive fluid, a fan bypass flow annulus generally circumscribing said core engine, a core engine inlet duct communicating with said bypass duct, a flow splitter for separating the fan motive fluid into a bypass portion and a core engine portion, an integral composite frame having first and second generally concentric hoop means of bonded composite filament fabrication interconnected by generally radially extending outer struts of composite filament fabrication bonded thereto, said first hoop means substantially spanning said flow splitter and said second hoop means sandwiched between inner and outer walls of composite filament fabrication bonded thereto, said inner wall defining an outer aerodynamic contour of the turbofan engine, and wherein said inner wall, said outer wall and said second hoop means form a shroud entirely supported in spacial relationship with said first hoop means through said outer struts; and mounting means connecting said first hoop means to said pylon.

4,055,042 BYPASS GAS TURBINE FAN EMPLOYING A STUB ROTOR STAGE AND A MAIN ROTOR STAGE

Rowan Herbert Colley, Sunnyhill, England, assignor to Rolls-Royce Limited, London, England
Filed July 8, 1976, Ser. No. 703,658

Claims priority, application United Kingdom, July 19, 1975, 30350/75

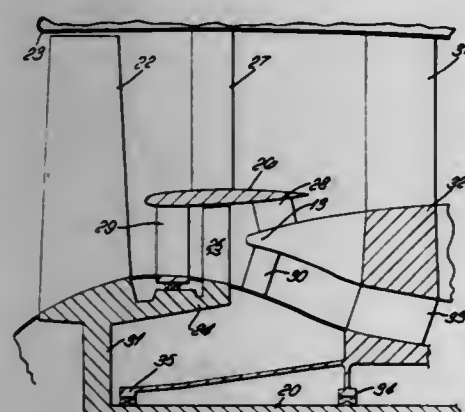
Int. Cl.² F02K 3/06

U.S. Cl. 60—226 R

5 Claims

1. A gas turbine engine comprising a core engine having an intake and having compressor

means, combustion chamber and turbine means in flow series;
 a fan upstream of said intake of said core engine and operatively driven by said core engine, said fan including at least one annular array of rotor blades defining a main rotor stage and a further annular array of rotor blades downstream of said main rotor stage and defining a stub rotor stage, said further annular array of rotor blades of said stub rotor stage having a smaller radial extent than said at least one annular array of rotor blades of said main rotor stage, said main rotor stage and said stub rotor stage each being adapted to compress air to form a main fan airflow and a stub stage airflow respectively;
 a first splitter ring extending around said stub rotor stage and defining an outer boundary of said stub stage airflow, said first splitter ring being arranged to divide said main airflow



of said main rotor stage into a first portion passing about the exterior of the same and a second portion passing through said stub stage rotor;
 a second splitter ring defined by an upstream end of said intake of said core engine, said second splitter ring being arranged to divide said stub stage airflow into a first portion which enters said core engine through said intake and a second portion which joins said first portion of said main fan airflow; and
 inner and outer stub stage outlet guide vanes extending respectively inwardly from said second splitter ring and outwardly of said second splitter ring to said first splitter ring, said inner and outer stub stage outlet guide vanes being adapted to give different degrees of deflection to said first and second portions of stub stage airflow respectively.

4,055,043 MANIFOLD REACTOR

Masam Konishi, and Kazumasa Futamura, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

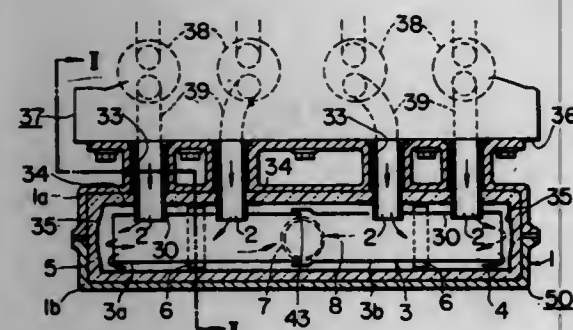
Filed Apr. 15, 1976, Ser. No. 677,376

Claims priority, application Japan, Nov. 11, 1975, 50-134708; Nov. 11, 1975, 50-134709

Int. Cl.² F01N 3/10

U.S. Cl. 60—282

8 Claims



1. In a manifold reactor for an internal combustion engine, the reactor including an inner core and an outer core of an

elongated cylindrical form, said inner core being concentrically placed within said outer core in spaced relation from the walls of said outer core both in the radial direction and in the axial direction and having open, opposite ends; exhaust gas intake pipes extending from engine cylinders through the walls of said outer and inner cores so as to open within said inner core; and at least one exhaust-gas discharge pipe, having one end open to an annular space defined between the wall of said outer core and the wall of said inner core; the improvements comprising:

at least two axially aligned cylindrical parts constituting said inner core, said parts having overlapping contiguous ends forming sliding air-tight connection between adjoining parts; and
 supporting members symmetrically spaced about said cylindrical parts of said inner core for independently securing each of said cylindrical parts of said inner core to the inner surface of said outer core.

4,055,044 ROCKET ENGINE CONSTRUCTION AND CONNECTION FOR CLOSED AND OPENED FLUID COOLING CIRCUITS FOR THE WALLS THEREOF

Helmut Dederra, Ottobrunn; Gunther Schmidt, Unterhaching, and Jürgen Stanke, Ottobrunn, all of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Germany

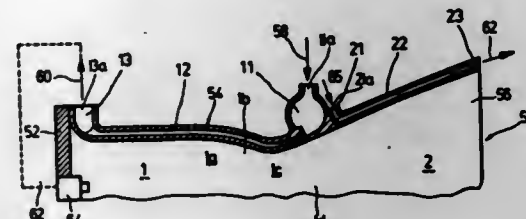
Filed Nov. 11, 1974, Ser. No. 522,990

Claims priority, application Germany, Nov. 13, 1973, 2356572

Int. Cl.² F02K 9/02, 11/02

U.S. Cl. 60—265

5 Claims



1. A fluid cooled rocket, comprising a tubular housing forming an interior combustion chamber having a closed end with an injector for injecting a propellant component into said combustion chamber and an opposite opened end forming a thrust gas discharge, said housing side walls defining an inwardly converging portion, a nozzle neck portion of smallest diameter, and an outwardly diverging portion extending from said closed end toward said gas discharge open end, said inwardly converging portion, said nozzle neck portion, and at least a part of said diverging portion having a first annular wall defining a first section with a plurality of circumferentially arranged longitudinally extending first cooling channels therein, a first inlet duct connected to said cooling channels adjacent the ends thereof which are toward the discharge open end, a first outlet duct connected to said cooling channels at the ends thereof adjacent said closed end and connected to said injector head for discharge into said combustion chamber, said first cooling channels and said first and second ducts being in a closed regenerative cooling fluid circuit, at least a portion of the remaining part of said diverging portion having second walls with a plurality of circumferentially arranged and longitudinally extending second cooling channels and defining a second section, means detachably connecting said second section to said first section, said second section being severable from said first section directly adjacent to said first inlet, said first section being constructed with said part of said diverging portion shaped to provide satisfactory operation for testing at atmospheric conditions on the ground, and said second detachable section having said at least a portion of the remaining part of said diverging portion shaped to provide the necessary divergence for vacuum operation, a second inlet connected to said second cooling channels at their ends thereof adjacent said closed end, the opposite ends of said cooling channels being

open to permit the discharge of the coolant in the general direction of the thrust gas discharge, said first and second inlets comprising a single annular connection duct having passage connections to said first cooling tubes and said second cooling tubes.

4,055,045

PORT LINER SUPPORT DEVICE

Kazumasa Futamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

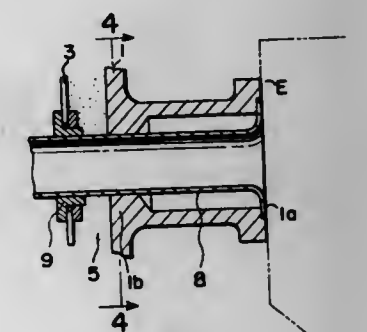
Filed Apr. 12, 1976, Ser. No. 676,205

Claims priority, application Japan, Aug. 15, 1975, 50-112920

Int. Cl.² F01N 3/10, 7/00

U.S. Cl. 60—322

5 Claims



1. In a manifold reactor comprising an outer shell having an exhaust gas inlet port therein, a sealing ring surrounding said inlet port, and a liner for said port leading into said reactor through said sealing ring, an improved support casing for said liner, which support casing is adapted to be connected at one end to a cylinder head fixture and comprises a projection on its inner surface between the cylinder head fixture and said sealing ring, which projection is adapted to fit against and support said liner.

4,055,046

CONTROL SYSTEM HAVING OVERRIDE FOR FLUID OPERATED WORK ELEMENTS

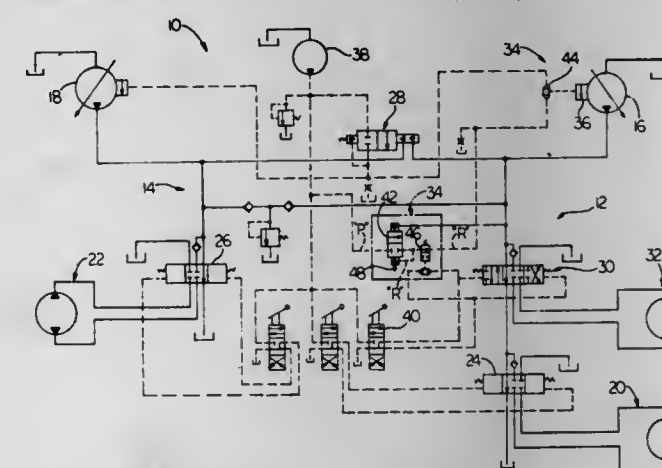
Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 22, 1976, Ser. No. 753,251

Int. Cl.² F15B 13/06, 13/09

U.S. Cl. 60—428

6 Claims



1. In a fluid system having first and second circuits each having a variable displacement pump serving respective first and second work elements through respective first and second directional control valves and being associated with a summing valve for controlling said pumps, the improvement comprising:

first means for controlling the output from the pump of one of the first or second circuits in response to a signal delivered from the summing valve during operation of the work elements of both circuits and for controlling the output of the said pump by a modified pilot pressure signal

in response to the operation of only the work element of the selected one of the first or second circuits.

4,055,047

SAFETY DEVICE FOR HYDRAULICALLY DRIVEN VEHICLES

Hideo Hara, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

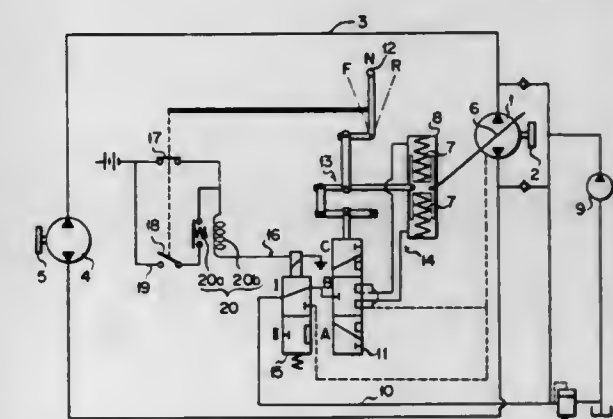
Filed July 29, 1976, Ser. No. 709,645

Claims priority, application Japan, July 29, 1975, 50-104125

Int. Cl.² F16H 39/46; F15B 20/00

U.S. Cl. 60—444

6 Claims



1. A safety device for hydraulically driven vehicles comprising a hydraulic motor for driving said vehicles, a variable displacement pump for supplying fluid under pressure to said motor, means for controlling displacement of said variable displacement pump, an additional pump for supplying fluid under pressure to said means, control lever means connected to said means for controlling forward and backward movements of said vehicles, valve means provided between said additional pump and said means for selectively communicating said means with said additional pump, and switching means connected to said control lever means to selectively open or close said valve means in response to the operation of said control lever means wherein said switching means is turned "ON" when said control lever means is at its neutral position and turned "OFF" when said control lever means is either at forward or backward movement position.

4,055,048

APPARATUS AND METHOD FOR SIDE STREAM DEMINERALIZATION OF CONDENSATE IN A STEAM CYCLE

Charles W. Reed, 5174 Brookside Lane, Concord, Calif. 94521

Filed Aug. 20, 1976, Ser. No. 716,319

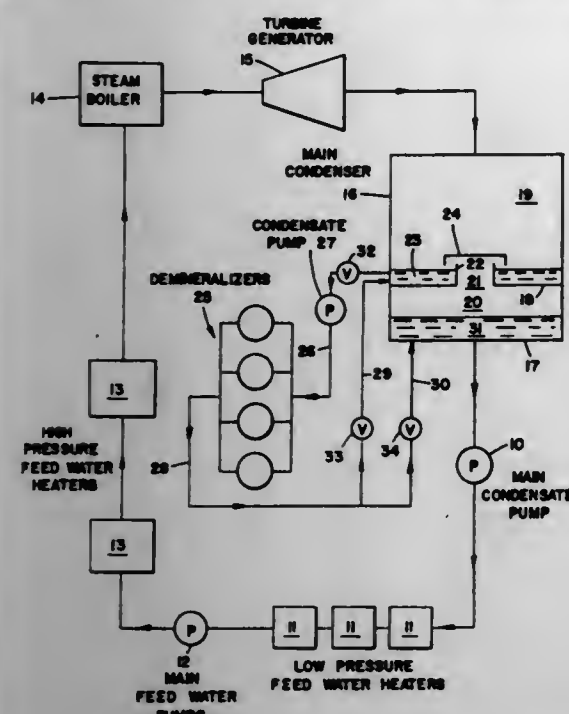
Int. Cl.² F01K 19/00

U.S. Cl. 60—646

10 Claims

1. In a power plant steam cycle having at least one main steam condenser with a hot well, a side stream condensate purification system for clean-up of the feed water comprising: divider means in said condenser disposed for separating condensate on a first side of said divider means from condensate on the second side of said divider means and in the hot well; a passageway through said divider means for flowing condensate from the first side thereof to the second side thereof and to said hot well; means for removing impurities from said feed water spaced from said condenser; first conduit means defining a fluid path from the first side of said divider means to said means for removing impurities; second conduit means defining

a fluid path from said means for removing impurities to the first side of said divider means; and third conduit means defining a



fluid path from said means for removing impurities to the second side of said divider means.

4,055,049 CONSTANT BOILING MIXTURES OF 1,2-DIFLUOROETHANE AND 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

Kevin P. Murphy, Orchard Park, and Richard F. Stahl, Hamburg, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 15, 1976, Ser. No. 750,758
Int. Cl.² C09K 5/04; F01K 25/06

U.S. Cl. 60—651

4 Claims

1. Constant boiling mixtures consisting essentially of about 43 weight percent of 1,2-difluoroethane and about 57 weight percent 1,1,2-trichlorotrifluoroethane.

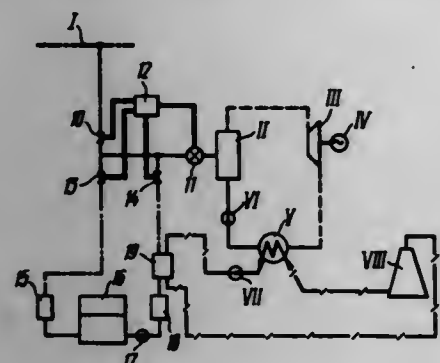
4,055,050 APPARATUS FOR AND METHOD OF REGASIFYING LIQUEFIED NATURAL GAS

Vladimir Borisovich Kozlov, ulitsa Butlerova, 2, korpus 2, kv. 134, Moscow, U.S.S.R.

Filed Feb. 11, 1976, Ser. No. 657,297
Int. Cl.² F01K 13/00

U.S. Cl. 60—692

6 Claims



1. A steam power plant comprising:
a boiler unit heatable by gas supplied from a pipeline for converting water into steam, at least part of the gas being storable as reserve liquefied gas;
a turbine powered by the steam generated by said boiler unit, the steam giving up energy to power said turbine;
a condenser for receiving the energy-depleted steam from said turbine, said condenser including a cooling circuit

having water circulation; a storage facility for the reserve liquefied gas; and
heat exchanger means for regasifying the liquefied gas, at least a portion of said cooling circuit being in heat-exchange contact with the liquefied gas, whereby the liquefied gas is regasified by way of step regasification and supplied to said boiler unit upon a deficiency of gas occurring in the pipeline.

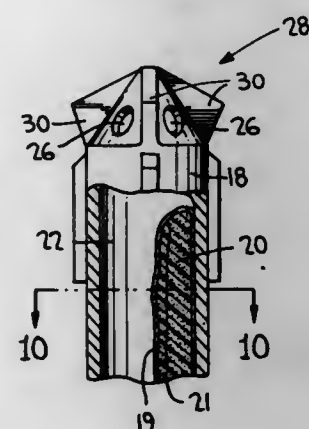
4,055,051 UNITARY DRILL BIT AND ROOF BOLT

James Lee Finney, Cranbury, N.J., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 8, 1976, Ser. No. 647,522
Int. Cl.² E21D 21/00, 20/02

U.S. Cl. 61—45 B

19 Claims



1. A unitary roof bolt and drill bit for forming a bore hole in a mine roof and for subsequent permanent mounting therein in order to strengthen same, which comprises:
a rigid tubular body,
bit means formed at one end of said tubular body for drilling a bore hole in the mine roof,
adhesive and hardener means, which, upon mixing, secure said tubular body within said bore hole, being integrally carried with and within said tubular body, aperture means on said tubular body for releasing said adhesive and hardener means into said borehole, and
bearing plate means formed at the outer end of said tubular body, for substantially covering the opening of said hole when said tubular body is adhesively secured therein by said adhesive and hardener means, and bearing against said roof.

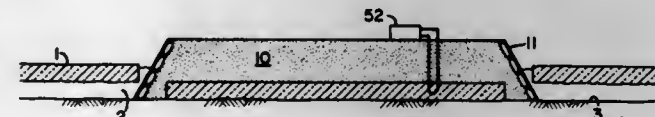
4,055,052 ARCTIC ISLAND

Michel Metge, Calgary, Canada, assignor to Exxon Production Research Company, Houston, Tex.

Filed July 30, 1976, Ser. No. 709,973
Int. Cl.² E02B 3/00; F25C 1/02

U.S. Cl. 61—103

12 Claims



1. A method for constructing an island in a body of water having an ice sheet floating thereon which comprises:
placing sufficient fill material having a density greater than the water on a first piece of the ice sheet which is to become an integral part of the island to round the first piece;
separating the first piece from the surrounding ice sheet;
placing an amount of fill material having a density greater than the water on a second piece of the ice sheet which is to become an integral part of the island, said amount of fill

material being not more than the amount which allows the second piece of ice to remain floating at the water's surface;
separating the second piece from the surrounding ice sheet;
positioning the second piece over the grounded first piece;
placing additional fill material having a density greater than the water on the second piece to sink it atop the first piece;
and
placing sufficient matter upon the grounded pieces to construct an island.

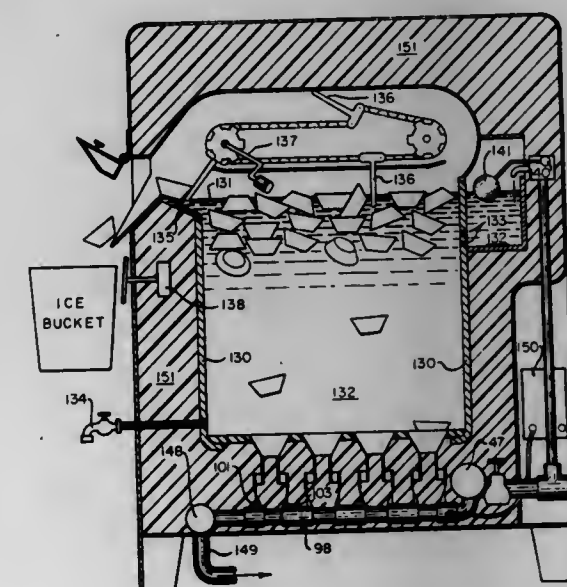
4,055,053 THERMOELECTRIC WATER COOLER OR ICE FREEZER

Thore M. Elfving, deceased, late of San Mateo, Calif.; by Claes T. Eleving, executor, 10951 Santa Theresa Drive, Cupertino, Calif. 95014, and Sven T. Elfving, 1560 Sandburg Terrace Apat.501, Chicago, Ill. 60610

Filed Dec. 8, 1975, Ser. No. 638,830
Int. Cl.² F25B 21/02; F25C 5/18

U.S. Cl. 62—3

16 Claims



1. A thermoelectric water cooling or freezing assembly comprising semiconductor bodies of P-type and N-type semiconductor material each having hot and cold sides of predetermined area with similar sides adapted to be connected in series by junction bridges to form thermocouples, said junction bridges including thin sheet metal portions disposed edgewise with respect to the associated semiconductor body with one edge in conductive contact with the associated side of the semiconductor body and with the other edge adapted to be associated with heat exchange means to the surrounding media, characterized in that an individual heat exchange means is associated with each cold junction bridge, said heat exchange means facing upwardly and adapted to freeze at least one ice cube and container means are provided to hold water in heat exchange with each of said heat exchange means.

4,055,054 CONSTANT BOILING MIXTURES OF DICHLOROMONOFUOROMETHANE AND 1-CHLORO-2,2,2-TRIFLUOROETHANE

Kevin P. Murphy, Orchard Park; Richard F. Stahl, Hamburg, and Sabatino R. Orfeo, Orchard Park, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 21, 1976, Ser. No. 753,055
Int. Cl.² C09K 5/04; F25B 9/00

U.S. Cl. 62—114

4 Claims

1. Constant boiling mixtures consisting essentially of about 26.2 weight % dichloromonofluoromethane and about 73.8 weight % of 1-chloro-2,2,2-trifluoroethane.

4,055,055 THERMOSIPHONIC BOILER

Ludvig L. Horwitz, Apelvagen 25, S-182 75 Stocksund, Sweden

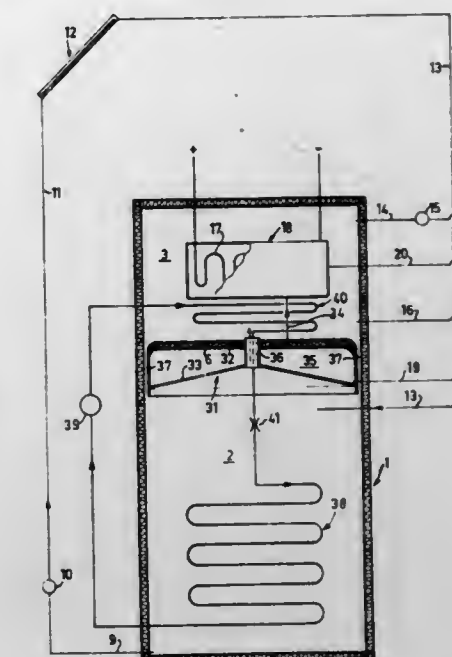
Filed Mar. 12, 1976, Ser. No. 666,334

Claims priority, application Sweden, Apr. 1, 1975, 7503667

Int. Cl.² F25B 27/02

U.S. Cl. 62—238

6 Claims



1. A thermosiphonic boiler with two mutually communicating water containers (2,3), one (3) situated above the other (2), said containers housing water volumes which are thermally insulated from the surroundings of the boiler by means of heat insulation (4) in the walls of the boiler and respectively from each other by means of a heat insulating layer (6) in an intermediate wall structure (5;21;31), common to both containers, which separates their water volumes, characterized in that the lower container (2) is incorporated in an energy supply circuit (9,11,12,13), through which water from the lower portion of the container can be caused to flow through heat exchanger means (12) arranged for heating up the water utilizing energy from a freely available source of energy and then back again to the upper portion of the container (2), and that the upper container (3) is connected to a circulation circuit through which water from the upper portion of this container is returned to its lower portion, when needed with the aid of pump means (15), via one or more heat dissipating means, there being arranged in the water volume of the upper container (3) a hot water supplier (18) supplied with water from a fresh water system (19) and provided with special heating means (17) from which supplier hot water can be tapped off, and that in the intermediate wall structure (5;21;31) there are first through-flow means (7;22;36) through which water from the upper portion of the lower container (2) can by thermosiphonic action or convection flow up into the upper container (3) and second through-flow means (8;23;37) through which water from the lower portion of the upper container (3) can flow down into the lower container (2).

4,055,056 REVERSIBLE REFRIGERANT SYSTEM AND FOUR-WAY REVERSING VALVE THEREFOR OR THE LIKE

Charles H. Perkins, Newtown Square, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 526,099, Nov. 22, 1974, Pat. No. 3,972,347. This application May 17, 1976, Ser. No. 686,910

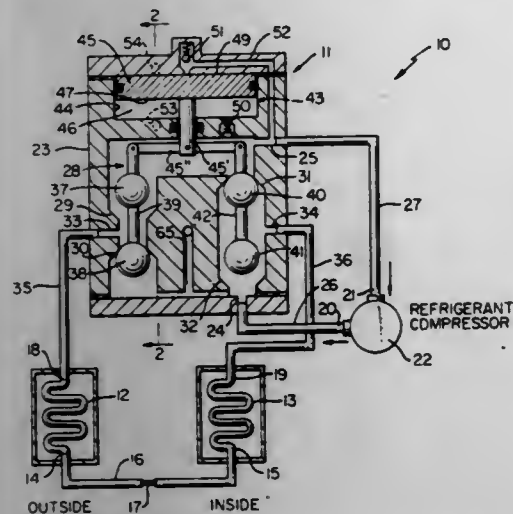
Int. Cl.² F25B 13/00

U.S. Cl. 62—324

8 Claims

1. In a refrigerant system having a compressor and a pair of coils operatively interconnected to a reversing valve for selectively interconnecting one of the discharge side and the suction side of said compressor to one of said coils while interconnect-

ing the other of the discharge side and the suction side of said compressor to the other of said coils so that one of said coils will act as a condenser and the other coil will act as an evaporator, the improvement wherein said reversing valve has four separate movable ball valve means for effecting the reversing



operation thereof, said reversing valve having a housing means carrying said ball valve means, a single actuating means carried by said housing means, and a lever pivotally interconnected to said actuating means and to said ball valve means to control said reversing operation thereof.

4,055,057

COUPLING DEVICE FOR THE OPPOSED ENDS OF BRACELETS

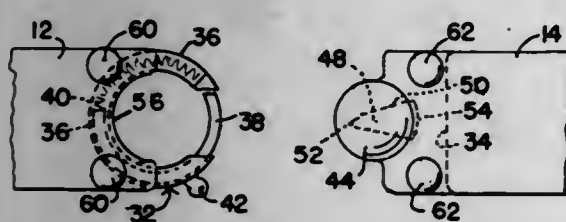
Anita M. Kolman, 527 Ramona St., Wilmette, Ill. 60091

Filed July 6, 1976, Ser. No. 702,537

Int. Cl.² A44C 5/00

U.S. Cl. 63-7

9 Claims



1. The combination with a bracelet consisting of first and second generally semi-circular relatively rigid sections hingedly connected in end-to-end fashion for swinging movement toward and away from each other between an open position wherein the free end regions thereof are separated, and a closed position wherein such ends are disposed in end-to-end coupled contiguity, coupling means for releasably maintaining said free end regions in their coupled relationship, said coupling means comprising a spring ring including an arcuate outer tubular sheath fixedly carried by the free end region of said first section and having opposed spaced apart ends establishing an entry gap, an arcuate plunger slidable in said sheath and movable between a retracted position wherein said gap is exposed and a projected position wherein the plunger substantially closes the gap, and a spring disposed within said sheath and yieldingly urging the plunger to its projected position, a transverse bore extending through the free end region of the second section inwardly of the extreme free end of such section and establishing an eyelet for reception of the plunger, the material of said second section forwardly of said bore being of a bulbous nature, being integral with such section, and substantially filling the internal confines of said spring ring when said plunger is projected through said transverse bore so that the sections are coupled, said bulbous portion being formed with a narrow groove on each lateral side thereof to facilitate entry of the bulbous portion of the second section into the

confines of said spring ring when the plunger is at least partially retracted.

4,055,058

ELECTRONIC CONTROL DATA TRANSMISSION FOR KNITTING MACHINES

Eric William Tewsley, Kirby Muxloe, and Ian Matthewman, Fleckney, both of England, assignors to Wildt Mellor Bromley Limited, England

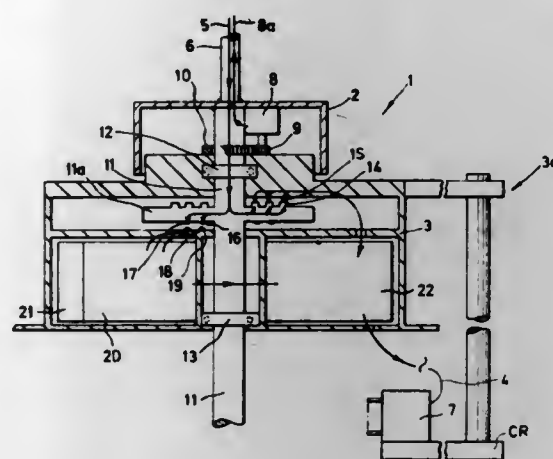
Filed Sept. 12, 1975, Ser. No. 612,849

Claims priority, application United Kingdom, Sept. 17, 1974, 40577/74

Int. Cl.² D04B 15/78

U.S. Cl. 66-50 R

9 Claims



1. In a knitting machine comprising a stationary part and a rotary part, a data transmitter associated with the stationary part and a data receiver associated with the rotary part: the improvement that the rotary part carries a photo-receiver arranged to follow a predetermined path as the rotary part rotates, said photo-receiver being connected to the data receiver, and that the stationary part carries a configuration of photo-emitters, said photo-emitter configuration consisting of an array of individual photo-emitters adapted to be energized simultaneously so as to illuminate a zone containing the whole of the path of the photo-receiver, the photo-emitter configuration being connected to the data transmitter to illuminate the path of the photo-receiver with a train of light pulses corresponding to the data transmitted so that the photo-receiver produces a train of electrical pulses corresponding to the data transmitted.

4,055,059

METHODS AND APPARATUS FOR DEWATERING LEATHER

Jiri Dokoupil, Hochstrasse 13, D-6251 Guckingen, Germany

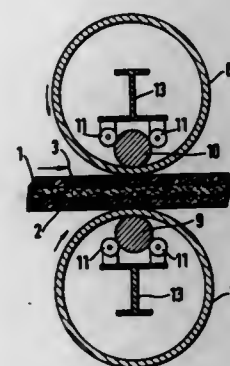
Filed Aug. 20, 1976, Ser. No. 716,179

Claims priority, application Germany, Aug. 30, 1975, 2538703

Int. Cl.² C14B 1/08

U.S. Cl. 69-41

10 Claims



2. An apparatus for dewatering leather, comprising at least one pair of dewatering-pressure rolls defining a dewatering

zone, a pair of transport bands conveying the leather therebetween in a predetermined direction of travel and between the dewatering-pressure roll pair, at least one of the transport bands is structured for taking-up water, a hollow roll within which there is arranged at least one of the dewatering-pressure rolls, said hollow roll having a flexible shell, said hollow roll cooperating with the other of said dewatering-pressure rolls to define therebetween a roll nip through which passes the leather to be dewatered, the dewatering pressure being transmitted via the flexible shell of the hollow roll to the leather, said flexible shell of the hollow roll possessing a greater elasticity in radial direction in comparison to the elasticity in radial direction of said one dewatering-pressure roll arranged therein.

4,055,060

BICYCLE LOCK

Jim Belino, 19209 Baseline, Glendora, Calif. 91776

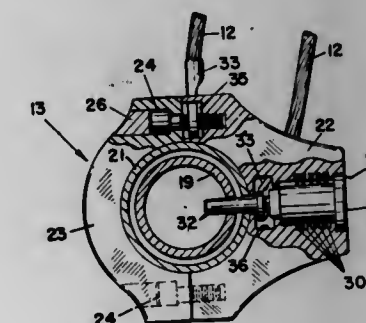
Filed July 9, 1973, Ser. No. 377,498

Disclosure was also published under the second Trial Voluntary Protect Program on May 26, 1976 as document No. B377,498.

Int. Cl. B62h 5/06

U.S. Cl. 70-234

5 Claims



1. A lock for preventing relative rotation between an external tube and a sleeve journaled to rotate therein, said lock comprising:
a member disposed around said tube and having a radially disposed bore;
said tube and said sleeve each having radially disposed holes which become aligned in a given relative position between said tube and said sleeve;
said hole on said tube being aligned with the said bore on said member;
a lock tumbler having means at one end to receive a key; and
a dowel extending from the other end;
said lock tumbler being the type that has a plurality of keepers spring biased radially outward;
said bore being shaped to receive said tumbler and including detents to respectively receive said keepers;
a cable;
means for fixedly anchoring one end of said cable to said member;
said member having a cutout into one side thereof, communicating with said bore; and
said cable having an eye socket at said other end and adapted to be engaged by said dowel when said eye socket is within said cutout.

4,055,061

APPARATUS FOR REFORMING AND STRAIGHTENING VEHICLES

Jeffrey T. Bayorgeon, Milwaukee; Dirk J. Vandalen, Milton, both of Wis., and Pierre N. Legrand, Soumagne, Belgium, assignors to Applied Power, Inc., Milwaukee, Wis.

Filed Apr. 26, 1976, Ser. No. 680,146

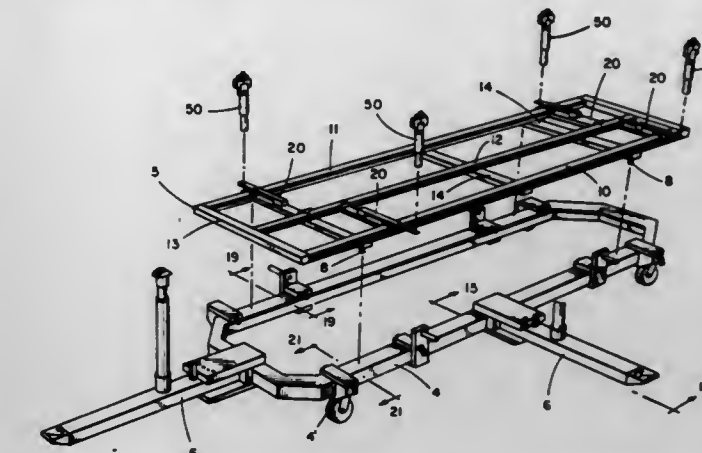
Int. Cl.² B21D 1/14; G01B 5/24

U.S. Cl. 72-32

24 Claims

1. An apparatus for straightening and reforming the body and frame of a vehicle comprising:
frame means adapted to be positioned beneath a vehicle;

force applying means selectively attachable to said frame means for applying a force to a vehicle through an elongated force transmitting element;
measuring means operatively coupled to said frame means; said measuring means being attached to a vehicle to respond to the application of force to the vehicle for a continuous indication of the magnitude of deformation of the vehicle back to its original configuration;
said measuring means includes at least one vertically extending element having an end attachable to a datum point on the vehicle;



said A means further includes first support means to support said at least one vertically extending element for movement in a first direction and second support means to support said at least one vertically extending element for movement in a second direction perpendicular to said first direction, and
said at least one vertically extending element is mounted for independent movement in said first and second directions laterally and longitudinally of the frame means in a substantially horizontal plane in response to the application of force to the vehicle.

4,055,062

PROCESS FOR MANUFACTURING STRIP LEAD FRAMES

Jack P. Martin, Lower Burrell, and Thomas H. Gray, Pittsburgh, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 596,039, July 25, 1975, Pat. No. 3,999,955.

This application Oct. 7, 1976, Ser. No. 730,401

Int. Cl.² B21B 45/00

U.S. Cl. 72-47

4 Claims

1. A process for producing strip material useful for lead frames comprising:
a. providing a strip of ferritic stainless steel not thicker than 50 mils;
b. coating all sides of said strip with a layer of copper sufficiently thick to result in a copper layer at least 50 micro-inches thick following cold rolling;
c. coating all sides of said copper coating with a layer of metal selected from nickel and tin sufficiently thick to result in a layer at least 50 microinches thick following cold rolling, and
d. cold rolling the resultant composite strip to reduce its thickness to below 0.03 inches; said composite strip having a distinct layer of copper and a distinct layer of metal selected from nickel and tin thereover.

4,055,063

APPARATUS FOR THE EXPANSION OF TUBE ENDS INSIDE OF A TUBE PLATE

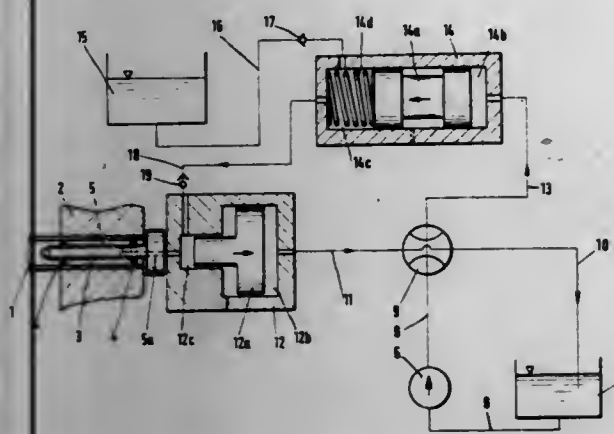
Herbert Krips, Bochum-Langendreer, and Miroslav Podhorsky, Bochum, both of Germany, assignors to Balcke-Durr Aktiengesellschaft, Ratingen, Germany

Filed Mar. 14, 1977, Ser. No. 777,099

Claims priority, application Germany, Apr. 14, 1976, 2616523
Int. Cl.² B21D 22/10; F15B 7/00

U.S. Cl. 72-62

4 Claims



1. An apparatus for the expansion of tube ends inside of a tube plate by means of a probe insertable in the respective tube ends, the probe forming an annular space with the tube member to be widened by means of two seals spaced from one another, a pump operatively feeding the annular space with a pressure medium for the expansion, and a pressure intensifier for bringing the pressure medium to a required pressure, comprising:

- a pressure intensifier defining a primary space driven by hydraulic oil and defining a secondary space,
- a medium separator connected to the secondary space of said pressure intensifier,
- a back-pressure valve operatively disposed between said medium separator and said secondary space of said pressure intensifier,
- a piston displaceably disposed in said medium separator, means for providing a restoring force for biasing said piston in said medium separator,
- a pump means for feeding hydraulic oil displacing said piston against said restoring force of said biasing means for filling said secondary space of said pressure intensifier with an operating medium,
- a source of operating medium and another back-pressure valve operatively connected to a secondary side of said medium separator, through which the operating medium is operatively fed to said secondary side of said medium separator.

4,055,064

MUTFLER AND TAIL PIPE EXPANDER AND CLEANER

Virgil L. Schow, Box 7, Fairview, Mont. 59221

Filed Jan. 8, 1976, Ser. No. 647,637

Int. Cl.² B21D 41/02

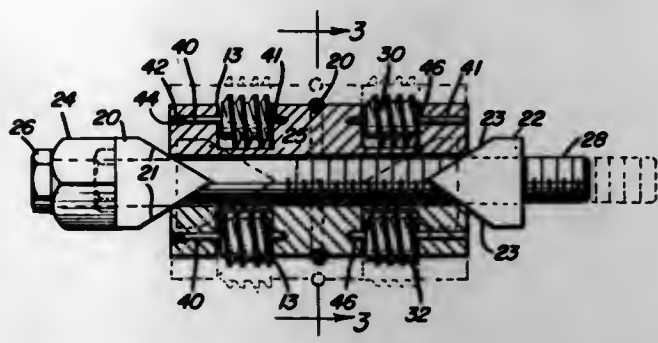
U.S. Cl. 72-118

7 Claims

1. Apparatus for expanding and cleaning pipes of varying internal diameter, comprising:

- a cylindrical body means formed of semi-cylindrical segments, the segments each having mounting recesses formed in the outer cylindrical walls thereof and further having expansion recesses formed in each end thereof, and extending longitudinally through the body means to respective communication with each other, resilient means for holding the two segments together;
- a cylindrical roller mounted for rotation within each of the mounting recesses, each roller having threads formed on outer cylindrical surfaces thereof, the threads being turned at an angle to the longitudinal axis of the roller;
- a wedge member located at each end of the body means and being at least partially received within the expansion

recesses, each wedge member having an aperture formed therethrough, one of said apertures being threaded; and, an adjusting bolt received through the expansion recesses throughout the body means, the bolt being received through the apertures in each wedge member, at least one end of the bolt being threaded and being received within the threaded aperture in one of the wedge members, the bolt having a flanged head at the other end thereof, and a biasing member having an aperture formed therein, the bolt being received within the aperture, the biasing member lying between and being contiguous to the head of the bolt and the outer end of the other of the wedge members, the bolt being rotatable after insertion of the end of the



assembly opposite the head of the bolt into an open end of a pipe to bias the wedge members toward each other, thereby displacing the segments of the body means towards the internal surfaces of the pipe to cause the threads on the rollers to engage said internal pipe surfaces, the biasing member then being rotatable in a plane parallel to the longitudinal axis of the body means and of that portion of the pipe in which at least a portion of the body means is disposed, thereby to cause the body means to rotate, the rollers also rotating and causing the angled threads thereon to cut into the internal pipe surfaces and to cause the body means to be displaced inwardly of the pipe.

4,055,065

METHOD AND APPARATUS FOR SIMULTANEOUS EDGE BENDING OF STAIR RAIL CAP STOCK AND CHANNEL STOCK

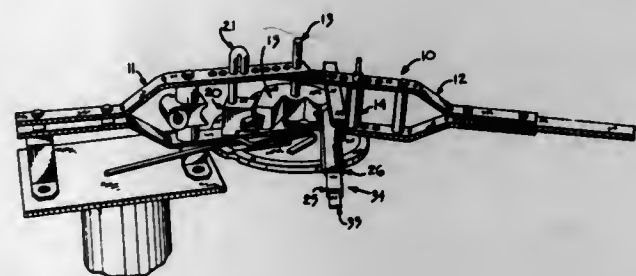
Cecil Whetstone, Jr., and Anthony G. Burns, both of Winona, Minn., assignors to Hossfeld Manufacturing Co., Winona, Minn.

Filed Nov. 22, 1976, Ser. No. 743,645

Int. Cl.² B21D 7/03

U.S. Cl. 72-217

6 Claims



1. An edge bending die system for simultaneously bending a length of channel stock and a length of handrail cap stock in an iron bender which includes a main frame hingedly connected by a center pin to a swing frame with a flat surface roller block releasably mounted therein, comprising:

- a forming die mounted on the center pin, which includes a generally semi-circular portion, a horn portion extending generally tangentially from said semi-circular portion, and a first side portion extending along the periphery of said semi-circular and horn portions, said first side portion having a first groove therein extending the length of said

first side portion, said first groove being of uniform cross section over its length formed to accept the edge of a portion of a length of channel stock with a length of cap stock fitted atop thereof;

- b. a back block having a second side portion with a second groove of uniform cross section over its length therein, complementing said first groove, fixedly mounted in the main frame adjacent said horn portion of said forming die, said second side portion facing toward said first side portion, the opposed grooves defining a recess that substantially conforms to the cross section of a length of channel stock with a length of cap stock fitted atop thereof; and
- c. a drawing block supported in position in the swing frame by the flat surface roller block, said drawing block including a third side portion complementing said first side portion, with a third groove of uniform cross section over its length therein, facing said first side portion, the opposed grooves together defining a recess that substantially conforms to the cross section of a length of channel stock with a length of cap stock fitted atop thereof, the drawing block further including an opposite side wall abutting the surface of the flat surface roller block.

4,055,066

AUTOMATIC MACHINE FOR BENDING SHEET MATERIAL

André Lamendour, Rue Gustave Zede, Z.I. de Kergonan, 29200 Brest, France

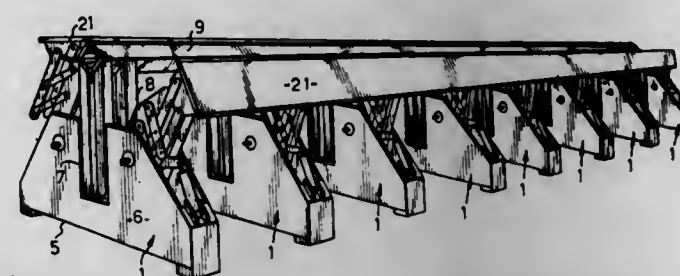
Filed Apr. 7, 1976, Ser. No. 674,314

Claims priority, application France, Apr. 16, 1975, 75.11837

Int. Cl.² B21D 5/00

U.S. Cl. 72-306

14 Claims



1. An apparatus for forming bends in deformable sheet material and comprising at least one bending unit, whose outstanding characteristic is that it is made up of a fixed frame, female means for upholding and clamping sheet material in a somewhat vertical alignment, the upper edge of said female means being parallel to the longitudinal axis of the apparatus, mobile tables for bending sheet material and set out lengthwise on either side of the sheet material to bend it in one direction or in the other, said tables rotating on an axis that is parallel to the longitudinal axis of the apparatus on respective intermediary supports, each of which are independently movable on the fixed frame from a first position corresponding to a retracted position of the table to a second position corresponding to a working position of the table, and respective means for independently operating said intermediate supports and said tables for bending sheet material.

4,055,067

METHOD AND A PUNCH/DIE ASSEMBLY FOR THE PRODUCTION OF HEAT EXCHANGER FINS

Toyoo Kozima, Tokyo, Japan, assignor to Hidak Engineering Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1975, Ser. No. 604,306

Claims priority, application Japan, Sept. 11, 1974, 49-103808

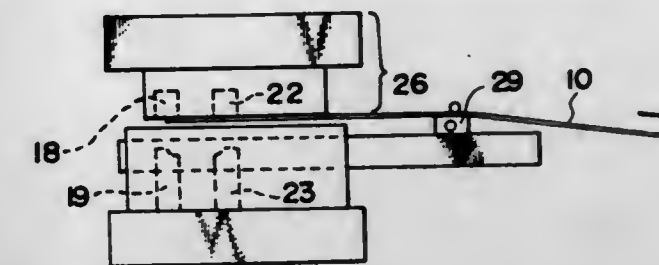
Int. Cl.² B21D 31/02

U.S. Cl. 72-328

4 Claims

1. A punch and die assembly for use in the formation of flanged apertures in heat-exchanger fins, said assembly comprising a lower tool holder supporting on the upper surface thereof a plurality of sets of first and second punches with said

punches in said sets being at a predetermined distance from each other, and an upper tool holder mounting on the lower surface thereof a plurality of sets of first and second dies in conformity with said first and second punches, one of said tool holders being movable towards and away from said other tool holder, said first dies each having a relatively small diameter and said first punches each having first and second surface means that, respectively, punch and bend a plurality of small diameter, flanged apertures at predetermined positions on a



single workpiece, said second punches each having a first portion that substantially conforms in size to said second surface means of said first punches and a second portion that is larger than said first portion, said second dies each having a single size opening that cooperates with said second portion of said second punches whereby said second dies and said second punches are adapted to enlarge the diameter of said small apertures into perpendicularly projecting cylinders of a predetermined length dimension by simultaneous burring and ironing operations.

4,055,068

PROCESS FOR MANUFACTURING MONOBLOC VEHICLE WHEELS

Roger Lucas, Issoire, and Jacques Auberger, Jumeaux, both of France, assignors to FORGEAL, Société pour le Forgeage et l'Estampage des Alliages Legers, Paris, France

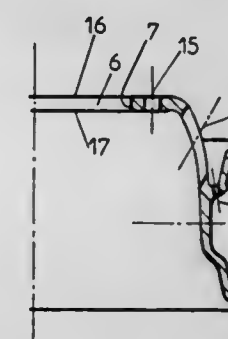
Filed Apr. 8, 1976, Ser. No. 674,869

Claims priority, application France, Apr. 9, 1975, 75.11725; Dec. 3, 1975, 75.37696

Int. Cl.² B21D 22/00; B21H 1/02

U.S. Cl. 72-356

4 Claims



1. The process of manufacturing monobloc metal vehicle wheels including a central disc portion comprising a large and small flange area, a rim portion for pneumatic tires, and a junction zone between said disc and rim portions, said process comprising a shaping step beginning with a roughly shaped article in the form of a cylindrical disc and a finishing step involving mechanical machining wherein the shaping is effected by a combination of die stamping and press widening operations consisting of the following steps: a first die stamping step producing the wheel disc and simultaneously forming on its circumference a junction zone terminating in a thickened bead oriented in a direction substantially parallel to the axis of the wheel and the inner side of the wheel to define one part of the rim portion; a second die stamping step elongating said bead and said junction zone in the same general direction as in the preceding step and simultaneously forming the rough shape of a small flange portion of the rim on the bead adjacent the junction zone; a third die stamping step forming the small flange to a shape approximating its final form and simulta-

neously elongating the junction zone and the bead in the same direction as in steps one and two imparting thereto a length substantially equal to the final length of said junction zone and said bead to define the large flange portion of the rim; and a press widening of the elongated bead to a shape from which said large flange may be machined to finished form.

4,055,069 PORTABLE MANUALLY CONTROLLED HYDRAULIC PIPE BENDING APPARATUS

Alessandro Caporusso, and Mario Caporusso, both of Viale dei Mille, 12, Frosinone, Italy

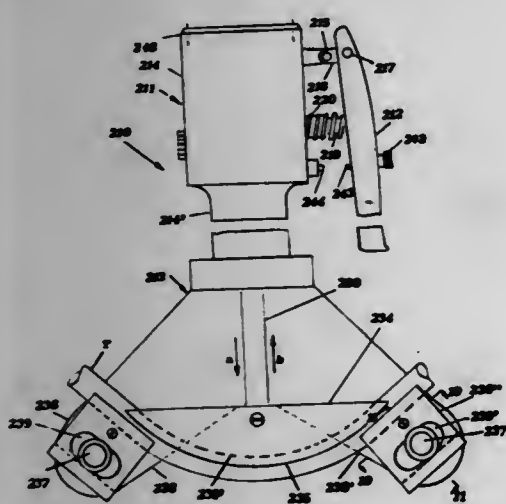
Filed Mar. 31, 1976, Ser. No. 672,438

Claims priority, application Italy, Apr. 3, 1975, 12203/75; Sept. 8, 1975, 51236/75; Feb. 18, 1976, 48162/76

Int. Cl.² B21D 7/06

U.S. Cl. 72—389

9 Claims



1. A portable hydraulic pipe bending apparatus which is operated manually and comprises: a main body with valve and piston systems therein enclosed; a control lever pivotable about a pin of said main body; and a fork section which is integral with the bottom end of said main body; said main body having: an upper section wherein a central cavity is provided to be used as a fluid tank, the top open end of which is closed by means of a closure member with a vent-hole, while a sealing, movable cover is provided over the fluid which fills said tank, said valve and piston systems being arranged within said upper section; and an elongated lower section the end of which is integral with said fork section of the apparatus, to the legs of which corresponding pins are fastened for guiding pipe supporting elements in rotation about said pins when a pipe bending operation is carried out; said valve and piston systems comprising: a pair of opposite ball valves for inlet or outlet fluid flow; a first cylinder-piston unit, with the piston normally held in its outwards position by a spring to intake the fluid from said tank, and which may be operated manually by means of said lever for a positive stroke which must be limited by the operator up to a predetermined angle of said lever; a second piston, to the free end of which an arched member is provided having a peripheral concave groove facing said concave grooves of said pipe supporting elements, so that a pipe to be bent may be held and bent therebetween; a third piston which is driven only when the manually controlled rotation of said lever is extended beyond said predetermined angle, to open a passageway to reverse the fluid flow and return said second piston to initial position at the end of a pipe bending operation.

4,055,070 GAGE STOP ASSEMBLY

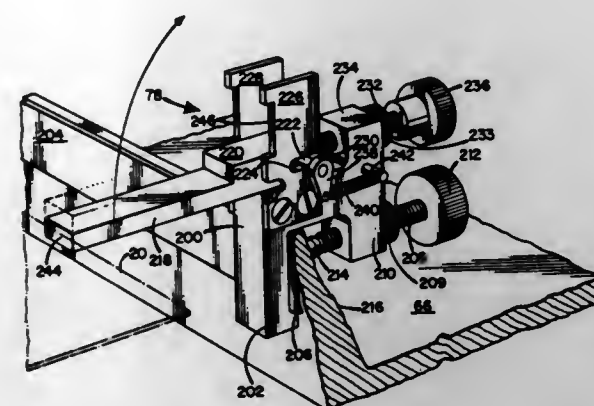
Sidney A. Wingate, Concord, Mass., and Edward L. Dreano, Jr., Derry, N.H., assignors to Dynamics Research Corporation, Wilmington, Mass.

Filed Aug. 30, 1976, Ser. No. 718,815

Int. Cl.² B21D 11/22

U.S. Cl. 72—461

14 Claims



1. A gage stop assembly comprising:
a body having a clamping portion by which the assembly is adjustably affixed to a mounting member;
first and second guide plates upwardly extending from the body, each having a slot therein extending along an axis of adjustment and being open rearwardly of said guide plates;
an elongated gage stop having a gaging face at the forward end thereof and an arcuate face at the rearward end thereof and an axle at the rearward portion;
said gage stop being disposed with the axle pivotally and slidably mounted within said slots;
an adjusting screw threadably attached to the body and having an end engageable with the arcuate surface of the gage stop;
spring means coupling the gage stop to the body and urging the arcuate surface of the gage stop into engagement with the adjusting screw;
said adjusting screw being manually rotatable to cause movement of the gage stop along the adjustment axis to thereby adjust the position of the gaging face;
the gage stop being pivotally movable upward from its normal position in response to an upward force applied thereto and being returnable by the spring means to its normal position.

4,055,071 METHOD AND APPARATUS FOR DETERMINING THE WET STRENGTH OF PAPER

William C. Frazier, Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed May 11, 1976, Ser. No. 685,160

Int. Cl.² G01N 3/30, 33/34

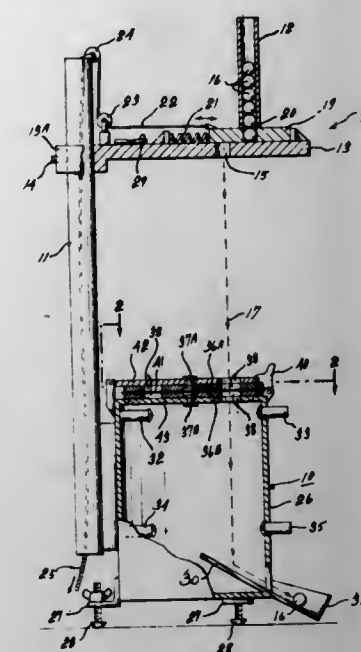
U.S. Cl. 73—12

12 Claims

1. An apparatus for determining the wet strength of paper comprising means for releasing a ball from a predetermined height to drop freely in a vertical path, clamp means to support a sheet of wet paper and to position the sheet at a predetermined location within the vertical path of the ball and perpendicular thereto, wherein the clamp means includes two discs clamped together to hold a sheet of wet paper therebetween, the two discs having a central axis of rotation, each of the two discs having a plurality of similar sized apertures equi-spaced from and about the axis of rotation, such that the apertures of one disc line up with the apertures in the other disc, wherein the wet paper is positionable between the discs so as to obstruct the apertures, the two discs being rotatably mounted about the

axis of rotation such that each of the apertures is positively locatable in the vertical path of the ball, and means for deter-

said output signal being indicative of the concentration of the sorbate in the fluid stream.



4,055,073 DRAWING DIE FOR ELONGATED TWIST BODIES

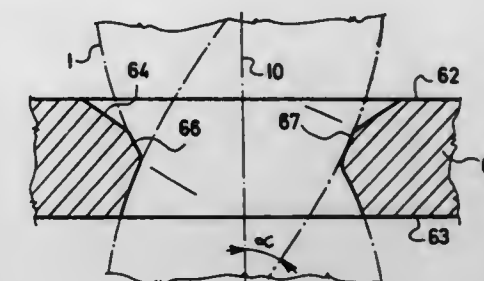
Oldrich Langr, Tesetice, Czechoslovakia, assignor to Sigma Lutín, národní podnik, Lutín, Czechoslovakia

Filed Sept. 16, 1976, Ser. No. 723,787

Int. Cl.² B21C 3/04

U.S. Cl. 72—467

3 Claims



mining speed of the ball dropping in the vertical path below the clamp means.

4,055,072 APPARATUS FOR MEASURING A SORBATE DISPERSED IN A FLUID STREAM

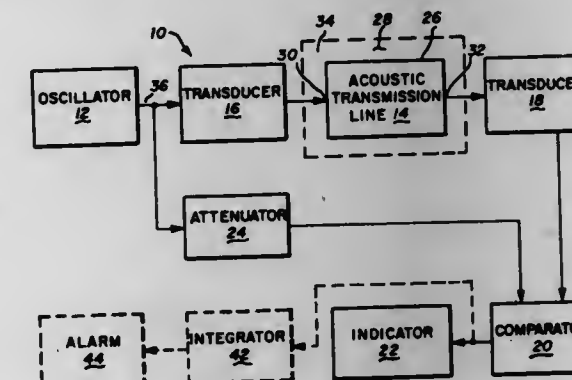
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Otis L. Updike, Charlottesville, Va.

Filed Sept. 19, 1975, Ser. No. 615,030

Int. Cl.² G01N 31/06

U.S. Cl. 73—23

13 Claims



1. Apparatus for measuring a sorbate dispersed in a fluid stream comprising:
a signal source means for generating an alternating-current signal;
acoustic transmission line means for disposition in the fluid stream and including an elongated body having a surface capable of sorbing an amount of a first sorbate to be measured representative of the concentration thereof in the fluid stream, said body being capable of propagating acoustic energy along its length from one end portion to another end portion, the propagated acoustic energy being damped in amplitude and shifted in phase such that the change in amplitude or phase is proportional to the amount of sorbate sorbed by said surface;
first transducing means for converting said alternating current signal to acoustic energy and for applying said acoustic energy to said one end portion;
second transducing means for converting the acoustic energy propagated to said other end portion to a corresponding first electrical signal; and
comparator means for comparing said first electrical signal to said alternating current signal and for developing an output signal corresponding to a difference therebetween,

4,055,074 WINDOW METHOD FOR MEASURING LEAKAGE

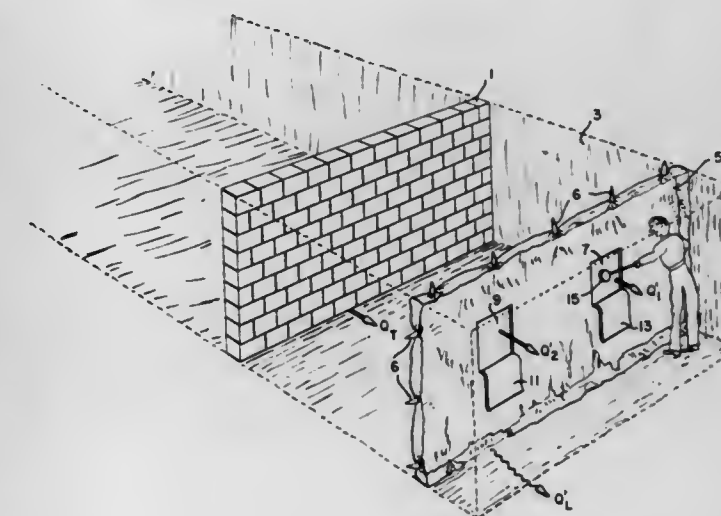
Edward D. Thimons, Natrona Heights; Robert P. Vinson, Pittsburgh; Fred N. Kissell, Pittsburgh, and Albert Tall, Pittsburgh, all of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 30, 1976, Ser. No. 755,916

Int. Cl.² G01M 3/26

U.S. Cl. 73—40

6 Claims



1. A method for measuring fluid leakage past a first barrier comprising the steps of:
a. setting up a test stopping barrier near the first barrier whose leakage is to be measured, said barrier having two windows therein capable of being opened or closed;

- b. measuring the fluid flow rate through the first of said opened windows while the second window remains closed; measuring the fluid flow rate through the same first window with both windows open; measuring the fluid flow rate through the second window when both windows are opened; and
- c. calculating the total fluid flow leakage past the first barrier under observation based upon the three foregoing measurements.

4,055,075

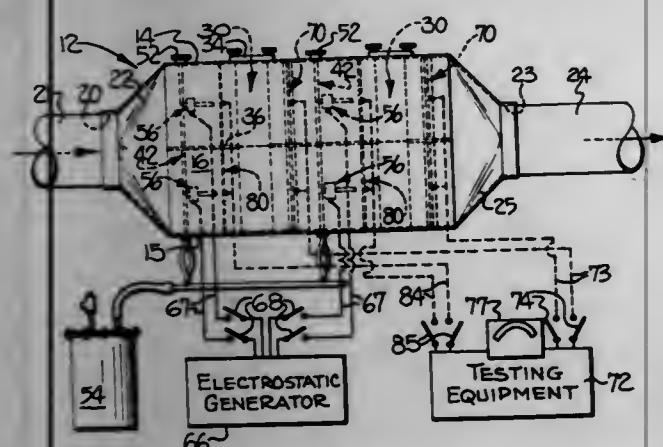
METHOD AND APPARATUS FOR THE LEAK TESTING OF FILTERS

Thomas T. Allan, San Francisco, and David E. Wilcox, Millbrae, both of Calif., assignors to Flanders Filters, Inc., Washington, N.C.

Filed Apr. 8, 1976, Ser. No. 675,076
Int. Cl.² G01M 3/20

U.S. Cl. 73-40.7

34 Claims



1. A method for testing for leakage of particles of predetermined size through or around an air filter which is sealably mounted within a housing, and characterized by the ability to substantially uniformly disperse the particles across the entire area of the upstream face of the filter from a point relatively close to the filter, and comprising the steps of
- passing an airstream through the housing and filter, distributing particles of predetermined size into the airstream within the housing and upstream of the filter, and while imparting a like electrical charge to the particles such that the particles repel each other and substantially uniformly disperse within the airstream, and while monitoring the airstream on the downstream side of the filter to detect at least a portion of any particles in the airstream and thereby permit a determination as to whether any of the particles are leaking through or around the filter.

4,055,076

CENTRIFUGAL GRANULOMETER

Michèle Tropea, Viale A. Alagona, 27/H, Catania, Italy

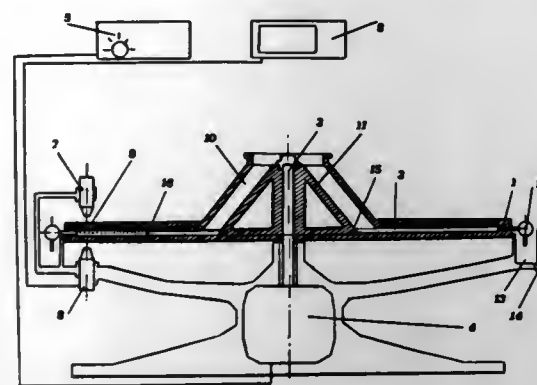
Filed Mar. 22, 1976, Ser. No. 668,852
Claims priority, application Italy, Mar. 21, 1975, 6606/75
Int. Cl.² G01N 15/04

U.S. Cl. 73-61.4

7 Claims

1. A centrifugal granulometer comprising a centrifugal rotor in the form of a hollow disc, means mounting said disc for rotation about a vertical axis, means for rotating said disc about said vertical axis, a cone mounted for rotation coaxially with said disc, the base of the cone comprising the radially inner edge of a single flat continuous annular chamber within said disc, the disc having a single translucent continuous annular peripheral zone, means to project a light beam through said translucent zone, and photoelectric means to determine and record the intensity of said beam which has passed through said zone as a function of time, said cone comprising the inner

wall of a frusto-conical feed passage for a specimen whose granulometry is to be determined, the lower edge of said feed



passage opening into the inner edge of said annular chamber entirely about said inner edge.

4,055,077

METHOD AND APPARATUS FOR THE MOISTURE MEASUREMENT OF TEXTILE WEBS

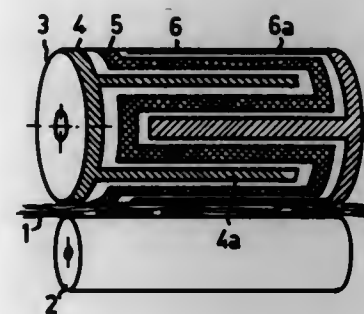
Ernst Loch, Uster, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland

Filed Aug. 16, 1976, Ser. No. 714,846
Claims priority, application Switzerland, Oct. 2, 1975, 12780/75

U.S. Cl. 73-73

Int. Cl.² G01N 27/04

9 Claims



1. A method of measuring the moisture content of textile material, comprising the steps of guiding the textile material forming a test material over at least one grounded-ground electrode, applying at least one measuring electrode to the side of the test material opposite the ground electrode, dividing the surface of the measuring electrode into positive, grounded and negative regions, and measuring the conductivity of the textile material between the ground electrode and the measuring electrode.

4,055,078

STRAIN TRANSDUCER

Nicholas F. D'Antonio, 7695 Admiral Drive, Liverpool, N.Y. 13088; Richard L. Bates, 125 Hillside Way, Camillus, N.Y. 13031, and Richard W. French, 609 Vine St., Liverpool, N.Y. 13088

Filed July 1, 1976, Ser. No. 701,649
Int. Cl.² G01L 1/22

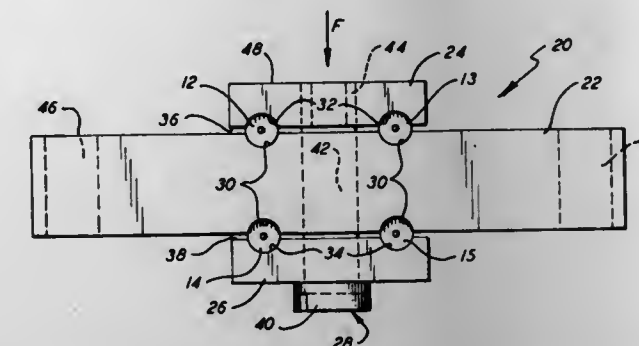
U.S. Cl. 73-88.5 R

10 Claims

1. A transducer comprising:
- a plurality of impedance devices connected together to form an electrical circuit, the impedances of said devices varying in response to the application of force to said devices, said circuit generating an output signal in response to the application of an electrical potential across said circuit, the value of said output signal depending upon the difference in impedance between said devices;
- pre-stressing means for applying predetermined force to said impedance devices to effect first impedance characteristics in said circuit;

force transmitting means for transmitting input forces to a portion of said impedance devices to vary the impedances in said portion of said devices; and

force relieving means for reducing the predetermined force on the remainder of said impedance devices in conjunc-



tion with the transmission of force by said force transmitting means to said portion of said devices, for increasing the difference between the impedances of said portion of said devices and said remainder of said devices, to effect a strong output signal when an electrical potential is connected across said circuit.

4,055,079

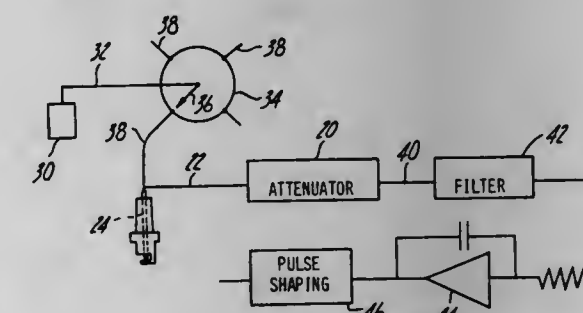
CYLINDER FIRING INDICATOR

Thaddeus J. Dudziak, Nashua, N.H., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 9, 1976, Ser. No. 712,630
Int. Cl.² G01M 15/00

U.S. Cl. 73-117.3

1 Claim



1. In a cylinder compression test apparatus for a spark ignition engine: improved circuit means for generating an electrical pulse representing the firing cycle in a selected cylinder, said pulse-generating means comprising a signal attenuator having a hardwire connection to the high tension electrode in the spark plug for the selected cylinder, said attenuator having an output signal voltage whose magnitude is approximately one-tenth of 1 percent of the high tension voltage; a low-frequency-pass filter receiving the output of the attenuator, said filter having a capability for rejecting the attenuated highest voltage spike generated in the high tension electrode, while passing the attenuated high tension steady state signal occurring during the cylinder fire period; the filter output being essentially a pulse having a width that is approximately the same as the duration of the cylinder fire signal, whereby said pulse, after additional filtering and conditioning is suited to act as a trigger means for a digital-logic element, e.g. a flip-flop.

4,055,080

TORQUING APPARATUS

Emory W. Farr, 649 Jalapa Drive, Covina, Calif. 91724, and Robert D. Greene, 267 Renoak Way, Arcadia, Calif. 91006

Filed Nov. 11, 1974, Ser. No. 522,599
Int. Cl.² B25B 23/14

U.S. Cl. 73-139

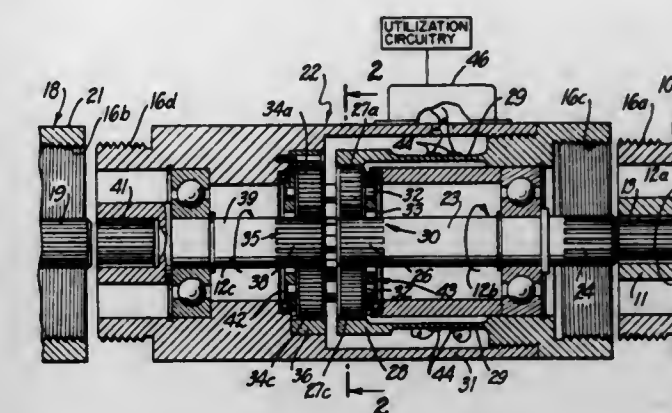
6 Claims

1. In combination with a power wrench and a wrench attachment therefor, the improvement comprising:

an insertable/removable torquing unit adapted to be inserted between said wrench and said attachment;

means for removably attaching said torquing unit in an in-line relation with said power wrench;

said torquing unit having a power transmitting train means for transmitting power from said wrench, through said insertable torquing unit, to said attachment;



said power transmitting train of said insertable torquing unit comprising a gear system having a 1:1 input/output arrangement;

whereby said power transmitting train may transmit torque from said power wrench to a work piece.

4,055,081

METHOD AND APPARATUS FOR IMPROVING THE RIDE CHARACTERISTICS OF MOTOR VEHICLE WHEELS

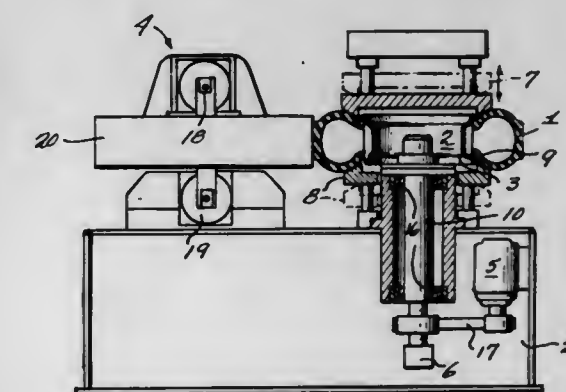
Herwig Hönlinger, Jugenheim an der Bergstrasse, Germany, assignor to Gebr. Hofmann KG, Maschinenfabrik, Darmstadt, Germany

Filed Feb. 24, 1977, Ser. No. 771,690

Claims priority, application Germany, Apr. 6, 1976, 2614852
Int. Cl.² G01M 17/02

U.S. Cl. 73-146

6 Claims



1. A method for reducing the smooth road vibrations of motor vehicles having a wheel rim and a tire mounted on said rim, comprising the steps of:
- rotating the rim and tire in a first measuring run; measuring the amplitude and angle of the first forces of reaction of the rim and tire produced during said first run; rotating the rim and tire with respect to each other by a predetermined angle;
- rotating the rim and tire in a second measuring run; measuring the amplitude and angle of the second forces of reaction of the rim and tire produced during said second run;
- at least when the vibrations can be corrected by more than a predetermined amount, calculating the offset angle between tire and rim to reduce vibrations from said measured first and second forces; and
- rotating said rim and tire with respect to each other to said offset angle.

4,055,082

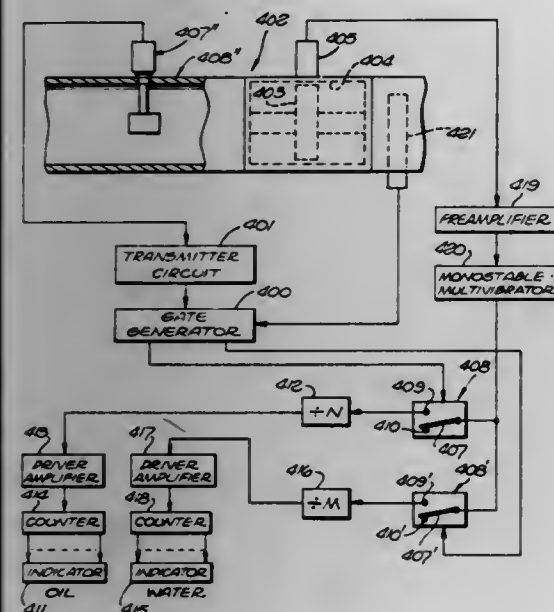
NET OIL COMPUTER

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,583

Int. Cl.² G06G 7/75; G01F 1/00

U.S. Cl. 73—194 R



1. A net oil computer or the like for producing an output directly proportional to the total volume flow of at least one of first and second fluids flowing as a mixture in a pipeline and having densities d_o and d_m , respectively, said computer comprising: first means connected with the pipeline for producing first pulses at a pulse repetition frequency directly proportional to the volume rate of flow of both fluids in said pipeline; second means connected with the pipeline for producing an output directly proportional to the mean density d_m of said mixture; a switch having a first input lead connected from said first means to receive said first pulses, said switch having at least one output lead connected therefrom, said switch having a second input lead and being electrically operable upon receipt of a pulse on said second input lead to change the connection between the first input and the output lead of said switch; and third means connected from said second means to receive the output thereof and adapted to impress second pulses on the second input lead of said switch of a pulse width directly proportional to one of the time periods T_o and T_m where

$$T_o = [K] \left[\frac{\pm d_o \mp d_m}{\pm d_o \mp d_o} \right]$$

$$T_m = [K] \left[\frac{\pm d_m \mp d_o}{\pm d_m \mp d_o} \right]$$

and K is a constant,

said third means causing said first pulses to be passed and interrupted alternately from the first input lead to the output lead of said switch.

4,055,083

CHEMICAL TRACER METHOD OF AND STRUCTURE FOR DETERMINATION OF INSTANTANEOUS AND TOTAL MASS AND VOLUME FLUID FLOW

Rudy M. Haas, 8171 Forestlawn, Detroit, Mich. 48234

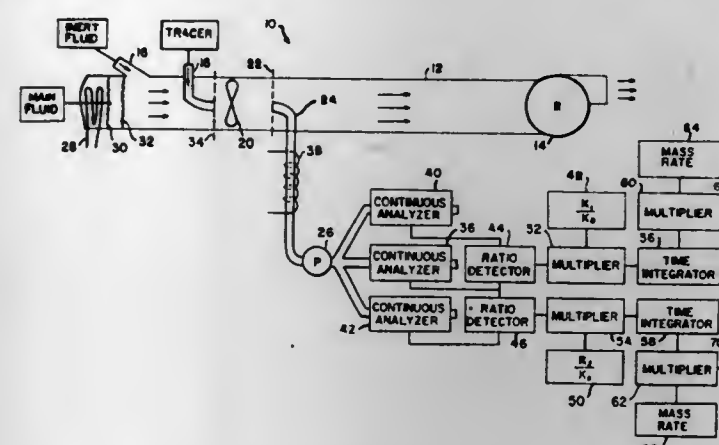
Continuation-in-part of Ser. No. 349,622, April 9, 1973, Pat. No. 3,988,926, which is a continuation-in-part of Ser. No. 141,749, May 10, 1971, Pat. No. 3,727,048. This application Sept. 7, 1973, Ser. No. 395,135

The portion of the term of this patent subsequent to Apr. 10, 1990, has been disclaimed.

Int. Cl.² G01F 1/70

U.S. Cl. 73—194 E

20 Claims



1. Structure for determining mass flow rate of at least one component of interest of a flowing fluid mixture which comprises a main fluid and a tracer over a period of time comprising means for introducing a tracer into the main fluid at a known mass rate, means for analyzing the resulting fluid mixture for the tracer concentration and at least one component of interest concentration, means for providing the reciprocal of the tracer concentration, means for obtaining the mass flow rate of the tracer from its known mass introduction rate, means for multiplying electronically representing the product of the reciprocal of the tracer concentration, the concentration of at least one component of interest and the mass flow rate of the tracer.

4,055,084

LIQUID FLOW METER CONSTRUCTION

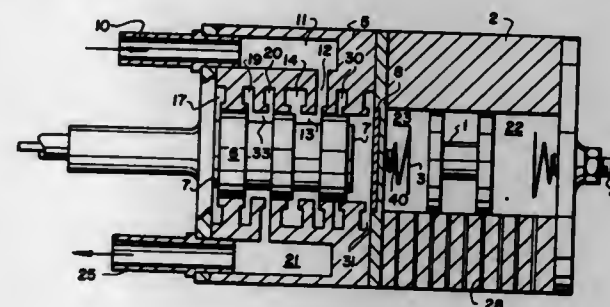
Hans Wilde, Bubenhalde 92, Stuttgart 30, Germany (D-7000)

Filed July 8, 1976, Ser. No. 703,584

Int. Cl.² G01F 11/14

U.S. Cl. 73—249

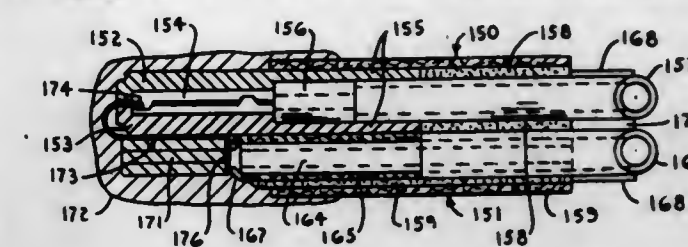
12 Claims



1. A liquid flow meter comprising, in combination, a measuring chamber; a measuring member reciprocable in said measuring chamber between two limit position; a control chamber having an inlet and outlet for the liquid to be measured; a control slide reciprocable in said control chamber and formed with control passages for the measured liquid; passage means interconnecting said measuring and control chambers so that the liquid to be measured flows, under dynamic pressure, from said inlet through said control passages and through said measuring chamber to reach said outlet; said control slide being movable between two end positions in each of which said control passages direct fluid under dynamic pressure to a

different respective end of said measuring member to reverse the movement of said measuring piston; said control slide, when said measuring piston is stopped in either of its limit positions with said control slide in one of its end positions, being moved, under the effect of the dynamic pressure of the measured liquid, to its opposite end position to effect reverse movement of said measuring piston; a counter operable responsive to reciprocation of one of said measuring piston and said control slide; and respective power accumulators, operable to store energy responsive to motion of said measuring piston, in said measuring chamber at each limit position of said measuring member, said power accumulators accelerating said measuring member during initiation of reversal of its motion.

whereby when molten metal is received in said chambers it will engage and fasten itself to said portions of said appendage



for connecting solidified samples of metal formed in said chambers.

4,055,085

MOTION AMPLIFIER FOR CONDITION RESPONSIVE GAUGE INSTRUMENT

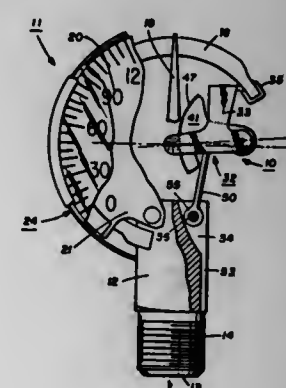
Richard Harry Wetterhorn, Fairfield, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 413,483, Nov. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 186,120, Oct. 4, 1971, abandoned. This application July 26, 1976, Ser. No. 708,510

Int. Cl.² G01L 7/04

U.S. Cl. 73—418

8 Claims



1. A motion amplifier for a gauge instrument having a motion producing condition responsive element, said amplifier comprising in combination:

- a support frame;
- pivot means pivotally supported on said support frame and including receiver means in which to receive an actuator operably connected to the condition responsive element for pivoting said pivot means in correlation to the motion produced by said element;
- mounting means adapted for mounting said support frame and said pivot means as a unit on a stationary portion of the gauge instrument; and
- calibration means adjustable to displace said unit on said mounting means relative to the received actuator for effecting presettable operational accuracy of the amplifier.

4,055,086

DEVICE AND METHOD FOR OBTAINING ONE OR MORE SAMPLES OF LIQUID

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Division of Ser. No. 543,687, Jan. 24, 1975, Pat. No. 4,002,071.

This application Feb. 9, 1976, Ser. No. 656,660

Int. Cl.² G01N 1/12

U.S. Cl. 73—425.4 R

9 Claims

1. In combination: a pair of devices disposed in a side-by-side relation, one of said devices comprising: a head forming a relatively large chamber and the other device an elongated chamber, tubular means communicating with each of said chambers and having a free extremity extending outwardly therefrom for entry into a supply of molten metal; means for holding said devices in said relation, means common to said extremities for supporting the same, an appendage having portions respectively disposed in relation to said chambers

4,055,088

APPARATUS FOR SAMPLING DRY SOLIDS

Edward M. Diss, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 4, 1976, Ser. No. 729,328

Int. Cl.² G01N 1/20

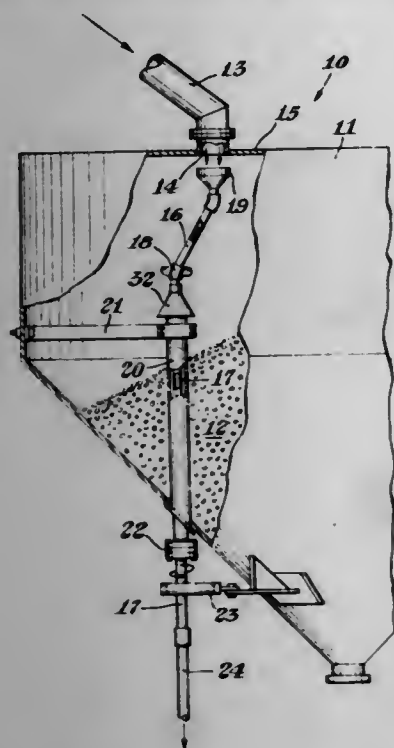
U.S. Cl. 73—424

5 Claims

1. An apparatus for sampling a stream of dry, free-flowing solids at a point between a classifier means and a packaging means, the apparatus including:

- a hopper which is suitable for storing dry, free-flowing solids, and which includes a top wall with an opening therein;
- a delivery conduit which communicates with a means for classifying the dry solids and with the top wall opening, and which is suitable for carrying a stream of the dry solids from the classifier means to the storage hopper;

a sample receiving conduit which includes an upper section and a lower section which is coupled to the upper section; the upper section of the sample receiving conduit having an open end which is positioned inside the storage hopper below the opening in the top wall; the lower section of the sample receiving conduit having a lower end which extends outside the storage hopper; a collection conduit which connects into the said lower end of the sample receiving conduit; an oscillator means which is fastened to the said lower end of the sample receiving conduit, the oscillator being adapted



for moving the sample receiving conduit to a first position in which the open end of the upper section is in direct alignment with the opening in the top wall of the hopper, and a second position in which the said open end is not aligned with the opening in the top wall of the hopper; a support column which is positioned inside the hopper, which is fastened to the hopper, and which encloses the lower section of the sample receiving conduit; a bearing assembly which is fitted to the lower section of the sample receiving conduit near the point at which the said lower section is coupled to the upper section of the sample receiving conduit.

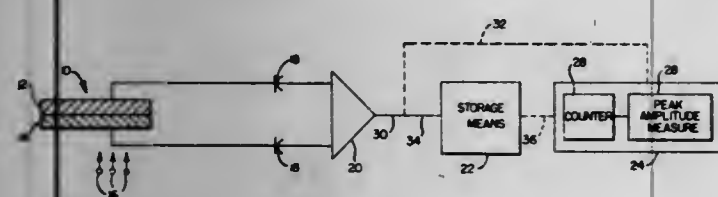
4,055,089

SEMICONDUCTOR PROJECTILE IMPACT DETECTOR
Edward L. Shriver, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 11, 1976, Ser. No. 665,734
Int. Cl.² G01L 1/14

U.S. Cl. 73-432 R

4 Claims



1. A method for investigating the nature of hypervelocity particles comprising the steps of:
a. introducing a coverless solid-state photovoltaic cell into an environment containing said particles;
b. measuring the peak amplitude of voltage pulses developed across the cell in response to the particles impacting thereon; and

c. counting the number of pulses produced by the cell.
2. Apparatus for investigating the nature of hypervelocity particles comprising:
a. a coverless, solid-state, two-terminal photovoltaic cell responsive to the impact thereon of a hypervelocity particle for generating a voltage pulse across the terminals proportional to the kinetic energy of the impacting particle.
b. a counter responsive to the terminal voltage of the cell for counting the number of voltage pulses produced by the cell as a consequence of impacting particles; and
c. peak amplitude measuring means responsive to the terminal voltage of the cell for measuring the peak value of the voltage pulses reduced by the cell as a consequence of impacting particles.

4,055,090
SENSOR

Werner Karl Heinz Fuchs, Sedlmayrstr. 14, 8 Munich 19, Germany

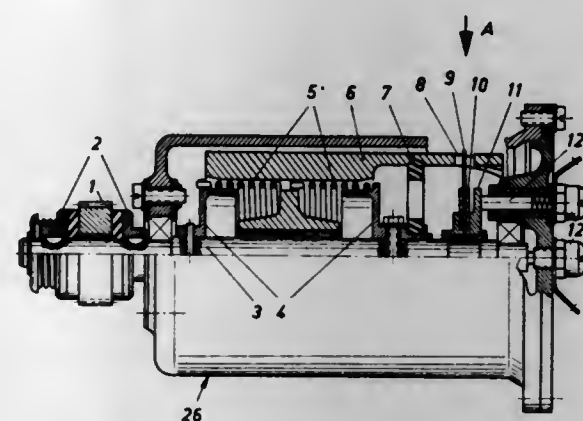
Continuation-in-part of Ser. No. 412,685, Nov. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 185,130, Sept. 30, 1971, abandoned. This application June 27, 1975, Ser. No. 670,350

Claims priority, application Germany, Oct. 5, 1970, 2048802; July 6, 1973, 2334493

Int. Cl.² G01P 15/00

U.S. Cl. 73-510

18 Claims



1. A sensor which measures and automatically compares the wheel angular deceleration with the vehicle linear deceleration on a vehicle with wheels, comprising:

a housing,
a shaft journaled in the latter and arranged parallel to the longitudinal axis of the vehicle and connected with at least one of the vehicle wheels in order to be driven proportionally to the wheel speed of rotation,
a mass, which can move in an axial direction and independently of this also in a rotary direction on the shaft, elastic means interposed between said shaft and said mass elastically supporting said mass upon said shaft for relative movement thereto,
magnetic conductive helical teeth on said mass extending in the same direction in which the mass freely moves relative to the shaft when the ratio of wheel periphery deceleration to the vehicle linear deceleration remains constant, whereby as a result of the wheel angular deceleration the mass twists relative to the shaft and — independently of the twisting — there is an axial displacement as a result of the vehicle linear deceleration,
a toothed gear which is fixed on said shaft and magnetically isolated from it in order to serve as a non-contacting inductive sensing means,
an iron core attached to said housing in order to conduct a magnetic flux through the toothed gear and the teeth of the mass, and
a coil on the iron core in order to measure the magnetic reluctance between the toothed gear and the mass and provide the measured value when the ratio of angular

deceleration to linear deceleration exceeds a predetermined quantity.

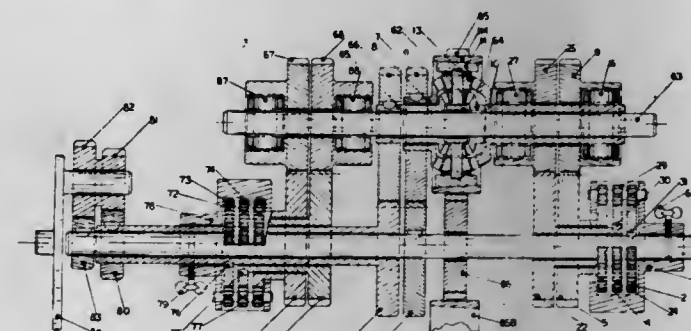
4,055,091

VARIABLE OUTPUT TRANSMISSION

John Hugh Kerr, Kitchener, Canada, assignor to Ker-Train Systems N.V., Curacad, Netherlands Antilles
Division of Ser. No. 390,454, Aug. 22, 1973, abandoned. This application Nov. 24, 1975, Ser. No. 634,683
Claims priority, application Canada, Aug. 31, 1972, 150683
Int. Cl.² F16H 35/02, 37/06, 1/38

U.S. Cl. 74-394

3 Claims



1. An inverted-gear-train-loop with the first gear-element of said loop consisting of identical driver-gears of two sets of variable-ratio-gears with said sets incorporating the embodiments as specified for square-wave-generator elements:

Driven Gear	$\frac{x+y}{x}$	Teeth
	$\frac{x}{x}$	Voids
Driver Gear	$\frac{x+y}{x}$	Teeth
	$\frac{x}{x}$	Voids
A/B Ratio	between 1 and 4	
Asymmetry Ratio	between .5 and .95	
Bias Ratio	between -.2 and +.2	
Cyclical Ratio	between 1/10 and 10	
Cycle Ratio	between 1/10 and 10/1	

with one of said driver-gears affixed to a first shaft together with a common-spur-gear control-element, with the second driver-gear affixed to a tubular shaft together with a second identical common-spur-gear control-element, with said tubular shaft concentrically mounted between the one driver-gear and control-element of said first shaft; concentrically mounted and free to rotate on said first shaft adjacent to said control-element is a control cage incorporating a plurality of double-spool gear-elements with one spool having one less tooth than the other, with said spool with one less tooth congruent to said one control-element affixed to said first shaft, and with said spools with one more tooth congruent to said control-element affixed to said tubular shaft, so that, when said control cage is rotated with said tubular shaft held relatively fixed, said first control-element together with said first shaft and said one driver-gear will be caused to rotate relative to said second driver gear affixed to said tubular shaft; with the second gear-element of said inverted-gear-train-loop consisting of identical driven-gears of said two sets of variable-ratio-gears, to which are affixed the bevel gears of a differential-gear-train, said differential-gear-train also having a carrier and at least one pinion, with the carrier and pinions of said differential-gear-train affixed to a third shaft with an end thereof extended to form the inner race of an overrunning clutch, with the outer race of said overrunning clutch together with the third spur-gear-element of said inverted-gear-train-loop affixed to a fourth shaft co-axially mounted with said third shaft; and congruent to said third spur-gear-element is the last spur-gear-element of said inverted-gear-train-loop, to which is affixed a fifth shaft co-axially mounted with said first shaft.

4,055,092

SAFETY DEVICE FOR GEAR WHEELS

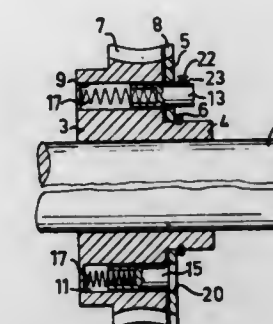
Martin Birger Aberg, 137 Morrison Road, Oakville, Ontario, Canada

Filed Nov. 12, 1976, Ser. No. 741,496

Claims priority, application Sweden, Nov. 13, 1975, 7512752
Int. Cl.² F16H 55/12, 55/18, 1/16, 55/00

U.S. Cl. 74-439

11 Claims



1. A safety device for use with a toothed wheel structure whose teeth engage a toothed element arranged to trip a protection device when a tooth of the toothed wheel structure is broken or when there is a predetermined amount of tooth wear, characterized in that the device comprises a tripping element mounted so as to be rotatable relative to said toothed wheel structure said tripping element having a rim of teeth with the same pitch as the teeth of said toothed wheel structure so that the teeth of said tripping element also engage the toothed element or an element synchronically movable therewith, and signalling means responsive to relative rotary movement between said tripping element and said toothed wheel structure for tripping a protection device when there is rotary movement between said tripping element and said toothed wheel structure beyond a given angle.

4,055,093

10-SPEED BICYCLES

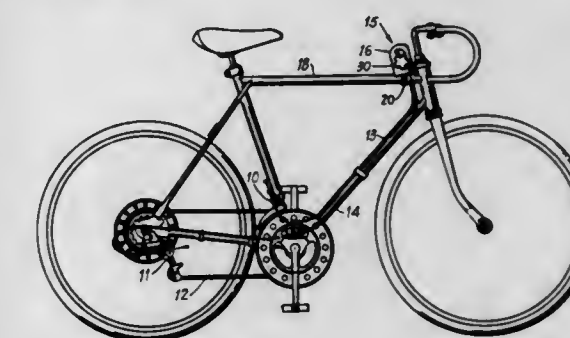
Haldon Ross, Olney, Ill., assignor to AMF Incorporated, White Plains, N.Y.

Filed June 18, 1976, Ser. No. 697,314

Int. Cl.² B62M 9/00; F16H 9/00, 7/22

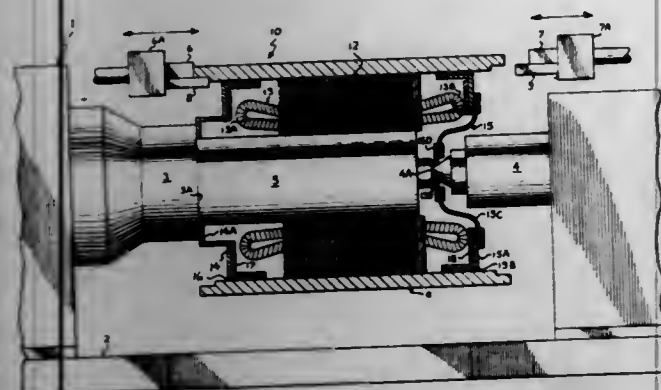
U.S. Cl. 74-501 R

4 Claims



1. In a 10-speed bike having front and rear derailleur mechanisms, and a pair of movable cables connected at one of their ends to different ones of said mechanisms for controlling the same, the improvement of a single manual control for all 10 speeds of said bike, said improvement comprising a pair of 10-station cams mounted on a common shaft, a pair of cam follower mechanisms engaged with said cams and having the other ends of said cables connected thereto, and a single manual member for rotating said shaft to move said cams in unison, and an indicator for all 10 speeds of said bike.

4,055,094
METHOD FOR PROTECTING STATOR WINDINGS OF DYNAMOELECTRIC MACHINE
 Curtis M. Menke, Hendersonville, Tenn., assignor to General Electric Company, Schenectady, N.Y.
 Filed Oct. 4, 1976, Ser. No. 729,450
 Int. Cl.² B23B 1/00
 U.S. Cl. 82-1 C 9 Claims

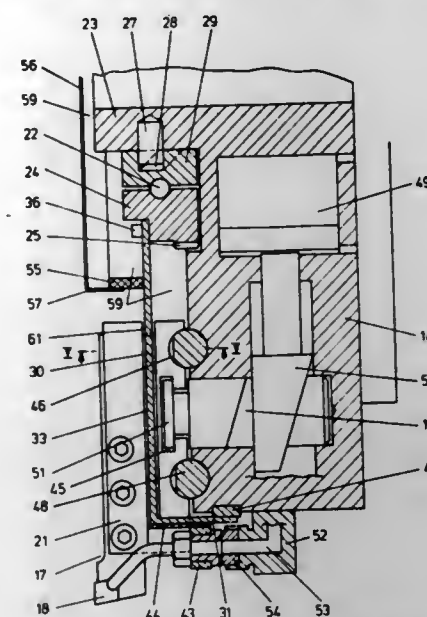


1. A method for protecting the stator winding of a dynamoelectric machine from metal fragments while machining the housing of the machine, comprising the steps of:
 - a. providing a lathe having; a rotatable headstock arbor, a tailstock reciprocally mounted coaxially with said arbor, and at least one cutting tool movably supported radially outward from said arbor;
 - b. mounting a shield closely around part of the arbor for rotation therewith;
 - c. supporting on the arbor for rotation therewith a dynamoelectric machine housing having a stator and stator winding assembly mounted therein spaced from the ends of the housing, said housing being supported to position said shield at least partially within one end of the housing with the peripheral surface of the shield in snug engagement with an inner circumferential surface housing at a point thereon outward from one end of said winding assembly;
 - d. placing a flexible diaphragm within the other end of the housing, said diaphragm being supported to position said shield positioned snugly against an inner circumferential surface of the housing outward from the other end of the winding assembly;
 - e. moving the tailstock against the central portion of the diaphragm to secure it in operating position for rotation with the housing;
 - f. adjusting the cutting tool and rotating the housing supported on the arbor thereby to machine at least one end of the housing, said cup-shaped shield and said diaphragm being effective during said machining operation to prevent metal particles from entering said stator winding;
 - g. withdrawing the tailstock, removing the diaphragm from the housing thereby to force collected metal particles from one end of the housing, and removing the housing from the arbor, thereby to slide the shield from the other end of the housing and force metal particles from said other end of the housing.

4,055,095
TOOL CHANGING DEVICE FOR A LATHE
 Herbert Gramspacher, and Armin Feisel, both of Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Switzerland
 Filed Mar. 16, 1976, Ser. No. 667,352
 Claims priority, application Switzerland, Mar. 27, 1975, 3934/75
 Int. Cl.² B23B 29/00; B23Q 1/00; B23B 39/20
 U.S. Cl. 82-36 A 5 Claims

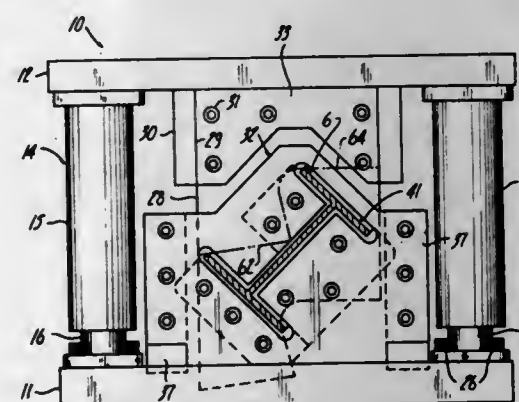
1. Tool changing apparatus for use on a lathe of the type having a base structure, longitudinal guide means and means for holding a workpiece for rotation about an axis, the apparatus including the combination comprising

a plurality of tool holders each one adapted to hold a tool; a tool magazine for replaceably supporting said plurality of tool holders in an unclamped condition; a cross slide member slidably mounted on the longitudinal guide means of said lathe; means for mounting said tool magazine on said cross slide, said magazine being movable to cause each tool and tool



holder to follow a curvilinear path so that any one of said tools can selectively be moved to a working position adjacent the workpiece lying adjacent said path; and means on said cross slide for establishing a rigid and direct connection between any selected one of said tool holders and said cross slide when said selected tool holder is moved through said path to said working position while said tool holder remains on said magazine.

4,055,096
DIE SET FOR CUTTING I-BEAM
 Alexander Borzym, Dearborn, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.
 Filed June 7, 1976, Ser. No. 693,170
 Int. Cl.² B23D 25/02; B26D 1/56
 U.S. Cl. 83-37 9 Claims

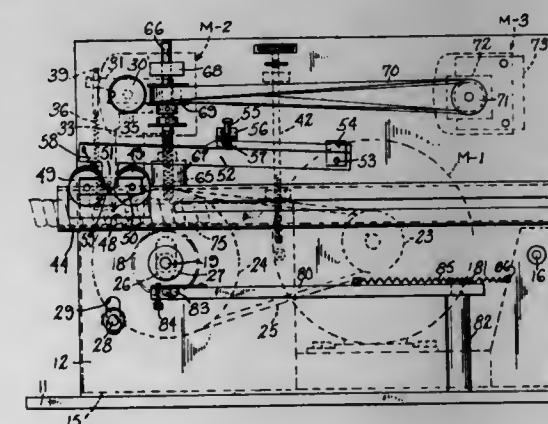


1. A method of cutting off an I-beam comprising simultaneously cutting through the beam with a stepped cutting blade having two blade cutting edges, one edge trailing the other edge, said blade moved at an acute angle to the planes of the web and flanges and substantially perpendicularly to the longitudinal axis of the beam in which said leading blade edge cuts through one flange and approximately half of the web of the beam and said trailing blade edge cuts through the other flange and the remainder of the web of the beam.

5. A die set for use in combination with a press or the like for severing structural sections of predetermined configuration having a web and having a flange extending transversely to the web fixed on each edge of the web, the die set comprising a frame defining a guide slot directed transversely of the section and at an acute angle to the plane of the web; a movable cutting

blade reciprocable in the slot through a cutting stroke having a cutting edge movable across the section to sever the section; and fixed blade support means underlying the web and flanges in position to support the section against the thrust of the movable blade; the said cutting edge having two cutting portions offset from each other in the direction of movement of the blade each adapted to sever respective parts of the section, the cutting portions each extending approximately at a right angle to the direction of movement of the blade, and one portion being in advance of the other portion so that the said one portion engages the web and one flange of the section substantially at the same time the other portion engages the other flange during the cutting stroke.

4,055,097
AUTOMATIC CUTTER FOR ARMORED CABLE
 Lucien C. Ducret, c/o Seatek Co., Inc., 1156 E. Putnam Ave., Riverside, Conn. 06878
 Filed July 9, 1976, Ser. No. 703,779
 Int. Cl.² B23D 45/04; B27B 5/20
 U.S. Cl. 83-169 9 Claims

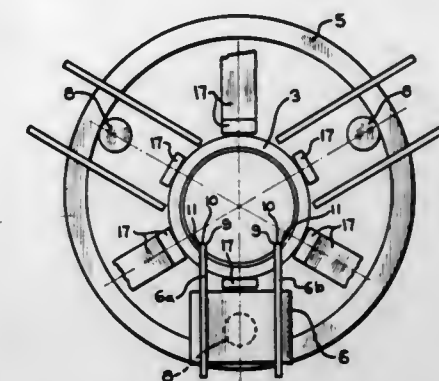


1. An armored cable cutting machine comprising, a base, cable guiding and holding means supported on said base, a carriage mounted on said base for pivotal movement about a horizontal axis, a circular saw carried by the carriage, a motor on the carriage for driving the saw, and carriage moving means including a carriage feed motor supported on the base, a cam on a cam shaft and driven by the feed motor, a toggle linkage system having one link journaled on the cam shaft and another link connected to the carriage, and resilient means cooperating with said links to bias the carriage toward cutting position.

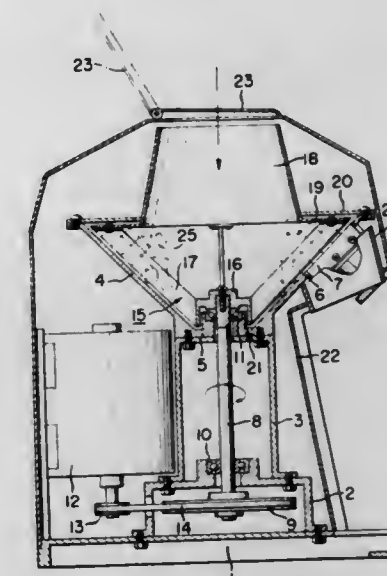
4,055,098
MANUFACTURING CORRUGATED PERFORATED PLASTIC TUBES
 Arnoldus Willem Jan Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Netherlands
 Division of Ser. No. 487,201, July 10, 1974, Pat. No. 3,965,782.
 This application Nov. 25, 1975, Ser. No. 635,175
 Claims priority, application Netherlands, July 16, 1973, 7309844
 Int. Cl.² B26F 1/18 5 Claims

1. A device for forming perforations in a corrugated plastic tube, comprising:
 - guide means for supporting said corrugated plastic tube;
 - a plurality of punching members, at least two of said punching members being substantially parallel and spaced in close proximity to each other;
 - operating means for activating said punching members;
 - means for preventing deformation of said tube;
 - conveying means for conveying said tube to be perforated;
 - said operating means simultaneously activating said at least two substantially parallel spaced punching members; and

said at least two substantially parallel spaced punching members being disposed in a plane which is oriented substantially transverse to the longitudinal axis of said conveying means.



4,055,099
FOOD SLICER
 Yoshihiko Mitsubayashi, Kuwana, Mie, Japan, assignor to Chubukoki Kabushiki Kaisha, Kuwana, Mie, Japan
 Filed Feb. 24, 1976, Ser. No. 660,924
 Claims priority, application Japan, Feb. 28, 1975, 50-28200[U]; June 5, 1975, 50-67773
 Int. Cl.² B26D 7/06; B02C 17/02; B07B 13/00
 U.S. Cl. 83-403 2 Claims



1. A slicer for foodstuffs, comprising
 - a. an upwardly diverging conical case with a slot in an upper part thereof for discharging sliced foodstuff and with a recess for receiving a bearing at its bottom;
 - b. a flat ring attached to the top end of the conical case to cover its upper portion;
 - c. a cutting blade attached to the conical case at a portion of the case above said slot to slice lumps of foodstuff;
 - d. a rotor assembly consisting of a downwardly diverging hopper as an upper member, a plurality of carrier-arms as intermediate members and a boss as a bottom-member, the hopper being provided with an outwardly extending wide flange at its bottom, and the carrier-arms being connected at their top-ends and at the bottom ends to the said flange and said boss, respectively; and
 - e. a vertical shaft connected to the rotor and its driving means including an electric motor.

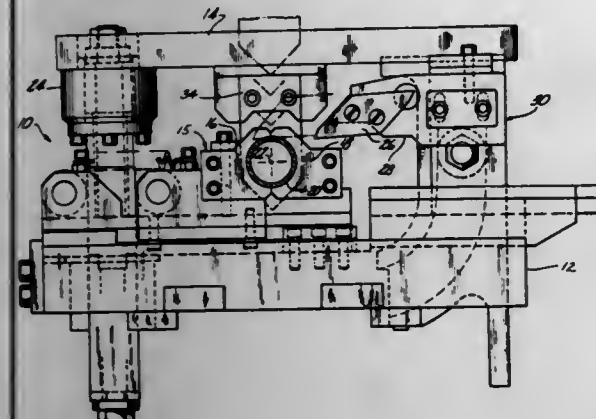
4,055,100

SEVERING KNIFE FOR TUBE CUTOFF APPARATUS
Alexander Borzym, Dearborn, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.

Filed July 12, 1976, Ser. No. 704,420
Int. Cl.² B26D 5/42

U.S. Cl. 83-454

2 Claims



1. In a tube cutoff apparatus of the type using a ram-driven shearing blade to sever a clamped workpiece:
holder means for said blade and comprising a clamping structure, said clamping structure mechanically interconnecting said holder means and blade and defining a pocket having support surfaces for the faces and sides of the blade, said support structure having vertically extending portions enveloping the edges of said blade when in the pocket and bounding a central upwardly recessed portion over which the faces of the blade are exposed;
workpiece clamping means adapted to receive and hold the workpiece to be severed, and having a central slot for permitting the blade to pass therethrough and through the workpiece;
the clamping means having a top surface which is matingly conjugate with the holder means
whereby the blade holder abuts the workpiece clamping means in substantially nesting relationship when the ram is fully driven toward the workpiece.

4,055,101

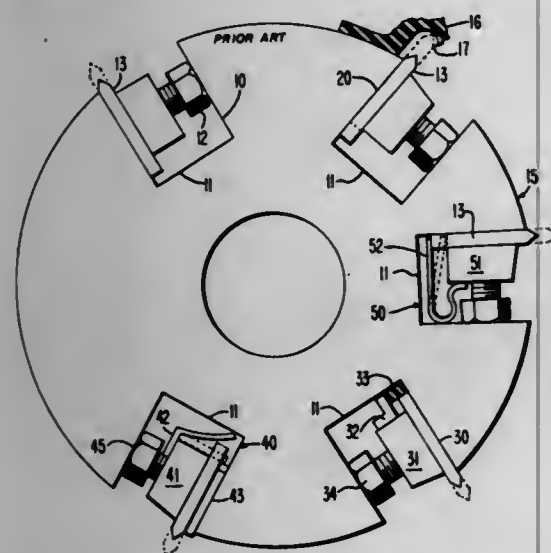
ROLL FED ROTARY WEB DEVICE WITH IMPROVED PERFORATOR

Joseph Martin Collins, Ontario, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 19, 1976, Ser. No. 687,806
Int. Cl.² B26F 1/20

U.S. Cl. 83-660

4 Claims



1. A roll fed rotary web device, such as printing press or collator, having:
a roll feed station, and
a perforation station,
the perforation station having a perforation cylinder in

which there is a longitudinal groove across the cylinder aligned with the axis of the cylinder,
at least one lug plate and fastening member located within the groove such that a perforation blade can be set between the lug plate and the side wall of the groove and the perforation cylinder,
a support surface normally positioned to support an inserted perforation blade to increase strike-in position being provided to support the perforation blade above the bottom surface of said groove and between said lug and side wall of said groove, said support surface element being deformable by pressure applied to the perforation blade.

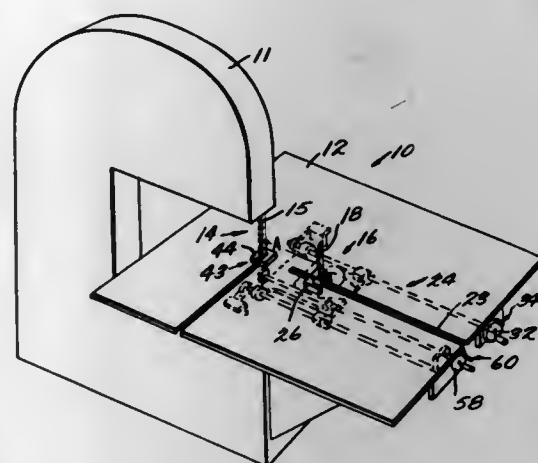
4,055,102

BAND AND SABER SAW ARRANGEMENT
James Henry Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Mar. 12, 1976, Ser. No. 666,172
Int. Cl.² B27B 11/00, 15/00

U.S. Cl. 83-749

10 Claims



1. Apparatus for cutting sheet material and the like comprising:
a generally horizontally disposed table top,
a band saw having a toothed blade that is disposed in a generally vertical plane and passes through said table top,
a saber saw having a toothed blade that is adapted to be disposed in a generally vertical plane parallel to the vertical plane of said band saw blade, said saber saw blade passing through the table top when disposed in said generally vertical plane,
the teeth of said band and saber saw toothed blades being disposed on the same side of a vertical plane passing through said blades,
means for mounting said saber saw to adjust the horizontal spacing thereof from the vertical plane of said band saw blade, and
power means for operating said band saw and said saber saw, when in a generally vertical plane, at the same time so that a workpiece will have two parallel cuts made therein at the same time when brought into engagement with said saw blades.

4,055,103

ELECTRONIC MUSICAL INSTRUMENT USING INTEGRATED CIRCUIT COMPONENTS

William V. Machanian, Lewiston, N.Y., assignor to The Wuritzer Company, Chicago, Ill.

Continuation of Ser. No. 475,449, June 3, 1974, abandoned. This application July 26, 1976, Ser. No. 708,897
Int. Cl.² G10H 1/00, 5/06

U.S. Cl. 84-1.01

14 Claims

1. In an electronic musical instrument the combination comprising: audio output means for reproducing different tones, generator means coupled to said audio output means for electronically generating signals corresponding to said tones, a

4,055,105

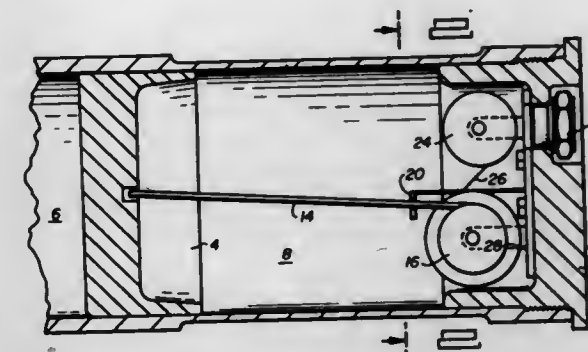
METHOD AND APPARATUS FOR VISUALLY LOCATING THE POSITION OF A FLOATING PISTON INSIDE OF A CYLINDER

Harold H. Wiese, Davenport, Iowa, and James E. Wildman, Moline, Ill., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

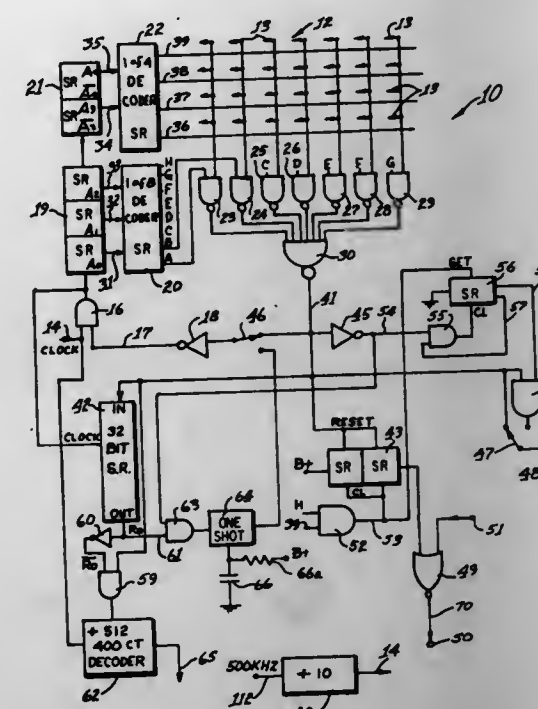
Filed May 27, 1976, Ser. No. 691,047
Int. Cl.² F41F 19/02

U.S. Cl. 89-43 R

3 Claims



plurality of key switches, means for selectively manipulating each of said key switches for the selection of predetermined ones of said tones, circuit means including a ROM interconnected with said generator means and means for scanning such key switches to determine switch closures responsive to the



manipulation of particular key switches for causing said generator means to produce electronic signals corresponding to predetermined tones associated with said particular key switches, said circuit means causing said generator means to produce said electronic signals of substantially constant level until said key switches are released.

1. A recuperator assembly of a recoil mechanism of a weapon system wherein said recuperator assembly includes a cylinder with a piston therein separating the interior of the cylinder into a high pressure fluid chamber and a high pressure gas chamber,

means adapted for visually displaying the interior of the gas chamber and indicating the position of the piston in the cylinder including
sight glass means carried by said cylinder for visually displaying the interior of said gas chamber to the exterior thereof,

said sight glass means comprising a window located in an end wall of said cylinder,

movable means in the gas chamber including a connection movable with said piston, said movable means being positioned for viewing through said sight glass means and being movably responsive to piston movement through said connection and,

indicia means on said movable means viewable through said sight glass means for indicating the position of said piston in said cylinder,

said movable means comprising spool means carried by said end wall of said cylinder and comprising first, second and third spools, said first and third spools being co-axial and movable with each other, said second spool being located at a distance from said first and third spools in vertical alignment with said third spool, said second spool being positioned with its surface located in the line of sight of said window and having indicia means carried thereby, said connection comprising a cable carried at one end by said piston and wound on and attached at its other end to said first spool,

a constant force load spring attached to, carried by and wound partially on said second spool at one end thereof, said spring being attached, carried by and wound on said third spool.

4,055,106

VARIABLE OUTPUT FLUID PUMP/MOTOR

Kenneth H. Frey, Hyattsville, Md., assignor to Edward A. Byrne; Gladys U. Byrne, Lorton; Robert B. Morrison and Patricia A. Morrison, Fairfax, all of Va., part interest to each

Filed Nov. 29, 1974, Ser. No. 528,406
Int. Cl.² F01B 3/10, 3/00

U.S. Cl. 91-495

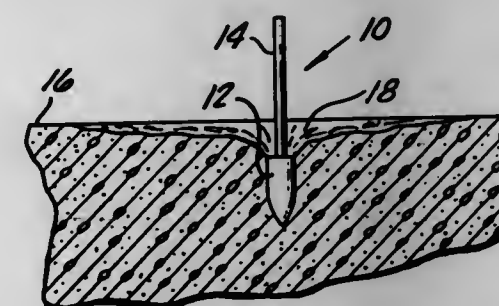
43 Claims

1. In combination, a fluid pump/motor unit comprising a cylindrical housing within which there is arranged at least one rectangular expansible chamber assembly mounted on a crankshaft having at least a portion thereof which is adjustably

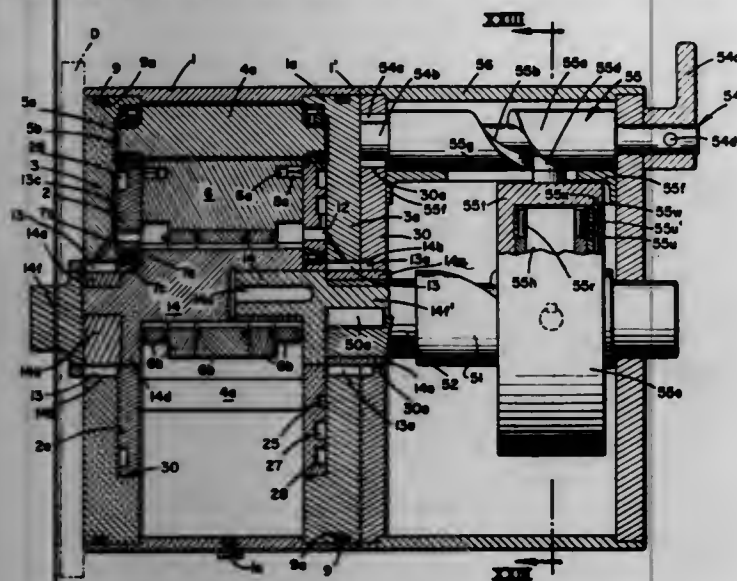
1. A tire piercing munition for emplacement in concrete paving comprising:

a forward section having a sharp, hard, high strength point, said forward section of sufficient mass to be driven into and below the surface of said concrete paving when delivered with sufficient velocity or force, and

an aft section attached to said forward section comprising a smooth flexible shaft adapted to protrude above said concrete paving when the forward section has been emplaced in said paving, said shaft having a stiffness and cross-section sufficient to penetrate a pneumatic tire.



displaceable from the axis of the housing, each end of said displaceable portion being eccentrically mounted in the opposing ends of said housing, and means to supply and receive fluid to and from said unit, a power source having a connection to one end of said shaft, which connection is co-axial with said housing axis; and means coupled to said unit to control the output of said unit irrespective of the speed of said power source by varying said displacement of said shaft portion the control means comprising a housing connected at one end to said unit, a first shaft journaled in said housing and keyed to the end of the displaceable portion of the shaft in the pump/motor unit, a first camming unit keyed to said first shaft and comprising a concentrically positioned pair of cylindrical sleeves encircling said first shaft, the inner sleeve being secured to said first shaft, the axis of said sleeves being parallel to but spaced



from the axis of said first shaft each sleeve having a helical path in the wall of each, said helical paths lying at right angles to each other and forming a moving intersection of said paths so that the inner sleeve can be rotated counter to the rotation of the outer sleeve, means encircling said sleeves with means to engage said paths so as to rotate with said sleeves, a second camming unit holding said first camming unit in rotational relationship to said second unit and mounted on a second shaft in said controller unit housing, said second shaft being parallel to, but spaced from, said first shaft, means to restrain said second camming unit against rotational movement, said second camming unit including means for linear movement along said second shaft to move said encircling means over said sleeves to move said path engaging means along said paths to rotate said first shaft to vary said displacement of said shaft portion.

4,055,107

APPARATUS FOR REMOVING FLUID IN A PISTON CYLINDER ASSEMBLY

William W. Bartley, New Castle, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 533,092, Dec. 16, 1974, abandoned.

This application Sept. 20, 1976, Ser. No. 724,897

Int. Cl.² F01B 31/00

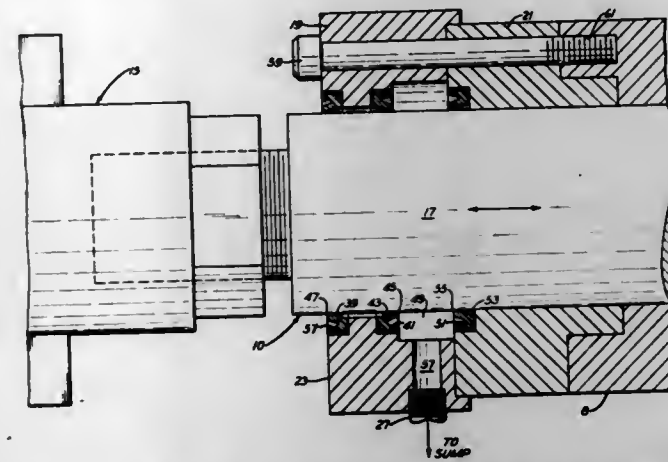
U.S. Cl. 92—86.5

1 Claim

1. In a fluid piston cylinder assembly comprising a piston reciprocable relative to a piston cylinder and a piston rod attached to the piston, wherein during its operation fluid is introduced on the piston rod side of the piston wherein fluid adheres to the piston rod upon the relative displacement of the piston rod and piston cylinder, the improvement comprising a fluid removing means having at least two piston rod encircling scraper elements and a fluid receiving means including a piston rod encircling recess,

said fluid removing means and said fluid receiving means located on said piston rod said of the piston, said scraper elements each having a varying inner diameter, means for locating one of said scraper elements to remove said adhering fluid from said piston rod during relative

movement of said piston rod and said piston cylinder in a first direction, means for locating the other one of said scraper elements to remove said adhering fluid from said piston rod during relative movement of said piston rod and said piston cylinder in a second direction opposite to said first direction and, the inner diameter of said one scraper element decreases to a minimum inner diameter in said second direction so as to remove said adhering fluid on said piston rod upon said in said first direction relative movement, the inner diameter of said other scraper element decreases to a minimum inner diameter in said first direction so as to remove said adhering fluid on said piston rod upon said relative movement in said second direction, means for locating said recess of said receiving means between said minimum inner diameters of said two scraper elements, said recess constructed in a manner to immedi-



ately receive said fluid after removal from said piston rod and having different portions contiguous to said minimum inner diameters and having an outer diameter larger than the outer diameter of said scraper elements, said recess having an axial dimension which substantially equals the separation between said minimum inner diameters, gland plate means comprising two separate members, one of which has an annular projection, an opening in said piston cylinder for receiving said projection, said one member including a recess for receiving one of said scraper elements, the other member having an annular projection for contacting with an annular surface formed on said one member, said other member also having a recess for receiving said other scraper element, and being formed with said recess of said fluid receiving means, and means for securing said two members to said piston cylinder.

4,055,108

CRIMPER ASSEMBLY

Herbert K. Holden, Bon Air, and Peter W. Mansfield, Richmond, both of Va., assignors to American Filtrona Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 562,911, March 28, 1975, Pat. No. 4,007,668. This application Sept. 14, 1976, Ser. No. 723,296

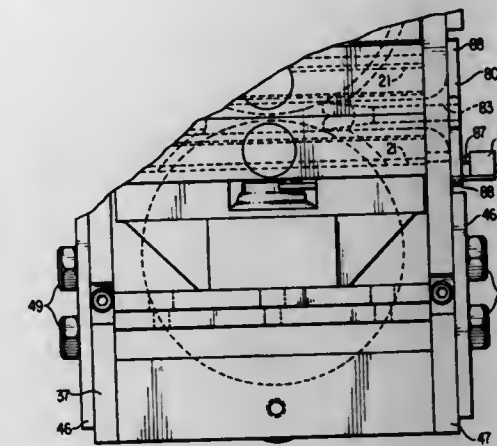
Int. Cl.² A24C 5/50

U.S. Cl. 93—1 C

4 Claims

1. In a crimping assembly for crimping a rod of fibrous material, said assembly having at least one pair of crimping wheels each having embossing means defined on its peripheral surface, means for rotatably supporting each pair of crimping wheels so as to juxtapose their respective embossing means and means for rotating each crimping wheel, the improvement comprising a separate central block extending axially through said crimping assembly from an upstream to a downstream location relative to said crimping wheels, said block having a longitudinally extending bore therein, an anti-stuffing tube inserted in said bore at the downstream location and having its inner end juxtaposed to said crimping wheels, and cut-out

portions on said inner end generally corresponding in configuration to the surface pattern of said crimping wheels, said anti-stuffing tube having a central, longitudinally extending



bore for receiving said rod of fibrous material so as to guide said rod along the bore of said central block and to prevent passage of said rod into the space between the peripheral surface of a crimping wheel and said central block.

4,055,109

METHOD AND APPARATUS FOR PRODUCING SELF-STANDING BAGS

Osamu Kan, Kyoto, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

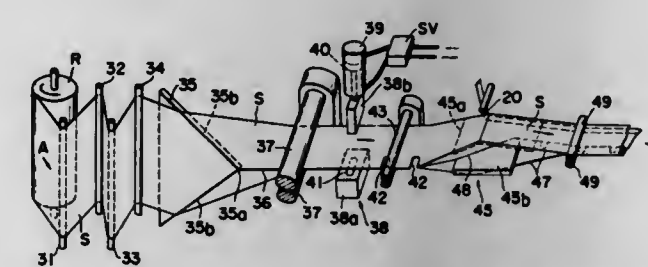
Division of Ser. No. 601,506, Aug. 4, 1975, Pat. No. 3,980,225.

This application May 4, 1976, Ser. No. 683,071

Int. Cl.² B31B 31/74

U.S. Cl. 93—35 R

14 Claims



1. A method for producing a self-standing bag from a continuous strip of blank sheet, comprising the steps of feeding said continuous strip of blank sheet in the direction of its length, folding said strip along its longitudinal centerline constituting a central folding line so as to form two opposing halves, punching a series of slots of a specific width in the folded strip transversely thereof along and adjacent the central folding line at a predetermined pitch, forming two secondary folding lines on said strip on opposite sides of said central folding line and in parallel therewith while moving said two halves of said folded strip away from each other, depressing a part of said strip between said two secondary folding lines transversely inward thereby to reverse the folding direction of said central folding line to form said strip into a W-shaped cross section with said slot now located between and covered by said two halves of said folding strip, subjecting said strip to a transverse heat-fusing operation in a region thereof extending transversely and covering each of said slots, with a width broader than that of said slots, and cutting the strip successively along a transverse line bisecting the width of each of said slots.

4,055,110

FLAP LAMINATING MECHANISM FOR CARTON BLANKS

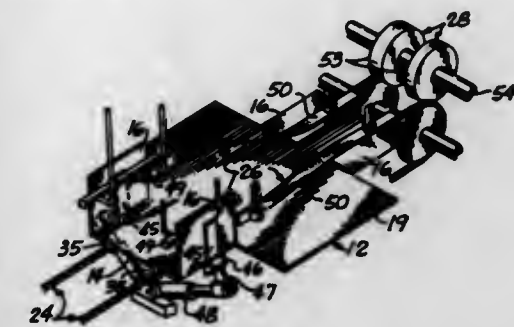
Robert H. Graham, Spokane, Wash., assignor to R. A. Pearson Co., Spokane, Wash.

Filed May 26, 1976, Ser. No. 690,159

Int. Cl.² F01B 19/00

U.S. Cl. 93—49 R

8 Claims



1. A mechanism for laminating pre-cut flaps on planar carton blanks as the carton blanks move to a carton forming station, wherein each carton blank is rectangular in configuration with transverse forward and rearward end edges joining opposed longitudinal side edges, and wherein a laminating flap is located at each corner of the blank, the laminating flaps being transversely foldable about longitudinal laminating fold lines substantially parallel to the side edges of the carton blank, the transverse width of the carton blank area between transversely aligned laminating fold lines being at least twice as great as the transverse width of each laminating flap from its laminating fold line to the side edge of the blank, said mechanism comprising:

a stationary framework;

a longitudinal, upwardly-facing, powered conveyor flight extending along the framework for elevationally supporting individual carton blanks and for continuously moving the carton blanks in succession along a longitudinal path extending the length of the conveyor flight from an infeed end to a discharge end;

carton blank delivery means for directing individual carton blanks onto the conveyor flight adjacent its infeed end, with the longitudinal side edges and laminating fold lines of the carton blanks arranged parallel to the longitudinal path of the conveyor flight with respect to the framework; a pair of pivot arms mounted to said framework at opposite sides of the conveyor flight, said pivot arms being movable about longitudinal axes parallel to the conveyor path, each pivot arm being movable between a lowered position wherein it is clear of carton blanks moving along the conveyor flight, and a raised position where it engages a laminating flap folded upwardly thereby along its laminating fold line;

stationary folding irons extending downstream along the length of the conveyor flight at each side thereof from locations adjacent the respective pivot arms, said folding irons having inwardly-facing surfaces for engagement by the raised laminating flaps folded by the raised pivot arm adjacent thereto and for folding the raised flaps inwardly over their laminating fold lines and against the adjacent areas of the carton blanks in response to the continuous movement imparted to the carton blank by the conveyor flight;

the distance between each pivot arm and the stationary folding iron associated therewith being less than the laminating flap length measured parallel to the longitudinal path of the conveyor flight, whereby each laminating flap can momentarily overlap both the pivot arm and stationary folding iron adjacent thereto while moving continuously along the longitudinal path of the conveyor flight.

4,055,111

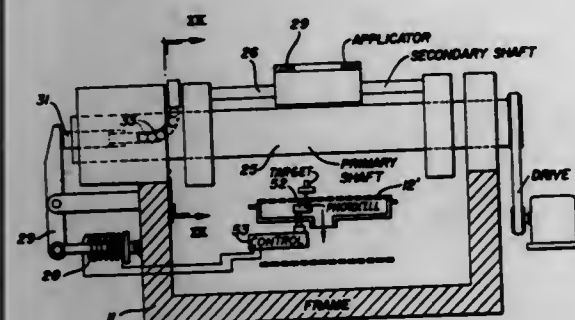
ENVELOPE MACHINE

George F. Howatt, Holden, Mass., assignor to New England Envelope Manufacturing Co., Worcester, Mass.
Division of Ser. No. 543,676, Jan. 24, 1975, Pat. No. 3,982,472, which is a division of Ser. No. 487,906, July 12, 1974, Pat. No. 3,869,905, which is a continuation of Ser. No. 335,725, Feb. 26, 1973, abandoned. This application May 21, 1976, Ser. No. 688,617

Int. Cl.² B31B 1/08

U.S. Cl. 93—61 R

1 Claim



1. An envelope machine, comprising:
 - a. an elongated frame,
 - b. a conveyor mounted in the frame for carrying envelope blanks longitudinally of the frame, the conveyor consisting of a plurality of endless belts mounted side-by-side to define gaps between them and a suction means including a tray underlying the upper run of the belts to provide suction in the gaps, the tray being open upwardly and having vertical side walls whose upper edges extend longitudinally in sealing relationship with the two extreme side belts, and
 - c. a blank processing element mounted on the frame above the conveyor and spaced upstream a substantial distance from the discharge end of the conveyor.

4,055,112

PROCESS AND APPARATUS FOR VENTILATING OR TEMPERING ROOMS

Birger Larkfeldt, Jonkoping, Sweden, assignor to AB Svenska Flakfabriken, Nacka, Sweden

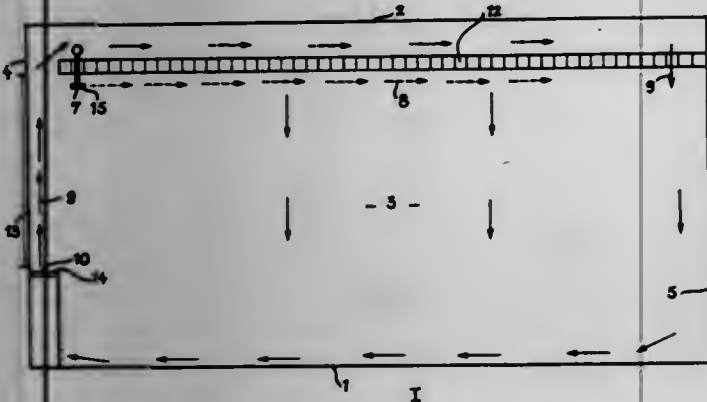
Filed Dec. 30, 1975, Ser. No. 645,514

Claims priority, application Sweden, Dec. 30, 1974, 7416340

Int. Cl.² F24F 13/00, 7/02

U.S. Cl. 98—33 A

13 Claims



1. A process for controlling the flow in a room of air controllably conditioned as to its temperature and/or freshness to maintain air in the central portion of said room at or near a predetermined desired temperature and/or freshness, comprising:

launching one or more jets of control air along a plane generally parallel and near to the ceiling of said room but spaced downwardly therefrom, from a launching location positioned near but downwardly of said ceiling, to form a sheet of rapidly-moving control air spaced below and

generally parallel to said ceiling over a major portion of the area of said ceiling; and
injecting a flow of said conditioned air into the region of said room above said jets of air and along said ceiling in a direction generally parallel to the direction of flow of the adjacent portion of said sheet of control air;
moving the control air in said sheet at a velocity high compared with said flow of conditioned air and serving to confine said flow of conditioned air substantially to a path extending through said region over at least a major portion of the area of said ceiling.

4,055,113

VENTILATOR APPARATUS

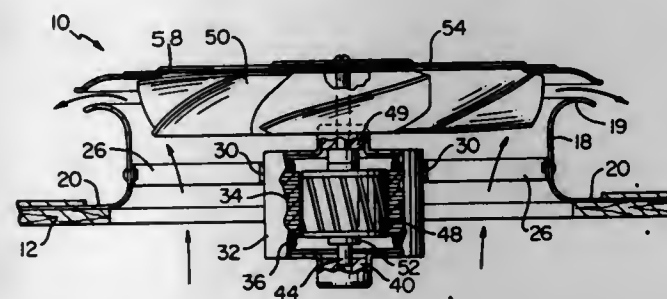
Thomas D. Monroe, Memphis, Tenn., assignor to Robbins & Myers, Inc., Springfield, Ohio

Filed May 7, 1976, Ser. No. 684,147

Int. Cl.² F24F 7/02, 13/10

U.S. Cl. 98—43 C

12 Claims



1. Ventilator apparatus of the type provided with an annular shroud, a fan member encompassed by the shroud, the improvement comprising:
 - a. an electric motor coaxial with the fan member, the electric motor including a stator and a rotor, the rotor being rotatably and axially movable within the stator by magnetic forces created within the stator and rotor, a shaft attached to the rotor and rotatably and axially movable therewith, the fan member being attached to the shaft for rotative and axial movement therewith, a closure member attached to the shaft for axial movement therewith, the closure member being in a normal inactive position in substantial closing relationship to the shroud,
 - b. the rotor, when magnetically energized, moving rotatively and axially with respect to the stator, thus rotatively and axially moving the shaft and the fan member and moving the closure member axially, positioning the closure member in spaced relationship from the shroud for movement of air between the shroud and the closure member during rotation of the fan member.

4,055,114

APPLIANCE FOR MAKING COFFEE AND THE LIKE

Mindert Kats, and Hendrikus Bernardus Sleumer, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,132

Claims priority, application Netherlands, Apr. 15, 1975, 7504441

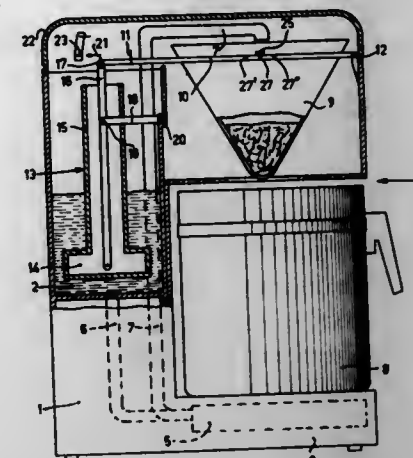
Int. Cl.² A47J 31/10

U.S. Cl. 99—280

5 Claims

1. An appliance for making coffee and the like, which comprises a housing for a water reservoir and a filtering device including a filter holder, a movable element responsive to the level of the water in the water reservoir, and a lever pivotally supported by the housing and pivotally supporting the filter

holder, one end of the lever being pivotally attached to the movable element, whereby a desired ratio between the amount



of water in the water reservoir and the amount of substance in the filter holder to be filtered can be obtained.

4,055,115

BALE-TIE INTERLOCK DEVICE

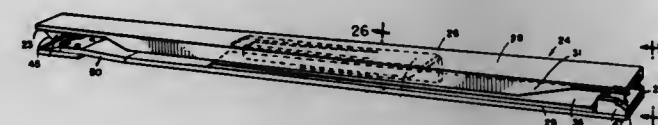
Emil Simich, Chicago, and Walter R. Traxinger, Palatine, both of Ill., assignors to A. J. Gerrard & Company, Des Plaines, Ill.

Filed Dec. 14, 1976, Ser. No. 751,348

Int. Cl.² B65B 13/06

U.S. Cl. 100—34

5 Claims



1. A bale-tie interlocking device for use with a baling press having a platen for engaging the looped ends of the bale-tie wires about the girth of a bale, comprising:
 - a. a housing defining a channel therein and having a plate member extending substantially the length thereof and substantially thereacross to permit release of the engaged and interlocked looped ends of the bale-tie wire from said housing,
 - b. shuttle means longitudinally slidable in said housing,
 - c. shuttle stop means mounted to said housing at one end thereof to thereby retain said shuttle means within said channel, and
 - d. inclined hook plate means mounted in said channel adjacent said shuttle stop means, such that upon the insertion of one looped end of the bale-tie wire into said housing, said shuttle means biases the looped end against said hook plate means to hold the same, such that upon the insertion of the opposite looped-end into said housing, the looped ends are engaged, interlocked together and the shuttle is pushed back to release the engaged looped ends.

4,055,116

COUNTING AND PRINTING MECHANISM WITH INTERCHANGEABLE UNIT PRINTER WHEEL

Arnold E. Roberts, and Jack D. Harshman, both of Statesboro, Ga., assignors to Emerson Electric Co., St. Louis, Mo.

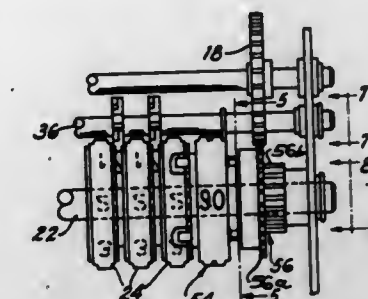
Filed Feb. 17, 1976, Ser. No. 658,485

Int. Cl.² B41L 45/00

U.S. Cl. 101—79

10 Claims

1. In a counter-printer device, a frame, a printer wheel shaft mounted in said frame, a counting printer wheel rotatably mounted on said shaft and having numerical printing characters on the rim thereof, a drive wheel rotatably mounted on said shaft, a unit designating printer wheel assembly rotatably mounted on said shaft between said drive wheel and said counting printer wheel, said assembly comprising a unit designating printer wheel having unit designating printing characters on the rim thereof and a central bore therethrough, and a driving hub member mounted for rotation in said wheel bore, said hub having a flange at each end and a central bore therethrough receiving said shaft for rotation thereon, means on the adjacent faces of said hub member and said drive wheel cooperating to form a driving connection and means on the adjacent faces of said hub member and said counting printer wheel cooperating to form a driving connection, support means adjacent the rim of said unit designating printer wheel, and releasable locking means for locking said unit designating printer wheel in a selected rotated position to said support means.



erating to form a driving connection and means on the adjacent faces of said hub member and said counting printer wheel cooperating to form a driving connection, support means adjacent the rim of said unit designating printer wheel, and releasable locking means for locking said unit designating printer wheel in a selected rotated position to said support means.

4,055,117

PRINTING METHODS AND APPARATUS

Basil Sidney Munday, Harpenden, England, assignor to International Computers Limited, London, England

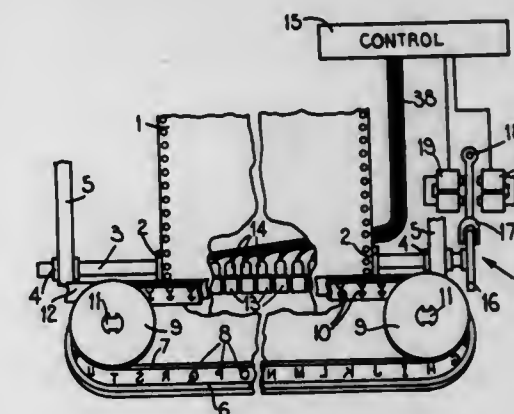
Filed June 17, 1976, Ser. No. 697,244

Claims priority, application United Kingdom, July 2, 1975, 27876/75

Int. Cl.² B41J 1/20

U.S. Cl. 101—93.14

5 Claims



1. Apparatus for printing on a record a line of characters from one of a plurality of interchangeable fonts of type, each font consisting of characters of the same size, different fonts having characters of different sizes respectively, the required pitch spacing of characters in a line being dependent upon the particular font from which the characters are selected, the apparatus including means for supporting the record in a line parallel to the line in which the characters are required to be printed and being spaced apart at constant pitch, driving means engageable with a type carrier having a member carrying the characters of a single font to drive that member to move the characters in sequence past each of the hammers during a printing cycle; selectively operable shifting means for producing a lateral displacement between the record and the hammers in the direction of the printing line; switch means settable in accordance with the size of the characters of the engaged type carrier and control means effective to select the hammers to be operated at those time instants when characters are respectively in their required positions in the line during the cycle, the control means being further arranged in response to the setting of the switch means to operate the hammers to print all

the characters of a line in a single cycle if the characters are of a first size requiring the spacing of the characters in the line to correspond to the pitch spacing of the hammers, to operate the hammers to print the line of characters in at least two cycles if the characters are of a second size requiring the spacing of the characters in the line to be less than the pitch spacing of the hammers and to operate the shifting means to produce a lateral displacement equal to the required pitch spacing of characters in the line between successive ones of those printing cycles required to complete the printing of the line.

4,055,118

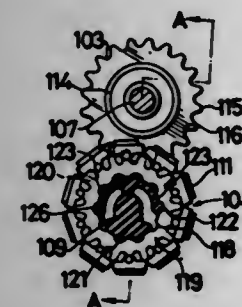
PRINTING HEAD FOR PORTABLE LABELING MACHINE, OR THE LIKE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan
Filed Feb. 17, 1976, Ser. No. 658,491
Claims priority, application Japan, Feb. 17, 1975, 50-020759[U]

Int. Cl.² B41J 1/20

U.S. Cl. 101-110

9 Claims



1. A printing head for selecting and imprinting selected indicia, comprising:

at least one rotatable indexing wheel; said indexing wheel having an external periphery; said indexing wheel having a central axial opening passing therethrough; said central opening being defined by an internal annular wall of said indexing wheel;

first detent means spaced at predetermined intervals around said internal wall;

an internal positioning member; means supporting said positioning member against rotation along with rotation of said indexing wheel; said positioning member passing through said central opening; said indexing wheel being rotatable with respect to said positioning member; said positioning member further comprising two engagement pieces for said indexing wheel; said positioning member also comprising an engaging member in engagement with said internal wall and to which said engagement pieces are integrally attached; said engagement pieces extending in opposite directions from their said engaging member around said internal wall; said engagement pieces being held in fixed position on said positioning member engaging member and being held in engagement with said indexing wheel internal wall; each said engagement piece comprising a resilient arm bent into shape and positioned to engage the respective said internal wall along the length of said engagement piece arm;

at least one second detent means attached to each said engagement piece and engageable with each said first detent means as said indexing wheel and its said first detent means are rotated past said second detent means; said second detent means being so spaced apart and placed on their respective said engagement piece that both said second detent means always simultaneously engage a respective said first detent means;

a plurality of printing types; means for holding said printing types to the exterior of said indexing wheel; said indexing wheel having a print position thereon at which a said type is in position to imprint; the length of each said type around said indexing wheel being related to the interval between two said first detent means such that rotation of

said indexing wheel from engagement between one said first detent means and said second detent means to engagement between another said first detent means and said second detent means serves to remove one said type from said print position on said index wheel periphery and moves another said type to said print position on said indexing wheel;

said positioning member supporting a bearing portion having a bearing surface that engages said internal wall at the same side of said indexing wheel as said print position for said types; said engaging member engaging said internal wall of said indexing wheel at a location thereon opposed to the side thereof of said print position;

said positioning member, said engagement pieces and said engaging member for said engagement pieces all being an integral, single, solid piece inside said indexing wheel central opening;

rotating means for causing rotation of said indexing wheel.

4,055,119

MEANS FOR MOUNTING AND BIASING A SQUEEGEE

Mathias Mitter, Verl-Sende-Mitte, Germany, assignor to Mitter & Co., Schloss Holte, Germany

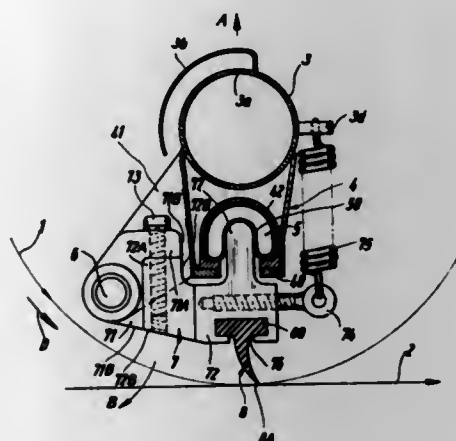
Filed June 19, 1974, Ser. No. 479,948

Claims priority, application Germany, June 20, 1973, 2331428
The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.² B41F 15/46

U.S. Cl. 101-120

2 Claims



1. In a screen printing machine, a combination comprising an elongated liquid-permeable stencil having endless internal and external surfaces; means for moving said stencil so as to engage successive increments of a web of material to be treated along a region of contact which extends lengthwise of said stencil; a movable holder having one side facing towards said region of contact and another side which faces away from said region of contact and is provided with a bar-shaped extension extending lengthwise of said stencil, stationary support means for supporting said holder and having a portion located in the interior of said stencil; a squeegee mounted on said holder at said one side thereof, said holder comprising a first portion which is pivoted to said support means; a second portion which supports said squeegee, and fastener means separably securing said second portion to said first portion, and said holder being movable by pivoting about an axis which is substantially parallel to the longitudinal extension of said stencil and is located ahead of said squeegee, as considered in the direction of movement of said stencil; and biasing means interposed between said support means and said holder to urge said squeegee against said internal surface, including an elongated tubular gas-filled cushion which straddles said bar-shaped extension and is inwardly deformed by the same so that variations in the depths of the deformation of said cushion result in corresponding variations in the biasing action.

4,055,120

APPARATUS FOR ADJUSTING A TENSIONING DEVICE IN PLATE CYLINDERS OF ROTARY PRINTING MACHINES

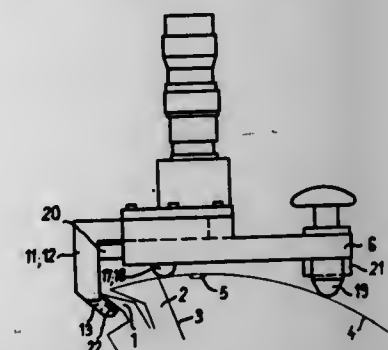
Wolfgang Kamm, Stettlen, Switzerland, assignor to Maschinenfabrik Wifag, Bern, Switzerland

Filed Apr. 7, 1976, Ser. No. 674,587

Claims priority, application Sweden, Apr. 14, 1975, 7504270
Int. Cl.² B41B 1/00; B41F 27/00

U.S. Cl. 101-378

8 Claims



1. Apparatus for adjusting a tensioning rail of a tensioning device in a printing plate support cylinder of a rotary printing machine, comprising:

a support base member;

at least one abutment member engageable with the tensioning rail; said abutment member being supported by said base member and being adjustable in position with respect to said base member;

an optical control device supported on said base member, oriented so as to view a field of view on the plate cylinder and spaced away from said abutment member a distance measured angularly around the plate cylinder; adjustable support means on said base member and engageable with the plate cylinder for adjusting the tilt and orientation of said base member on and with respect to the plate cylinder, thereby to orient said optical control device to have its field of view radially aligned with the plate cylinder; said base member having a bottom, a top and sides; said abutment member projecting from a said side of said base member and is movable with respect to that said side; said optical control device being above said top of said base member; said support means extending beneath said bottom of said base member.

4,055,121

DEPTH CONTROLLED NAVAL MINE

Robert E. Jasperson, Annapolis, Md.; Charles G. Erb, Falls Church, Va.; Donald F. Haber, Cape St. Clair, and Andrew A. Pouring, Edgewater, both of Md., assignors to Trident Engineering Assoc., Inc., Annapolis, Md.

Filed Sept. 10, 1968, Ser. No. 758,766

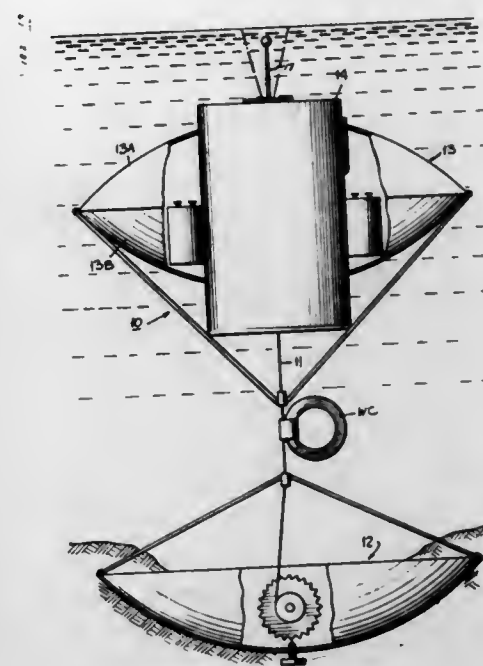
Int. Cl.² F42B 22/18

U.S. Cl. 102-14

4 Claims

1. A tethered automatic naval mine comprising
A. a buoyant casing formed with a parabolic profile and having an explosive charge therein, and
B. a removable container insertable in said casing, said container including:
a. a detonator for said charge,
b. a switch coupled to said detonator to set off said charge when the switch is closed,
c. a wand operatively coupled to said switch and extending outside of said container, said wand normally occupying a vertical position and being caused to assume an angular position to actuate said switch when contacted by a passing craft,
d. a pressure-sensitive transducer responsive to water pressure to provide a signal representative of the depth of said mine below the surface of the water, and
e. means responsive to said signal to vary the depth of said mine to maintain said mine at a predetermined depth

regardless of changes in the level of the water, said means including an extendible cable linking said mine to



an anchor, the length of said cable being varied in response to said signal.

4,055,122

METHOD OF PLACING BLASTING CHARGES IN WET BOREHOLES

Barney P. Muldrow, Jr., Ocala, Fla., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1976, Ser. No. 677,185

Int. Cl.² F42D 1/00

U.S. Cl. 102-23

1 Claim



1. The method of placing an aqueous gel explosive charge in a water-filled borehole in a poorly consolidated rock formation comprising the steps:

a. placing sections of cardboard tubing end-to-end inside a removable casing which is standing in a borehole containing water, while reinforcing and connecting the ends of the sections of cardboard tubing together by placing a close-fitting tubular bushing of sufficient compressive strength inside and extending for a substantial distance inside the ends of adjacent sections of tubing;
b. removing the removable casing which surrounds the cardboard tubing, and
c. filling the inside of the connected sections of cardboard tubing with an aqueous gel explosive composition.

4,055,123

SYSTEMS FOR MAGNETICALLY SUPPORTING A VEHICLE

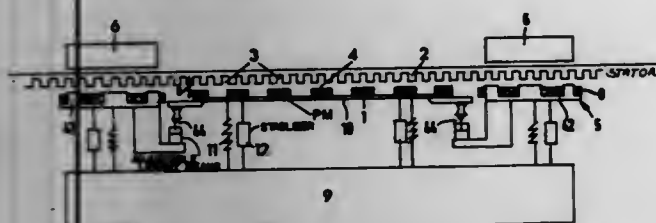
Gotz Heidelberg, Am Hugel 16, D-8136 Percha, Germany
Filed July 23, 1975, Ser. No. 598,271

Claims priority, application Germany, July 26, 1974, 2436106;
Oct. 17, 1974, 2449528

Int. Cl.² B61B 13/08

U.S. Cl. 104—148 LM

13 Claims



1. A magnetic system for supporting a vehicle moving along a roadway, including: a stator member provided along said roadway; a plurality of permanent magnets located on said vehicle and defining an air-gap between a surface of each permanent magnet defining a pole face and the stator member; means located on said vehicle for maintaining the air-gap between said pole faces of the permanent magnets and the stator member; means defining a magnetic lateral guide system between said vehicle and said roadway, said magnetic guide system being weakened in predetermined regions along said roadway; and means defining a mechanical lateral guide system composed of mechanical lateral guide elements secured to said vehicle, and guide blocks located on said stator member in those regions where said magnetic guide system is weakened and arranged to cooperate with said guide elements.

4,055,124

FOLDING TRAINING TABLE

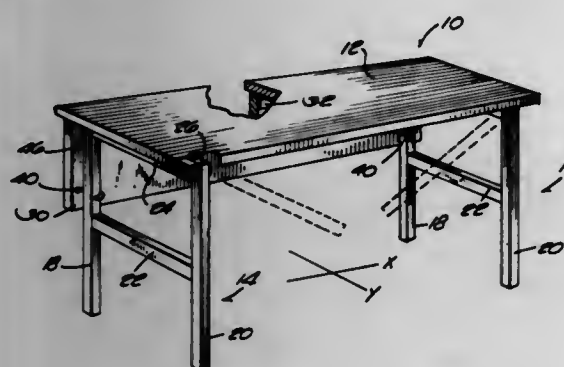
James A. Weagle, Tupelo, Miss., assignor to Krueger Metal Products, Inc., Green Bay, Wis.

Filed Nov. 11, 1976, Ser. No. 740,907

Int. Cl.² A47B 3/00

U.S. Cl. 108—132

3 Claims



1. A table having a top with a longitudinal X axis and a transverse Y axis said table having ends and sides, leg assemblies hingedly connected to said top adjacent the ends thereof for pivotal movement about a Y axis between folded and unfolded positions, a side panel hingedly connected to a side edge of said table for movement about the X axis between a folded and unfolded position, and means for connecting said panel to said leg assemblies to maintain the leg assemblies and panel in the unfolded erect position, said means including an opening in each leg assembly open along the Y axis and facing laterally outwardly of the top along the Y axis, projections on said panel registrable with said leg openings when the panel and leg assemblies are in the unfolded position, said projections preventing movement of said leg assemblies about said hinged connection to the top, said means further including hooks shiftable along the X axis between a leg clearance position and a leg embracing position with said hooks preventing movement of said panel to the unfolded position and disengagement

of the projections when said hooks are in the leg embracing position, and wherein said hooks are supported in apertures in said projections and said hooks are rotatable about an axis parallel to the X axis to afford folding of the hook against the panel.

4,055,125

INCINERATOR, ESPECIALLY FOR BURNING WASTE MATERIAL

Heinz Mallek, Linnich-Tetz, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschränkter Haftung, Julich, Germany

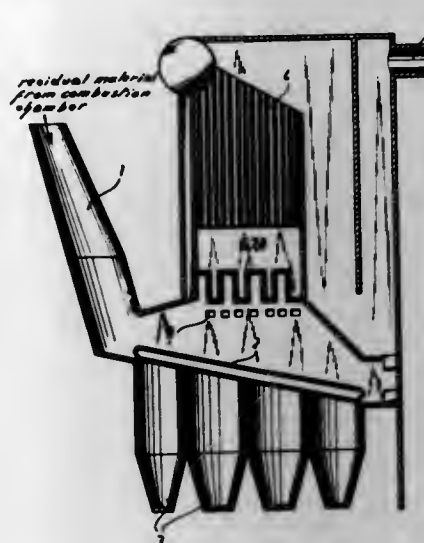
Filed Apr. 26, 1976, Ser. No. 679,912

Claims priority, application Germany, Apr. 24, 1975, 2518128

Int. Cl.² F23G 5/00; F23J 3/00

U.S. Cl. 110—8 R

4 Claims



1. An incinerator plant with a flue, especially for burning waste materials, which comprises combustion means including a combustion chamber for receiving and burning waste materials, conduit means associated with said combustion chamber for conveying fresh air therethrough, and purifying means for purifying flue gases derived from the combustion of waste materials, said purifying means including filter means of high heat resistant material in said combustion chamber so that deposited particles themselves form a solid filter layer and interposed directly between said combustion chamber and said flue.

4,055,126

SUB-SOIL BREAKING, SURFACE-SOIL CONDITIONING AND PLANTER MACHINE

Ronald P. Brown, 203 Meadowlake Drive, Ozark, Ala. 36360, and Jerrell W. Harden, Rte. 1, Banks, Ala. 36005

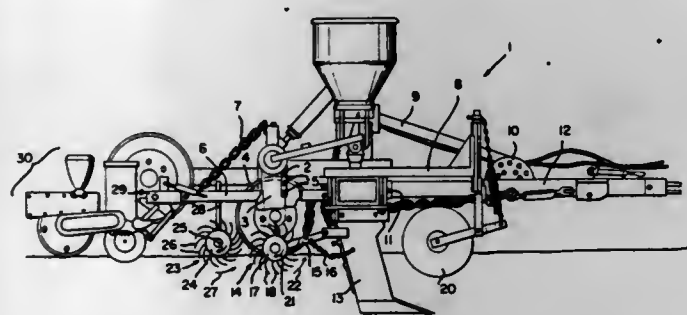
Division of Ser. No. 578,356, May 16, 1975. This application

Jan. 8, 1976, Ser. No. 647,465

Int. Cl.² A01C 5/00; A01B 21/02

U.S. Cl. 111—85

12 Claims



1. A sub-soil breaking and surface-soil modifying and planting combination, comprising first support means for supporting functional elements; a rotary cutting blade means for rotating along and cutting a slot in upper earth soil, to a first predeter-

4,055,128

ORNAMENTAL STITCH SEWING MACHINE

Teiichi Nishigami, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

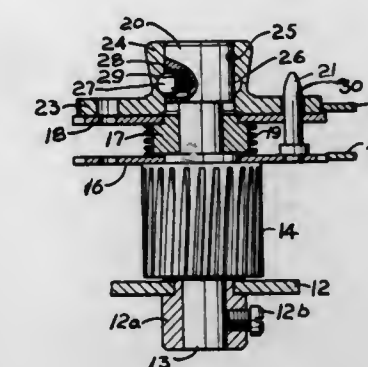
Filed Feb. 23, 1976, Ser. No. 660,367

Claims priority, application Japan, Feb. 27, 1975, 50-27272

Int. Cl.² D05B 3/02

U.S. Cl. 112—158 A

4 Claims



mined depth, and mounted on the first support means; a sub-soil blade cutting means for cutting through and extending down and below said upper earth soil in sub-soil earth a second predetermined depth, and mounted on said first support means in trailing cutting relationship to the rotary cutting blade means and aligned therewith for following within said slot, such that a sub-soil groove is formed; a sub-soil earth-filler means for collapsing side walls defining said slot and said groove to effect a substantially filling-in of soil into said groove; a rotary tine-wheel means for preparing a seed bed and mounted on said first support means and aligned with each of the sub-soil blade cutting means and the sub-soil earth-filler means in trailing relationship thereto for following filled-in-earth prepared by said sub soil earth filler means; and a planter means for planting into prepared seed bed prepared by said rotary tine-wheel means; said sub-soil earth-filler means being mounted on said first support means; said planter means being mounted on the first support means such that the planter means follows in a trailing relationship to the rotary tine-wheel means; said sub-soil earth-filler means including a rotatable wheel-like element having blunted tines extending radially outwardly from a hub, some of the blunted tines extending laterally in one direction and others extending laterally in an opposite direction, the lateral directions being lateral relative to a plane of rotation of the rotatable wheel-like element, and a predetermined dimension between terminal ends of the tines extending in said one direction and tines extending in said opposite direction being substantially larger than the predetermined width of said groove such that the terminal ends are adapted to collapse said side walls of the groove, and when the rotating wheel-like element is rotated along the sub-soil slot.

1. In an ornamental stitch sewing machine comprising a frame, a feed dog, means for imparting movement to the feed dog, control means for varying the amplitude and the direction of the feed movements of the feed dog during sewing, means including a first cam and first cam tracking element for mechanically and automatically imparting movement to the control means to vary the amplitude and direction of the feed movement of the feed dog during sewing, a needle bar mounted for endwise reciprocation and for sidewise movement transversely of the direction of reciprocation, a second cam, a second cam tracking element, means biasing the first and second cam tracking elements against respective cams whereby the tracking elements will track and respond to said respective cams, transmission mechanism connecting the second cam tracking element with the needle bar for shifting the needle bar sidewise in conformance with the cam response of the second tracking element, means for rotating said cams in synchronism with the needle bar reciprocating movements, said first and second cams being coaxially mounted in spaced relation on a drive shaft for rotation therewith with said second cam being axially slidable, spring means normally biasing said second cam axially of said shaft into operative registration with said second tracking element, a third cam arranged to be received on said shaft in superposed relation to said second cam so as to displace said second cam from registration with said second tracking element, and means for releasably securing said third cam on said shaft in operative registration with said second tracking element whereby said second tracking element will respond only to said third cam with said second cam being rendered ineffective.

4,055,127

HEM FOLDING ATTACHMENT

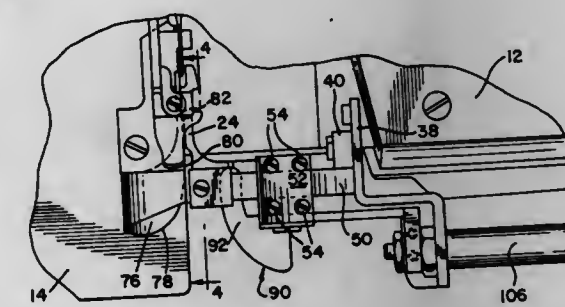
James E. Sharp, Economy, Ind., assignor to Union Special Corporation, Chicago, Ill.

Filed Mar. 12, 1976, Ser. No. 666,386

Int. Cl.² D05B 35/04

U.S. Cl. 112—143

10 Claims



1. An apparatus for folding the edge of a flexible sheet prior to the stitching of the folded edge by a stitch forming mechanism, said apparatus comprising:

first movable guide means having a folding portion means; second movable guide means; a stitch forming mechanism; actuation means connected to said guide means for effecting movement of said guide means wherein said second guide means cooperably associates with said first guide means to effect folding of an edge portion of said sheet to form an S-shaped fold in said edge; and finger portion means associated with said first movable guide means, being interposed within said fold and having a rearwardly extending guiding edge which is generally parallel to the line of feed in front of said stitch forming mechanism for urging said sheet against said stitch forming mechanism.

4,055,129

DIGITAL DIFFERENTIAL CAPACITANCE PROXIMITY SWITCH

Barney D. Hunts, Mountain Lakes, N.J.; George H. Hare, San Mateo, Calif., and Bradley Eaton, Pompton Plains, N.J., assignors to The Singer Company, New York, N.Y.

Continuation-in-part of Ser. No. 596,685, July 16, 1975,

abandoned. This application Dec. 3, 1975, Ser. No. 637,449

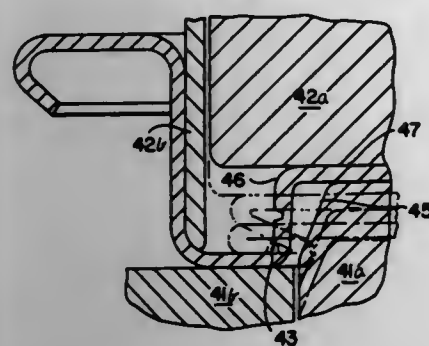
Int. Cl.² D05B 3/02

U.S. Cl. 112—158 E

8 Claims

1. In a sewing machine having stitch-forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches; logic means for storing pattern stitch information in digital form; means operating in timed relation with the sewing machine for recovering selected digital pattern stitch information from said logic means; feed and bight digital-to-analog converter means for generating positional feed and bight analog signals, respectively, related to said selected digital pattern stitch information; and feed and bight closed loop

said connecting portion so that at least a part thereof assumes a substantially perpendicular position relative to said two sections and part of it forms an extension of one of said sections, and then collapsing the remaining part of



said connecting portion between said sections, said score being shifted radially inwardly during said upsetting of said connecting portion to effect a stress on the score residual primarily in compression.

4,055,135

RUDDER ERROR DETECTOR

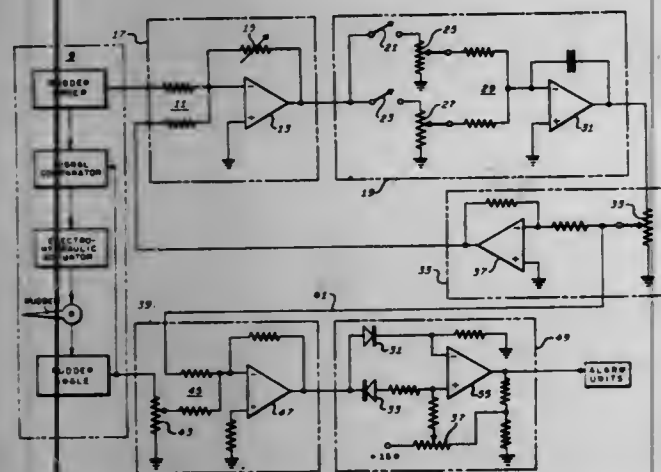
Charles R. Wesner, Crozet, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 4, 1976, Ser. No. 692,814

Int. Cl.² B63H 25/36

U.S. Cl. 114-144 E

4 Claims



1. Apparatus for detecting a malfunction in a ship's hydraulic steering system employing a plurality of pumps, said apparatus including means to provide rudder order and actual rudder angle signals indicative of the instantaneous position of the helm and rudder, respectively, simulator means for providing a simulated rudder angle signal indicative of the expected response of the rudder to an order signal, said simulator means including an adjustable integrating means for providing a time delay approximating that experienced in the mechanical components of the ship's steering system and a separate potentiometer corresponding to each of the pumps for matching the integrator to each pump individually, means for comparing the simulated and actual rudder angle signals, and means for actuating an alarm whenever the difference between the instantaneous values of the simulated and actual rudder signals exceeds a given threshold.

4,055,136
MULTI-CELL GAS-FILLED BAG AND METHOD FOR PRODUCING THE SAME

Masao Fujisawa, Chigasaki; Mitsugu Makise, and Mamoru Kadono, both of Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

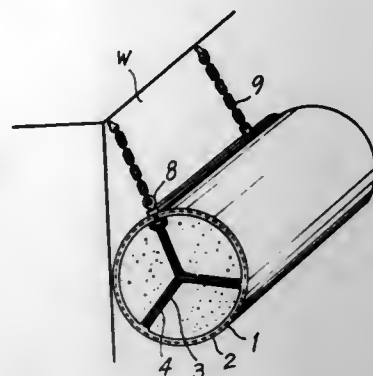
Filed Mar. 31, 1976, Ser. No. 672,358

Claims priority, application Japan, Apr. 2, 1975, 50-39268

Int. Cl.² B63B 59/02

U.S. Cl. 114-219

5 Claims



1. A multi-cell gas-filled bag comprising: an outer sleeve composed of an elastic rubber cylinder having a tension-resistant reinforcing material embedded therein, an inner concentric sleeve of substantially the same length as said outer sleeve composed of an elastic hollow cylinder having a tension-resistant reinforcing material embedded therein, said inner and outer sleeves united with each other at their ends and at a plurality of adhering portions extending longitudinally of and being equally spaced around said sleeves such that the inner surface of the outer sleeve is divided into equal segment regions, and is adapted to form gas-filled cavities, each cavity having an independent partition wall formed by the deformation of the inner sleeve between adjacent adhering portions in the longitudinal direction and between adhering portions at both ends of said inner and outer sleeves.

4,055,137

VESSEL MOORING SYSTEM

Yoichi Motai, Urawa; Keijiro Gouda, Chofu, and Atsuya Isono, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd. and Mirua Shokai Company Ltd., both of Tokyo, Japan

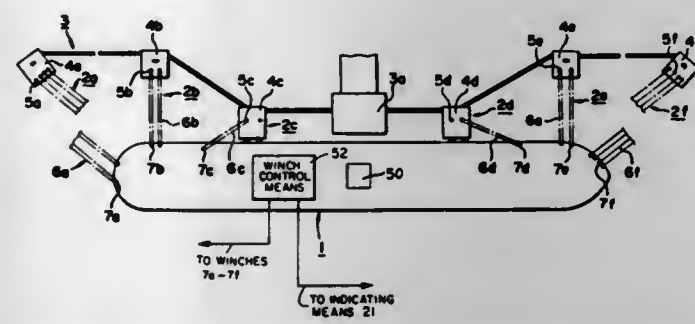
Division of Ser. No. 535,570, Dec. 23, 1974, Pat. No. 3,970,028.

This application June 4, 1976, Ser. No. 692,765

Int. Cl.² B63B 21/16

U.S. Cl. 114-230

1 Claim



1. A system for mooring a vessel to a facility on a wharf or pier, said system comprising a plurality of mooring means, tensional force detecting means incorporated in each said mooring means, said tensional force detecting means including means for generating a tension signal and means for adjusting the tensional force exerted on said respective mooring means in accordance with the signals generated by said detecting means whereby the vessel is moored to the facility in a well balanced condition, each said mooring means comprising a plurality of fixing means rigidly secured to the mooring facility, at least one hook formed on each said fixing means, each said hook comprising a base portion defined by a pair of spaced apart side

plates that straddle said hook and which are coupled to each other by means of a transverse pin, a plurality of ropes each having one end connected to said hook, and a winch which is provided on board said vessel and to which the other end of said ropes are connected, each said detecting means comprising strain gauge means mounted on each said plate, each said strain gauge means comprising two pair of strain gauges with each said pair of gauges being defined by an active gauge and a dummy gauge, one of each said pair of active and dummy gauges being located above said pin and one of each said pair of active and dummy gauges being located below said pin, said active strain gauges and dummy gauges each being connected by conductors, thereby defining a single load cell, there being further included a visual indicating means located in the central portion of said mooring facility, said visual, indicating means being connected by means of a conductor to the respective tensional force detecting means, whereby the tensional force on the respective ropes is signaled by said visual indicating means and control means for the respective winches, said control means being located on board the vessel, said control means being electrically connected to said indicating means to thereby present automated tensional force control for said ropes.

4,055,138

UNDERWATER VEHICLE TOWING AND RECOVERY APPARATUS

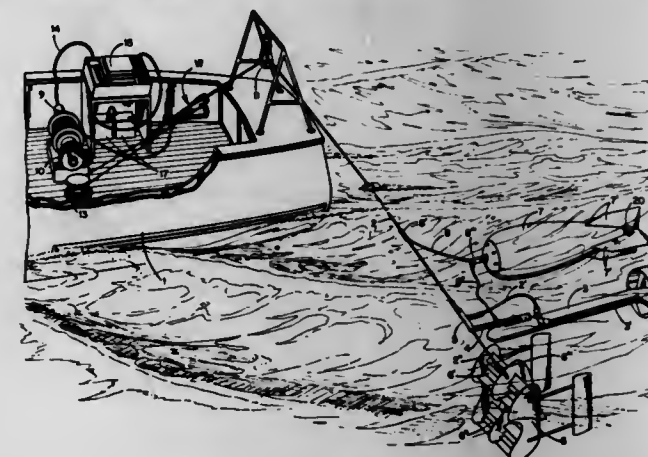
Martin Klein, Amesbury, Mass., assignor to Klein Associates, Inc., Salem, N.H.

Continuation of Ser. No. 547,998, Feb. 7, 1975, abandoned, which is a continuation of Ser. No. 335,681, Feb. 26, 1973, abandoned. This application June 21, 1976, Ser. No. 698,300

Int. Cl.² B63G 8/42

U.S. Cl. 114-244

8 Claims



1. Underwater vehicle towing and recovery apparatus having, in combination, tow cable means, vehicle means having coupling means connected to the tow cable means; water foil depressor means connected with the vehicle means for creating downward forces as the vehicle means is towed underwater by the tow cable means; elongated streamlined buoyant recovery means, stabilized at a free end by a fin structure, and disposed above said vehicle means, said recovery means being flexibly connected at a leading end only thereof to a leading end of said vehicle means and to said cable means to be towed horizontally submerged substantially parallel to and above the vehicle means and being provided near its other and free end with the normally ineffective signalling means, the recovery means being permanently buoyantly adjusted so as to rise free-end upward to the surface when the vehicle means is no longer being towed, as upon at least one of stoppage of towing and severance of the tow cable means, to carry at least the vehicle means to the vicinity of the surface, and to float in a vertical attitude with its free end exposed above the surface, said recovery means and said vehicle means being free to move downwardly in response to the downward forces of said depressor means and being devoid of restraint from the water surface other than by said tow cable means; and the recovery means being further provided with means for rendering the

normally ineffective signalling means effective when the said free end surfaces in upward position.

4,055,139

CONVEYING AND RETAINING APPARATUS

Horst Scheiding, Düringer Str. 4, 2854 Loxstedt, Germany

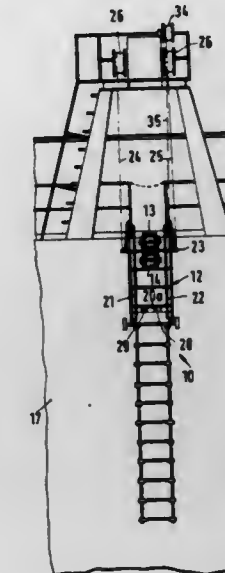
Filed Nov. 3, 1975, Ser. No. 628,677

Claims priority, application Germany, Nov. 14, 1974, 2454099

Int. Cl.² B63B 35/00

U.S. Cl. 114-270

8 Claims



1. In an apparatus suitable for transporting and retaining payloads on ferrous metal surfaces using electromagnetic holding devices, more particularly a pilot lift on the outboard walls of ships having at least one electromagnet disposed at a reduced distance from a surface to be moved over by running gear on a bearing frame adapted to receive the payloads, the improvement comprising an electricity generating unit for providing power to the electromagnet being mounted on said bearing frame, said generating unit comprising a D.C. generator drivable by a compressed-air motor, said generator capable of producing electric power for the electromagnet, and being disposed on the bearing frame.

4,055,140

JET DRIVE BOAT COVER

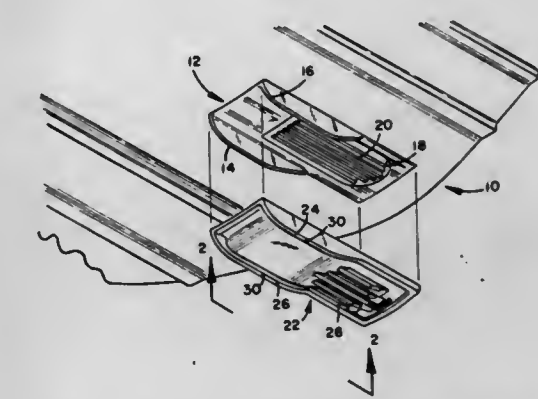
James J. Kirchhan, 1192 Pularino Ave., Costa Mesa, Calif. 92626

Filed Jan. 15, 1976, Ser. No. 649,472

Int. Cl.² B63H 5/16

U.S. Cl. 115-76

10 Claims



1. A cover for an opening of a jet drive boat propulsion system for mounting on a boat hull wherein the opening is formed within a fixture placed in the bottom of the boat hull and has a grating thereover said cover comprising: a housing for substantially conforming to the fixture in a manner whereby it covers the opening; and an overcenter latching device connected to said housing and having an engagement hook for latching to the grating

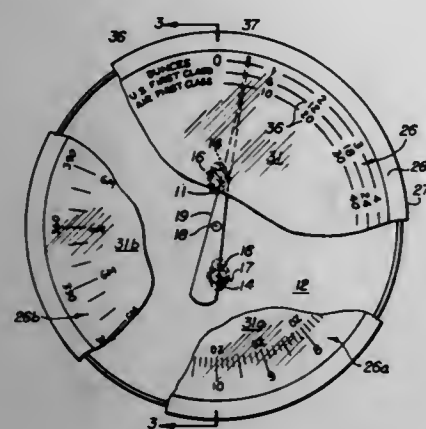
wherein said hook is operable from the outside of the housing by an eccentric linkage means which moves said engagement hook eccentrically from an unsecured into a secured relationship with a portion of the grating.

4,055,141
TRANSPARENT DIAL AND OUTER TRANSPARENT COVER FOR SCALE WITH ZERO-SETTING ADJUSTMENT
Douglas M. Homs, 1538 Industrial Way, Hillsborough, Calif. 94002

Filed Feb. 27, 1976, Ser. No. 662,147
Int. Cl.² G01D 7/00

U.S. Cl. 116—129 F

7 Claims



1. A scale dial-cover combination comprising a transparent circular cover having a flat circular face and cylindrical peripheral first flange, a scale pan having a cylindrical peripheral second flange shaped to engage said first flange, said circular face marked with scale dial markings, said flanges fitting over each other with a slip fit to permit rotation of said cover about the central axis of said pan and to permit said cover to be slipped off said second flange for replacement with a different face, a scale frame bracket, said pan being apertured, attachment means for securing said pan to said bracket, a pointer staff extending through said pan, and a pointer on said staff a short distance behind said face, said pan being formed with enlarged holes and said bracket with tapped holes, screws fitting with play through said enlarged holes and into said tapped holes, to adjust and fix the position of said pan relative to said bracket with said second flange centered relative to said staff.

4,055,142
METHOD AND APPARATUS FOR PERFORMING A PLURALITY OF SEQUENTIAL OPERATIONS UPON EACH OF A SERIES OF ARTICLES
Dusan Sava Lajovic, 73 Victoria St., Smithfield, New South Wales, Australia (2164)

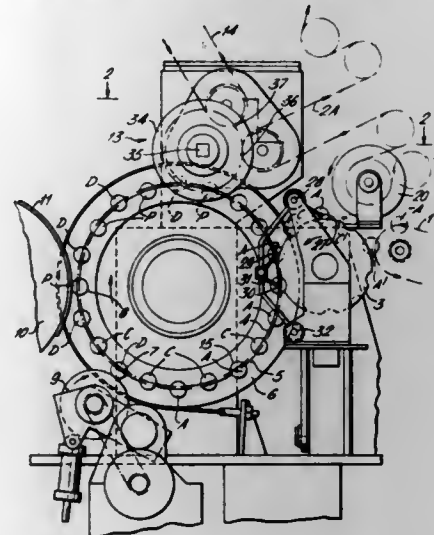
Filed Sept. 15, 1975, Ser. No. 613,352
Claims priority, application Australia, Sept. 25, 1975, 9015/75
Int. Cl.² B05C 1/02, 13/02

U.S. Cl. 118—46

5 Claims

1. Apparatus for performing coating and printing operations on each of a series of cylindrical articles comprising:
a rotatable turret;
a plurality of first axially directed mandrels fixed to said turret and equally circumferentially pitched in an outer circular array coaxial with said turret;
a similar plurality of second axially directed mandrels fixed to said turret, said second mandrels being equally circumferentially pitched in an inner circular array concentric with said outer array and having a diameter smaller than that of said outer array, said mandrels in said inner and outer arrays being staggered so that mandrels in one of said arrays are substantially equidistant from adjacent mandrels in the other of said arrays;
means for indexing said turret to bring each of said first mandrels successively into a first loading station, a coating station and a first unloading station while also bringing

each of said second mandrels successively into a second loading station, a printing station and a second unloading station, said stations being spaced around said turret at angular positions separated by an integral multiple of said pitch;
means at said first loading station for loading a cylindrical article on the mandrel in said outer array indexed into said first loading station;
means at the coating station for applying a coating to the external surface of the article on the mandrel in said outer array indexed into said coating station, said coating means including a coating roller located outside of said arrays and arranged to contact articles on said outer array while avoiding contact with articles on said inner array so that only articles on said outer array are coated;
means at said first unloading station for removing coated articles from the mandrel in said outer array indexed into said first unloading station for curing of said coating;



means at said second loading station for loading cured articles on the mandrel in said inner array indexed into said second loading station;
means at said printing station for applying a coating of print to cured articles on the mandrel in said inner array indexed into said printing station, said printing means including a printing drum located wholly outwardly of said arrays and having a raised printing surface interpenetrating said outer array for contacting cured articles on said inner array, said raised printing surface covering only a portion of the circumference of said printing drum so that rotation of said printing drum carries said raised printing surface away from said arrays while the mandrels on said outer array index through said printing station whereby only articles on said inner array are printed; and
means at said second unloading station for removing printed articles on the mandrel in said outer array indexed into said station.

4,055,143
RELEASE MATERIAL APPLICATION SEAL
Louis R. Hattler, Marion, and Sukumaran K. Menon, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

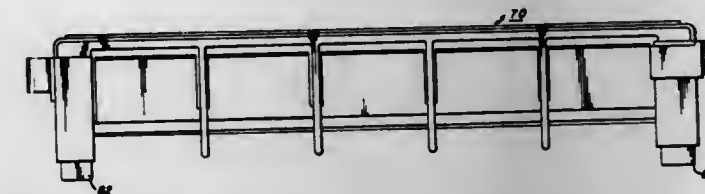
Filed Sept. 20, 1976, Ser. No. 724,446
Int. Cl.² B05C 11/04, 1/06; G03G 15/20

U.S. Cl. 118—60

6 Claims

1. An apparatus for applying a fluid release material to a fuser member in communication with a backup member as a sheet of support material having particles thereon passes therebetween with the particles contacting the fuser member, including:
a housing defining a chamber for storing a supply of release material in operative communication with the fuser member; and
a blade member disposed closely adjacent to the fuser mem-

ber for controlling the thickness of the layer of release material applied to the fuser member, said blade member comprising truncated triangular pads extending in an outwardly direction, substantially normal to the edge of



said blade member at opposed, spaced side marginal regions thereof, each truncated triangular pad being resiliently urged into engagement with the fuser member to prevent leakage of the release material thereat.

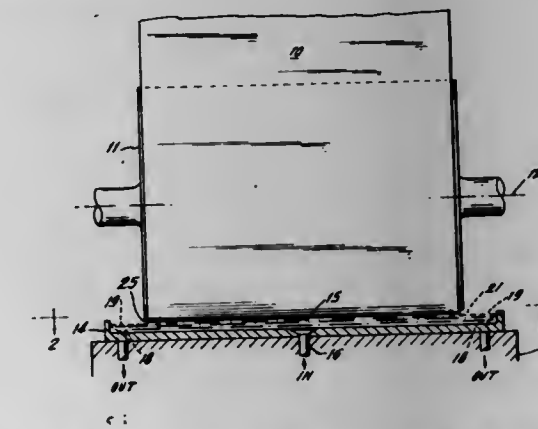
4,055,144
APPARATUS FOR MENISCUS COATING OF A MOVING WEB

Simon L. Chu, Dobbs Ferry; Robert Sharowsky, Hastings-on-Hudson, and Peter Shu, Yonkers, all of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,814
Int. Cl.² B05C 5/02

U.S. Cl. 118—401

1 Claim



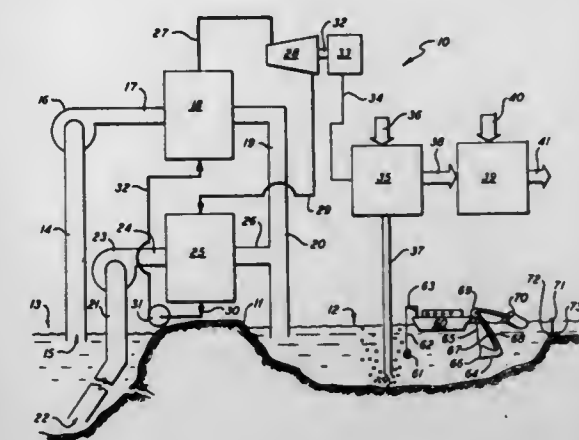
1. Apparatus for coating a moving surface of aluminum substrate which comprises:
a. a pan having a longitudinally extending groove at the upper surface thereof, capable of containing a relatively elongated, shallow pool of a light-sensitive coating solution;
b. level-regulating fluid flow means interior to said pan continually supplying said coating solution to said pan in the absence of substantial turbulence at a rate at least 5% in excess of that required to support a meniscus between a surface of said aluminum substrate and the upper level of said pool, and evacuating a portion of said coating solution from said pan while maintaining the elevation of said coating solution at a substantially constant level, said fluid flow regulating means comprising at least one enlarged disturbance damping fluid inlet port located midway between the ends of the pan at the bottom level of said pan and at least two outlet ports located at the ends of the pan at the top level of said pan, said inlet and outlet ports being positioned in a plane containing said longitudinally extending groove and the longitudinal axis of said pan;
c. a roller, having a diameter at least four times the width of said pool at its upper surface, which supports said aluminum substrate by engaging one surface thereof to position the other side of said aluminum substrate close to and above the upper surface of said pool such that the space between said aluminum substrate and the upper pool surface is in the range of 15 to 35 mils; and
d. a meniscus of said coating solution extending from the upper surface of said aluminum substrate such that the arc of aluminum substrate contacted by said meniscus of coat-

ing solution subtends an angle of no more than 20° measured from the longitudinal axis of said roller.

4,055,145
SYSTEM AND METHOD OF OCEAN THERMAL ENERGY CONVERSION AND MARICULTURE
David Mager, 20 W. 64th St., Amherst, Mass. 10023, and William E. Heronemus, 730 West St., New York, N.Y. 01002
Filed Sept. 29, 1976, Ser. No. 727,681
Int. Cl.² A01K 61/00

U.S. Cl. 119—2

29 Claims



1. An integrated system of ocean thermal energy conversion and mariculture comprising:
a lagoon located adjacent to a deep ocean region having warm seawater at the surface of the region and nutrient-rich cold seawater at a predetermined depth below the surface, the surface seawater in said region having an average minimum temperature of at least about 21° C and the deep nutrient-rich seawater having an average maximum temperature of no more than about 10° C, the lagoon being stocked with a preselected species of edible marine fauna;
a passageway connecting the lagoon to the adjacent ocean region;
a closed loop power generating plant located adjacent to the lagoon, said closed loop containing a working fluid capable of operating in a Rankine cycle between the warm and cold seawater temperature, and said generating plant including
a first heat exchanger connected in said loop and having a separate seawater side;
means for delivering a stream of warm surface seawater from said ocean region to the seawater side of said first heat exchanger for evaporating the working fluid at a substantially constant first pressure;
a second heat exchanger connected in said loop and having a separate seawater side;
means for delivering a stream of cold nutrient-rich seawater from said predetermined depth of the ocean region to the seawater side of the second heat exchanger for condensing the working fluid at a substantially constant second pressure lower than said first pressure;
pumping means connected in said loop between the second and first heat exchangers for pumping the working fluid as liquid from the second heat exchanger at said second pressure to the first heat exchanger at said first pressure;
power generating means connected in said loop between the first and second heat exchangers for extracting useful work from the working fluid as a vapor expanding from said first pressure to said second pressure; and
conduit means having an inlet connected to the seawater sides of the first and second heat exchangers and an outlet into the lagoon approximately opposite the passageway connecting the lagoon with the adjacent ocean region for mixing the streams of cooled surface seawater from the first heat exchanger and the warmed nutri-

ent-rich deep seawater from the second heat exchanger and discharging the mixed streams into the lagoon at an optimum temperature for growth of said preselected marine fauna.

4,055,146

AUTOMATIC FEEDING APPARATUS

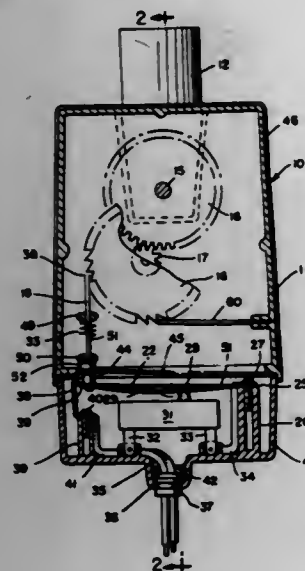
Thomas J. Smrt, Bartlett, Ill., assignor to Fox Valley Marking Systems, Inc., Cary, Ill.

Filed Aug. 30, 1976, Ser. No. 718,684

Int. Cl.² A01K 61/02

U.S. Cl. 119—51.11

7 Claims



1. An automatic feeding apparatus comprising a frame, a hopper on the frame for holding material to be fed, valve means mounted on the frame below the hopper for feeding a discrete amount of material from the hopper, wheel means rotatably mounted on the frame for actuating the valve means, the wheel means including a ratchet wheel, an actuator reciprocally mounted on the frame and engageable with the ratchet wheel for intermittently rotating the ratchet wheel, a pair of electrical terminals adapted to be connected to a source of electric power, and a thermostatic metal strip connected to one of the terminals, the thermostatic metal strip being movable by thermal expansion and contraction between a first position in which the strip engages the other terminal and a second position in which the strip is out of contact with the other terminal, the strip completing a circuit between the terminals when the strip is in the first position whereby the strip is heated, the electric circuit being opened when the strip moves to the second position whereby the strips cools, the strip engaging and moving the actuator when the strip moves from one of its positions to the other of its positions whereby the ratchet wheel is rotated.

4,055,147

AUTOMATIC FLUID DISPENSER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Peter C. Sakellaris, Portland, Oreg.

Filed Oct. 8, 1975, Ser. No. 620,675

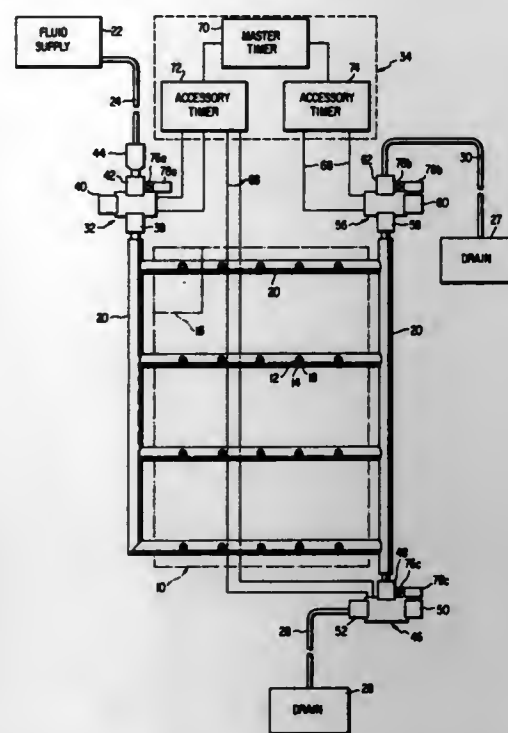
Int. Cl.² A01K 7/02

U.S. Cl. 119—72.5

11 Claims

1. An automatic fluid dispensing apparatus comprising:
a. a supply of fluid to be dispensed;
b. a drain for said fluid;
c. one or more individual fluid dispensing units each adapted to dispense fluid when sucked by a user;
d. conduit means for coupling said individual fluid dispensing units to said supply and to said drain;
e. first automatic control means adjacent said supply for causing a flow of the fluid from the supply to the individual fluid dispensing units during predetermined dispensing intervals and for preventing flow of the fluid from the

supply to the dispensing units after completion of said predetermined dispensing intervals; and
f. second automatic control means to cause a flow to said drain, via said conduit means, of all fluid in said conduit



means except the portion between said fluid supply and said first automatic control means, said flow being caused at the completion of each predetermined dispensing interval.

4,055,148

ANIMAL HOLDING CLAMP APPARATUS

Arnold Brockman, Humboldt, and Norbert Beaujot, Saskatoon, both of Canada, assignors to Brockman's Service Ltd., Humboldt, Canada

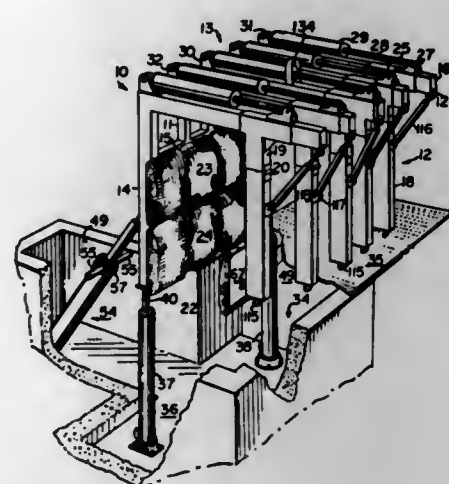
Filed Oct. 24, 1975, Ser. No. 625,531

Claims priority, application Canada, Oct. 28, 1974, 212399

Int. Cl.² A01K 15/00

U.S. Cl. 119—103

23 Claims



1. Animal immobilizing clamp apparatus comprising an elongate open three-sided framework of inverted "U" cross-sectional form comprising a top-wall frame and opposed side-wall frames of length and height sufficient to confine the sides of an animal to be immobilized, said framework having open ends and bottom, one side-wall frame comprising a rigid planar structure integrally joined with said top-wall frame, the other side-wall frame comprising a series of columns spaced apart horizontally and extending downwardly from said top wall frame, a first plurality of cushioned plate elements mounted on the inner side of each column, and a second plurality of cushioned plate elements mounted on the inner side of said rigid side-wall frame, means mounting said columns in said top-wall

frame for independent guided rectilinear movement of a column toward and away from said rigid side-wall frame, means for controllably moving each column to vary the spacings between opposed plate elements for clampedly engaging opposite sides of an animal and for releasing the animal, and means for connecting said apparatus is supported relation with a reference structure.

8. Animal immobilizing apparatus, comprising opposed elongate side-wall frames and a top-wall defining a three-sided animal-receiving framework having open ends and bottom, one side-wall frame comprising a rigid braced group of longitudinally spaced upright beam members having a height at least as high as the largest animal to be confined integrally joined with longitudinal bracing beam members, said top-wall frame comprising a plurality of transverse beam members, said upright beam members being integrally joined at their upper ends with the adjacent ends of corresponding transverse beam members, respectively, guide means carried by each transverse beam member, the other side-wall frame comprising an equal group of longitudinally-spaced upright cantilever beam members, each cantilever beam member carrying integral slide means mounted on a respective guide means for independent guided reciprocatory movement along said guide means toward and away from said rigid side-wall frame, animal clamping means comprising a plurality of plate elements mounted on the inner sides of said side-wall frames in closely adjacent spaced relation and distributed over substantially the entire inner areas thereof as at least two tiers having combined vertical span sufficient to cover the side of an animal, said plate elements each supporting a cushion body, powered motive means connected with said top-wall frame and with cantilever beam member for moving each cantilever beam member independently along associated guide means, control means for actuating said motive means for clampedly engaging the sides of an animal received between opposed tiers of cushion bodies and for disengaging from said animal, and means connecting said clamp apparatus for support by a reference structure.

4,055,149

NECK FRAME FOR CATTLE

Adolf Haiges, Bonnigheim, Germany, assignor to Firma Suevia

Haiges KG, Kirchheim, Germany

Filed Aug. 16, 1976, Ser. No. 714,502

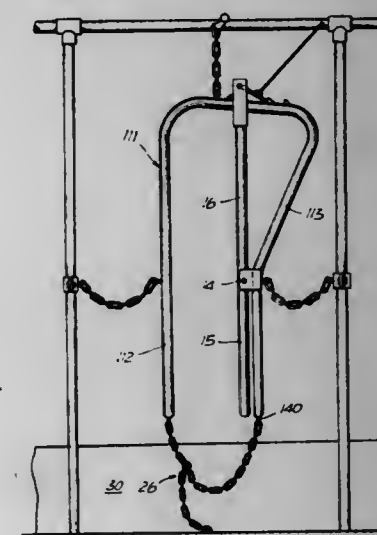
Claims priority, application Germany, Aug. 14, 1975, 7525811;

May 19, 1976, 2622172

Int. Cl.² A01K 1/06, 1/08

U.S. Cl. 119—147 A

10 Claims



1. A neck frame for cattle adapted to be suspended in a cattle stand comprising an essentially U-shaped frame including two generally vertically extending shanks and a connecting cross-piece, said frame defining an upper head opening adapted to receive the head of an animal and a lower neck opening for the neck of the animal, each of said shanks having a free end adjacent said neck opening, means flexibly connecting the free ends of said shanks and adapted to be connected to the floor of a

stable for defining the lower portion of said neck opening, a closing lever having upper and lower free ends and being pivotally mounted near its midpoint on one of said shanks about an axis extending perpendicular to the plane of said frame, said lever having an upper closing arm and a lower actuation arm, said lever being pivotable from an open position wherein said closing arm is spaced from the other one of said shanks to permit the animal to pass its head through said head opening to a closed position wherein said closing arm approaches said other one of said shanks to prevent the animal from pulling its head out of the frame, means for automatically locking said closing lever in said closed position, said cross-piece comprising a generally horizontal portion extending over said head opening, said free end of said closing arm being connected to guide means movable along said horizontal portion of said frame, and wherein said locking means is interconnected between said guide means and said horizontal portion of said frame.

4,055,150

ANIMAL OILER DEVICE

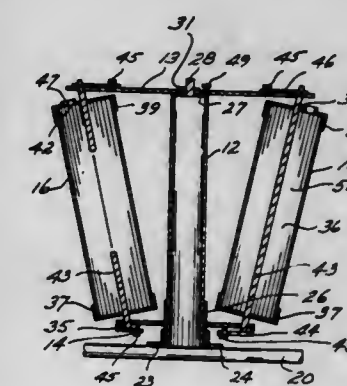
Richard R. Williams, P.O. Box 25, Ithaca, Nebr. 68033

Filed July 16, 1976, Ser. No. 683,988

Int. Cl.² A01K 29/00

U.S. Cl. 119—157

7 Claims



1. An animal oiler device comprising:
a base member;
an upright shaft secured to said base member;
a pair of spaced generally horizontally disposed plates rotatably mounted on said shaft;
a plurality of spaced generally upright post means rotatably mounted between said plates, each post means having a reservoir formed therein form containing oil and each post means having means formed therein to permit the oil to seep from the reservoir to the surface thereof.

4,055,151

WASTE HEAT BOILER

Robert James Cummings, Morpeth, England, assignor to Clarke Chapman, Ltd., England

Division of Ser. No. 496,673, Aug. 12, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,834

Claims priority, application United Kingdom, Aug. 21, 1973,

39405/73; Sept. 8, 1973, 42326/73

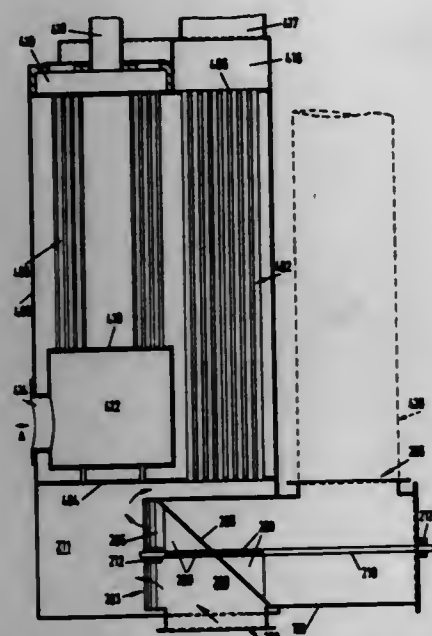
Int. Cl.² F22B 1/18

U.S. Cl. 122—7 B

10 Claims

1. A boiler comprising a housing, a boiler heat exchange zone within the housing, a duct bypassing said heat exchange zone, a valve within said housing and comprising wall means defining a valve chamber, a valve member and means mounting said valve member for rotation in said valve chamber about an axis extending centrally of said valve chamber between first and second positions, said valve member having peripheral surface means in sealing relationship with said wall means including opposite end portions in sealing relationship with respective portions of said wall means which are separated both peripherally and longitudinally of said valve chamber,

said wall means defining a first outlet port leading to said heat exchange zone and a second outlet port leading to said duct bypassing said heat exchange zone and an inlet port which is put in communication only with said first outlet port by rotation of said valve member about said axis to said first position, said inlet port being put in communication only with said second port by rotation of said valve member about said axis to said second position, and said inlet port being put in communi-



cation with both said outlet ports by rotation of said valve member about said axis to any intermediate position between said first and second positions, said valve member in any of said intermediate positions cooperating with said wall means to define two passage means respectively contiguous with said boiler and said duct, the ratio of the proportions of said passage means being variable in response to said rotation of said valve member between said first and second positions.

4,055,152

GAS BOILER, PARTICULARLY FOR CENTRAL HEATING

Maurice Vidaleux, 27, rue du Marechal Joffre, 78430 Louveciennes, France

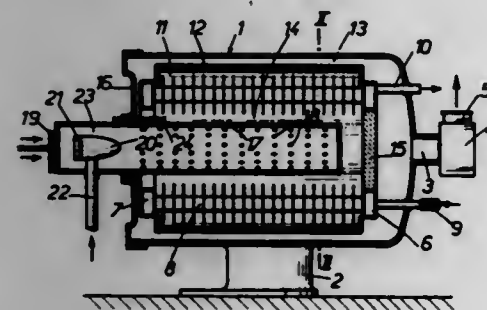
Filed June 7, 1976, Ser. No. 693,627

Claims priority, application France, June 9, 1975, 75.17959; Apr. 21, 1976, 76.11692

Int. Cl.² F22B 15/00, 37/10; F23L 17/00

U.S. Cl. 122-235 R

19 Claims



1. A gas-burning boiler comprising a boiler chamber, walls defining said boiler chamber, a plurality of heat-exchanger tubes arranged in said chamber, the heat exchanger tubes being parallel to each other, an outlet for gases from the chamber in one of said walls, an extraction fan in said outlet, a burner unit mounted in said chamber and penetrating an aperture in one of said walls, the burner unit comprising an inlet for combustion air gas fuel into the chamber, ignition means in said chamber for igniting the combustion air and gas fuel, a flame surface of said burner unit extending between the

heat exchange tubes of the plurality of heat exchange tubes and generally parallel to them and baffle means in said chamber for defining a gas flow path from the burner unit to the fan such that hot gases flow from said flame surface substantially equally over each of the plurality of heat exchanger tubes, whereby upon operation of the extraction fan combustion air and gas fuel are drawn into the chamber and ignited there under a sub-atmospheric pressure.

4,055,153

FUEL SUPPLY SYSTEM FOR A ROTARY PISTON ENGINE

Toshiyuki Kono, Toyooka, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

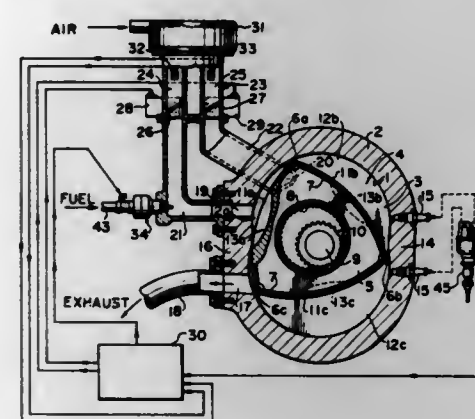
Filed Nov. 12, 1975, Ser. No. 631,391

Claims priority, application Japan, Aug. 15, 1975, 50-99387

Int. Cl.² F02B 53/10

U.S. Cl. 123-8.09

5 Claims



1. A rotary piston engine comprising a casing composed of a rotor housing having a trochoidal inner peripheral surface and side housings which close opposite ends of said rotor housing, a polygonal rotor adapted to rotate eccentrically in said casing with apex portions thereof sliding over said trochoidal surface thereby defining a plurality of combustion chambers between said trochoidal surface and individual flanks of said polygonal rotor, said casing having first and second intake ports which open in the inner wall of said casing, said second port being positioned so as to be advanced in the rotational direction of said rotor relative to said first port, first and second intake systems connected to said first and second ports, respectively, fuel injection means for injecting fuel into said first intake system, first and second means to detect intake air flow rate in said first and second intake systems and to despatch first and second flow rate signals showing the intake air flow rate in said first and second intake systems, respectively, means to detect the rotation of said rotor and to despatch a timing signal showing the rotational timing of said rotor, a computer which operates depending upon said first and second flow rate signals and said timing signal to produce a series of fuel injection signals for actuating said fuel injection means in a manner that the duration and timing of the fuel injection in said first intake system are determined by said flow rate signals and said timing signal, respectively, wherein said duration is cyclically altered for every sequential suction stroke performed by said plurality of combustion chambers so as to charge the individual combustion chambers with a relatively rich fuel-air mixture or a relatively lean fuel-air mixture.

4,055,154

FUEL SUPPLY SYSTEM FOR A ROTARY PISTON ENGINE

Toshiyuki Kono, Toyooka, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

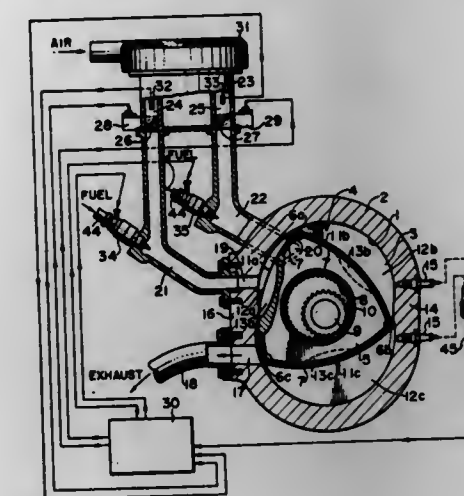
Filed Nov. 12, 1975, Ser. No. 631,414

Claims priority, application Japan, Aug. 15, 1975, 50-99388

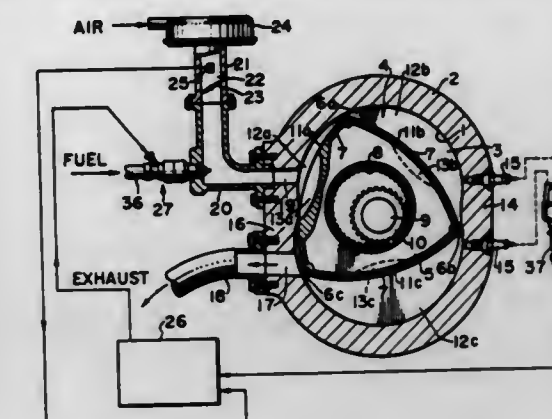
Int. Cl.² F02B 53/10

U.S. Cl. 123-8.09

5 Claims



a polygonal rotor adapted to rotate eccentrically in said casing with apex portions thereof sliding over said trochoidal surface thereby defining a plurality of combustion chambers between said trochoidal surface and the individual flanks of said polygonal rotor, an intake port which opens in the inner wall of said casing, an intake manifold connected to said intake port for supplying air therethrough, a fuel injection means for injecting fuel into said intake manifold, means for detecting the intake air flow rate and for dispatching a first signal showing the intake air flow rate, means for detecting the rotation of said rotor and



1. A rotary piston engine comprising a casing composed of a rotor housing having a trochoidal inner peripheral surface and side housings which close opposite ends of said rotor housing, a polygonal rotor adapted to rotate eccentrically in said casing with apex portions thereof sliding over said trochoidal surface thereby defining a plurality of combustion chambers between said trochoidal surface and individual flanks of said polygonal rotor, said casing having first and second intake ports which open in the inner wall of said casing, said second port being positioned so as to be advanced in the rotational direction of said rotor relative to said first port, first and second intake systems connected to said first and second ports, respectively, first and second fuel injection means for injecting fuel into said first and second intake systems, respectively, first and second means to detect intake air flow rate in said first and second intake systems and to dispatch first and second flow rate signals showing the intake air flow rate in said first and second intake systems, respectively, means to detect the rotation of said rotor and dispatch a timing signal showing the rotational timing of said rotor, a computer which operates depending upon said first and second flow rate signals and said timing signal to produce a first and second series of fuel injection signals for actuating said first and second fuel injection means in a manner that the duration and timing of the fuel injection in said first intake system are determined by said first flow rate signal and said timing signal, respectively, that the duration and timing of the fuel injection in said second intake system are determined by said second flow rate signal and said timing signal, respectively, and that said first fuel injection means is actuated for every sequential suction strokes performed by said plurality of combustion chambers while said second fuel injection means is actuated for only cyclically selected ones of said sequential suction strokes performed by said plurality of combustion chambers.

for dispatching a second signal showing the rotational timing of said rotor, a computer which operates, depending upon said first and second signals, to produce a series of fuel injection signals for actuating said fuel injection means in a manner such that the duration and timing of the fuel injection are determined by said first and second signals, respectively, and that the duration is further modified to be relatively long or short with respect to individual fuel injections according to a predetermined order so as to selectively produce a relatively rich fuel-air mixture of about 11-12 air/fuel ratio or a relatively lean fuel-air mixture of about 18-19 air/fuel ratio.

4,055,156

ROTARY ENGINE

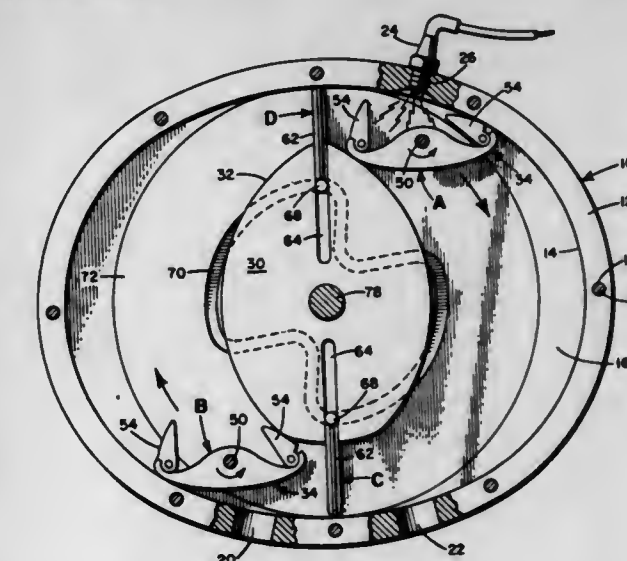
Hugo A. Terán Salguero, La Paz, Bolivia, assignor to Gundlach, S.A., Bolivia

Filed Mar. 12, 1976, Ser. No. 666,500

Int. Cl.² F02B 53/08

U.S. Cl. 123-8.33

15 Claims



FUEL SUPPLY SYSTEM FOR A ROTARY PISTON ENGINE

Toshiyuki Kono, Toyooka, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 12, 1975, Ser. No. 631,415

Claims priority, application Japan, Aug. 15, 1975, 50-99386

Int. Cl.² F02B 53/10

U.S. Cl. 123-8.09

5 Claims

1. A rotary piston engine comprising a casing composed of a rotor housing having a trochoidal inner peripheral surface and side housings which close opposite ends of said rotor housing,

1. An internal combustion engine of the rotary type comprising: inner and outer housings and housing side plates having surfaces defining an annularly disposed working chamber, intake and exhaust openings in communication with said working chamber for permitting admission of combustible gases and exhaust of the products of combustion, first and second valves substantially oppositely positioned in said chamber for dividing said chamber into a compression zone and an expansion zone,

at least one piston mounted in said chamber, means for effecting orbital movement of said piston within said chamber, said piston being movable relative to said inner and outer housings, said piston being operable to compress a charge of combustible gases while moving through said compression zone and to be driven through said expansion zone by the action of said combustible gases when ignited therein, power output means connected to said piston and driven thereby as said piston moves through said expansion zone, valve actuating means connected to said first and second valves for opening said valves to allow said piston to pass between said zones, means carried by said piston for containing the charge of compressed combustible gases from said compression zone and transporting said compressed combustible gases from said compression zone to said expansion zone, and ignition means for igniting said compressed combustible gases when said piston is in said expansion zone.

4,055,157

IGNITION DISTRIBUTOR-BREAKER SYSTEM HAVING CENTRIFUGAL TIMING ADJUSTMENT

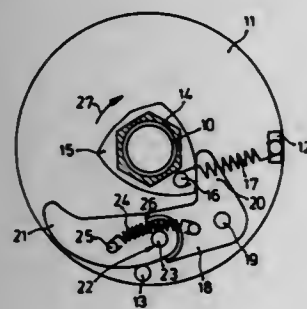
Thilo Gehring, Markgroningen, and Heinz Berger, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 25, 1976, Ser. No. 689,749

Claims priority, application Germany, Aug. 21, 1975, 2537138 Int. Cl.² F02P 5/04

U.S. Cl. 123—117 R

6 Claims



1. Ignition distributor-breaker system for the timing of an ignition event in internal combustion engines, with centrifugal timing adjustment having
a shaft (10) driven by the crankshaft of the engine; a support plate (11) driven by the shaft;
a timing cam (14) concentric with the shaft and rotatable with the plate (11) and hence with the shaft while being additionally rotatable with respect to the plate (11) and hence the shaft (10);
bias means (17) resiliently biasing the timing cam to rotate in a direction tending to retard the spark;
centrifugal timing means (18, 21) secured to the plate (11) and engaging the timing cam (14) to adjust its relative rotary position with respect to the plate (11) to effect spark advance or retard upon relative change of rotary position of the cam with respect to the shaft when the cam is engaged by ignition breaker contacts;
and limit means (13) limiting excursion of the timing means (18, 21) under influence of centrifugal force characterized in that
the centrifugal timing means comprises two link elements (18, 21), one (18) of which engages the timing cam (14);
and a knee joint (22, 26) and spring means (24) connecting said link elements (18, 21), said link elements forming a single centrifugally deflectable unit below a critical speed, the centrifugal force above said critical speed overcoming the connecting force of said spring means and permitting the other (21) of said link elements to deflect about the limit means (13) and thus break the deflecting unity of the link elements (18, 21) and permit rotation of the said one link element (18) with respect to the other (21) and consequently rotation of the timing cam (14) in the direction of

spark retardation under the influence of the bias means (17).

4,055,158

EXHAUST RECIRCULATION

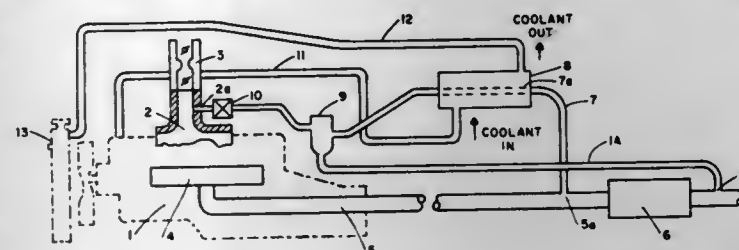
Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 458,508, April 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 304,735, Nov. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 162,853, July 15, 1971, abandoned. This application Mar. 19, 1976, Ser. No. 668,589

Int. Cl.² F02M 25/06

U.S. Cl. 123—119 A

7 Claims



1. In a spark ignited internal combustion engine having a carburetor type fuel/air induction system and an exhaust system, said engine having an exhaust recycle passage through which a portion of the exhaust gas is recycled from said exhaust system to said fuel/air induction system thereby lowering the nitrogen oxides content of the exhaust gas emitted by said engine, the improvement comprising a liquid-cooled heat exchanger in said exhaust recycle passage whereby exhaust gas flowing through said recycle passage passes through said heat exchanger and comes into heat exchange contact with the cooled surfaces within said liquid-cooled heat exchanger and is cooled below about 250° F, said heat exchanger comprising a heat exchanger housing through which said recycle exhaust gas passes and comes into heat exchange contact with a liquid-cooled surface, said housing having a drain opening at a low point, said drain opening being connected by a drain conduit to said exhaust system at a location downstream from where said exhaust recycle passage connects to said exhaust system, said recycle passage being connected to deliver cooled recycle exhaust to said fuel/air induction system downstream from the throttle plate of said carburetor whereby the nitrogen oxide content of said exhaust gas is lowered to an extent substantially greater than that obtained without said cooling.

4,055,159

GAS SAVING DEVICE

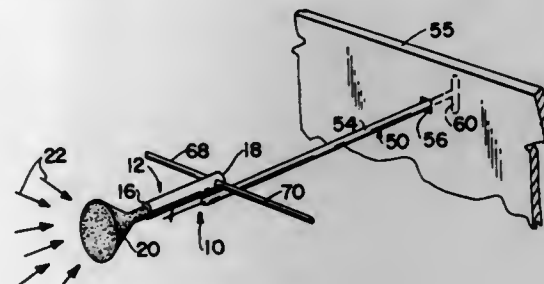
Luciano Cappiello, 52 Sunset Drive, Shelton, Conn. 06484

Filed Sept. 8, 1976, Ser. No. 721,402

Int. Cl.² F02M 25/06

U.S. Cl. 123—119 B

10 Claims



1. An auxiliary air inlet device for internal combustion engines in motor vehicles, comprising:
a. elongated tubular housing means adapted to be mounted relative to the combustion engine,
b. a replaceable air filter,

c. mounting means for removably connecting one end of said air filter to one end of said housing means,
d. means for connecting said housing means in spaced relation to said air filter to the carburetor and P.V.C. valve of the motor vehicle,
e. a valve mounted within said housing means and adapted to be moved between an open position permitting the flow of air therethrough and a closed position preventing the flow of air therethrough, said valve including:
1. a valve member having an exterior surface conforming to the interior configuration of said housing means in the closed position of the valve, and
2. inlet passages extending across the exterior surface of said valve member in spaced relationship to each other for the air to flow therethrough in the open position of said valve,
f. lever means operatively associated with said valve member, said lever means including a lever arm having a free end and a fixed end thereof coupled to the axis of said valve member for angular rotation thereof within said housing means between the open and closed respective positions, and
g. control means operatively associated with said lever means to be manually controlled from within the motor vehicle, said control means including a control link pivotably coupled to said free end of said lever arm and having the other end thereof extending into the vehicle to control therefrom.

4,055,160

TABLE SAW

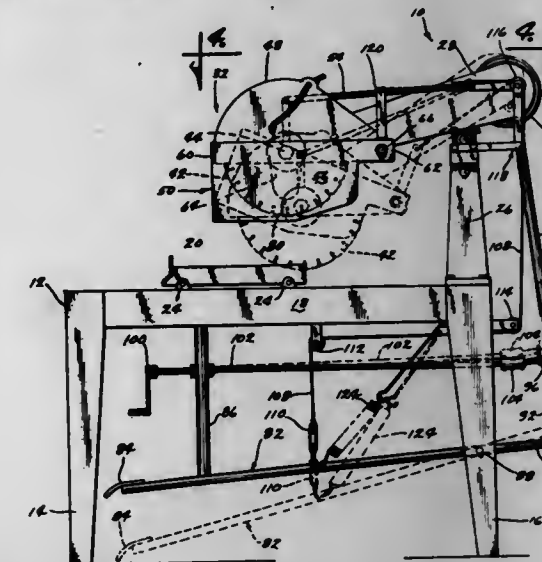
Harry R. Wilson, 1410 Pin Oak Drive, Cedar Falls, Iowa 50613

Filed Apr. 29, 1976, Ser. No. 681,448

Int. Cl.² B28D 1/04

U.S. Cl. 125—13 SS

16 Claims



1. A table saw comprising:
a table having an upstanding post on which a saw arm having a saw blade on its outer free end is pivotally mounted for pivotal movement between raised and lowered positions;
a foot lever having a foot engaging end and an opposite end pivotally connected under said table to said table with the pivotal axis between said foot engaging end and said opposite end for vertical pivotal movement,
an upstanding link connected at one end to said opposite end of said foot lever and at the other end to said saw arm on the opposite side of said saw arm pivotal axis from said saw blade such that said foot lever and said saw arm pivot in substantial parallel relationship to raise and lower the outer free end of said saw arm relative to said table whereby said saw blade on the outer free end of said saw arm moves towards and away from a work piece on said table,
a blade guard having a top saw guard covering the top half of said saw blade pivotally connected to said saw arm and

a bottom saw guard pivotally connected to said saw arm by being pivotally connected to said top guard for pivotal movement of said blade guard between raised and lowered positions relative to said saw blade with said blade being protected by said guard when said guard is in its lowered position and being exposed when in its raised position,
leveling means connected between said saw arm and said top guard to maintain said top guard level as said saw arm is raised and lowered, and
cable means connected to said foot lever between said pivotal axis of said foot lever and said foot engaging end and extending upwardly into engagement with said bottom guard at a point on the opposite side of said pivotal axis for said bottom saw guard from said saw blade such that said bottom guard pivots in a direction opposite to the pivotal movement of said saw arm relative to said table.

4,055,161

SOLAR ENERGY COLLECTOR AND SUN TRACKING CONCENTRATOR

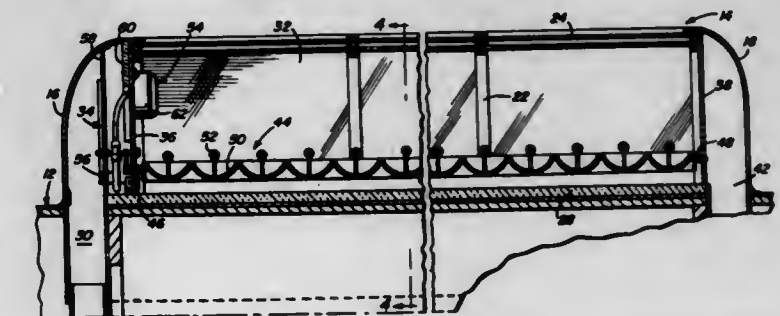
Robert L. Jones, 3410 Truman, El Paso, Tex. 79930

Filed Dec. 16, 1975, Ser. No. 641,242

Int. Cl.² F24J 3/02

U.S. Cl. 126—271

19 Claims



1. In combination with an energy collector receiving radiant energy from a moving source, automatic tracking means including means mounting said collector for movement along a predetermined path, fluid sensing means for producing a differential fluid pressure in response to reception of said radiant energy from the source reflecting movement thereof, and gravitational drive means connected to the fluid sensing means for imparting said movement to the collector in response to said differential fluid pressure, said gravitational drive means including a balancing tube having opposite inlet ends, means pivotally mounting the tube for angular movement about a fixed axis, a separating mass displaceably retained within said tube intermediate said inlet ends, conduit means connecting the fluid sensing means to the inlet ends of the tube for displacement of said mass to shift the center of gravity of the tube relative to said fixed axis, and gear means drivingly connecting the tube to the collector for transmitting said angular movement of the tube in response to the differential fluid pressure applied to the inlet ends of the tube.

15. In combination with a transparent housing having a longitudinal axis, an energy concentrator comprising a curved reflector, a transparent panel connected to said reflector to enclose a heat receiving chamber, a heat absorbing tube and means connected to said panel for suspending the tube therefrom in parallel relation to said longitudinal axis within the heat receiving chamber.

4,055,162

SOLAR ENERGY COLLECTOR

Ed Gonzalez, 2284 NE. 1st Ave., Boca Raton, Fla. 33432

Filed Apr. 26, 1976, Ser. No. 679,898

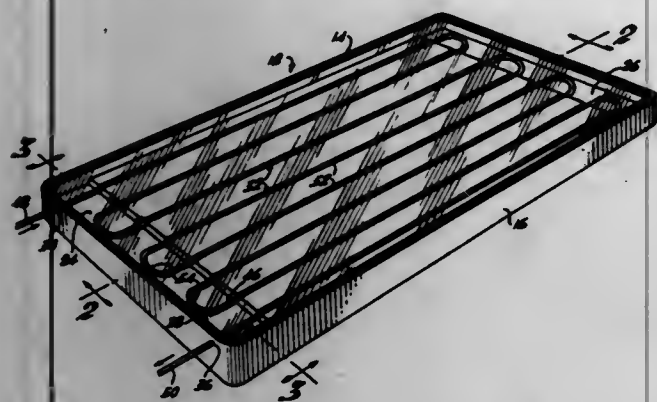
Int. Cl.² F24J 3/02

U.S. Cl. 126—271

10 Claims

1. A solar collector comprising:
an open shell, said shell comprising a rim with an outer

downwardly extending skirt terminating at a support surface, and a floor within the skirt, said floor having a first end zone and a second end zone between the floor and the support surface defining spaced lower end floor zones and said shell including a septum spanning the skirt between the lower floor zones and the support surface



defining a space between the floor and septum, and said floor having a plurality of elongate, spaced, parallel recessed portions of generally U-shaped, cross section extending between the end zones, and the base zone of the recessed portions being semi-circular in cross section and of a predetermined radius of curvature, and said shell having an inlet and outlet opening.

4,055,163

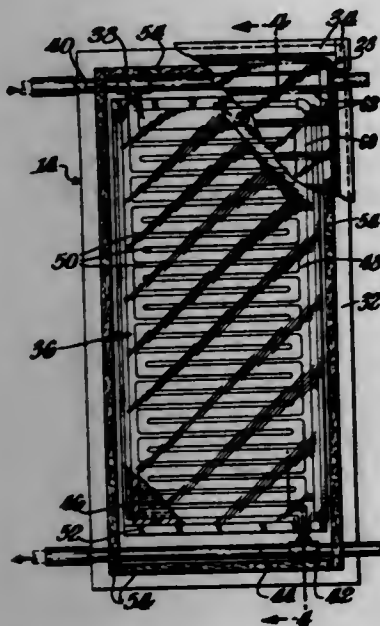
SOLAR HEATING SYSTEM

Frederick A. Costello; James L. Manniso; Anthony J. DiPinto, and Gerald W. Smith, all of 1605 Ayre St., Newport, Del. 19804

Filed Apr. 16, 1975, Ser. No. 568,436
Int. Cl.² F24J 3/02

U.S. Cl. 126—271

3 Claims



1. A heating system comprising a solar heating panel, black fluid, and means for selectively circulating the black fluid through the heating panel, the panel including an enclosure having a light-transmitting upper surface, a light-transmitting conduit within the enclosure closely arranged in serpentine fashion through which the black fluid selectively circulates, and a reflective surface directly under the conduit arrangement substantially completely masked by that arrangement when black fluid is circulated therethrough and substantially completely unmasked when no black fluid is circulated therethrough, and wherein the enclosure is sealed, and the interior thereof is at least partially filled with a gas having a thermal conductivity lower than that of air.

4,055,164
APPARATUS FOR AUTOMATIC GAS IGNITION CONTROL

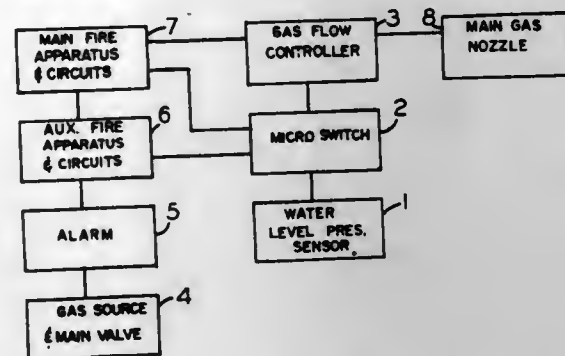
Tu Wu-Heng, No. 33 Sec. 3, Ming-Teng Road, Jul-Fang Chen, Taipei Hsien, China /Taiwan

Filed July 9, 1976, Ser. No. 704,109

Int. Cl.² F24H 1/00

U.S. Cl. 126—351

8 Claims



1. An apparatus for automatic gas ignition control which comprises:
 - a. a water level sensor, micro switch, and gas flow controller for regulating the gas flow in accordance with changes in water level above a predetermined water level, said micro switch changing states when the water falls below said predetermined level;
 - b. an alarm mechanism including pressure measuring means, said mechanism indicating when the gas pressure upstream of said controller is below a predetermined level;
 - c. automatic gas control apparatus for controlling an auxiliary fire and a main fire, connected to said gas flow controller;
 - d. a high voltage electric ignition circuit for igniting said auxiliary fire;
 - e. an electric ignition circuit for igniting said main fire; and wherein said automatic gas control apparatus for producing an auxiliary fire and a main fire comprises
 - a. a gas entrance port and a gas exit port for gas flow;
 - b. an electromagnetic coil to produce magnetic force;
 - c. a steel bar with a rubber diaphragm fixed thereon to be moved by the attraction of magnetic force produced by said electromagnetic coil, said diaphragm selectively allowing communication between said entrance port and said exit port; and
 - d. a tension spring to restore said steel bar back to its initial position blocking said communication when said magnetic coil ceases to function;
- to thereby automatically control the gas flow in accordance with an electric current in said coil.

4,055,165

CARBONACEOUS BOILER

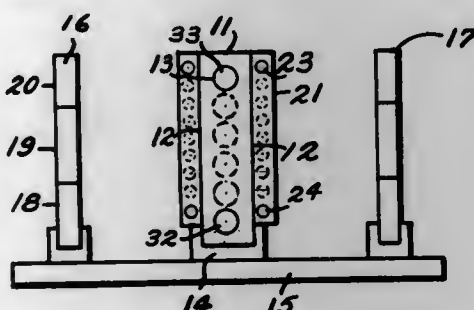
Robert L. Scragg, and Alfred B. Parker, both of 2937 SW. 27th Ave., Miami, Fla. 33133

Filed Dec. 19, 1974, Ser. No. 534,588

Int. Cl.² F24H 7/00

U.S. Cl. 126—400

6 Claims



1. A boiler comprising a block of low permeability, impermeous silicon carbide having relatively large radiation receiving side surfaces and a relatively small depth dimension, a first

fluid conducting channel formed in said block in the form of a grid so that said channel passes in proximity to a substantial portion of said radiation receiving sides of said block, a counter flow heat exchanger block positioned proximate said channel in said block, said counter flow block having a second channel for conducting a high temperature fluid in said heat exchanger block in the opposite direction to the flow of fluid in said first fluid conducting channel to thereby exchange heat with the fluid in said first conducting block, and means for directing infrared radiation onto at least one of said radiation receiving side surfaces of said block, said block efficiently absorbing said radiation and conducting said absorbed radiation energy to said channel to heat the fluid passing therethrough.

4,055,166

APPARATUS FOR MAKING SURFACE TEMPERATURE MEASUREMENTS ON THE HUMAN BODY

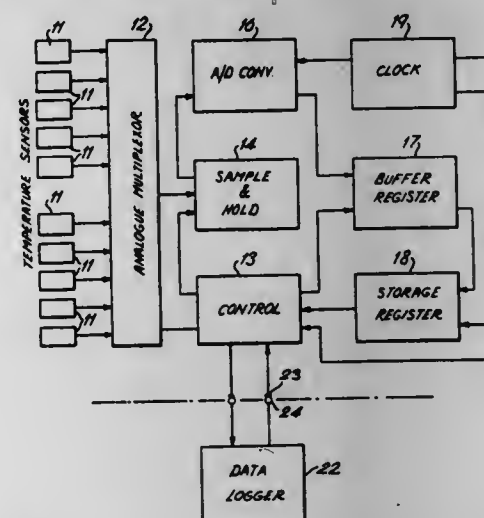
Hugh Walter Simpson, 2 Kirklee Terrace, Glasgow, and Douglas Green, 1 Kingsmill Drive, Kennoway, both of Scotland

Filed July 9, 1975, Ser. No. 594,555

Int. Cl.² A61B 5/00; G01K 1/02

U.S. Cl. 128—2 H

14 Claims



1. Apparatus for measuring surface temperatures at points in a region of the human body, including
 - a garment,
 - a plurality of temperature sensors in the form of semiconductor junctions located in the garment at spaced apart positions,
 - means for storing signals representing output signals from the sensors, control means for passing said signals representing output signals from the sensors to said storing means, clock means for producing clock pulses for actuating said control means whereby the time of occurrence relationship of the said output signals stored in said storing means is retained, the storing means, control means, and clock means being integral with the garment.

4,055,167

CURETTEMENT DEVICE

Dell L. Bernstein, 1295 Colorado Blvd., Denver, Colo. 80206

Filed Apr. 23, 1976, Ser. No. 679,675

Int. Cl.² A61B 1/00, 17/22; A61M 1/00

U.S. Cl. 128—2 B

6 Claims

1. A cannula for uterine curettement comprising:
 - a. a straight, rigid tube proportioned for insertion into the uterus with an excess of length to provide a handle section and a connective section therebeyond for the connection of a suction tube;
 - b. an enlargement at the handle section to facilitate gripping of the tube;
 - c. a flattened, thin walled, closed end permanently affixed at the insert end of the tube; and
 - d. a first opening, having a width slightly less than the tube diameter, immediately adjacent to the flattened end of the

tube and a second opening of approximately the dimensions of the first opening, axially spaced along the tube from the first opening and on the opposite side of the tube



from the first opening with the edges of the openings squared, moderately sharp and generally smooth to facilitate curettement action, and with the openings proportioned to receive blood, serum and tissue from the uterus.

4,055,168

POSTURE TRAINING DEVICE

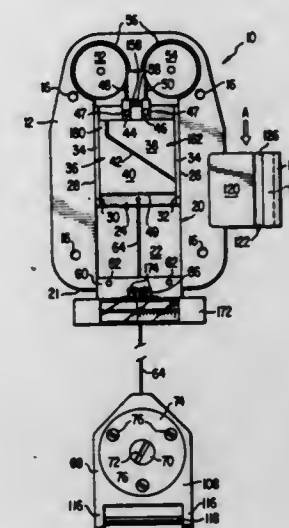
Neal E. Miller, and Barry R. Dworkin, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Sept. 21, 1976, Ser. No. 725,231

Int. Cl.² A61B 5/00

U.S. Cl. 128—2 S

15 Claims



1. A posture training device to be worn by a person so as to improve the person's posture, comprising:
 - first harness cable means disposed about the longitudinal axis of the torso of the person and having a length which is variable depending upon a change in the posture of said person and/or a change in the underlying curvature of the spinal column, as well as upon a change in the degree of respiration of said person;
 - second harness cable means disposed transversely about the upper torso of said person and having a length which is variable depending upon a change in the degree of respiration of said person;
 - signal emitting means for emitting a signal when said person assumes a poor postural condition or position so as to

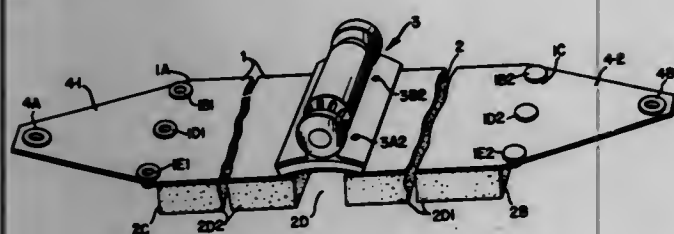
indicate to said person the assumption of said condition or position;
electrical control means operatively connected to said first and second harness means for controlling an electrical circuit including said signal means; and
means for correlating the changes in length of said first and second cable means such that said electrical control means will activate or deactivate said signal means only when the change in length in said first cable is due to a change in the posture and/or underlying curvature of the spinal column of said person.

4,055,169 VIBRATING STRAP

Richard E. Baker, and Elizabeth F. Baker, both of 2701 Arlington Blvd., Apt. 101, Arlington, Va. 22201
Filed Mar. 25, 1976, Ser. No. 671,072
Int. Cl.² A61H 1/00

U.S. Cl. 128—32

5 Claims



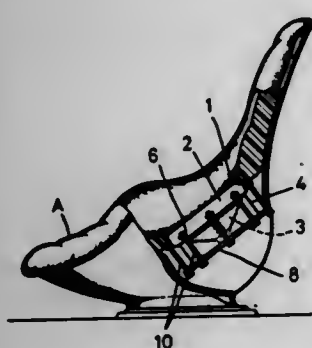
1. A VIBRATING STRAP comprising:
a strap-like outer component more or less rectangular in shape, thin, flexible, and provided with securing means at each end which hold said component so that its inner surface is oriented around and/or over areas of the human body to be vibrated;
subterminal snap-like means for securing together the two ends of said strap-like outer component so that said vibrating strap can be oriented and secured around a much smaller member of said human body to be vibrated;
centrally located means for securing a standard vibrator over the outer surface of said component; and
a pad-like inner component which is soft and resilient, the outer surface contiguous with the inner surface of said strap-like component, and the inner surface oriented around and/or over and in direct contact with areas of the human body to be vibrated.

4,055,170 HEALTH PROMOTING APPARATUS

Ryutaro Nohmura, No. 19-19, 3-chome, Senriyama-nishi, Suita, Osaka, Japan
Filed July 22, 1976, Ser. No. 707,606
Int. Cl.² A61H 1/00

U.S. Cl. 128—33

4 Claims



1. An apparatus for health promotion comprising:
a hollow supporting structure for supporting a human body resting on said apparatus, said supporting structure formed with an opening at a seat portion on which the occupant rests,
a tubular member mounted inside said supporting structure so as to be directed toward said opening,

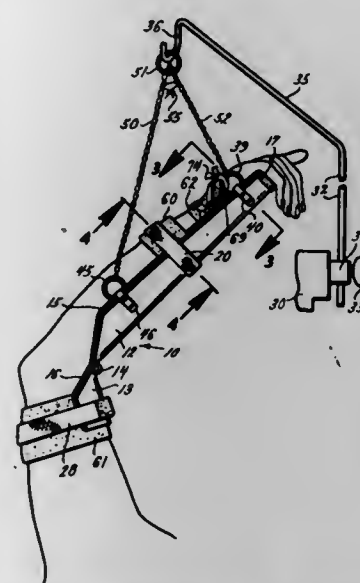
flexible sheet means stretched over the upper end of said tubular member so as to close said opening;
means for pretensioning said flexible sheet means; and
a loudspeaker mounted inside said tubular member so as to be slightly spaced from, and directed toward, said flexible sheet means, whereby sound vibrations emanating from said loudspeaker cause said flexible sheet means to vibrate.

4,055,171 SPLINT

Douglas A. Ries, St. Louis, Mo., assignor to Edward M. Ring, St. Louis, Mo., a part interest
Filed July 19, 1976, Ser. No. 706,743
Int. Cl.² A61F 5/04

U.S. Cl. 128—87 R

14 Claims



1. In a surgical splint to suspend a patient's arm during operations, the combination of: an elongated splint member of relatively stiff material resistant to longitudinal collapse, having a forearm portion of length to extend along the forearm from adjacent the wrist of the patient to adjacent the elbow; means to secure the patient's arm to the forearm portion of the splint member against slippage longitudinally of the member when the member with the arm is raised; at least one elongated flexible connector attached at one end to the splint adjacent the wrist end and attached at its other end to the splint member adjacent the elbow end thereof; a suspending support extending above the splint and vertically adjustable, the support having a hanger element onto which the connector is hung, and across which the connector may be moved to change the ratio of the distance along the connector from the hanger to the elbow relative to the distance from the hanger to the wrist, as the suspending support is raised and lowered without raising the body of the patient.

4,055,172 NAIL AND SET FOR CORRECTLY RESETTING FRACTURED BONES FOR THEIR IMMEDIATE RE-USE

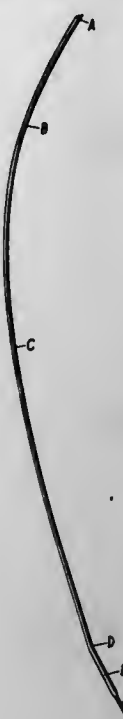
Josef Ender, Steinbrecherring 23A, 4400 Steyr, and Hans-Georg Ender, Ferstelgasse 6/20 A, 1090 Vienna, both of Austria
Continuation of Ser. No. 477,418, June 7, 1974, abandoned. This application Apr. 17, 1975, Ser. No. 568,987
Claims priority, application Austria, July 18, 1973, 6344/73
Int. Cl.² A61F 5/04

U.S. Cl. 128—92 BC

8 Claims

1. A curved nail for repositioning and fixing fragments of bones, such as leg bones from below and permitting rotational elastic penetration of its proximally-driven end into the upper portion of the bone, such as the femur head comprising:
a proximal end,
a curved relatively thin, flexible and resilient portion extending from said proximal end,
a distal end provided with a coupling element adapted to be connected to means for driving the nail, said nail being

straightened as it is driven through the medullary canal, and an initial stress being thus imparted to it, and



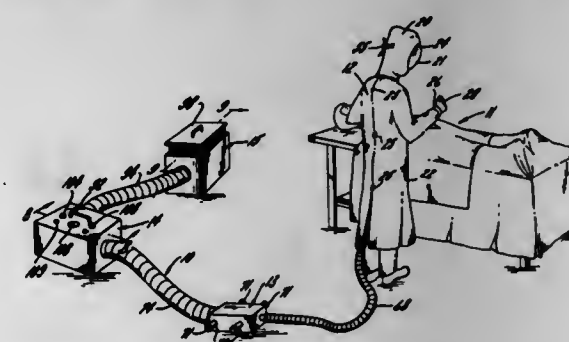
a straight portion between said coupling element and said curved portion.

4,055,173 SURGICAL MASKING AND VENTILATING SYSTEM

James V. Knab, 2916 Hall St., SE., Grand Rapids, Mich. 49506
Filed Apr. 21, 1975, Ser. No. 570,237
Int. Cl.² A62B 7/02

U.S. Cl. 128—139

24 Claims



12. A surgical masking and ventilating system for protecting an operating zone from contaminants emanated by members of a surgical team comprising protective apparel for substantially isolating each said member from the environment of the operating zone, said apparel for each member including a transparent visor, said visor having an arcuate front portion and a flat flange about the periphery of said arcuate portion, a headpiece for supporting said visor on the head of a member, said headpiece having an adjustable horizontal band of flexible material, a rigid arcuate shaped visor support having terminal ends thereof secured to said horizontal band at diametrically opposed portions thereof and extending outwardly in spaced relation from said horizontal band and thereby, from the head of the member upon which it is positioned for supporting said visor a distance from the front of said head, means for releasably securing said visor to said visor support, said releasable visor securing means including a plurality of snap members secured on said visor support in spaced relationship to each other, said visor having a plurality of correspondingly spaced apertures positioned along the upper periphery of said flange which receive said support snap members when said visor is positioned on said support, at least one fastening member releasably fastened on said support snaps to retain said visor in place, a hood positioned over said visor and extending at least to shoulder length, a gown positioned over the shoulder por-

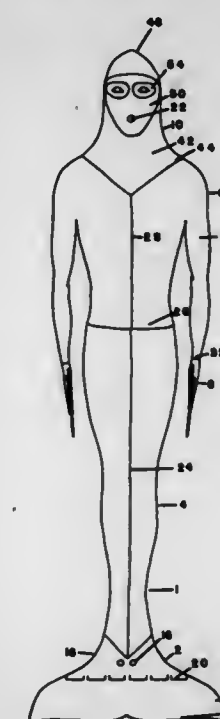
tion of said hood and extending at least to knee level, said hood having a front aperture within which said visor arcuate portion is positioned, means for maintaining the periphery of said front aperture firmly against said visor, an aspirator, conduit means connecting said aspirator to said apparel of each member, said conduit means including a suction tube extending in a loop about the mouth of the visor with the opposite ends positioned at the back side of the user and means coupling said suction tube ends to said aspirator, means for releasably fastening the looped portion of said suction tube to said visor, said aspirator being operative to generate a vacuum in said conduit that draws air and contaminants within said apparel into said conduit and away from said operating zone, and means for filtering the air drawn from said apparel a substantially contaminant free condition prior to its discharge into the environment of the operating zone.

4,055,174 SWIMMING SYSTEM

Kenneth W. LeVasseur, 1129 Ala Moana Bl., Honolulu, Hawaii 96814
Division of Ser. No. 471,545, May 20, 1974, Pat. No. 3,934,290.
This application Dec. 22, 1975, Ser. No. 643,163
Int. Cl.² A62B 7/00

U.S. Cl. 128—142.5

12 Claims



1. Swimming apparatus comprising a helmet, viewing means in the front portion of said helmet adapted to lie over the eyes of a swimmer the helmet having an annular cushion means generally surrounding a neck area of the helmet for forming a streamlined curve between a top of a head and shoulders of the wearer, the helmet further defining a blow-hole in a rearward portion of the helmet, a mouthpiece mounted on the front portion of the helmet below said viewing means and adapted to cover the mouth area of a swimmer, snorkel tube means leading forward from the blow-hole forward through the annular cushion to the mouthpiece, the snorkel tube means having a first open end connected to the blow-hole and a second open end connected to the mouthpiece and a neck surrounding fastening means being connected to a lower surface of the helmet.

4,055,175

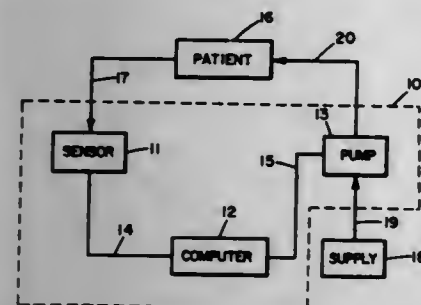
BLOOD GLUCOSE CONTROL APPARATUS

Anton Hubert Clemens, Elkhart, and Robert Weston Myers, Milwaukee, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 7, 1976, Ser. No. 685,881
Int. Cl.² A61M 5/00

U.S. Cl. 128-213

4 Claims



1. Apparatus for controlling the concentration of glucose in the blood stream of a subject by controlled supply of insulin to such subject dependent upon both the particular concentration of glucose in said blood stream and the rate of change of said blood glucose concentration comprising means for determining serial values of blood glucose concentration and for providing computer input signals corresponding to said serial values; computer means coupled to receive said serial input signals, said computer means being programmed to provide output signals based upon said serial input signals; and pump means responsive to said output signals for supplying insulin to such subject at a rate determined by said output signals; said computer being capable of deriving output signals from serial input signals in accordance with an equation of the form

$$IR = RI \left(\frac{G + GD - BI}{QI} + 1 \right)^4$$

wherein

IR = calculated insulin infusion rate

BI = basal glucose concentration

RI = desired basal insulin infusion rate at BI

G = measured previous serial blood glucose reading and BI, RI, and QI are preselected values and wherein if the blood glucose concentration is rising

$$GD = (K_R A^2 10) + 64$$

wherein A is the average change in blood glucose concentration over several previous serial readings and K_R is a preselected value and wherein if the blood glucose concentration is falling

$$GD = (K_F A^2 10) + 64$$

wherein A is the same as above and K_F is a preselected value which is different from and less than K_R , said GD being subtracted from G in the above equation when the blood glucose concentration is falling.

4,055,176

UNIVERSAL DRIP CHAMBER AND SPIKE ASSEMBLY

Ingenieur H. Landquist, Oakland, Calif., assignor to Valleylab, Boulder, Colo.

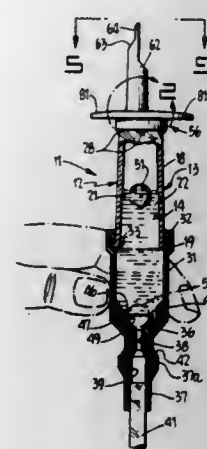
Filed May 24, 1976, Ser. No. 689,114
Int. Cl.² A61M 5/16

U.S. Cl. 128-214 C

7 Claims

1. In a universal drip chamber and spike assembly for use with a source of liquid in a container having a neck with a permeable stopper disposed in the neck and for use with a tube connected to a patient, a drip chamber body defining the upper portion of a drip chamber, said body having a relatively rigid substantially transparent wall surrounding the upper portion of the drip chamber and being open at its lower end, a drip cham-

ber booth formed of a flexible rubber-like material secured to the lower end of said drip chamber body and defining a lower portion of the drip chamber, said booth having an outlet flow passage in its lower extremity in communication with the drip chamber and adapted to be placed in communication with the tube connected to the patient and having means forming a valve seat in the drip chamber surrounding said outlet flow passage, said valve seat being in the form of an upstanding relatively thin self supporting annulus of a soft rubber-like material, a spike assembly mounted on the drip chamber body and being adapted to be inserted into the permeable stopper of the container to permit liquid to flow from the container into the drip chamber, said drip chamber being capable of receiving liquid from said container and a ball-like float member being capable of floating in said liquid in said drip chamber, said ball-like float member being of a size so that it is capable of



seating within said annulus to a depth so that a major portion is disposed therein for closing off said outlet flow passage when substantially all of the liquid from the drip chamber has passed out of said drip chamber to form an air-tight seal between the ball-like member and said annulus to thereby prevent the flow of air from the drip chamber through the outlet flow passage, said booth having a sufficient length above the annulus when the ball-like float member is disposed in the annulus so that the booth can be squeezed by hand without dislodging the ball-like float member to pump liquid from the source into the drip chamber, said ball-like float member being retained by the annulus after it has seated in said annulus and after liquid has been pumped into the drip chamber to a level above the surface of the ball-like member, said booth being filed to a desired level, it can be squeezed by hand to dislodge the ball-like float member from the annulus.

4,055,177

HYPODERMIC SYRINGE

Milton J. Cohen, 9201 Persimmon Tree Road, Potomac, Md. 20854

Filed May 28, 1976, Ser. No. 690,846
Int. Cl.² A61M 5/00

U.S. Cl. 128-218 M

7 Claims

1. In a hypodermic syringe for injection of a liquid composition formulated of at least two ingredients, one of which is a liquid phase, to be maintained in a separated relation until admixture with the other ingredients immediately prior to injection, comprising a single unitary elongate tubular member having a bore extending continuously therethrough from an open forward end to an open rearward end of the tubular member, a rupturable sealing disc mounted on the forward end of the tubular member to seal the open forward end, a piston plug within the tubular member dimensioned to extend crosswise of the bore into sealing engagement with the inner walls of the tubular member for axial sliding movement relative thereto as a piston and means for actuating said piston plug for axial movement within the bore, a rupturable sealing member axially slidable within the tubular member and extending cross-

4,055,179

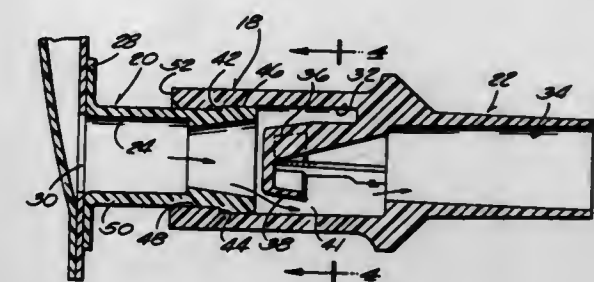
VALVE FOR URINARY DRAINAGE CONTAINER OR SIMILAR ARTICLE

James Gordon Manschot, Mukwonago, and Byron L. Mather, Milwaukee, both of Wis., assignors to Plastronics, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 563,490, March 31, 1975, abandoned. This application Mar. 24, 1976, Ser. No. 669,874
Int. Cl.² A61F 5/44

U.S. Cl. 128-275

16 Claims



for axial sliding movement relative thereto, and a hollow penetrating needle fixed to said disc member to provide a passage therethrough with the end of the needle extending axially beyond the disc member in the direction towards the sealing member whereby the needle penetrates the sealing member responsive to axial movement to bring the needle into engagement to penetrate the sealing member to enable the liquid phase to flow from the rearward chamber into the forward chamber responsive to axial displacement of the piston plug forwardly in the bore.

4,055,178

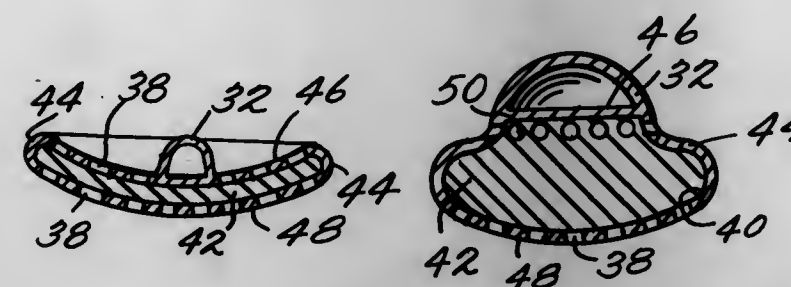
DRUG DELIVERY DEVICE FOR PREVENTING CONTACT OF UNDISSOLVED DRUG WITH THE STOMACH LINING

Roy M. Harrigan, Bromley Mountain Road, Manchester, Vt. 05254

Filed Mar. 10, 1976, Ser. No. 665,698
Int. Cl.² A61M 31/00; A61J 1/00

U.S. Cl. 128-260

36 Claims



1. A drug delivery device for use in body cavities containing fluid, said device comprising:
means for containing a drug;
a drug located within said containing means;
means in operative relationship with said drug containing means for enabling entry of said fluid into said containing means and into dissolving contact with said drug and for enabling exit of said fluid and said dissolved drug from said containing means;
said enabling means being located in the device to substantially prevent physical contact of said drug in undissolved form with the body cavity walls.

10. The combination of a flexible urinary drainage container and a drainage valve therefor comprising:

a sealed container having a drainage opening in the bottom portion thereof;

a two-piece drainage valve attached to said container for controlling the flow from said container through said drainage opening; said two-piece valve comprising a first tubular member having a flow passageway means therethrough and a tapered valve seat formed in said flow passageway means, and a second tubular member having a flow passageway means therethrough and a valve element fixedly mounted therein on the axis of said second tubular member, said first and second tubular members being telescopically engaged with each other with said first tubular member slidably positioned inside said second tubular member, said valve element of said second tubular member having a tapered valve surface thereon adapted for sealing engagement with said tapered valve seat of said first tubular member when said tubular members are telescoped axially one inside the other, said tapered valve element and said tapered valve seat having self-holding taper angles so that when said valve element is firmly seated in said valve seat the parts will be retained in mating engagement without the need for some type of additional retaining means to hold the parts in closed position, said flow passageway means of said first tubular member including at least one flow passageway positioned adjacent said valve element which will be blocked when said tapered valve surface of said valve element is moved into sealing engagement with said tapered valve seat of said first tubular member and which will be opened to allow flow through the valve when said valve element is moved out of sealing engagement with said valve seat surface; and

said combination further characterized by having the end of said second tubular member within which said first member is telescopically positioned extending over and engaging the outer surface of said first tubular member so that any tendency of the valve seat to be expanded outwardly due to the wedging action of the parts will be restrained not only by the inherent strength of said first tubular member but also by the reinforcing action of that portion of said second tubular member which fits over the outside surface of said first tubular member.

4,055,180
ABSORBENT ARTICLE WITH RETAINED
HYDROCOLLOID MATERIAL

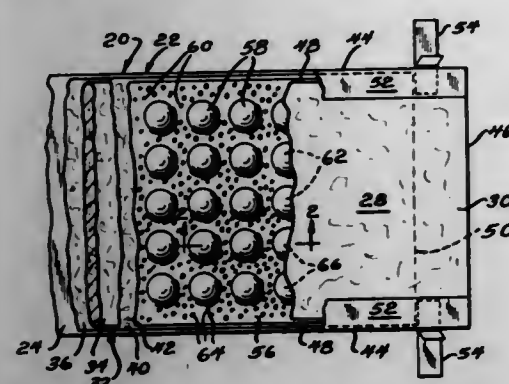
Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,541

Int. Cl.² A41B 13/02; A61F 13/16

U.S. Cl. 128—287

31 Claims



1. An absorbent article comprising, a fluid pervious top sheet, a fluid impervious backing sheet, first and second retaining sheets located intermediate said top and backing sheets and extending substantially between opposed ends of the article, said retaining sheets being attached together in areas and defining a plurality of pockets between said areas and means for permitting passage of body fluids into the pockets, and a hydrocolloid material positioned in said pockets.

4,055,181
TAPE CLOSURE HAVING RELEASE MEANS INTEGRAL
WITH DIAPER BACKING SHEET

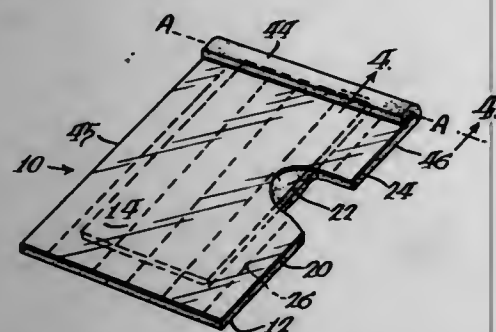
Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 4, 1976, Ser. No. 655,181

Int. Cl.² A41B 13/02

U.S. Cl. 128—287

4 Claims



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-imperious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a pair of elongated tape segments each having: one face provided with an adhesive coating and a non-tacky opposite face, a fixed end attached to said diaper by means of said adhesive coating at a side marginal location of said outside surface, and a free end, said adhesive coating on said free end being pressure-sensitive, said free end being adapted for folding back so that the non-tacky face of said free end is juxtaposed to the non-tacky face of said fixed end and said adhesive-coated face of the free end faces in the same direction as said diaper outside surface;

said diaper having a transverse margin which is provided with a pair of slits defining a middle segment of said transverse margin and flaps flanking said middle segment, each flap being situated next to one of said tape segments; release means provided on said flaps on said outside surface of said diaper and adjacent to said fixed end of each tape

segment for releasably covering the adhesive-coated face of the folded back free end of each tape segment; and each flap being adapted for folding over said adhesive-coated face of the folded-back free end of said associated tape segment to releasably adhere said adhesive-coated face of each free end to said release means.

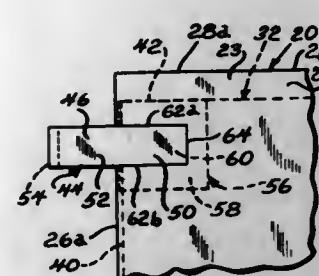
4,055,182
DISPOSABLE DIAPER REINFORCEMENT
 Robert John Mack, Palatine, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 8, 1975, Ser. No. 620,733

Int. Cl.² A61F 13/16

U.S. Cl. 128—287

21 Claims



1. A disposable diaper, comprising: an absorbent pad assembly having an absorbent pad, and a relatively thin sheet of flexible material covering a surface of said pad; a tape fastener comprising, a pressure-sensitive tape strip having a section secured to an outer surface of said sheet in an area at least partially covering said pad, and a securement portion adapted to extend past a side edge of the pad assembly for securing the diaper about an infant; and adhesive means directly bonding said sheet to said pad surface in an isolated region overlapping a major portion of the area and extending beyond said area to a location spaced from the area in a direction away from forces normally applied to the strip during placement and use of the diaper, said region including a portion extending substantially the width of said tape section in said area and being sufficiently saturated to reinforce the pad adjacent said surface and minimize tearing of the pad assembly in said region.

4,055,183
DISPOSABLE DIAPER WITH CUTOUT PAD AT TAPE
ATTACHMENT AREA

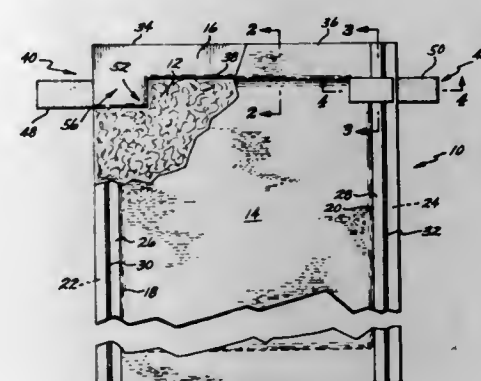
Arthur Sensor Ryan, Longview, and Raymond August Van Vliet, Castle Rock, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Oct. 4, 1976, Ser. No. 729,230

Int. Cl.² A41B 13/02; A61F 13/16

U.S. Cl. 128—287

8 Claims



1. A disposable diaper of the type having a generally rectangular shaped absorbent pad disposed between a fluid-permeable cover sheet and a thin plastic backing sheet together with

a pair of pressure-sensitive fastening tapes for securing the diaper about a person has the improvement comprising:

a pair of cutout regions within the absorbent pad positioned at the corners thereof where said tapes are fixedly secured to said backing sheet; and means to bond together the regions of the cover sheet overlying the backing sheet within the cutout regions into integral tape attaching bases to which a portion of said fastening tapes are attached, whereby tension exerted on the free end of a tape will be transferred, at least in part, to the cover sheet.

4,055,184
ABSORBENT PAD
 Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,544

Int. Cl.² A61F 13/16

U.S. Cl. 128—287

7 Claims



1. An absorbent pad for use in contact with the skin comprising a water pervious facing layer for contacting the skin, a water-imperious backing sheet bonded to the facing layer around its periphery to form a container, and disposed within said container an absorbent mass comprising a solid finely-divided mixture of (1) a completely hydrolyzed starch-polyacrylonitrile graft copolymer in acidic form containing 0.6 to 2 parts by weight of grafted hydrolyzed polyacrylonitrile per part by weight of starch and (2) a non-irritating and non-toxic water-soluble basic material, the relative proportion of base to copolymer being from 1:4 to 1:1 by weight.

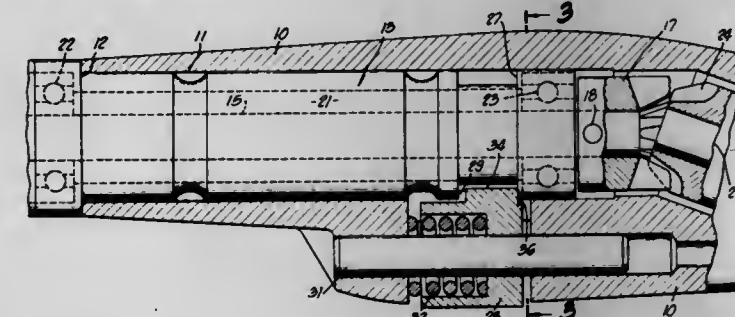
4,055,185
ROTARY DRILL FOR SURGEONS
 Stephen H. Waldron, Camarillo, Calif., assignor to American Sterilizer Company, Erie, Pa.

Filed Mar. 2, 1976, Ser. No. 663,070

Int. Cl.² A61B 17/00

U.S. Cl. 128—305.1

1 Claim



1. In a rotary tool of the type described, the combination of: a manually graspable housing having an open ended socket, a rotary drive gear positioned at the end of the socket remote from the open end thereof, a rotary bur having a cutting element on one end of a shank and having a driven gear on the other end of said shank adapted to mesh with said drive gear, a sleeve encompassing said shank and having axially spaced bearings therein rotatably supporting said shank, said sleeve and bur being removably positioned as a unit in said socket in a position in which the gears are in mesh, said housing having an opening in a side thereof, said sleeve having an annular shoulder adjacent said opening, a latching device for releasably locking said sleeve against removal from said socket, said latching device including a latch mounted on the housing in

said opening to turn about an axis parallel to the rotary axis of said bur, said latch being mounted for limited movement along its own axis, resilient means opposing axial movement of said latch in one direction, said latch having a taper surface engageable with said annular shoulder whereby turning of the latch about its axis serves to insure proper meshing of said gears, the latch having an arcuate detent for reception of a portion of said shoulder to hold the latch against turning movement, said resilient means acting to maintain said arcuate detent in contact with said annular shoulder.

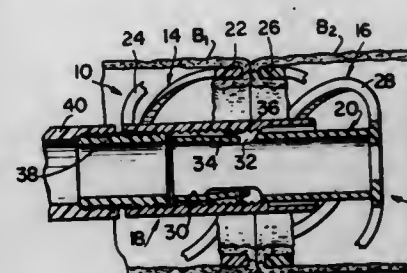
4,055,186
ANASTOMOSIS BUTTON
 Harry H. Leveen, 800 Poly Place, Brooklyn, N.Y. 11209

Filed Feb. 11, 1976, Ser. No. 657,205

Int. Cl.² A61B 17/04

U.S. Cl. 128—334 C

6 Claims



1. A clamping member for axial engagement with a complementary clamping member to form an anastomosis button, said clamping member including a hub and a crown, said hub including axial guiding and engaging means for axially mating and engaging a complementary hub on a said complementary clamping member, and said crown including a clamping collar coaxially positioned about and spaced radially outward of said hub medially located therealong and a plurality of resilient, flexible spring leaves spaced apart and attached at one set of ends thereof to said hub member at intervals thereabout to one side of said clamping collar, said leaves extending radially outward and lengthwise of said hub and said leaves being attached at the other set of ends thereof to said clamping collar at arcuate intervals thereabout.

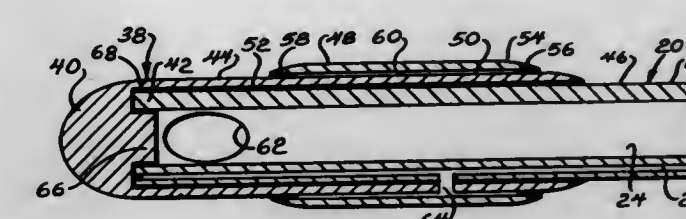
4,055,187
CATHETER WITH IMPROVED BALLOON ASSEMBLY
 Bhupendra C. Patel, Elgin; William J. Binard, Cary, and Daniel M. McWhorter, Arlington Heights, all of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Aug. 5, 1976, Ser. No. 711,948

Int. Cl.² A61M 25/00

U.S. Cl. 128—349 B

11 Claims



1. A catheter, comprising: an elongated shaft having a main lumen and an inflation lumen extending along a wall of the shaft; and a balloon assembly comprising a tip secured to a distal end of the shaft, a first sleeve extending proximally from the tip and being bonded to an outer surface of the shaft adjacent the distal end thereof, said first sleeve being of one-piece construction with said tip, an expansible second sleeve overlying and being joined to the first sleeve at a first proximal zone extending circumferentially around the

assembly and being joined to the assembly at a second zone extending circumferentially around the assembly at a location spaced distally from said proximal zone to define a fluid receiving cavity intermediate the first and second sleeves, and opening communicating between the main lumen of the shaft and an outer surface of the assembly at a location distal said cavity, and opening means communicating between the cavity and the inflation lumen for inflation of the second sleeve.

4,055,188

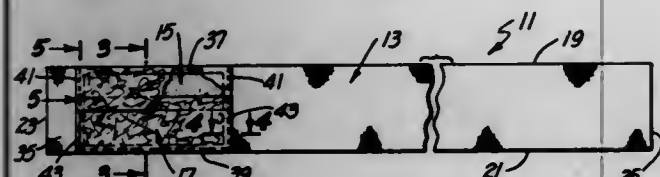
THERAPEUTIC WRAP

Robert J. Pelton, Santa Ana, Calif., assignor to Divajex, Santa Ana, Calif.

Filed Feb. 9, 1976, Ser. No. 656,705
Int. Cl.² A61F 7/00, 7/04

U.S. Cl. 128-402

5 Claims



1. A therapeutic wrap comprising: an elongated flexible bandage, said bandage being resilient in at least one direction and having first and second faces, said bandage being adapted to be wrapped around an injured region to resiliently compressively load the injured region;
- a pocket having a front wall, at least a substantial portion of said front wall being defined by means other than said bandage, said bandage being substantially longer than said pocket;
- means for attaching the pocket to the bandage with a substantial length of the bandage extending beyond said pocket;
- a refrigerant gel package including refrigerant gel and container means for containing the refrigerant gel therein; and said refrigerant gel package being carried by said pocket whereby the pocket and the refrigerant gel package are both carried by said bandage and said bandage can be wrapped around an injured region to resiliently compressively load the injured region.

4,055,189

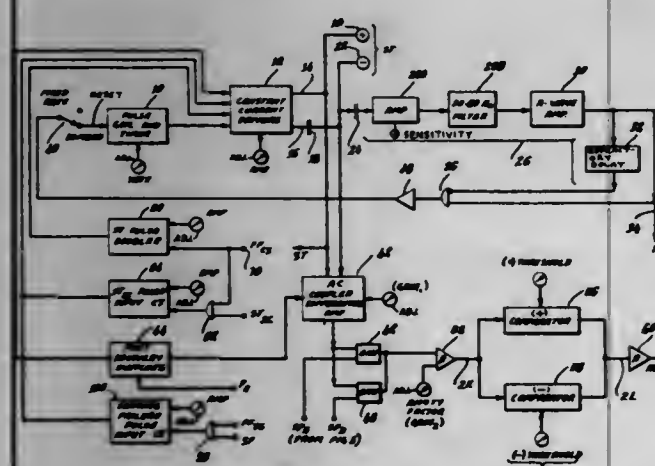
CONDITION MONITORING PACER

Albert A. Auerbach, New York, N.Y.; George M. Katz, Leonia, N.J., and Sidney Steinberg, Bronx, N.Y., assignors to Medalert Corporation, New York, N.Y.

Filed May 19, 1975, Ser. No. 578,644
Int. Cl.² A61N 1/36

U.S. Cl. 128-419 PG

27 Claims



1. A pacer for cardiac stimulation and cardiac condition monitoring comprising a single current path for both stimula-

tion and sensing, generating means coupled to said current path for generating a cardiac stimulation signal, sensing means coupled to said current path for sensing cardiac events, said cardiac events normally including a biphasic cardiac signal properly produced in response to said stimulation signal, said sensing means including means for generating sampling signals coincident with at least a portion of both phases of a biphasic cardiac signal produced in response to said stimulation signal, gating means for producing an output signal in response to said coincidences, and a monitoring means coupled to said gating means and responsive to a lack of coincidence between both said sampling signals and the respective expected phase signals of a normal response biphasic signal indicating an improper condition and providing a warning signal, time displaced from said stimulation signal and thus clinically discernible.

4,055,190

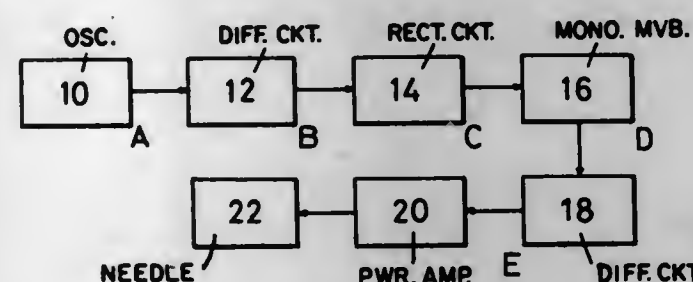
ELECTRICAL THERAPEUTIC APPARATUS

Michio Tany, No. 2-24-12, Minami Aoyama, Minato, Tokyo, Japan

Filed Dec. 19, 1974, Ser. No. 534,430
Int. Cl.² A61N 1/36

U.S. Cl. 128-422

5 Claims



1. An electrical therapeutic apparatus which comprises a multi-frequency generating oscillator for generating voltages of predetermined shape over a frequency range including relatively low and relatively high frequencies, means for selecting a voltage of predetermined frequency and wave shape matched to an affected meridian, and conductive needle means for applying the selected voltage at puncture points on the human body at the affected meridian, said oscillator generating a series of voltage pulses at frequencies of between 2.5 KHz to 1.6 MHz at intervals of 1/4 to 10 seconds.

4,055,191

TOBACCO COMPOSITION

Vello Norman, Raleigh, and Herman G. Bryant, Jr., Durham, both of N.C., assignors to Liggett & Myers Incorporated, Durham, N.C.

Continuation-in-part of Ser. No. 458,355, April 5, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,536
Int. Cl.² A24B 15/02, 15/04

U.S. Cl. 131-9

28 Claims

19. A smoking tobacco composition comprising:
 - a tobacco, and
 - a catalytic mixture consisting, essentially of palladium, in an amount of from about 0.01 to about 0.1 weight percent based on the weight of the tobacco and a non-toxic inorganic nitrate salt in an amount of from about 0.25 to about 0.75 weight percent calculated as added nitrate nitrogen based on the weight of the tobacco.

4,055,192

RECOVERY OF REUSABLE TOBACCO PARTICLES IN MACHINES FOR THE PRODUCTION OF PLAIN AND FILTER TIPPED SMOKERS PRODUCTS

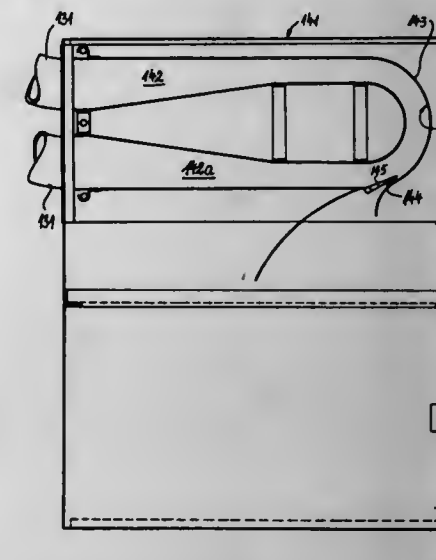
Herbert Berlin, Siegfried Abrahams, and Peter Brand, all of Hamburg, Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Oct. 16, 1974, Ser. No. 515,440

Claims priority, application Germany, Nov. 28, 1973, 2359193
Int. Cl.² A24C 5/18; A24B 7/14

U.S. Cl. 131-84 B

13 Claims



1. In an apparatus for the manufacture and processing of smokers' products wherein wrapped rod-like tobacco fillers are transported by conveyors along at least one predetermined path and/or otherwise manipulated at a plurality of stations, wherein the transport and manipulation of wrapped fillers is effected at least in part by at least one stream of air with attendant unpredictable entry of tobacco particles from the wrapped fillers into the stream, and wherein at least some particles of tobacco are removed from the air stream during passage of the stream through a first segregating means, the improvement which consists in the provision of additional segregating means including at least one separator having means for admitting the air stream ahead of said first segregating means, means for removing at least some tobacco particles from the thus admitted stream, and means for guiding the stream from said separator to said first segregating means.

4,055,193

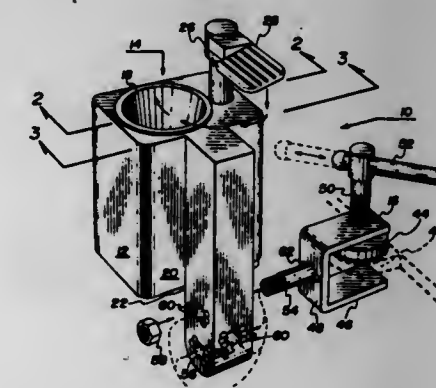
CIGARETTE SNUFFING ATTACHMENT FOR AN ASHTRAY

James Arlo Lehman, El Cajon, Calif., assignor to Warner-Lehman Corporation, El Cajon, Calif.

Continuation-in-part of Ser. No. 722,708, Sept. 13, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 741,803
Int. Cl.² A24F 13/18, 19/14

U.S. Cl. 131-235 R

6 Claims



1. A cigarette snuffing attachment for an automobile ashtray having a snuffing eyelet, said attachment comprising:

- a snuffing device having means to extinguish a lighted cigarette;
- a clamp for clamping an ashtray; and
- means connecting said clamp to said snuffing device, whereby said snuffing device is attached to an ashtray to insure the complete and safe snuffing of cigarette butts placed therein, said connecting means is angularly adjustable to permit installation of said snuffing device at a selected orientation relative to an ashtray to which said device is attached;
- said clamp and said snuffing device are connected by a shaft and are rotatable relative to one another on said shaft, and said connecting means includes detents to permit the selection of one of several angular orientations of the snuffing device relative to the clamp about said shaft.

4,055,194

HAIRDRESSER'S STORAGE AND DISPENSER CASE

John Martinez, 3371 W. 30th Ave., Denver, Colo. 80211

Filed June 11, 1976, Ser. No. 695,236
Int. Cl.² A45D 2/02

U.S. Cl. 132-39

10 Claims



1. A case for storing and dispensing hair rollers and similar hairdresser's items comprising a base component having upstanding front and back and left and right side walls to provide an open top miscellaneous items storage compartments, guide elements extending from front to back along the oppositely positioned side walls of said base component, a top component of generally hollow type construction having front, back and end walls for disposition in alternate open and closed positions with respect to said base for receiving and holding said hair rollers when the top is in either position, and pivot means interengaging said guide elements and top component for attaching said base and top components together with said pivot means being translationally movable along said guide elements from back to front of said base as the top component is moved pivotally and translationally from back to front as it is moved from an upright open position above said base and at the back of said base compartment to a flat closed position wherein the back wall of said top compartment is in contact with said base for closing off access to said base compartment.

4,055,195

FLUID-RESERVOIR HAIR COMB

Lawrence L. Moses, 1917 Vineyard Ave., Los Angeles, Calif. 90016

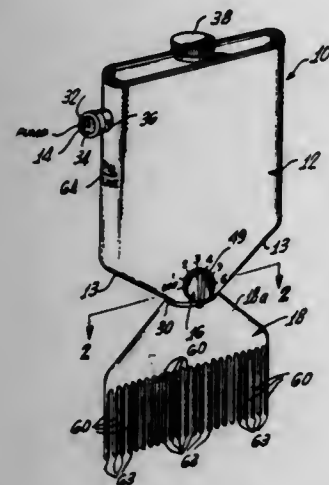
Filed May 7, 1976, Ser. No. 684,367
Int. Cl.² A45D 24/22

U.S. Cl. 132-115

3 Claims

1. A fluid-reservoir hair comb comprising:
 - a fluid reservoir;
 - means for providing positive pressure within said fluid reservoir;
 - a comb body;

a plurality of teeth, each having a bore, fluid-connected to said comb body;
a plurality of roller bearings, each of said roller bearings being mounted, for rotational movement only, within an outer end of each of said bores of said teeth; and
an adjustable valve means which in its open position, fluid-



connects said fluid reservoir body to said comb body to provide uniform flow of fluid, from said fluid reservoir, through said valve means, into said comb body and through each of said bores of said teeth to wet said roller bearing and dispense said fluid uniformly to a person's hair, and scalp by means of the rotational movement of said roller bearings.

4,055,196

IMMERSION TYPE METAL DEGREASER WITH COMPRESSION-EXPANSION SYSTEM FOR HEATING AND COOLING OF LIQUID SOLVENT AND SOLVENT VAPORS

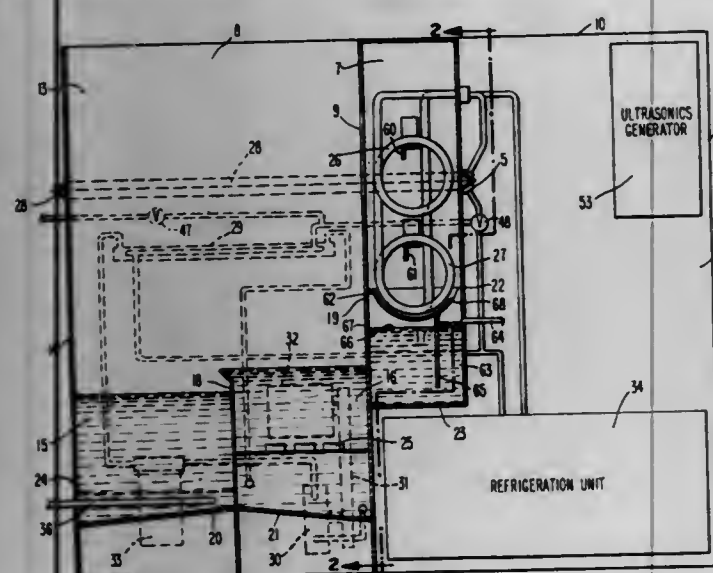
Thomas J. Kearney, Detroit, Mich., assignor to Detrex Chemical Industries, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 522,609, Nov. 11, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,271

Int. Cl.² B08B 7/04

U.S. Cl. 134-107

5 Claims



1. Metal degreasing apparatus for cleaning metal work objects first by immersion in a bath of boiling liquid solvent having a boiling point in the range from about 97° to about 120° F. and then by exposure to hot solvent vapors generated from said boiling liquid solvent bath comprising, in combination, a boil chamber constructed to contain said liquid solvent in sufficient amount to enable immersion of metal work objects therein, a rinse chamber constructed to contain a sufficient volume of said liquid solvent to provide a rinsing action on immersion of metal work objects therein and disposed in relation to said boil chamber so that overflow of said liquid solvent from said rinse chamber is directed into the liquid solvent bath

contained in said boil chamber, a space overlying said boil chamber and said rinse chamber for containing hot solvent vapors generated through boiling of the liquid solvent contained in said boil chamber, a separate cooling chamber in lateral open communication with the upper level of said hot solvent vapors for condensing said solvent vapors to liquid condensate, means for delivering said liquid condensate to said rinse chamber, a refrigeration system including a refrigerant, a high pressure compressor, condenser coils, and evaporator coils, said condenser coils being totally immersed in the liquid solvent bath contained in said boil chamber and said evaporator coils being immersed in the solvent vapors contained in said separate cooling chamber, said compressor having an operating pressure of from about 207 p.s.i.g. to about 250 p.s.i.g. and the temperature of the refrigerant delivered to said immersed condenser coils being in the range from about 140° to about 200° F., whereby the liquid solvent bath contained in the boil chamber is continuously maintained at its boiling point through heat interchange with the immersed condenser coils and whereby the solvent vapor generated from said continuously boiling solvent bath are continuously condensed to liquid solvent by the cooling action of the evaporator coils immersed in the solvent vapors contained in the separate cooling chamber and wherein said apparatus further includes ultrasonic transducer means immersed in the solvent contained in said rinse chamber and a heat exchanger operably associated with said refrigeration system through which solvent from said rinse chamber is circulated to maintain the solvent in said rinse chamber at a predetermined optimum temperature for operation of said ultrasonic transducers, and means responsive to the temperature of the solvent in said rinse chamber for selectively delivering to said heat exchanger a portion of the hot refrigerant from said condenser or a portion of the cold refrigerant from said evaporator.

4,055,197

ELECTRO-PROPORTIONAL PRESSURE CONTROL APPARATUS

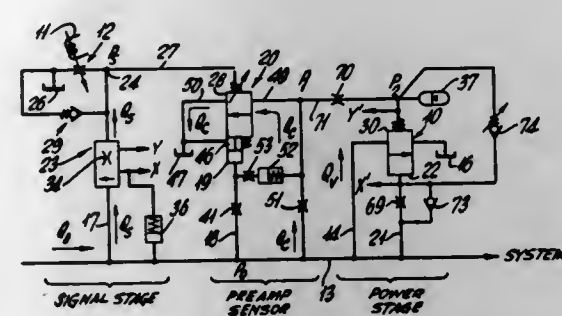
Robert E. Raymond, Zanesville, Ohio, assignor to De Laval Turbine Inc., Princeton, N.J.

Filed Sept. 10, 1976, Ser. No. 721,936

Int. Cl.² G05B 6/05; G05D 16/00

U.S. Cl. 137-84

23 Claims



1. In pressure-control apparatus for connection to and combination with a source of fluid pressure; power-valve means including an inlet port and an outlet port, a valve element having opposed control areas, a first fluid chamber communicating with one of said control areas and having means for connection to said source, a second fluid chamber communicating with the other of said control areas, said valve element being movable between open and closed positions responsive to a pressure-differential between said first and second chambers for delivering a control flow of fluid from the source and via said ports, means biasing said valve member in its valve-closing direction, and control means to modify the pressure difference between said chambers; said control means comprising a pilot valve having inlet and outlet ports, an inlet-port connection for said pilot valve for connecting the same to the source and including a first orifice for drawing a control flow of pressure fluid, said pilot valve including a pilot-valve element with at least one control area, a pilot-valve fluid chamber

communicating with said pilot-valve control area, chamber-connection means for connecting said pilot-valve chamber to the source and including an orifice whereby the pilot-valve chamber senses source pressure via the orifice of said pilot-valve chamber-connection means, a control connection from said pilot-valve inlet port to the second chamber of said power-valve means, means for biasing said pilot-valve member with a force in opposition to pressure in said pilot-valve chamber, and means including a compliant barrier to static flow interconnecting said pilot-valve chamber and said pilot-valve inlet port.

4,055,198

EXCESS PRESSURE RELIEVING VALVE

Frank M. Iannelli, Livingston, N.J., assignor to Tannetics, Inc., Erie, Pa.

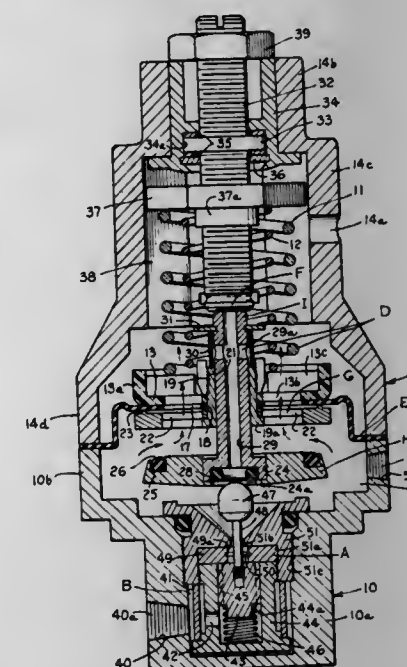
Continuation of Ser. No. 497,753, Aug. 15, 1974, abandoned.

This application Dec. 12, 1975, Ser. No. 640,077

Int. Cl.² G05D 16/06

U.S. Cl. 137-116.5

7 Claims



6. A safety device for fluid pressure reducing apparatus having a fluid pressure reducing valve, through which fluid passes from a high pressure inlet chamber to a reduced pressure outlet chamber, operable responsive to a compression spring simulating reduced pressure, and a diaphragm interposed between said reduced pressure outlet chamber and said compression spring including:

- an elongated threaded element carried for rotation at a predetermined position on a side of said diaphragm opposite said fluid pressure reducing valve;
- an abutment bearing on an end of said compression spring remote from said diaphragm carried for axial movement on said elongated threaded element responsive to rotation of said elongated threaded element for setting said reduced pressure;
- a valve member carried by said diaphragm having a fluid relief port communicating with said reduced pressure outlet chamber;
- a closure member carried below said diaphragm normally in position closing said fluid relief port by seating on the underside of said valve member; and
- an operator carried by said closure member in spaced relation with an adjacent end of said elongated threaded element when said closure member is in position closing said fluid relief port which engages said adjacent end of said elongated threaded element restraining said closure member against further movement when said diaphragm and said valve and closure members carried thereby are moved responsive to an excessive pressure in said reduced pressure outlet chamber but permitting further movement of said diaphragm and valve member carried thereby

separating said valve member from said movable closure member; whereby the elongated threaded element acts as a means for setting said reduced pressure and as a stop opening said fluid relief port permitting fluid to escape therethrough relieving excessive pressure in said reduced pressure outlet chamber.

4,055,199

NOZZLE SEAL

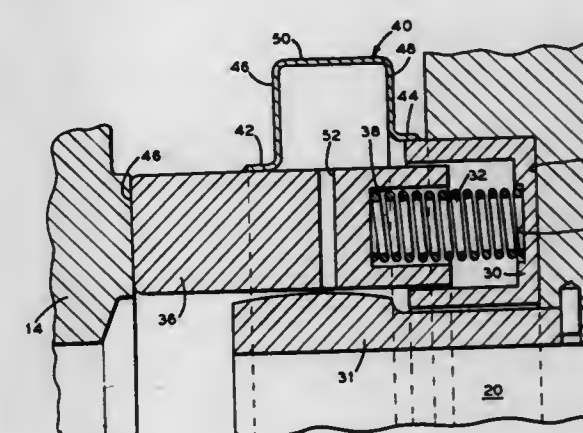
Richard Frederick Herman, North Canton, Ohio, assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 3, 1975, Ser. No. 583,488

Int. Cl.² E03B 11/00

U.S. Cl. 137-590

5 Claims



1. A reactor system comprising a pressure vessel having inlet and outlet nozzles, a distribution hoop within said pressure vessel having a fluid passage opening in flow communication with a respective one of said inlet and outlet nozzles, sealing means disposed about said hoop opening and interposed between said hoop and said outlet nozzle to establish a leak-proof connection between said hoop and said nozzle, said sealing means having an annular cup shaped cross section compressing ring, a sealing ring in axial alignment with the compression ring, the sealing ring being slideably engaged within the cup shaped compression ring forming a restricted leakage flow passageway therethrough, a spring operatively disposed between said compression ring and said sealing ring to force the sealing ring into leak tight engagement with the outlet nozzle, and an impervious flexible leak restraining member disposed in space surrounding relation to the compression ring and the sealing ring and circumferentially seal welded thereto to prevent leakage flow through the passageway.

4,055,200

MOISTURE DETECTION APPARATUS

Warren G. Lohoff, 1947 Havenwood Drive, Los Angeles, Calif. 91360

Filed Nov. 17, 1975, Ser. No. 632,451

Int. Cl.² A01G 25/00

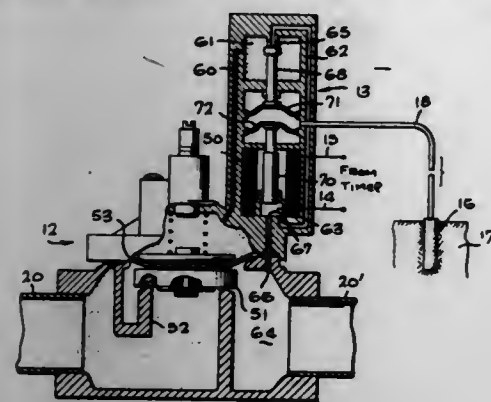
U.S. Cl. 137-624.11

13 Claims

1. A soil moisture detector and actuation apparatus for opening and closing a water supply valve, the combination comprising:

- a timer opening said water supply valve for a predetermined period of time;
- a soil moisture sensing means comprising a porous air valve buried in the soil adapted to block the passage of air when moist and to conduct the passage of air when dry;
- a detector having a pneumatic actuator means whereby a pressure level is maintained or released within a pressure chamber in response to the wet or dry soil condition sensed by said sensing valve; and

release of said pressure level in said pressure chamber of said pneumatic actuator means operable in unison with said



timer during said predetermined period of time to actuate said water supply valve.

4,055,201

EXPANSIBLE FABRIC FOR FLUID DISPENSING APPLICATION

John Rayford Fowler, Wilmington, Del., and Edward Merrick Hogan, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

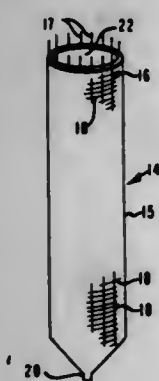
Division of Ser. No. 626,964, Oct. 29, 1975, Pat. No. 3,981,415.

This application Aug. 16, 1976, Ser. No. 714,410

Int. Cl.² D03D 15/08, 3/02; D04B 21/18, 21/20

U.S. Cl. 139-421

17 Claims



1. An expansible fabric suitable for disposition about a fluid-containing expansible member in a dispensing container for providing the force to dispense said fluid from said expansible member and thus from said container, said fabric being expansible by at least 200% and having a unidirectional recovery force to provide the force to dispense said fluid, said fabric comprising elastomer yarn providing said unidirectional recovery force, said recovery force being at least 750 g per cm of fabric width at 100% elongation of said fabric to provide a pressure of at least 0.15 atm, said elastomer yarn being present in said fabric at least 20,000 denier per cm of fabric width in the cross direction to the elastomer yarn, and yarn in engagement with said elastomer yarn to maintain the position of said elastomer yarn in said fabric during its expansion and recovery to prevent blow out of said expansible member between the yarn of said fabric upon the filling of said member with said fluid.

4,055,202

IN-CASE BOTTLE FILLING APPARATUS

James Albert Greene, 455 Tiffany, Richardson, Tex. 75080

Filed June 29, 1976, Ser. No. 700,758

Int. Cl.² B65B 3/04

U.S. Cl. 141-59

12 Claims

1. A bottle filling apparatus, comprising an elevatable table upon which at least one bottle may be positioned oriented, a fill tank position-mounted over said table; a fill valve means associated with each bottle to be filled, each said fill valve means comprising a fill tube extending downwardly through the bottom of said tank with the longitudinal axis thereof being

coextensive with that of the associated bottle to be filled, each said fill tube slideably received through a fixed-mounted securing cup means having an under surface conformingly and pressure sealably engagable with the neck opening of a bottle to be filled; means for selectively elevating said table; means for air evacuating each of said bottles to be filled upon said

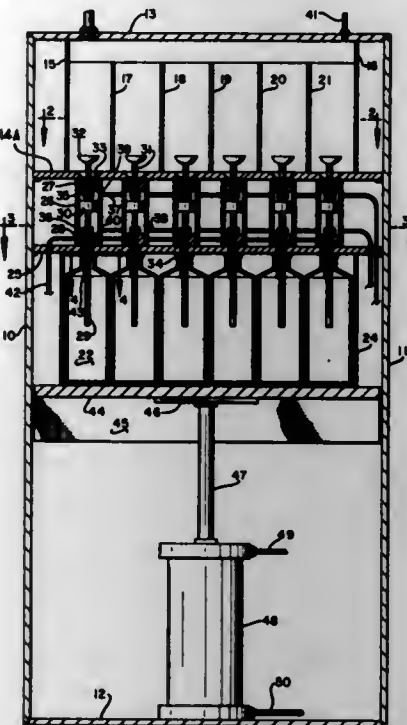


table being elevated for engagement between said securing cup means and said bottles; means for pressurizing said fill tank; and means operable upon engagement of said securing cup means and an associated one of said bottles to activate said fill valve means to effect fluid communication between each said fill tube and the confines of said fill tank.

4,055,203

LOOSE FILL CELLULOSE INSULATION MATERIAL PACKING MACHINE

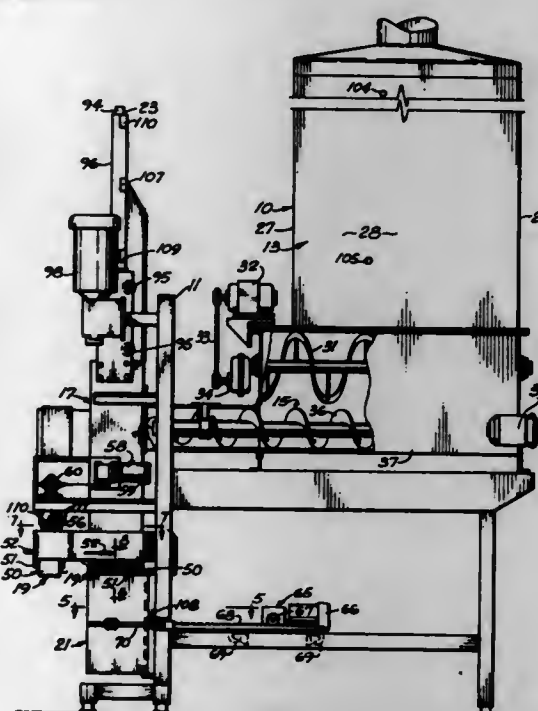
G. Roger Crawford; Duane Sanders, and David B. Shill, all of Spokane, Wash., assignors to Thermoguard Insulation Co., Spokane, Wash.

Filed Dec. 12, 1975, Ser. No. 640,073

Int. Cl.² B30B 15/30; B65B 1/20

U.S. Cl. 141-73

9 Claims



1. Apparatus for packing low density cellulose fibrous loose fill type building insulation material into flexible containers without forming lumps, comprising:

a supporting framework;
a hopper on the framework adapted to receive a bulk quantity of the cellulose insulation material;
an upright charging tube on the framework for receiving insulation material; said upright charging tube having a downwardly extending open discharge end;
container receiving means on the framework directly below the downwardly extending open discharge end of the charging tube for receiving and supporting an open end of a flexible container in open communication with the downward extending open discharge end of the charging tube;
enclosure means on the framework below the charging tube having a preselected interior shape for releasably encircling the flexible container to form a mold about the flexible container;
a feed screw rotatably mounted within the hopper and in operative communication with the charging tube to withdraw insulation material from the hopper and convey the insulative material to the charging tube;
selectively operable drive means operatively connected to the feed screw for rotating the feed screw at a prescribed speed for a preset time period to withdraw a preselected amount of insulation material from the hopper;
a ribbon screw blender rotatably mounted in the hopper above the feed screw;
a drive means operatively connected to the ribbon screw blender for rotating the blender to agitate the insulation material within the hopper and maintaining the feed screw full of insulation material of a constant density;
compactor means on the framework and operatively connected to the charging tube for pushing the prescribed amount from the charging tube downward into the open flexible container and compressing the insulation material in the flexible container against the encircling enclosure means to form a filled flexible container of compressed insulation material having an exterior shape conforming to the interior shape of the enclosure means; and
control means operatively connected to and operating: (1) said enclosure means to encircle said flexible container on said receiving means; (2) said feed screw drive means and said ribbon screw blender drive means to convey the preselected amount of insulation material from said hopper to said discharge tube; (3) said compactor means to push the preselected amount of insulation material through the discharge end of the discharge tube and compress the insulation material in the flexible container against said enclosure means and; (4) said enclosure means to release the encircled flexible container to enable the container to be removed.

4,055,204

ADJUSTABLE WOBBLE DADO ASSEMBLY HAVING IMPROVED DYNAMIC BALANCE

Fred G. Gunzner, Colton; Dale Edwards, Oregon City, and John A. Lanning, Mulino, all of Oreg., assignors to Lifetime Carbide Company, Colton, Oreg.

Filed Nov. 22, 1976, Ser. No. 743,686

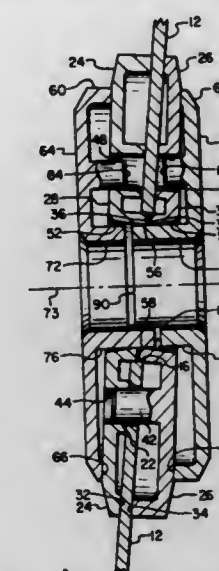
Int. Cl.² B23C 1/02

U.S. Cl. 144-238

4 Claims

1. An adjustable wobble dado assembly comprising:
a. a plate-like circular blade having two opposite side surfaces, a plurality of cutting teeth spaced around its periphery and means defining an aperture formed axially through its center;
b. a pair of inner plate member, fixedly and centrally mounted on opposite sides of said blade, having generally parallel outer surfaces and complementary inner surfaces inclined with respect to said outer surfaces and in contact with said blade for holding said blade at a position inclined relative to said outer surfaces, each of said inner plate members having means defining a circular bore formed centrally and axially through said inner plate member, each of said bores being tapered so as to have a radius of

curvature gradually decreasing in a direction from said outer surface toward said inner surface; and
c. a pair of interconnected outer plate members, having generally parallel outer surfaces and complementary inner surfaces inclined with respect to said outer surfaces of said outer plate members and bearing rotatably against said respective outer surfaces of said inner plate members, each of said outer plate members having means defining an arbor bore formed centrally through said outer plate member along an axis generally normal to the outer surface thereof and a substantially cylindrical hub surrounding said arbor bore and extending centrally from said inner surface of said outer plate member into a respective one of



said circular bores along the same axis as said arbor bore. each of said cylindrical hubs having an outside radius of curvature at locations along the length thereof which is smaller than the corresponding radius of curvature at the same location of the circular bore into which the hub extends, the difference between said hub radius of curvature and said circular bore radius of curvature being greater at a location adjacent the outer surface of said inner plate member than at a location adjacent the inner surface of said inner plate member so as to permit tilting of said circular bore with respect to said hub about said location adjacent the inner surface of said inner plate member when said circular bore and hub are rotated relative to one another.

4,055,205

PRESS SEAL

Alfred J. Withoff, and David C. Schultz, both of Grand Rapids, Minn., assignors to Blandin Wood Products, Grand Rapids, Minn.

Filed July 16, 1976, Ser. No. 705,762

Int. Cl.² B27D 3/00; F02F 5/00; B30B 1/23

U.S. Cl. 144-281 R

7 Claims



5. A hydraulic molding press having a non-circular cylinder or ram powered by a working fluid under pressure, said cylinder being sealed against loss of working fluid with an elastomeric seal having a generally L-shaped cross-section including a support portion and a wiping portion; said support portion having a series of longitudinally spaced perforations for receiving means for clamping said seal in an operation position; said support portion further having longitudinally extending ribs

along its inner face embracing said perforations for engaging in a sealed relationship with a supporting structure; said wiping portion and said support portion coming together in a generally perpendicular relationship to form a rounded nose where their outer faces meet; and a reinforcing fabric formed into said seal along its outer surface and extending across the nose of the seal.

4,055,206

COMPOSITE SHOP TRAILER

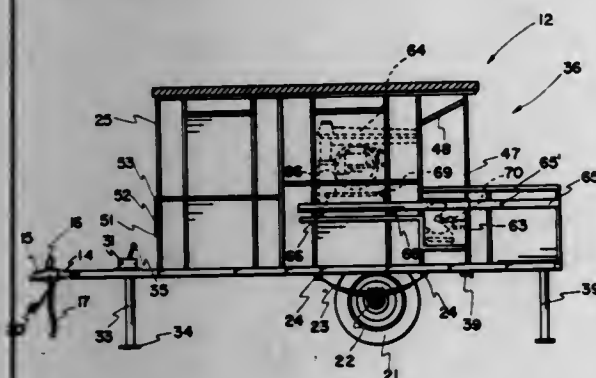
Carl W. Griffin, 100 Twin Acres, Fayetteville, N.C. 28305

Filed May 14, 1975, Ser. No. 577,355

Int. Cl.² B25H 1/12

U.S. Cl. 144-285

9 Claims



1. A transportable, shop type composite system comprising: an enclosed structure; shop type material processing equipment; means for removably attaching and supporting said equipment within said enclosure; means enabling removal of said equipment from said enclosure while maintaining the attachment of said supporting means by such enclosure; work material support means in the form of a feeder bench so mounted on the exterior of said enclosure as to fold to a vertical position flatly against said exterior during transport and to fold to a generally horizontal position and swing perpendicular to said exterior in its operative position adjacent said equipment when the same is in removed operative position; means for attaching said material support means in aligned position adjacent said removed equipment; and means for transporting said enclosure when said equipment is contained therewithin.

4,055,207

UNITARY CLUB RETAINER FOR GOLF BAGS

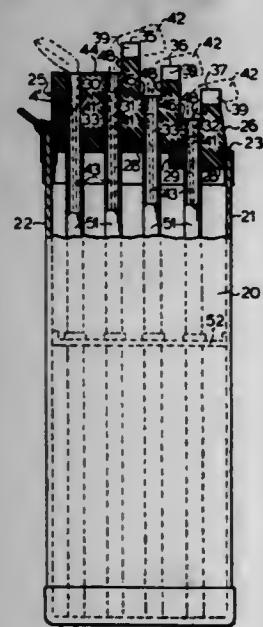
Joseph E. Goodwin, 414 W. Fourth, Russellville, Ark. 72801

Filed June 17, 1976, Ser. No. 696,924

Int. Cl.² A63B 55/00

U.S. Cl. 150-1.5 R

4 Claims



1. A unitary golf bag head (25) for suspending playing clubs (43) in upright inverted predetermined arrangements, said

clubs each having a shaft (41) with a blade (42) extending laterally from one end thereof, said head comprising:

a body member (26) having front and back sides and adapted to fit into the upper open end of said bag;
a plurality of ribs (35, 36, 37) integral with and subdividing the upper surface of said member (26) into a plurality of alternately spaced surface segment levels (44, 45, 46) each extending rearwardly from the base line of the adjacent rib;
said ribs and segment levels each being stepped forwardly and downwardly relative to the head;
said body member (26) having a row of passageways (33) extending downwardly therethrough from points disposed rearwardly adjacent the base line of each of said stepped levels, to thereby permit said club blades (42) to be vertically supported upon the ribs in substantially parallel forwardly projecting positions while the respective club shafts are laterally confined in said passageways, and means for releasably attaching said supported blades upon said ribs, wherein said ribs are made of resilient material, and wherein the attaching means for said blades includes V-shaped notches in the upper side of ribs, the angularity between the opposite faces of said blade being less than the angularity between the inner opposed faces of said notches to thereby cause the resilient walls of the notches to laterally clamp the opposite faces of said blade at the notch apices.

4,055,208

LOCKING FASTENER DEVICE

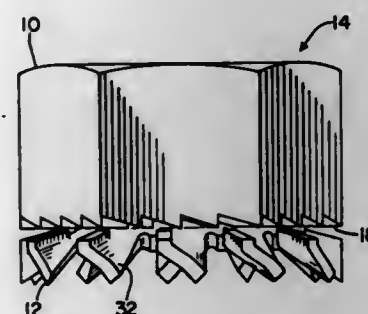
John Joseph Blaul, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sept. 20, 1976, Ser. No. 724,789

Int. Cl.² F16B 39/32

U.S. Cl. 151-37

2 Claims



1. A fastener unit including, in combination, a rotary threaded fastener member having a central axis and a clamping surface extending generally perpendicularly to the axis, the clamping surface including a plurality of ratchet-type cogs spaced circumferentially thereabout, each cog including a camming surface extending at an acute angle in one direction to a plane extending perpendicular to the central axis, a substantially flat abutment surface extending upwardly from the camming surface to said plane and substantially perpendicular thereto, the bottommost edge of each cog extending in a plane substantially perpendicular to the central axis of the fastener, a sheet metal lock washer operatively associated with said clamping surface including an annular body concentric with the axis of the fastener member and a plurality of integral circumferentially spaced teeth, each tooth being twisted from its root to free extremity about an axis extending generally radially from the annular body, the teeth in composite being generally frustoconical in an unstressed state so that initial compressive forces on the unit will axially deflect the inner region of the lock washer downwardly creating a spring force in the unit while bringing the upper edges of each tooth into operative association with the perpendicularly disposed bottom edges of the cogs, the transverse cross-sectional configuration of each tooth, taken across said axis extending radially

from the annular body, including a central region and a pair of side edge marginal regions, each marginal region being formed in opposite directions out of the plane of the central region with the marginal region closest to the clamping surface of the fastener member being formed upwardly toward said clamping surface, so as to extend generally perpendicular to said plane extending perpendicular to the central axis when the washer is in an unstressed condition, said marginal surface adjacent the upper edge being a radially extending tab sheared from the tooth adjacent the root thereof presenting a connection to the remaining portion of the lock washer along a line which is substantially radial thus creating a cantilever spring when engaged by the cogs.

4,055,209

PNEUMATIC RADIAL TIRE TREAD PATTERN

Gerhard Franz-Josef Senger, Aachen, Germany, assignor to Uniroyal Aktiengesellschaft, Aachen, Germany

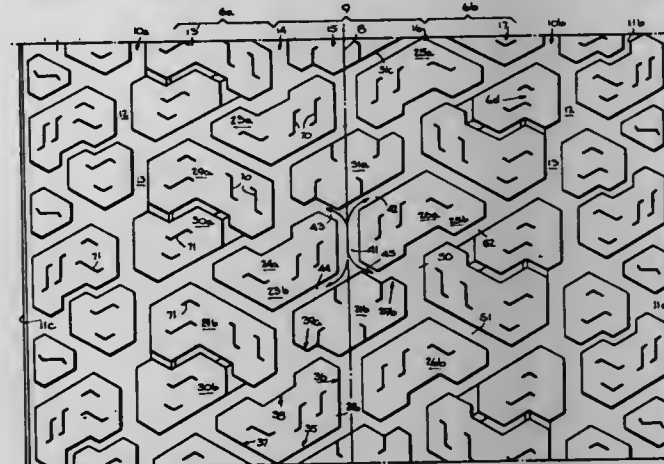
Filed May 13, 1976, Ser. No. 685,845

Claims priority, application Germany, Sept. 25, 1975, 3139; Nov. 5, 1975, 2549668

Int. Cl.² B60C 11/06, 11/12

U.S. Cl. 152-209 R

4 Claims



1. A pneumatic radial tire having an equator comprising: a carcass including at least one ply having cords disposed substantially radially of the tire;
a reinforcing belt extending substantially circumferentially of the tire over said carcass;
a tread portion, including shoulder portions, of elastomeric material over said carcass;
and outer shoulder and sidewall portions of elastomeric material over said carcass, said tread and outer shoulder portions comprising similar circumferentially overlapping patterns, each pattern having lugs and grooves and having a first tread lug at the equator of the tire and having four similar tread lugs of different shape from said first lug, first tread lug has a shape of a polygon having opposite sides parallel and substantially equal in length, wherein said different shape of said four similar tread lugs is a polygon having sides unequal in length, each of said four similar lugs having its longest side substantially parallel to the longest side of said first lug, wherein said four similar tread lugs surround said first tread lug, a first pair of said four similar lugs being adjacent a second lug at the equator in a second of said overlapping patterns and each of said first pair of said four similar lugs having its longest side substantially parallel to the longest side of said second lug, said first pair of said four similar tread lugs separating said first tread lug and said second tread lug along the equator, wherein said second tread lug is of substantially the same shape as said first lug, and a second pair of said four similar lugs being adjacent a third lug at the equator in a third of said overlapping patterns and each of said second pair of said four similar lugs having its longest side substantially parallel to the longest side of said third lug, wherein said first and second pairs of said four similar tread lugs surround said second tread lug, said second pair of said four

similar tread lugs separating said second tread lug and said third tread lug along the equator, wherein said third tread lug is of substantially the same shape as said first lug.

4,055,210

ANTI-SKID DEVICE

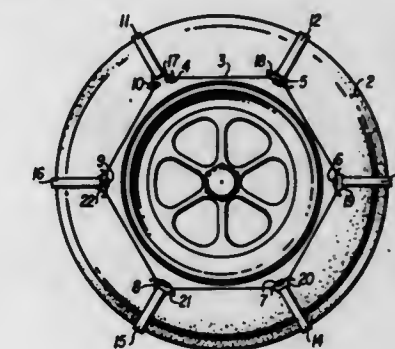
Jacques Mongault, 82 rue Dutot, Paris 15EME, France

Filed Oct. 1, 1975, Ser. No. 618,385

Claims priority, application France, Oct. 2, 1974, 74.33156
Int. Cl.² B60C 27/02

U.S. Cl. 152-239

10 Claims



1. Anti-skid device for a vehicle wheel comprising: a plurality of removable and extensible anti-skid straps to be disposed across the road-contacting portion of said wheel, first and second independent attachment cables, one for each side of the wheel to be equipped, a plurality of positioning nipples fixed at spaced intervals on the intermediate portion of each of said cables, stop nipples fastened on the ends of one of said cables, a safety hook fastened to each of the ends of each of said anti-skid straps, each safety hook of a strap adapted to be connected to a corresponding cable at a positioning nipple thereon, the safety hook at the end of one of said straps adapted to connect the ends of said one cable together by engaging said stop nipples, said safety hook for said end connection also providing mechanical tension for said cable when mounted on said wheel; and means for connecting the ends of said second cable.

4,055,211

FABRIC HANGING AND PLEATING BRACKET WITH STABILIZING ELEMENTS

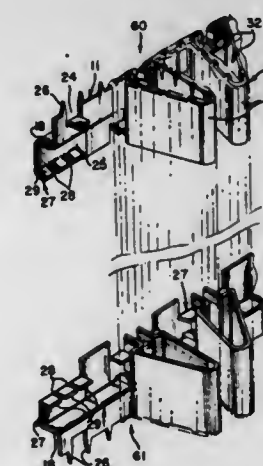
Phillip Sperling, 3206 Coolidge Ave., Los Angeles, Calif. 90066

Filed June 7, 1976, Ser. No. 693,368

Int. Cl.² A47H 23/00; E05D 13/02

U.S. Cl. 160-327

5 Claims



1. A fabric hanging and pleating bracket with sectional components, comprising:
a. an elongated holding bar including a lower strip with a bottom edge, an upper strip with a top edge offset out-

wardly and forwardly from the lower strip, and, an intermediate strip linking the lower strip and upper strip;

b. a plurality of prongs extending upwardly from the upper strip top edge for piercing and holding fabric;

c. at least one separable hanger unit removably coupled to and projecting forwardly from the holding bar, the hanger unit having a front wall shaped to assist in forming a fabric pleat and a pair of rearwardly extending shoulder;

d. spikes extending upwardly from a top edge of the hanger unit for piercing and supporting fabric;

e. a plurality of stabilizing means integrally formed at longitudinally spaced intervals with the holding bar — wherein each individual stabilizing means is a flange struck upwardly and forwardly from an edge section of the holding bar lower strip and is formed with a plurality of horizontally aligned parallel gaps defining at least three forwardly projecting tongues, and, at least one of the hanger unit shoulders is inserted into a gap and restrained from lateral movement by adjacent tongues,

wherein when fabric is laid generally against the holding bar and hanger unit and drawn over the prongs and spikes, a section of the fabric will be formed into a pleat.

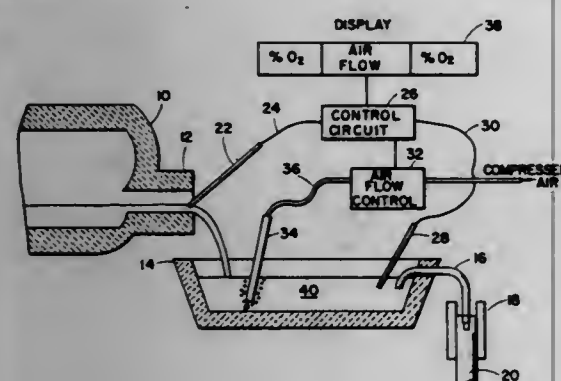
4,055,212

CONTROL SYSTEM AND METHOD FOR CONTROLLING THE OXYGEN CONTENT IN CONTINUOUSLY CAST METAL

Ralph A. Vogel, Three Rivers, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 26, 1976, Ser. No. 735,297
Int. Cl.² B22D 11/10, 11/16

U.S. Cl. 164—4



1. In a continuous casting system for producing an elongated metal rod including a continuous source of molten metal having an oxygen content which is lower than desired, and casting means for continuously withdrawing said molten metal, an automatic system for controlling the oxygen content of the molten metal being withdrawn, comprising:

oxygen content measuring means for providing a signal which is representative of the oxygen content of said molten metal from said source;

oxygen addition means situated intermediate said oxygen content measuring means and said casting means; and

control means for controlling the rate oxygen is added to said molten metal by said oxygen addition means in accordance with the signal provided by said oxygen content measuring means and the rate at which metal is withdrawn by said casting means.

4,055,213

METHOD FOR MAKING PATTERNS

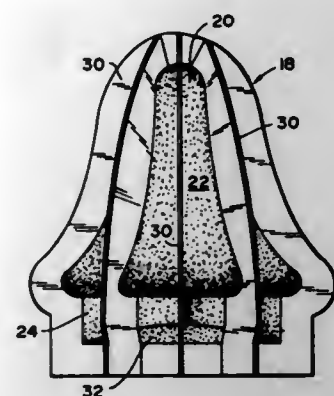
Richard G. Maher, 412 Margo, Tawas City, Mich. 48763
Continuation-in-part of Ser. No. 423,010, Dec. 10, 1973, abandoned. This application Aug. 30, 1976, Ser. No. 718,598
Int. Cl.² B22C 7/00

U.S. Cl. 164—45

1 Claim

1. The method of making a pattern and using said pattern in the fabrication of sand molds at elevated temperatures, comprising first fabricating a first pattern of the desired configura-

tion out of relatively soft material, then forming a shell of plastic material on said first pattern, removing the first pattern from said shell, electroplating nickel to a thickness of at least about 0.100 inch on said shell to form a second pattern, the surface thereof consisting of an inner surface and an outer



surface, removing said second pattern from the shell, and then using said second pattern as a pattern in the fabrication of sand molds at elevated temperatures, with one of the inner and outer surface of the pattern defining the surface for fabricating a sand mold and the other of said surfaces being substantially unsupported.

4,055,214

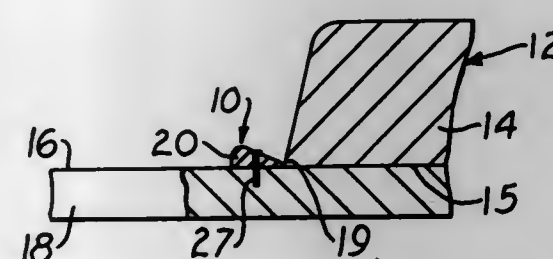
FLASH CONTROL MOLDING FOR MOLDS

John R. Nieman, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 5, 1976, Ser. No. 683,588
Int. Cl.² B22C 7/04

U.S. Cl. 164—241

9 Claims



1. A flash control molding in combination with a pattern having a nonlinear peripheral edge for forming a casting cavity in a mold, comprising:

an elongated strip of material having a preselected and substantially uniform cross sectional configuration throughout its length and defining a relatively thick edge portion and a juxtaposed relatively thin edge portion, said thin edge portion being disposed in abutting relation against said peripheral edge of the pattern with said thick edge portion spaced from the pattern, said elongated strip being separable from the pattern and of a pliable material having physical properties sufficient for shaping thereof conformingly to the nonlinear contour of said peripheral edge of the pattern.

4,055,215

HOT-TOP FOR THE PRODUCTION OF INGOTS USING AN ELECTROSLAG REMELTING PROCESS

Aldo Ramacciotti, and Eugenio Repetto, both of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed July 14, 1976, Ser. No. 705,263

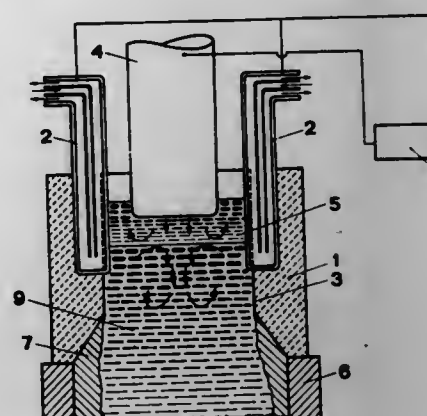
Claims priority, application Italy, July 23, 1975, 50628/75
Int. Cl.² B22D 27/02

U.S. Cl. 164—252

8 Claims

1. A hot-top for the production of ingots obtained at least in

part by an electroslog remelting process, the hot-top being made of refractory material and having on its inner surface a plurality of non-consumable elongated electrodes partially embedded in said refractory material, said electrodes having exposed parts constituting a plurality of elongated vertical parallel electrically conducting zones that extend from the upper edge of the hot-top downwardly, a consumable elec-



trode having its lower end disposed axially within said hot-top and spaced from the inner side walls of the hot-top, and means for passing an electric current between said consumable and non-consumable electrodes, said consumable electrode being in series with a plurality of said non-consumable electrode, a plurality of said non-consumable electrodes being in parallel with each other.

4,055,216

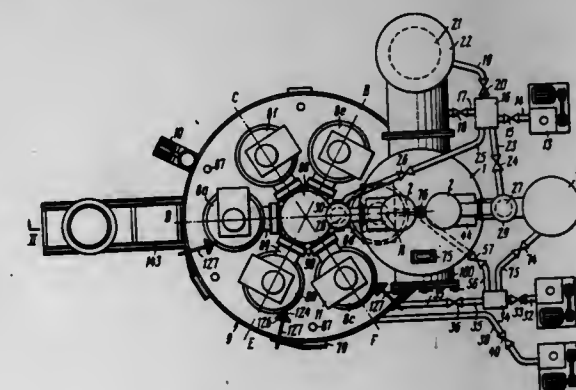
VACUUM CASTING MACHINE

Viktor Leonidovich Ulyanov, ulitsa Semashko, 21, kv. 78; Eduard Evgenievich Shishkarev, ulitsa Berezhnyakovskaya, 24, kv. 10; Valentin Vasilievich Nazarenko, Mikhailovskiy pereulok, 20, kv. 12, all of, Kiev, U.S.S.R.; Vladimir Efimovich Yavich, deceased, late of Kiev, U.S.S.R., and by Maria Semenovna Yavich, administrator, ulitsa Serova, 33, kv. 20, Kiev, U.S.S.R.

Continuation of Ser. No. 664,076, March 5, 1976, abandoned, which is a continuation of Ser. No. 542,703, Jan. 21, 1975, abandoned. This application Oct. 28, 1976, Ser. No. 736,360
Int. Cl.² B22D 27/16, 13/00

U.S. Cl. 164—258

6 Claims



1. A vacuum casting machine comprising

a melting chamber with an opening for pouring metal;

a vessel for melting metal disposed in said melting chamber; heaters for melting metal disposed in said melting chamber;

a first vacuum seal closing said opening for pouring metal;

a plurality of casting molds for receiving the melted metal;

a plurality of mold chambers each having one casting mold disposed therein, each mold chamber having a mold chamber opening for pouring the metal into its casting mold;

a plurality of second vacuum seals, each of said mold chambers having one of said second vacuum seals for closing

the mold chamber opening for pouring the metal into its casting mold;

a rotary table accommodating around its circumference said plurality of mold chambers with associated molds;

a self-contained drive of said rotary table operatively associated with said rotary table, said rotary table serving the purpose of registering, in turning, each of the mold chamber openings for pouring metal in said mold chambers containing the molds with said opening for pouring metal in said melting chamber;

a vacuum sealing means serving to couple said first vacuum seal with each of said second vacuum seals in a vacuum-tight fashion during the process of pouring the metal into said casting molds;

a system for evacuating said melting chamber and associated mold chamber with mold;

an additional vacuum system disposed away from said rotary table for evacuating said mold chambers prior to connection with said melting chamber;

a sealed rotatable connecting means for connecting said additional vacuum system to all of said mold chambers on said rotary table, and

a support means for supporting said melting chamber and said rotary table.

4,055,217

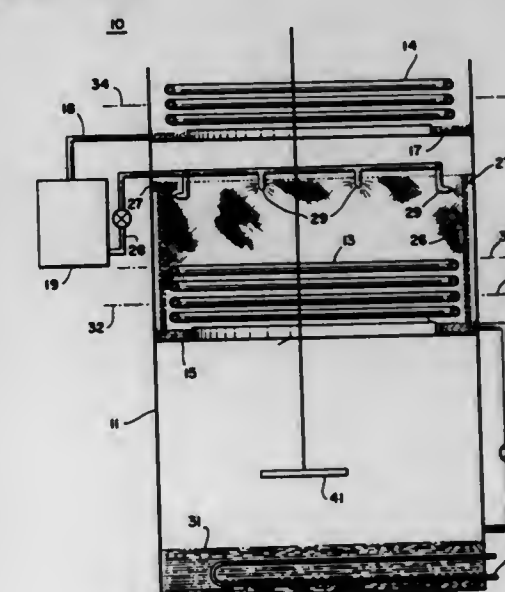
METHOD FOR MAINTAINING A VAPOR BLANKET IN A CONDENSATION HEATING FACILITY

Tze Yao Chu, Lawrence Township, Mercer County, and George Michael Wenger, Franklin Township, Somerset County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,242
Int. Cl.² F28D 15/00

U.S. Cl. 165—1

2 Claims



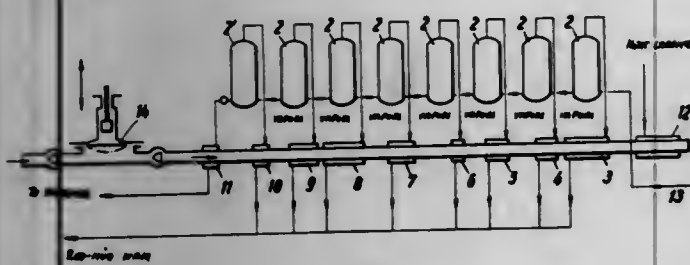
1. A method for maintaining a body of secondary vapor in a condensation heating facility having a vessel, open to the atmosphere, containing a body of hot primary vapor with the body of secondary vapor interposed between the body of primary vapor and the atmosphere, the method comprising the steps of:

depositing a secondary liquid on a wick mounted within the vessel, and

wicking the secondary liquid through the secondary body of vapor and into contact with the body of hot primary vapor to vaporize the secondary liquid to provide supplemental secondary vapor to maintain the body of secondary vapor.

4,055,218 METHOD AND ARRANGEMENT FOR CHANGING THE TEMPERATURE OF FLUIDS WHICH FORM INCRUSTATIONS

Fritz Kampf, and Hans-Georg Kaltenberg, both of Lunen, Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Germany
Continuation-in-part of Ser. No. 222,757, Feb. 2, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 500,123
Claims priority, application Germany, Feb. 10, 1971, 2106198
Int. Cl.² F28F 13/06, 13/14; B01D 1/28, 1/00
U.S. Cl. 165—1 10 Claims

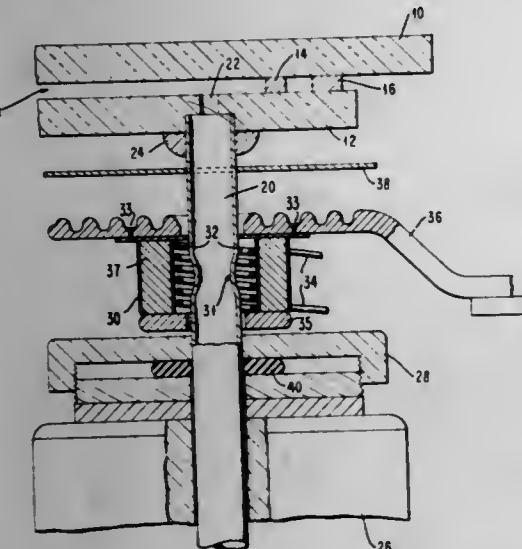


1. A method of effecting a temperature change of fluids which form incrustations, comprising the steps of: conveying a fluid medium to undergo temperature change along a predetermined path; changing the temperature of said fluid medium along a first segment of said path which is maintained substantially at a first temperature at which said fluid medium forms incrustations at a first rate, said first segment having a first length; and changing the temperature of said fluid medium along a second segment of said path which is maintained substantially at a second temperature at which said fluid medium forms incrustations at a second rate, selecting a predetermined second length for said second segment such that the ratio of said first length and said second length is substantially equal to the ratio of said first rate and said second rate.

4,055,219

ELECTRIC TIP-OFF HEAT SINK

John Victor Orlandi, Pine Plains; Neil Myron Poley, and Donald Miller Wilson, both of Kingston, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.
Filed June 17, 1974, Ser. No. 479,720
Int. Cl.² F28F 7/00, 13/00; H05B 3/58
U.S. Cl. 219—390 2 Claims



1. For use during the course of fabricating a gas panel, wherein as part of said fabrication process a partly completed gas panel is placed in a vacuum oven for a bake out, backfill and sealing and wherein a glass tubular member inserted into said gas panel is used for evacuating gaseous contaminants from said gas panel and thereafter is sealed by means of an oven which encircles said member, said oven having a heater

coil element and a relatively thin supporting structure that is in part located between the heater element and the gas panel, apparatus for protecting said gas panel from thermal damage by heat radiated from said oven comprising:

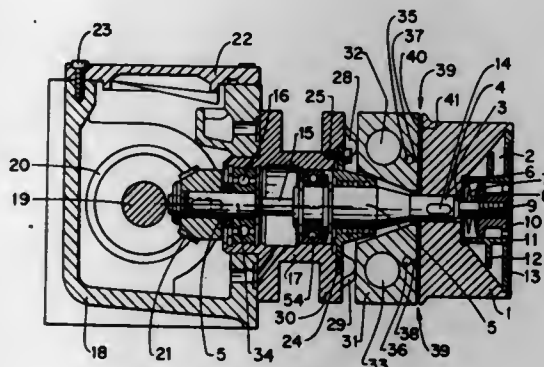
a separate heat sink mounted on the part of the oven supporting structure that is located between the heater coil element and the gas panel between said oven and said gas panel said heat sink being relatively thicker than said oven supporting structure and in thermal conductive contact with said oven for providing a thermal conductive path from said oven through said heat sink and away from said gas panel.

4,055,220

TRANSFER OF HEAT BETWEEN TWO BODIES

Willem Stelwagen, Velp, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Aug. 3, 1970, Ser. No. 60,371
Claims priority, application Netherlands, Aug. 7, 1969, 6912025
The portion of the term of this patent subsequent to Oct. 25, 1993, has been disclaimed.
Int. Cl.² F28D 11/02; F28F 5/02
U.S. Cl. 165—89 7 Claims



1. An apparatus for transfer of heat between a first body and a yarn transport roller mounted on a driving shaft rotatably connected to said first body, said first body and yarn transport roller being variably movable relative to each other, said first body and yarn transport roller having co-operating transfer surfaces adjacent and closely spaced to form a transfer gap, said transfer surfaces being symmetric and axially equidistant and perpendicular to the axis of rotation, comprising means for heating said first body, spring means for axially urging the yarn transport roller toward said first body, and means for supplying a non-solid interspacial substance under pressure to said transfer gap to transfer heat from said body to said yarn transport roller and to cause the pressure of said non-solid interspacial substance to vary inversely with width of said transfer gap.

4,055,221

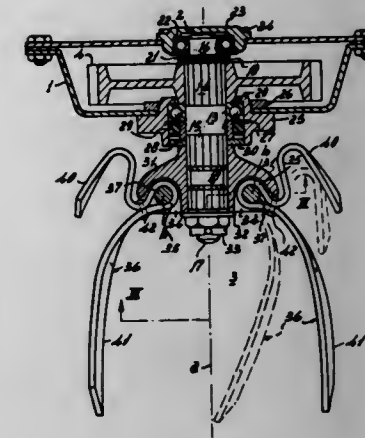
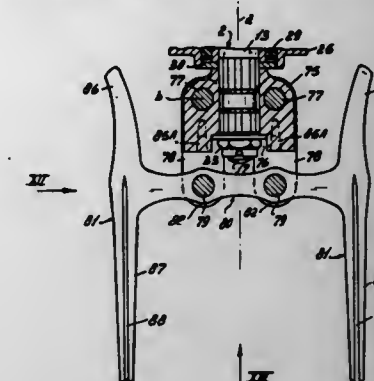
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed July 17, 1975, Ser. No. 596,825
Claims priority, application Netherlands, July 18, 1974, 7409706
Int. Cl.² A01B 33/06, 33/10, 33/14 17 Claims

U.S. Cl. 172—47
1. A soil-cultivating implement comprising a frame and at least one soil-working member being supported by said frame, said member being rotatable about an upwardly extending axis of rotation, driving means connected to said member to rotate same, time means mounted on a support of said soil-working member, said time means being strip-shaped and comprising

two operative, soil-contacting ends, said time means being connected to said support by elongated pin means and the



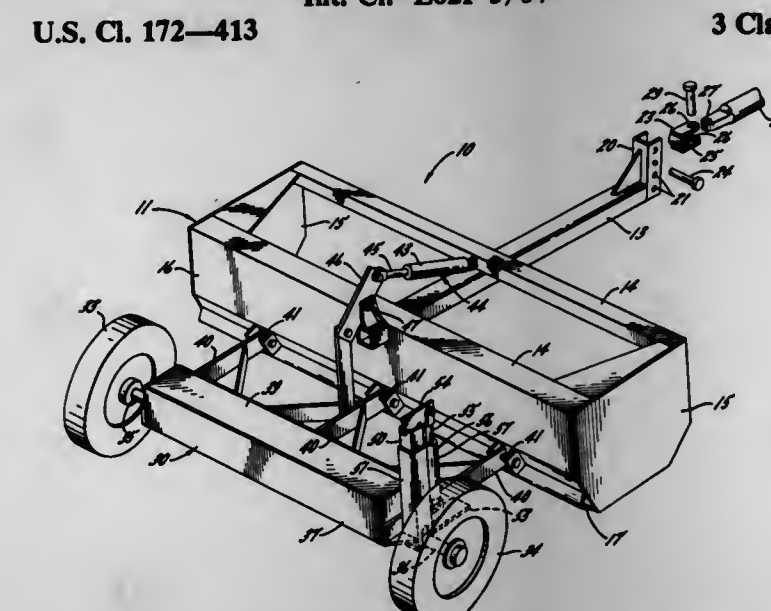
latter extending substantially horizontally and perpendicular to said axis of rotation.

4,055,222

EARTH MOVING IMPLEMENT WITH ADJUSTABLE WHEEL ASSEMBLY

Donald J. Runte, 1220 Hillcrest Drive, Freeport, Ill. 61032

Filed Apr. 29, 1976, Ser. No. 681,390
Int. Cl.² E02F 3/64 3 Claims



1. An earth mover adapted to be towed in a forward direction and comprising a bucket having laterally spaced upright side walls and having a scraping blade extending between the lower rear portions of said side walls, means attached to and projecting forwardly from said bucket for connecting the latter to a towing vehicle, a wheel assembly comprising a support and a pair of laterally spaced ground-engaging wheels attached to said support, means mounting said support for up and down pivoting on the rear of said bucket and about a transversely extending axis, a reversible hydraulic actuator connected between said bucket and said support and operable when operated in opposite directions to wing said support and said wheels upwardly and downwardly in unison relative to

said bucket and about said axis and thereby effect lowering and raising of said scraper blade with respect to the ground, means mounting one of said wheels for up and down linear movement relative to said support and said other wheel, and a second reversible hydraulic actuator connected between said support and said one wheel and operable when operated in opposite directions to shift said one wheel upwardly and downwardly relative to said support and said other wheel and thereby effect tilting of the bucket about a fore-and-aft extending axis.

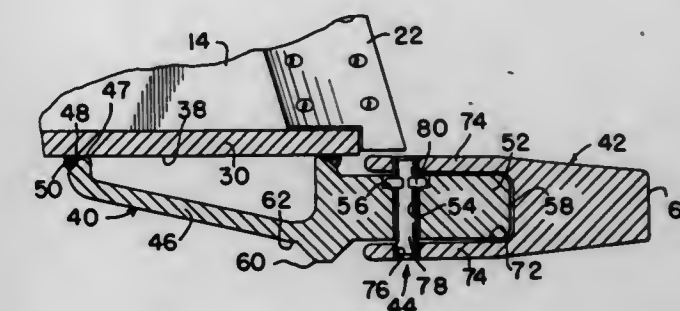
4,055,223

CORNER TOOTH ASSEMBLY FOR AN EARTHMOVING IMPLEMENT HAVING A HOLLOW REARWARD PORTION

Thomas P. Casey, Burlington, Iowa; Howard A. Hansen, Moss-ville; Gene R. Klett, Joliet, and James A. Olthoff, South Holland, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 563,862, March 31, 1975, abandoned.
This application Oct. 4, 1976, Ser. No. 729,326
Int. Cl.² E02F 3/60, 3/76 3 Claims

U.S. Cl. 172—777



1. A corner tooth assembly, for an earthmoving implement having a predetermined forward and rearward direction of travel and having an upright sidewall disposed in a plane substantially aligned with said directions of travel and including an outer surface, comprising:

a corner tooth adapter having a hollow rear portion of laterally inwardly extending C-shaped cross section, said rear portion tapering rearwardly and convergingly towards said sidewall and defining a substantially continuous peripheral edge which is secured to a lower forward portion of said outer surface of said sidewall by a weld, and a convergingly tapered nose portion extending forwardly of said sidewall in laterally outwardly spaced relation thereto; and

a socketed replaceable wear tip mounted on said nose portion of said adapter fully laterally outwardly of said outer surface of said sidewall to a location sufficient for working forces subjected on said wear tip during forward travel of the implement to be transmitted rearwardly through said adapter and thence directed solely to said outer surface of said sidewall through said weld.

4,055,224

METHOD FOR FORMING AN UNDERGROUND CAVITY

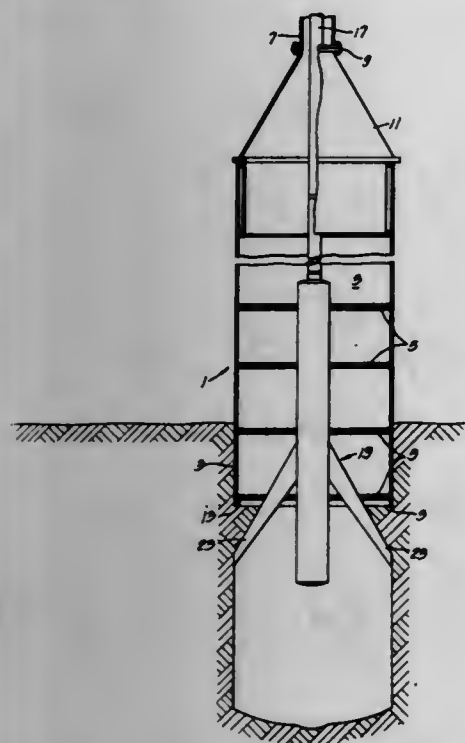
Richard A. Wallers, 111 Amethyst Ave., Balboa Island, Calif. 92662

Filed July 1, 1975, Ser. No. 592,169
Int. Cl.² E21B 7/12 12 Claims

U.S. Cl. 175—5

1. A method for placing an offshore caisson comprising: connecting at least one conductor section to said caisson, said conductor having a cross-sectional area less than the cross-sectional area of said caisson; lowering said caisson and said conductor section to a predetermined position on the underwater floor; positioning a drill stem having a combined drilling and

reaming tool attached thereto within said conductor section and said caisson;
reverse-circulating a drilling mud through the annular space between said connected conductor section and caisson and said drill stem, said drilling mud returning through said drill stem;



drilling with said drilling and reaming tool to a predetermined depth;
opening and rotating at least one reaming arm of said drilling and reaming tool; and
positioning said caisson within the area drilled and reamed by said drilling and reaming tool.

4,055,225

LUBRICANT PRESSURE COMPENSATOR FOR AN EARTH BORING DRILL BIT

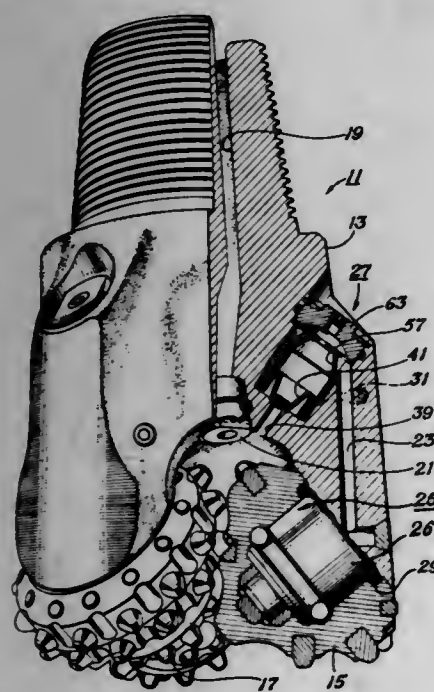
Stuart C. Millsaps, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed May 17, 1976, Ser. No. 687,131

Int. Cl.² E21B 9/10

U.S. Cl. 175—228

10 Claims



1. In an earth boring drill bit of the type having rotatable cutters mounted on depending head sections that define a shroud on the underside of the bit between the head sections, lubricant passages for supplying lubricant to the cutters, a lubricant reservoir having a base and walls, and a passage for

the admission of borehole fluids extending from the base of the lubricant reservoir to the shroud, an improved lubricant compensator for equalizing the lubricant pressure with the borehole pressure comprising:

a flexible diaphragm located in the reservoir, being expansible to define a cup-shaped configuration with a closed end, one side of the diaphragm being in contact with the borehole fluid, the other side of the diaphragm being in contact with lubricant in the reservoir;
primary seal means seated at the base of the reservoir for preventing borehole fluid from entering the lubricant reservoir;
protector means enclosing the diaphragm for limiting expansion of the diaphragm, with a mouth facing the primary seal means;
a closed cap bearing against the end of the protector means that is opposite the mouth and sealing the top of the reservoir from borehole fluids; and
retaining means for securing the cap and compressing the primary seal means, thereby providing a seal from borehole fluids at the interface of the primary seal means and the base.

4,055,226

UNDERREAMER HAVING SPLINED TORQUE TRANSMITTING CONNECTION BETWEEN TELESCOPING PORTIONS FOR CONTROL OF CUTTER POSITION

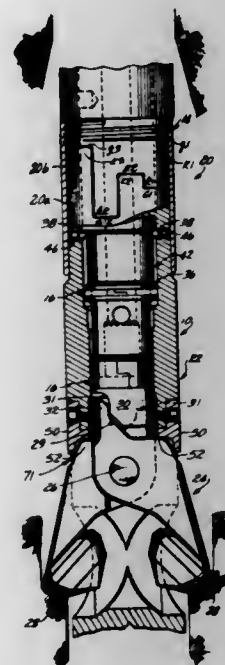
Robert W. Weber, Long Beach, Calif., assignor to The Servco Company, a division of Smith International, Inc., Gardena, Calif.

Continuation of Ser. No. 668,412, March 19, 1976, abandoned. This application Oct. 27, 1976, Ser. No. 736,109

Int. Cl.² E21B 9/26

U.S. Cl. 175—273

20 Claims



1. An underreamer comprising:
longitudinally telescoping and relatively rotatable upper and lower portions connectable respectively to an upper drill string and a lower drill string;
first and second connector parts, one carried by each said telescoping portion, each said connector part comprising a plurality of grooves of staggered length and a plurality of keys of staggered length, the grooves and keys of one connector part being engageable and disengageable with, respectively, the keys and grooves of the other connector part, said connector parts having first and second engaged positions, both positions for transmitting torque between the telescoping portions, said connector parts providing a different angular position and a different longitudinal position for the telescoping portions in each said engaged position;

a plurality of cutter arms;
means for pivotally mounting the cutter arms on one of said telescoping portions; and
means carried by the other telescoping portion for urging the cutter arms relatively outward towards an extended underreaming position when said connector parts are in said first position, the cutter arms being retracted relatively inwardly to a clearance position when said connector parts are in said second position.

4,055,227

HEAVY DUTY HYDRAULIC WEIGHING APPARATUS

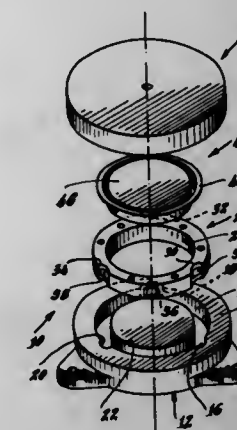
George E. Brackett, Nashua, N.H., assignor to The A. H. Emery Company, New Canaan, Conn.

Continuation-in-part of Ser. No. 619,395, Oct. 3, 1975, abandoned. This application May 6, 1976, Ser. No. 683,897

Int. Cl.² G01G 5/04

U.S. Cl. 177—208

3 Claims



1. In a hydraulic weighing apparatus which includes a piston, an annular ring fixed with and encircling the piston, a cooperating cylinder which fits radially between the ring and piston for receiving the piston in freely interfitable, relatively reciprocally movable relation, and a flexible diaphragm of fluid impervious material sealed in the cylinder and overlying the piston to form a fluid pressure receiving chamber therebetween which is adapted for fluid communication with an indicating device; a bearing arrangement for facilitating free relative reciprocal movement between the piston and ring and the cylinder comprising:

- A. a plurality of cylindrical raceways, a first portion of each raceway being defined in the outer wall of the cylinder and a second portion of each raceway being defined in the inner wall of the ring;
- B. a first bearing insert at least partially lining each of said first raceway portions;
- C. a second bearing insert at least partially lining each of said second raceway portions; each of said first and second bearing inserts comprising a hardened, arcuate strip having an angular dimension less than the angular dimension of said raceway portion which said insert lines, said insert being recessed into said raceway portion and having two opposing edges extending substantially parallel to the axis about which said strip is arcuate, said raceway portion circumferentially extending beyond and abutting said opposing insert edges to form webs that firmly lock said insert therein;
- D. ball bearing means disposed in each raceway; and
- E. means for positioning each ball bearing means to contact said first and second bearing inserts in each raceway.

4,055,228

DRIVE LINE DISCONNECT MECHANISM

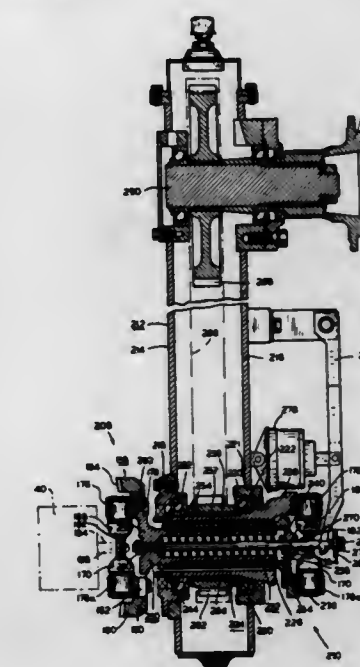
Donald E. Holmes, Clark Lake; Wayne R. Howard; John F. Fisher, and Burton S. Zeller, all of Jackson, all of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed May 24, 1976, Ser. No. 689,226

Int. Cl.² B60D 1/00

U.S. Cl. 180—14 B

18 Claims



1. In a modular vehicle which is separable into a powder module having drive means as well as drivable wheels and a work module having drivable wheels, said modules being adapted to be joined together via confronting opposed coupling members attached to said power and work modules, respectively, a drive line disconnect mechanism comprising:

- a. a first toothed coupling half rotatably mounted in a mid-mount bearing box attached to said power module coupling member, with one end of said first coupling half being adapted to be drivably connected with said power module drive means; and
- b. a second toothed coupling half rotatably and pivotally mounted in a disconnect assembly attached to said work module coupling member, said disconnect assembly including:
 1. a support housing attached to said work module coupling member and having a through bore;
 2. an output shaft member extending through said support housing bore and rotatably journaled therein, said output shaft member having a central bore, with one end of said output shaft member merging into opposed radially outwardly extending first flange portions, said output shaft member also including transfer means for drivably connecting said output shaft member with further transfer means adapted to be operatively connected with the drivable wheels of said work module;
 3. a transfer shaft member, coaxial with said output shaft member and having a longitudinally splined bore closed on one end, extends into the bore of said output shaft member, with an open end of said transfer shaft member merging into opposed radially outwardly extending second flange portions adjacent to said first flange portions, said second flange portions being connected with said first flange portions via a first universal joint assembly, thereby permitting a limited amount of multi-planar pivotal movement of said transfer shaft member with respect to said output shaft member;
 4. an input member, coaxial with said transfer shaft member, has an externally splined bore portion thereof extending into and intermeshing with the splined bore of said transfer shaft member thus forming a driving and axially slidable interconnection therebetween, with one end of said input member merging into opposed radially

outwardly extending third flange portions that are axially spaced from one end of said output shaft member;

5. said second toothed coupling half being coaxial with said input member and having opposed radially inwardly extending fourth flange portions adjacent to said third flange portions, said fourth flange portions being connected with said third flange portions via a second universal joint assembly thereby permitting a limited second amount of multi-planar pivotal movement of said second coupling half with respect to said input member;

6. means for centering said second coupling half relative to said first coupling half;

7. biasing means for biasing said input member and second coupling half into driving engagement with said first coupling half; and

8. disconnect means for selectively axially displacing said input member and second coupling half in opposition to said biasing means for disconnecting said first and second toothed coupling halves as said modules are joined, said first and second amounts of multi-planar pivotal movement combining with said means for centering so as to take up unavoidable misalignments between said vehicle modules as said modules are coupled so as to permit initial alignment of said first and second toothed coupling halves, with subsequent actuation of said disconnect means thereafter permitting said biasing means to bias said coupling halves into driving engagement.

4,055,229

FRAMES FOR MOTORCYCLES

James Henry Richard Lindsay, 108, Lower Churchtown Road, Dublin 14, Ireland

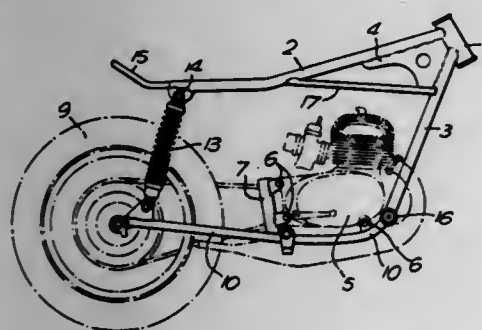
Filed Feb. 20, 1976, Ser. No. 660,023

Claims priority, application Ireland, Feb. 20, 1975, 347/75

Int. Cl.² B60K 15/00

U.S. Cl. 180—32

2 Claims



1. A trials motorcycle for use in off-the-road motorcycle sports having a frame comprising a top frame member, a saddle support mounted at the rearward end of said top frame member, an upwardly inclined front frame member connected at an upper end thereof to the forward end of said upper frame member, and a steering head mounted on said connecting ends of said top and front frame members; a forked swinging arm pivotally connected by pivot means at a forward end thereof to the lower end of said front frame member, said forked swinging arm extending rearwardly from the motorcycle frame, a rear wheel carried between the rear ends of the fork of said swinging arm, shock absorbing means connecting said rear ends of said swinging arm and top frame members, an engine mounted on said swinging arm forwardly of said saddle support and directly behind said front frame member and said pivot means, and a drive chain connected between power output means on the engine and said rear wheel.

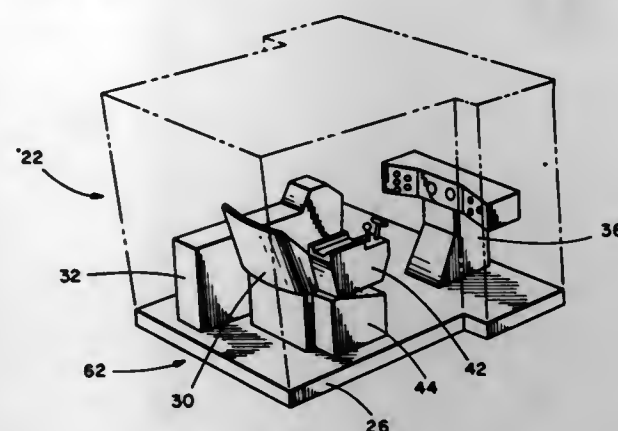
4,055,230
VEHICLE CONTROL ARMREST IN A VIBRATION ISOLATED CONTROL MODULE

Anthony M. Kestian, Berwyn, and Raymond J. Allori, Chicago, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 432,799, Jan. 11, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,442
Int. Cl.² B62D 33/06

U.S. Cl. 180—89.1

2 Claims



1. In a tractor vehicle having a main frame, an engine means, traction wheels, steerable wheels, and a drive line means providing for the transmission of motion from said engine means to said traction wheels, the improvement comprising:

a modular control defining an operator's station mounted above said main frame;

a vehicle seat having a seat frame structure, including a podium affixed to a side of the seat frame structure, mounted to said modular control platform;

a pivotal control armrest, including a frame structure, pivotally mounted to said podium, disposed adjacent to said vehicle seat having a shielded push-pull cable mounted to the armrest frame structure, the push-pull cable passing from the control armrest to the podium where the shielding of the push-pull cable is grounded whereby pivotal movement of the control armrest on the podium results in push-pull cable adjustment to provide a vehicle control function;

a control stick for operating said tractor vehicle through a plurality of flexible control cables, the control stick pivotally mounted to the armrest frame structure;

an instrument console disposed adjacent to said seat opposite said pivotal control armrest and mounted to said modular control platform;

an instrument pod mounted to said modular control platform in front of said vehicle seat having an array of instruments for monitoring said tractor vehicle;

a plurality of resiliently deformable mounting pads positioned between said modular control platform and said main frame whereby said modular control platform is isolated from shock and vibration of said main frame through the use of said resiliently deformable mounting pads and said flexible cables.

4,055,231

SILENCER FOR INTERNAL COMBUSTION ENGINES
Ginez Martínez, 153, rue Anatole France, 93130 Noisy le Sec, France

Filed Oct. 14, 1975, Ser. No. 622,116

Claims priority, application France, Oct. 14, 1974, 74.35358; Oct. 8, 1975, 75.30835

Int. Cl.² F01N 1/08, 7/18, 3/06

U.S. Cl. 181—241

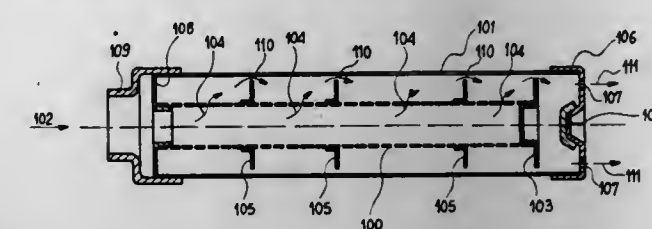
6 Claims

1. A silencer for an internal combustion engine, comprising: a supple resilient internal tube, adapted to vibrate longitudinally under the influence of the exhaust gas and permeable to said gas, receiving the exhaust gas from said engine; an elastic external sheath which is substantially not supple

and not adapted to vibrate longitudinally and substantially not permeable to the gas, said sheath being substantially coaxial with the internal tube;

an end piece closing the internal tube at the end opposite to the inlet of the exhaust gas therein;

washers or spacers slideably secured to the internal tube at irregular intervals and permitting the gas to pass in the



annular space comprised between the washers or spacers and the external sheath;

an end piece secured to the end of the external sheath opposite to the inlet of the gas and provided with apertures for the output of the exhaust gas; and

an expansion chamber between the end piece closing the internal tube and the end piece secured to the end of the external sheath.

4,055,232

POWER STEERING REGULATION FOR AUTOMOBILES

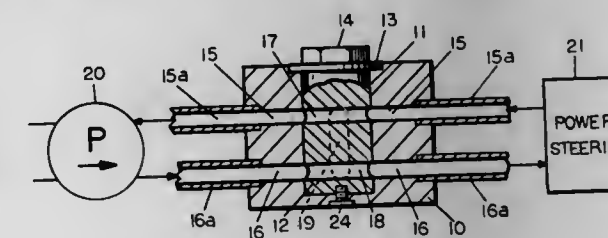
Walter A. Moore, 121 Mixer St., Adrian, Mich. 49221

Filed Oct. 20, 1976, Ser. No. 734,177

Int. Cl.² B62D 5/08

U.S. Cl. 180—132

1 Claim



1. A hydraulic pressure control for use in a power-assisted steering system of a motor vehicle including a source of hydraulic pressure comprising

- a valve body interposed between said source of hydraulic pressure and said steering system and having an inlet passageway communicating with said hydraulic pressure source and said steering system for delivering pressure fluid to the latter;
- an outlet passageway in said valve body parallel to said inlet passageway and also communicating with said steering system and said pressure source to enable return fluid flow to said source;
- a rotary plug valve in said valve body provided with parallel ducts adapted to align respectively with said inlet and outlet passageways, and a channel adapted to connect portions of said inlet and outlet passageways on the hydraulic pressure source side, thereby to enable unrestricted fluid flow and afford relatively easy steering operation;
- said valve being shiftable for selectively restricting or stopping the hydraulic flow therethrough for reducing the sensitivity and ease by which steering is accomplished, or rendering said power-assisted steering system ineffective;
- means on said valve on the outside of said valve body affording manual operating means for said valve, thereby to predetermine the resistance imposed on the steering effort of the operator;
- indicia means on said last means and valve body for visually indicating the adjusted position of the valve, and
- set screw means for securely holding said valve in position of adjustment.

4,055,233

EAR COUPLER

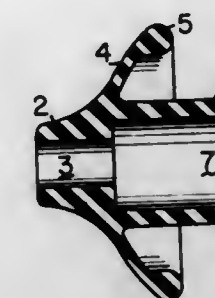
Charles B. Huntress, Orange, Calif., assignor to Electronic Engineering Co. of California, Santa Ana, Calif.

Filed Dec. 22, 1975, Ser. No. 643,571

Int. Cl.² A61B 7/02

U.S. Cl. 181—135

11 Claims



1. A self-forming ear coupler for acoustic control comprising:

- a conical portion, having an orifice therethrough, for entering the ear;
- only one soft flexible flange having a shallow conical shape extending outwardly and rearwardly from said conical portion, the external surface of said conical portion and said flange flaring smoothly outwardly to provide a smooth transitional shape therebetween, said flange having a circumferential bead of round cross-section at the outer periphery thereof, the radial extent of said flange being sufficient to effectively seal the external portion of the ear from said conical portion orifice, and
- a mounting portion on the side of said flange opposite to said conical portion, said mounting portion having an orifice extending from the orifice of said conical portion to provide a continuous passage through said ear coupler, the recited structure being proportioned to significantly deform said flexible flange when it is placed in the ear, whereby said flange acts as an ear plug sealing the ear against ambient sounds.

4,055,234

SKATEBOARD WITH BRAKE

Elwin E. Burton, 6530 SE. 89th Ave., Portland, Ore. 97266

Filed July 29, 1976, Ser. No. 709,726

Int. Cl.² B60T 1/04

U.S. Cl. 188—2 R

2 Claims



- a skateboard comprising
- an elongated rigid body member having forward and rearward ends and also having top and bottom surfaces;
- wheel assemblies on the bottom of said body member adjacent each end;
- each of said wheel assemblies having a pair of wheels;
- a slide member mounted on the bottom side of said body member for longitudinal adjustable movement;
- a cross frame support;
- brake shoe means on said cross frame support adjacent to said wheels;
- a single vertically disposed pivot means connecting said cross frame support to said slide member whereby said cross frame support and said brake shoe means can pivot with side turning of the wheels;
- an upright brake pedal extending through said body member and having an upper foot engaging portion;
- and link means operative by said brake pedal providing

longitudinal movement of said slide member to engage the brake shoes against the wheels upon a brake actuating movement of said brake pedal.

4,055,235

BICYCLE BRAKE DEVICE WITH INCREASED BRAKING POWER

Hiroshi Tanaka, Kawasaki; Noriyuki Ogisu, Tokyo, and Akira Urakawa, Yamato, all of Japan, assignors to Nichibei Fuji Cycle Co., Ltd., Tokyo, Japan

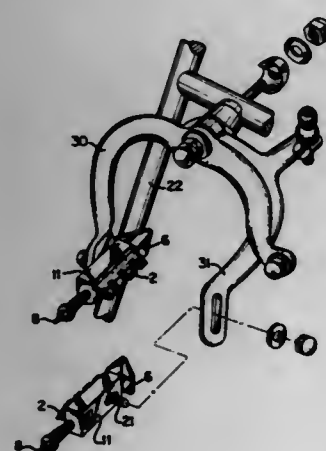
Filed July 8, 1976, Ser. No. 703,588

Claims priority, application Japan, Nov. 21, 1975, 50-157405[U]

Int. Cl.² B62L 1/12

U.S. Cl. 188—24

3 Claims



1. A bicycle brake device having increased braking power to be applied to the wheel rim of a bicycle, comprising a pair of caliper type brake arms mounted to the seat stay bridge of the seat stay of a bicycle body by an attaching bolt for pivotal movement of said arms about said bolt so that the ends thereof are movable toward and away from said bicycle wheel rim for applying braking pressure to said rim, a cage mounted on the ends of said caliper arms by a brake shoe pin and nut, said cage being open at one end thereof and closed at the other end thereof, a brake shoe slidably carried for axial movement in said cage through said open end thereof, said brake shoe having a front end and a rear end oriented with said open end and closed end respectively of said cage, the forward rotation of said wheel being in a direction from said rear end of said brake shoe toward said front end thereof, a brake block carried in said brake shoe having a surface for engaging said rim to apply friction forces thereto for braking action, a wedge shaped cam mounted at said front end of said brake shoe for engaging said seat stay upon forward sliding movement of said brake shoe in said cage as a result of friction forces between said brake block and said rim when said brake block engages said rim, so that when said wedge shaped cam engages said seat stay a component of a reaction force urges said brake block against the wheel rim with increased pressing power to increase braking power, a threaded bolt projecting from said rear end of said brake shoe and protruding through an opening in said closed end of said cage, and a spring coiled about said bolt between said cage and means on said bike for returning said brake shoe to its initial position after said cam has engaged said seat stay.

4,055,236

DISC BRAKE WITH AN ANNULAR METAL FRAME HOLDING PART-CIRCULAR PADS

Frederick Sidney Dowell, Coventry, England, assignor to Dunlop Limited, London, England

Filed May 3, 1976, Ser. No. 682,768

Claims priority, application United Kingdom, May 10, 1975, 1975/75

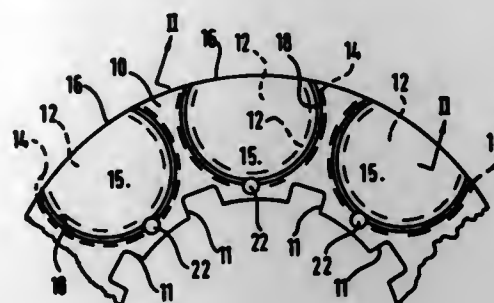
Int. Cl.² F16D 65/12

U.S. Cl. 188—73.2

12 Claims

1. A brake disc comprising an annular metal frame having means defining a plurality of circumferentially distributed

channels of segmented-circular shape, each having a gap corresponding to a chord of the circle, each said gap opening radially of the frame, and a plurality of friction members of a material more brittle and of higher specific heat than the frame, each member being shaped at least approximately as a segmented circle and fitting into an associated one of the channels by insertion through the gap and being subsequently rotated while in the channel; the width of the member on a diametral



line dissecting its chordal edge being less than the width of the gap of the associated channel whereby the member can be inserted in or removed from the channel through the gap when the chordal edge of the member extends radially of the frame; releasable means for preventing rotation of the member after being positioned in its associated channel so that when the member is in an operative position with its chordal edge extending generally circumferentially of the frame it is held in place.

4,055,237

DISC BRAKE FOR A VEHICLE

Akio Numazawa, Nagoya; Hiroyuki Nakamura, Toyota; Tokio Kurita, Toyota; Kouji Horie, Toyota, and Toshio Kondo, Chiryu, all of Japan, assignors to Aishin Seiki Kabushiki Kaisha and Toyota Jidoshu Kogyo Kabushiki Kaisha, both of, Japan

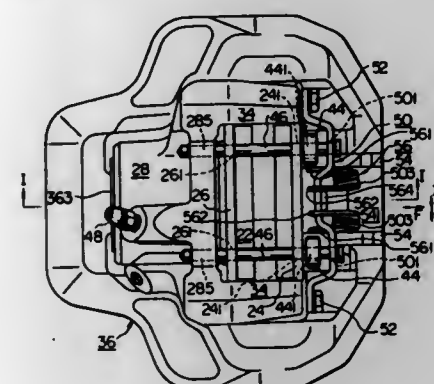
Filed Jan. 25, 1977, Ser. No. 762,343

Claims priority, application Japan, Jan. 27, 1976, 51-7818

Int. Cl.² F16D 55/228

U.S. Cl. 188—73.4

3 Claims



1. A disc brake for a vehicle comprising: a stationary member integral with a body of the vehicle; a first and a second friction pad of plate like shape parallelly arranged along a first direction transverse to a wheel axis, each pad being movably mounted to said stationary member in a second direction parallel to the wheel axis; a brake disc having a first and a second working surface parallelly arranged along said first direction, said brake disc being secured to said wheel axis so that the disc rotates in accordance with the rotation of the wheel axis, and said brake disk being arranged between said first and second friction pads so that the first working surface faces the first pad while the second working surface faces the second pad; a caliper plate loosely fitted to the stationary member so that it is positioned to be parallel to said second direction, said

caliper plate being arranged around the friction pads and has a first and a second inner end facing each other in said second direction, said first inner end being situated adjacent to said first friction pad;

a hydraulic mechanism arranged in the stationary member so that it is located between said second friction pad and said second inner end of the caliper plate, which hydraulic mechanism is capable of co-operating with said second friction pad to move said second pad toward said second working surface of the brake disc in said second direction so that said second pad touches said second working surface and is capable of co-operating with said second inner end of the caliper plate to move the caliper plate away from said second friction pad in said second direction so that said first pad touches said first working surface of the brake disc;

a pair of spaced apart arms formed integral with the stationary member in cantilever fashion along said second direction so that the first and the second friction pads are situated between said arms, the arms operating to receive brake torque generated between the friction pads and the brake disc in a circumferential direction of the disc when said hydraulic mechanism is operated to brake the vehicle; a bridge member arranged between free ends of said arms, and;

resilient means disposed between said bridge member and said caliper plate so that they are resiliently separated from each other in one direction transverse to the caliper plate and so that the caliper plate is resiliently held against movement thereof in another direction parallel to the caliper plate,

whereby rattling of the caliper plate, due to said loose fitting of the caliper plate to the stationary member, is prevented while the vehicle is moving.

4,055,238

ANTI-SQUEAL DEVICE IN DISC BRAKE

Tetsuo Harakawa, Funabashi, and Hiroshi Ito, Yokohama, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

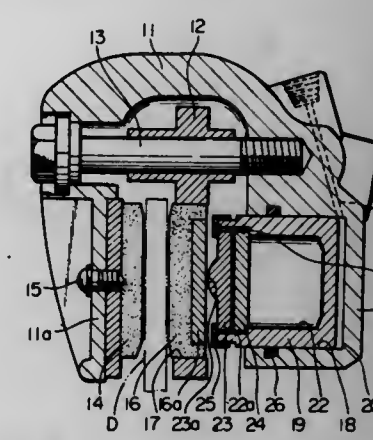
Filed Mar. 3, 1976, Ser. No. 663,228

Claims priority, application Japan, Mar. 3, 1975, 50-25731

Int. Cl.² F16D 65/00

U.S. Cl. 188—73.5

1 Claim



1. In a disc brake having a piston, a rotatable disc, and a friction pad having a back plate and urged against one surface of the rotatable disc by said piston, the improvement comprising a plate having a partially spherical projection on one surface thereof abutting the back plate of the friction pad, said piston having a stepped bore therein with a large diameter bore portion facing said back plate and a small diameter bore portion and a shoulder therebetween, said plate being in said large diameter bore portion and a predetermined clearance being left around the circumference of said plate between the large diameter bore portion and the outer circumference of the plate for permitting relative lateral movement between said plate and said large diameter bore portion, a generally flat spacer in said large diameter bore portion having one surface abutting said shoulder and the other surface being substantially flat and opposed to the other surface of said plate for transmitting

thrust from the piston to substantially the entire surface of said plate and thence through said plate to said friction pad, a predetermined clearance being left around the circumference of said spacer and said large diameter bore portion for permitting relative lateral movement between said spacer and said large diameter bore portion, and a lubricant between the spacer and the plate.

4,055,239

LUGGAGE CASE

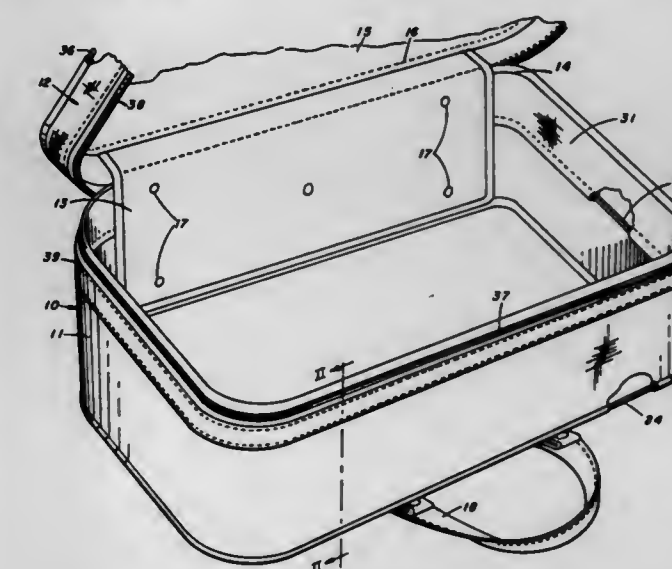
Jay H. Weiner, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.

Filed Feb. 13, 1976, Ser. No. 657,956

Int. Cl.² A45C 13/36

U.S. Cl. 190—50

3 Claims



1. A luggage case of the lightweight semi-rigid type, comprising a main body portion of substantially rectangular shape having a first spring steel support wire loop secured at the outside corner thereof, a mating cover portion, hinged to the body portion, and having a second spring steel support wire loop secured at the outside corner thereof, a peripheral flap member attached interiorly along one edge to the inner periphery of the main body portion and swingable exteriorly to a position outside the main body portion, and a third substantially rectangular spring steel support wire secured to the peripheral flap member and swung to a position in the interior of said main body portion intermediate between and parallel to the said first and said second support wire loops.

4,055,240

FLUID OPERATED TOOTHED CLUTCH WITH DASHPOT

Herbert Arthur Clements, Weybridge, and Robert Howard Heybourne, East Molesey, both of England, assignors to S.S.S. Patents Limited, London, England

Filed Jan. 19, 1976, Ser. No. 650,462

Claims priority, application United Kingdom, Jan. 21, 1975, 2622/75

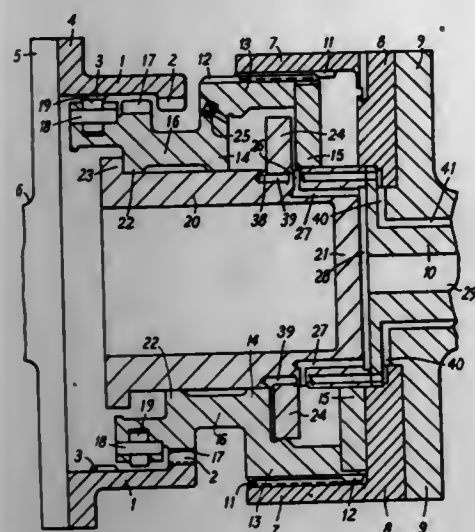
Int. Cl.² F16D 23/02

U.S. Cl. 192—67 A

1 Claim

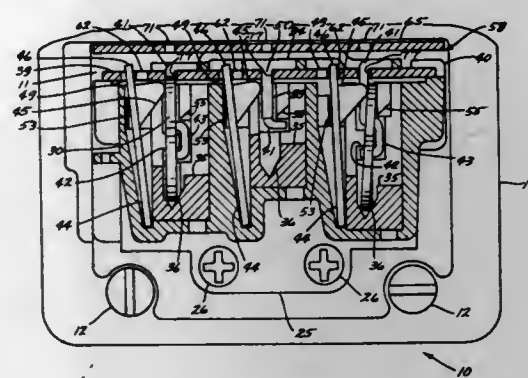
1. A toothed clutch of the self-engaging type that includes a hydraulic dashpot comprising a dashpot cylinder and a piston movable therein, for cushioning the final phase of clutch engagement, and duct system via which fluid under pressure can be fed to the dashpot cylinder whereby in the disengaged condition of the clutch to provide cushioning fluid in the dashpot cylinder on one side of the piston and in the engaged condition of the clutch to establish in the dashpot cylinder on the other side of the piston a holding pressure that resists clutch self-disengagement, the invention comprising a duct system which is independent of said first-mentioned duct system and via which in the engaged condition of the clutch fluid under pressure can be fed when required to the dashpot cylinder.

der on the said one side of the piston to establish a fluid pressure that opposes said holding pressure whereby to facilitate



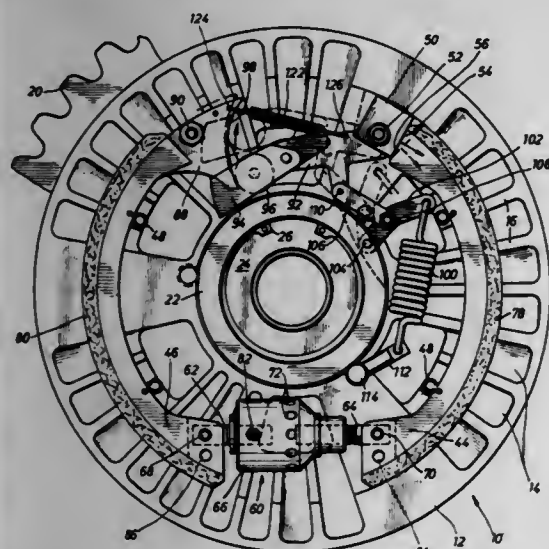
imparting expansion movement to said energizing shoe responsive to movement of said movement control means; adjustable means retarding movement of said shoe movement control means; and clutch housing means to which said rotatable driven element is nonrotatably connected, said clutch housing means defining a cylindrical internal clutch surface for engagement by said power shoe and energizing shoe.

4,055,242
TANDEM-COIN SLIDE APPARATUS
John C. Mellinger, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa
Filed July 9, 1976, Ser. No. 703,928
Int. Cl.² G07F 5/08
U.S. Cl. 194—55 9 Claims



the self-disengagement of the clutch without interruption of the supply of fluid to the dashpot cylinder via said first-mentioned duct system.

4,055,241
CENTRIFUGAL CLUTCH MECHANISM
Dwight E. Tripp, 1409 Valley Drive, Longview, Tex. 75601
Filed July 29, 1976, Ser. No. 709,790
Int. Cl.² F16D 43/06
U.S. Cl. 192—105 CE 18 Claims



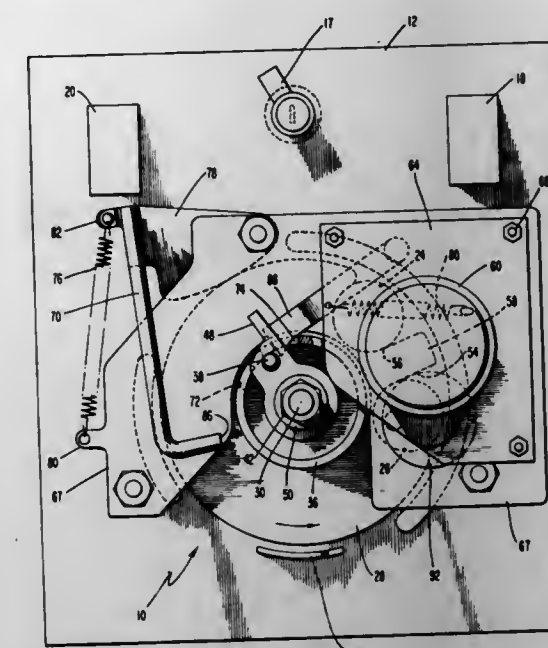
1. A centrifugal clutch mechanism for mechanical transfer of energy from a rotatable drive source to a rotatable driven element, said clutch mechanism comprising:
a rotor element adapted to be directly rotated by said drive source;
a power shoe being movably supported by said rotor element and being rotatable therewith;
adjustable drive means being fixed to said rotor element and releasably engaging said power shoe and imparting a preselected force vector from said rotor element to said power shoe;
an energizing shoe also being movably supported by said rotor element and being rotatable with said rotor element, said energizing shoe being in spaced opposed relation with said power shoe;
adjustable positioning means engaging opposed extremities of said power shoe and said energizing shoe and maintaining a predetermined spacing therebetween;
a shoe movement control means being movably supported for rotation along with said rotor element, said movement control means being movable by centrifugal force as said rotor element rotates, said shoe movement control means

1. A coin slide apparatus for initiating the operation of a machine with a predetermined combination of coins supported on edge comprising: slide support means for mounting said coin slide apparatus to said machine including a faceplate and a slide housing defining a coin slide guideway extending through said faceplate; coin receiver means supported in said slide housing and defining a plurality of coin slots for receiving and supporting said coins in a substantially vertical orientation and, upon manual actuation, for moving said coins from a coin receiving position to a coin measuring position, at least two of said coin slots being longitudinally aligned for supporting coins in tandem; means for authenticating individual coins and responsive to individual spurious coins and to an improper combination of coins for preventing movement of said slide assembly from said coin measuring position to an actuating position; means for moving said coins in tandem including means on said coin receiver means for contacting said coins to push them sequentially through said coin authenticating means and for retaining in escrow the first coin to pass through said coin authenticating means until the second coin has passed through said coin authenticating means; and coin ejecting means including at least one open port in said coin receiver means at a coin ejecting position through which said coins are ejected.

4,055,243
COIN OPERATED TIMER
Glenn C. Brand, Star Rte., Box 28C, Marcell, Minn. 56657
Filed July 26, 1976, Ser. No. 708,738
Int. Cl.² G07F 5/04
U.S. Cl. 194—61 18 Claims

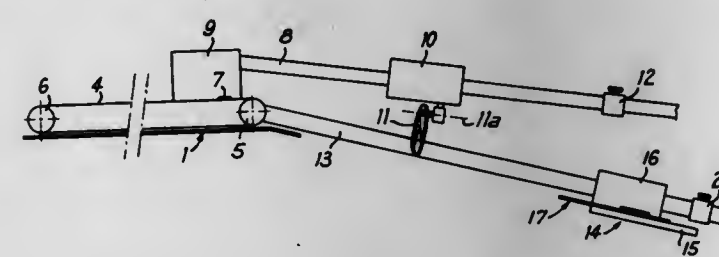
1. A coin controlled apparatus, comprising:
a frame;
a central shaft passing through said frame;
a coin-carrying disk coupled to said central shaft and rotatable therewith, said disk containing at least one circumferentially located receiving slot;
detent means attached to said disk, said detent means including at least a first detent;
engagement means mounted to said frame member and pivotable between first and second positions, said engagement means being engageable with said detent in only the

first position, said disk being locked against rotation during engagement;
clutch means for coupling said shaft to said disk, slippage therebetween being thereby provided when greater than a



predetermined amount of torque is applied between said shaft and said disk; and cam means for guiding said engagement means into said first position for engagement with said detent in an absence of a coin located in said slot.

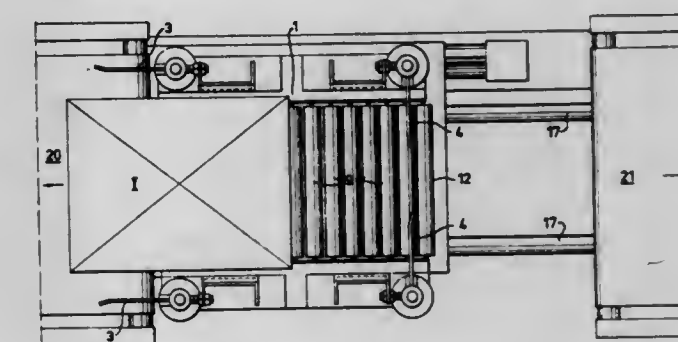
4,055,244
APPARATUS FOR INTRODUCING FABRIC ARTICLE PARTS TO AN ASSEMBLING MACHINE
Jean-Pierre A. Raisin, and André R. Bernardot, both of Troyes, France, assignors to Centre Technique Industriel dit Institut Textile de France, France
Filed Sept. 21, 1976, Ser. No. 725,275
Claims priority, application France, Oct. 3, 1975, 75.30399
Int. Cl.² B23Q 7/04
U.S. Cl. 198—345 8 Claims



1. In an installation for transferring article parts to an automatic assembling machine,
suspension means movable between a rear position and an advanced position along a first guide path and comprising first holding means for supporting the article parts between their front and rear ends,
a guide carriage movable between a rear and forward position along a second guide path substantially parallel to the first path, and
second holding means for engaging the rear ends of the article parts,
control circuit means,
first actuating means connected to the control circuit means for opening the first holding means when the suspension means is in its forward position,
second actuating means connected to the control circuit means for opening the second holding means when the guide carriage is in its forward position,
an introduction slide assembly for receiving article parts to

be assembled, each article part being provided with retaining members along the respective edges, and means for entraining the article parts along the slide assembly,
the said suspension means and the said carriage being movable along their respective guide paths to their forward positions for which the holding means are located at the intake to the slide assembly, under the action of said entrainment means at the time of the introduction to the slide assembly of article parts held by said holding means.

4,055,245
DEVICE WITH COLLECTING BASKET FOR COLLECTING PRINTED MATTER IN A PILE AND DISCHARGING THE SAME
Leif Sundberg, Eksjo, Sweden, assignor to Wamac AB, Eksjo, Sweden
Filed Apr. 12, 1976, Ser. No. 676,356
Claims priority, application Sweden, Apr. 16, 1975, 7504369
Int. Cl.² B65G 57/00
U.S. Cl. 198—422 9 Claims

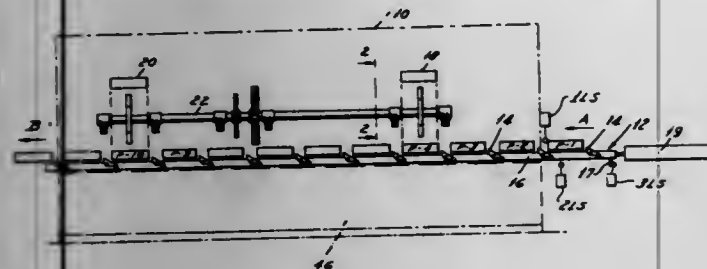


1. A device with a collecting basket for collecting printed matter, particularly newspapers, in the form of a pile and for discharging the pile through a lateral opening in the collecting basket, the bottom of said collecting basket comprising a freely movable conveyor having its direction of conveying movement aligned with the lateral opening in the basket, said device being characterized in that: said basket includes two mechanically controlled outwardly movable swing gates adjacent said lateral opening for selectively closing said opening and means connected to said gates for selective opening and closing of said gates; a laterally reciprocable sled means; means mounting said basket on said sled means for reciprocation therewith; power means connected to said sled means to reciprocate said sled means and basket laterally in a direction aligned with the direction of free movement of the basket bottom conveyor from a starting position, where said basket is positioned with the swing gates closed for collecting the printed matter, through a relatively short distance to a stop position and in which stop position the said swing gates are in an open condition; and a horizontal conveyor located with its input adjacent said stop position at substantially the same level as said basket bottom conveyor, so that a pile of printed matter, carried by said basket during lateral reciprocation of the sled means from the start position to the stop position, will by its own inertia move along the basket bottom conveyor out through the lateral opening and over onto the horizontal conveyor.

4,055,246
FERRIS WHEEL TYPE PARTS WASHER
Norman G. Zalewski, Southgate, Mich., assignor to Taylor & Gaskin, Detroit, Mich.
Filed Feb. 11, 1976, Ser. No. 657,240
Int. Cl.² B65G 47/00
U.S. Cl. 198—575 6 Claims

1. In an industrial parts washer of the ferris wheel type: a ferris wheel having a plurality of circumaxially spaced apart parts supporting stations;
parts transfer mechanism for delivering parts to and receiving

ing parts from successive stations of the ferris wheel when a station is in registry with the transfer mechanism;
a bull gear connected to the ferris wheel to rotate the same;
a spur gear in meshing engagement with the bull gear;
a rotary fluid pressure motor connected to the spur gear;
locking means for locking the ferris wheel against rotation when successive stations are in registry with the transfer mechanism;
and mechanism for controlling said motor and said locking means through a cycle of operation comprising;
a. means for initiating operation of said locking means to



release the ferris wheel and for starting said motor following transfer of a part between the transfer mechanism and a parts supporting station;
b. means responsive to the approaching registry of a parts supporting station on the ferris wheel with the parts transfer mechanism for decelerating the speed of the motor;
c. and means responsive to substantial registry of such parts supporting station on the ferris wheel with the parts transfer mechanism for stopping the motor and causing said locking means to lock the ferris wheel in such registry.

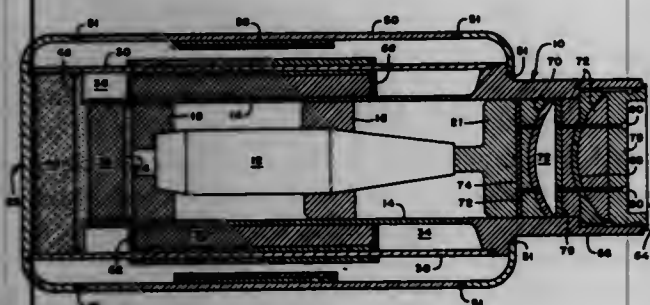
4,055,247

EXPLOSION CONTAINMENT DEVICE

William B. Benedick, and Charles J. Daniel, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Oct. 22, 1976, Ser. No. 734,834
Int. Cl.² F42B 37/02

U.S. Cl. 206—3

6 Claims



1. An explosive shipping container for absorbing the explosion energy and containing the products of an explosive disposed therein, said container comprising:
an inner layer of steel forming a cylindrical essentially gas-tight innermost chamber;
means for supporting said explosive within said chamber;
intermediate and outer layers of steel spaced from said inner layer and from each other substantially enclosing said innermost chamber;
filler comprising distended and crushable material disposed about said chamber between said inner and intermediate steel layers; and
a plurality of cold rolled stainless steel strips spaced from and encircling said explosive to enclose the area of maximum expected shrapnel density, wherein at least one of said steel strips is disposed between said inner and intermediate steel layers adjacent to said intermediate steel layer, said container being sufficiently strong to fully contain the

explosion effects of an explosive disposed in said innermost chamber.

4,055,248

FABRIC TREATING COMPOSITIONS AND ARTICLES
Mario S. Marsan, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Division of Ser. No. 533,742, Dec. 17, 1974, Pat. No. 3,989,631.
This application Aug. 12, 1976, Ser. No. 713,935
Int. Cl.² A23F 1/08

U.S. Cl. 206—5

9 Claims

1. An article of manufacture especially adapted for conditioning fabrics, comprising:
a. an effective amount of a clay mixture selected from: mixtures of hydrophilic Laponite clay and hydrophobic Laponite clay, at a weight ratio of hydrophilic Laponite to hydrophobic Laponite of from about 20:1 to about 1:20; mixtures of hydrophilic Laponite clay and smectite clay, at a weight ratio of hydrophilic Laponite to smectite of from about 20:1 to about 1:20; and mixtures of hydrophobic Laponite clay and smectite clay at a weight ratio of hydrophobic Laponite to smectite of from about 20:1 to about 1:20; said clay mixture being in releasable combination with;
b. a water-insoluble dispensing means.

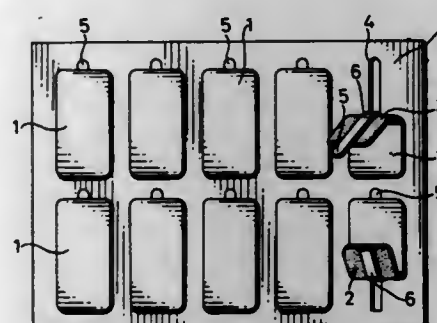
4,055,249

STICKER PACKAGE

Shirou Kojima, 14-3, 1-chome, Nishishinjuku, Shinjuku, Tokyo, Japan
Filed Mar. 19, 1973, Ser. No. 342,362
Claims priority, application Japan, Mar. 17, 1972, 47-27132
Int. Cl.² B65D 85/70

U.S. Cl. 206—447

4 Claims



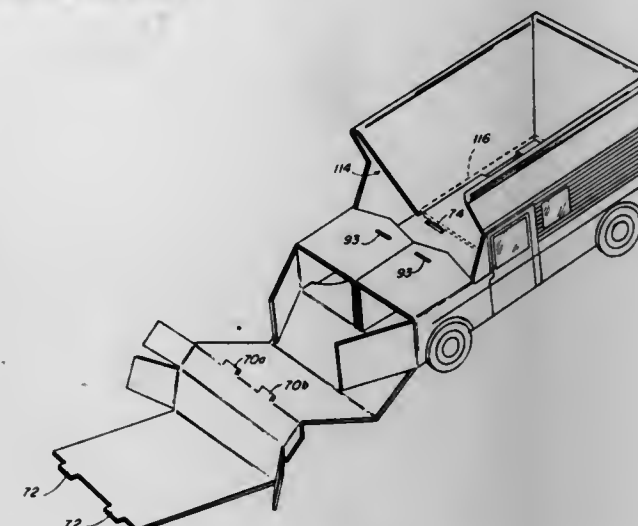
1. A sticker unit, comprising;
a plurality of sticking sheets disposed as a series in contact with one another longitudinally of the series and having sticker parting lines disposed transversely of the series between the sticking sheets;
a layer of pressure sensitive adhesive on a surface of the series of sticking sheets; and
a release sheet temporarily stuck on said layer of adhesive, said release sheet extending along and substantially coextensive with said series of sticking sheets and having parting lines defining release sheet portions, each portion comprising a part underlying a limited part of a respective sticking sheet and a lug at an end of said part, said lug underlying an adjacent sticking sheet;
thereby facilitating stripping successive sticking sheets of said series from the release sheet and also facilitating subsequent stripping of each sticking sheet from any surface whereon it is stuck.

4,055,250

FOLDING BLANK, VEHICLE SIMULATING DISPLAY
Theron T. Mayhew, Emporia, Kans., assignor to Hopkins Manufacturing Corporation, Emporia, Kans.
Filed July 21, 1976, Ser. No. 707,306
Int. Cl.² B65D 5/00

U.S. Cl. 206—457

17 Claims



1. A blank foldable to form a vehicle simulating display comprising,
a generally rectangular floor panel,
a front panel group foldably secured to a first edge of said floor panel,
a pair of side panel groups each foldably secured to second and third edges of said floor panel, each side panel group including inner and outer side wall panels,
a rear panel group foldably secured to a fourth edge of said floor panel opposite said first edge including inner and outer rear wall panels,
said front, side and rear panels groups being foldable towards said floor panel to a vehicle simulating position in which said inner and outer rear wall panels are each generally perpendicular to said floor panel and together with said floor panel from a generally rectangular open-top container, and the inner wall panel and the outer wall panel of each side and rear panel group are in a mutually parallel relationship, and
means formed in said blank for securing said front, side and rear panel groups in said vehicle simulating folded position including tab means in locking engagement with a portion of said front panel group and a portion of at least one of said side panel groups at a point spaced above said floor panel.

4,055,251

PORTABLE BLAST FURNACE SLAG BENEFICIATING PLANT

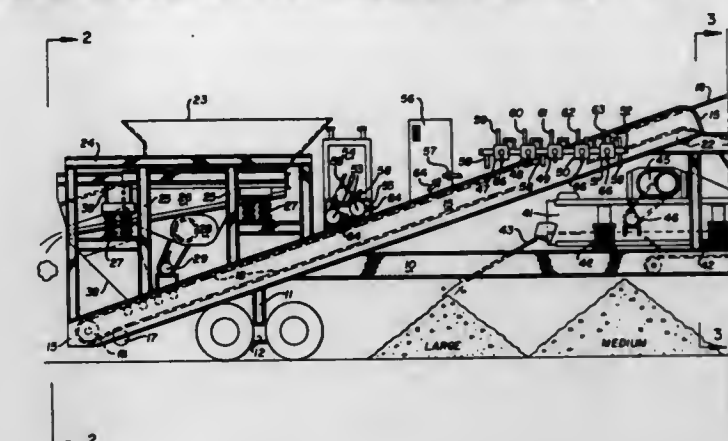
James L. Pieton, Girard, Ohio, assignor to McEsko Inc., McDonald, Ohio
Filed Dec. 8, 1975, Ser. No. 638,354
Int. Cl.² B03C 1/30

U.S. Cl. 209—38

5 Claims

1. In a portable slag beneficiating plant for processing steel mill slag and separating metallic pieces therefrom and classifying the metallic pieces as to particle size, a frame, a feed hopper on said frame, support springs on said frame, an inclined grizzly on said support springs and positioned beneath said feed hopper, an eccentric device attached to said inclined grizzly for oscillating the same, a magnetic separating roll and a conveyor belt extending from beneath said inclined grizzly to and trained over said magnetic separating roll and arranged to drive the same, second support springs on said frame, a second grizzly on said second support spring and positioned beneath said magnetic separating roll, a second eccentric device attached to said second grizzly for oscillating the same, said second grizzly arranged to receive metallic pieces from said

magnetic separating roll and a second belt conveyor extending from beneath a portion of said second grizzly to a point adjacent one end of said frame, a source of fluid pressure, a hydraulic motor connected to said first mentioned eccentric device for actuating the same, a second hydraulic motor connected to said eccentric device for actuating the same, a third hydraulic motor connected to said magnetic separating roll for driving



the same and the first mentioned conveyor belt and a fourth hydraulic motor connected to said second conveyor for moving the same, hydraulic piping interconnecting said source of fluid pressure and said hydraulic motors individually and throttle valves controlling said piping whereby said hydraulic motors may be individually controlled by the individual manipulation of said throttle valves.

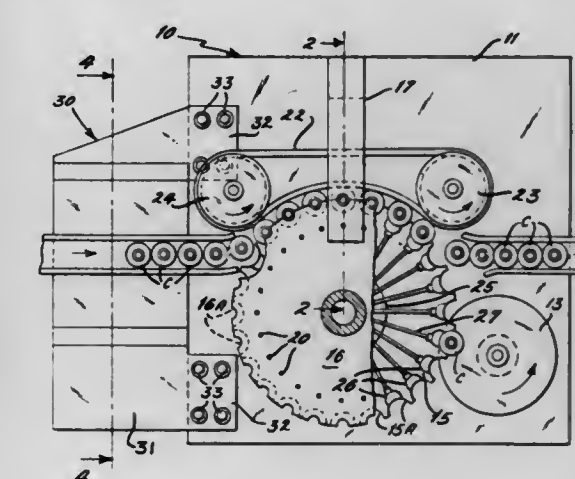
4,055,252

CONTAINER LIQUID LEVEL DETECTOR APPARATUS
Robert L. Klammer, St. Charles, and Maurice R. Day, Florissant, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed Mar. 25, 1976, Ser. No. 670,157
Int. Cl.² B07C 5/344

U.S. Cl. 209—74 M

18 Claims



1. In a container contents detector means for determining the presence of contents in a non-metallic container, first means generating a microwave beam, means moving a container across the microwave beam for determining the presence of contents therein, a second means spaced from said first means and detecting the microwave beam passing through the container, said first and second means being out of touching relation with the containers, means responsive to the reception of the microwave beam by said second means to generate a signal indicative of the presence of a container and the contents in the container, and means establishing a predetermined reference value for comparison with said signal generated by said second means representative of the presence of a container and its contents.

4,055,253

MERCHANDISE DISPLAY UNIT

Munir A. Oztekin, P.O. Box 6247A, Birmingham, Ala.

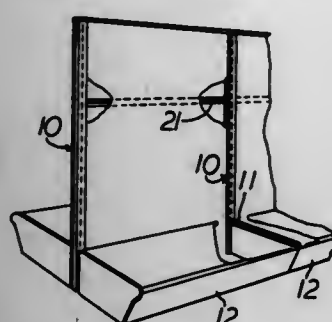
35217

Filed July 21, 1976, Ser. No. 707,231

Int. Cl.² A47B 9/14

U.S. Cl. 211-189

5 Claims



1. A merchandise display unit embodying a pair of spaced apart uprights detachably connected to adjacent ends of parallel, spaced apart shoe members which extend generally perpendicular to at least one upstanding side plate with the outer end of each said shoe member terminating adjacent one end of said side plate, the improvement comprising:

- adjacent parallel plates defining a shoe member with each of the plates having a clip-like member formed integrally with the outer end thereof with the inner surfaces of adjacent clip-like members having upstanding recesses therein which face each other,
- an intumed flange-like member carried by each end of said side plate and disposed to pass between said adjacent clip-like members, and
- at least one laterally extending projection carried by said intumed flange-like member in position to snap into an adjacent upstanding recess between adjacent clip-like members so that said intumed flange-like member is attached to said clip-like members.

4,055,254

SELF LUBRICATING YOKE WEAR PLATE ARRANGEMENT

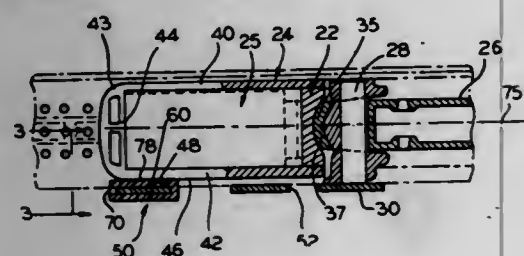
Osvaldo F. Chierici, Elmhurst, and Richard F. Murphy, Aurora, both of Ill., assignors to Holland Company, Lombard, Ill.

Filed Aug. 10, 1976, Ser. No. 713,189

Int. Cl.² B61G 7/10

U.S. Cl. 213-61

7 Claims



1. In a draft gear rigging for railroad cars having a channel shaped center sill opening downwardly and extending longitudinally of the car, with the rigging mounted at the end of the car and comprising a draft gear applied within the draft gear pocket between stops spaced longitudinally of the car and within the center sill, which draft gear is embraced by a yoke extending longitudinally of the car and operably connected to the car coupler, with the yoke being supported by a wear plate secured at its ends at the underside of the center sill, and with the underside of the yoke riding on the wear plate to dispose the yoke underside at its operative level within the center sill, the improvement wherein:

said wear plate is planar in configuration and parallels and is coplanar with the underside of the center sill, and including a liner interposed between the wear plate

upper side and the yoke underside on which the yoke inner end rides, said liner being formed from an ultra high molecular weight polymer of dry self lubricating characteristics characterized by having surfacing that resists adherence thereto of foreign matter but which surfacing resurfaces during use the yoke underside portion that engages the liner for reforming said yoke under surface portion to define a mirror finish, and means for securing the liner to said wear plate for maintaining said liner in place between the yoke and the wear plate.

4,055,255

MEASURED MATERIAL DELIVERY APPARATUS AND METHOD

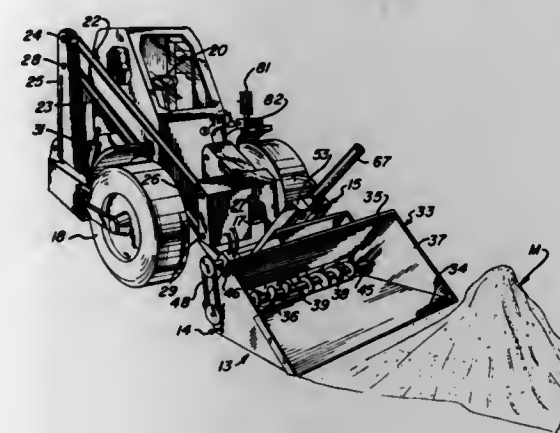
Jose Arthur Vasquez, 2963 Champa St., Denver, Colo. 80205

Filed Feb. 6, 1976, Ser. No. 656,581

Int. Cl.² G01G 19/10

U.S. Cl. 214-2

4 Claims



1. Measured material delivery apparatus comprising, in combination:

- a self-propelled vehicle;
- a boom mounted on and projecting out from said vehicle;
- a first selectively controlled, two-way hydraulic cylinder arranged to raise and lower the boom between a lowered scooping position, a raised travel and weighing position and a further raised dispensing position;
- a carriage assembly including a frame mounted at the end of the boom for pivotal movement about a horizontal axis and a carriage body movable up and down relative to said frame;
- a second selectively controlled, two-way hydraulic cylinder coupled between said boom and said frame for moving said frame about a horizontal axis;
- a bucket mounted on said carriage body for conjoint movement with said carriage body and for being positioned by said boom, said bucket having a centrally disposed dispensing opening in the bottom of a selected restricted size;
- a closure member for said dispensing opening adapted to move between a closed and an open position;
- a third selectively controlled hydraulic cylinder arranged for selectively moving said closure member between said open and closed positions;
- a fourth selectively controlled hydraulic cylinder mounted on said frame and coupled to said carriage body for raising and lowering the bucket relative to said frame;
- a fluid pressure indicating gauge coupled to said fourth hydraulic cylinder so that the weight of the load in the bucket elevated by said fourth hydraulic cylinder is reflected as pressure on the indicating gauge that is calibrated to indicate the weight of the load of the material in the bucket;
- a dispensing auger in the bottom of said bucket driven by a selectively controlled hydraulic motor for moving controlled amounts of a load of material collected in the bucket toward and through said dispensing opening until

4,055,257

STACKING APPARATUS

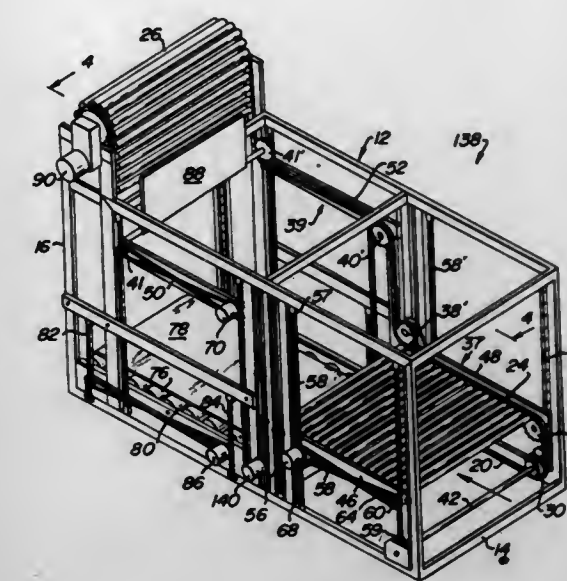
Charles Krebs, San Clemente, Calif., assignor to Molins Machine Company, Inc., Camden, N.J.

Filed May 4, 1976, Ser. No. 683,159

Int. Cl.² B65G 57/02

U.S. Cl. 214-6 DK

11 Claims



4,055,256

PACKAGE STACKING METHOD AND APPARATUS

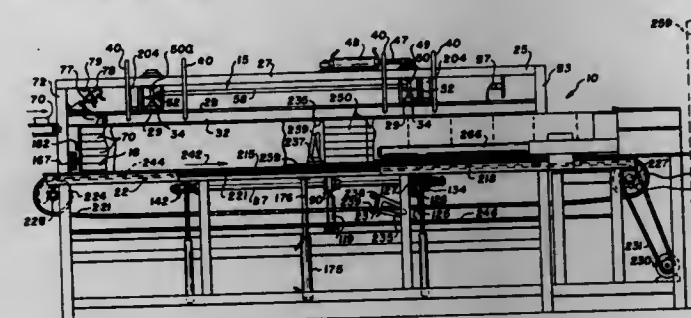
Hans Hagedorn, 947 Huntington Crescent, North Vancouver, British Columbia, Canada (V7G 1M4)

Filed Oct. 14, 1975, Ser. No. 622,386

Int. Cl.² B65G 57/06

U.S. Cl. 214-6 DK

22 Claims



1. Apparatus for stacking packages comprising an elongated horizontal support, feeding means for feeding packages one by one on to one end of the support such that the force imparted to the packages on the feeding means is transferred to the packages on the support to cause each package on the support to move the package ahead thereof longitudinally of the support to form a plurality of successive rows of a predetermined number of packages, longitudinal guides along opposite sides of the support spaced laterally apart sufficiently to prevent the packages from rotating during movement over the support, first stop means at an opposite end of the support to engage the leading package of each row for stopping movement of each row onto or along the support when the predetermined number of packages are on the support, means to stop the packages from being fed to the support when said leading package is engaged by the first stop means, a depressible elevator positioned beneath the support and extending the length thereof, means for shifting the support after each row is formed thereon to deposit said row on to the elevator, means for depressing the elevator by substantially one package thickness after each row is deposited thereon, thereby forming stacks of predetermined numbers of packages on the elevator, a conveyor beside the elevator and extending longitudinally the length thereof, said conveyor being positioned at the level of the elevator when said elevator is in its lowermost depressed position, a first wall extending longitudinally on the side of the elevator remote from the conveyor above the elevator when the latter is in said lowermost position and a further wall extending longitudinally on the side of the elevator opposite from the first wall, said first and further walls positioned to confine the stacks of packages on the elevator therebetween as the stacks are being formed thereon, said first wall also being a portion of a pusher for pushing the stacks transversely across the elevator onto the conveyor, said pusher also including a power means connected to said first wall and operable to shift the first wall across the elevator and back again to shift the package stacks in a row laterally off the elevator and on to the conveyor and said further wall being shiftable to an inoperative position to permit the movement of the stacks by the pusher from the elevator to the conveyor.

1. Apparatus comprising:

- a frame,
- an endless conveyor supported by said frame, a plurality of rotatable guide members in contact with said conveyor, a group of said guide members being supported so that their elevation may be changed, said conveyor having a horizontal top run and a bottom run, said conveyor having spaced platforms,
- motor means connected to said conveyor for driving said conveyor,
- first and second carriers supported by said frame for independent movement in a vertical direction, each carrier being adjacent a separate portion of the top run of said conveyor, each carrier supporting at least two of said group of guide members, said second carrier being downstream from said first carrier,
- discrete motors for moving said carriers in a vertical direction,
- means adjacent said second carrier for transferring articles off one of said conveyor platforms while said one platform is located along the top run of said endless conveyor and supported by said second carrier, and
- conveyor means for receiving articles transferred from said platforms.

4,055,258

SHEET MATERIAL DE-STACKING MACHINE

Willi A. Schneider, Pfisterholzli 9, 8606 Greifensee, Zurich, Switzerland

Filed Feb. 2, 1976, Ser. No. 654,418

Claims priority, application Switzerland, May 9, 1975, 5968/75

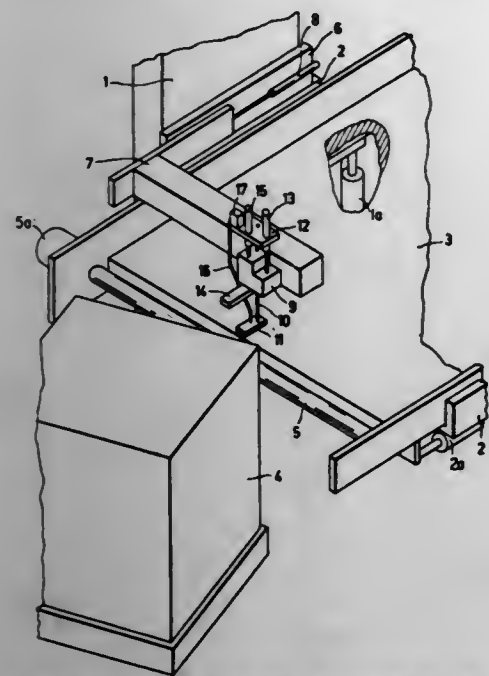
Int. Cl.² B65G 59/02

U.S. Cl. 214-8.5 C

7 Claims

1. A sheet material de-stacking machine for removing a partial stack from a stack of sheet material, comprising a machine frame, a table top which is horizontally movably mounted on said frame, a drivable separating roller which is arranged adjacent a front edge of said table top that is to be inserted into said stack of sheet material, a gripping device horizontally movably mounted on said frame and including upper and lower jaws for gripping an edge of said partial stack, and means for moving said gripping device horizontally against said stack, for gripping an edge of said partial stack with said gripping jaws, and for then holding said gripping

device with the gripped edge stationary during travel of said table top between the partial stack and remaining stack of sheet



material, to substantially avoid horizontal movement of the sheets of said partial stack during insertion of the table top.

4,055,259

SAMPLE TRANSPORT WITH ROTARY AIR INTERLOCK CHARGING AND DISCHARGING MEANS

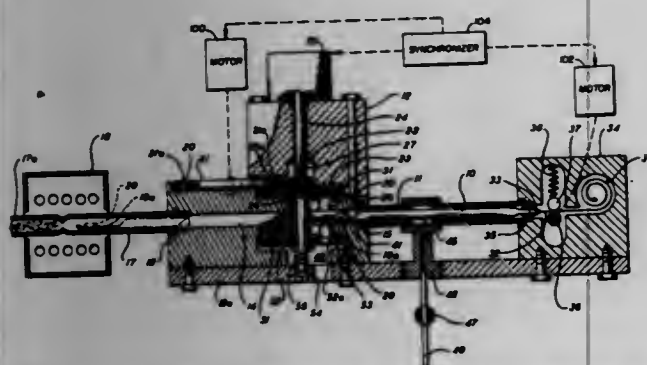
Joseph Sibrava, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 3, 1976, Ser. No. 663,537

Int. Cl.² G01N 1/02, 31/12

U.S. Cl. 214—17 A

7 Claims



1. An automatic sampling apparatus for conveying a series of discrete sample quantities to and from an analysis chamber comprising:

- means defining a conduit having one end adapted to be sealingly coupled in flow communication with said chamber;
- a sample inlet passage extending transversely into said conduit at a point remote from said one end and a sample discharge passage on the opposite side of said conduit, aligned with the sample inlet passage;
- a first transfer plate disposed in normally-occluding relationship to said sample inlet passage, said transfer plate containing a sample-receiving aperture;
- means mounting said first transfer plate for displacement to a loading position in which said aperture registers with said sample inlet passage;
- a second transfer plate disposed in normally-occluding relationship to said sample discharge passage, said second transfer plate containing an aperture adapted to receive the residue of a sample quantity subsequent to analysis in said chamber;
- means mounting said second transfer plate for displacement to a sample discharge position in which the aperture in the second transfer plate registers with the sample discharge passage;
- means for sealing said first and second transfer plates around

and with respect to the inlet and outlet sample passages respectively, said sealing means including a spring for each said transfer plate and said springs being compressed against said transfer plates respectively to exert the sealing forces in converging directions along the alignment axis of said sample passages; and

means for displacing said transfer plates in timed relation to one another to bring the aperture of the first plate into registration with the sample inlet passage while the sample discharge passage is occluded by the second transfer plate and the aperture of the second transfer plate into registration with the sample discharge passage when the sample inlet passage is occluded by the first transfer plate.

4,055,260

BATTERY EXTRACTOR FOR VEHICLES

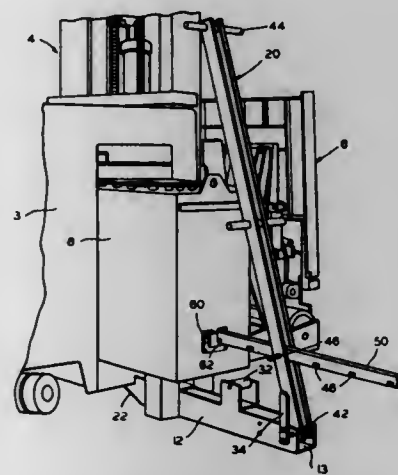
Attila J. Tamas, Lexington, Ky., assignor to Clark Equipment Company, Buchanan, Mich.

Filed July 15, 1976, Ser. No. 705,660

Int. Cl.² B65G 67/42

U.S. Cl. 214—44 R

12 Claims



1. A battery extractor comprising an elongated base assembly adapted to abut at one end thereof the side of a vehicle, an elongated actuator handle bar pivoted from the end of the base assembly opposite the end which abuts the vehicle, an elongated ratchet bar connectible to a battery in a battery compartment of the vehicle at one end and to said handle bar at a plurality of adjustment positions thereof, said ratchet bar extending above and longitudinally of the base assembly and said handle bar being manually actuatable in both directions about its pivot connection to said base assembly at each adjustment position of said ratchet bar for extracting and inserting the battery from and into the battery compartment, and wherein said handle bar includes a pair of elongated side members having an opening therebetween in the area of said ratchet bar, a member connecting the sides of said handle bar through said opening, said ratchet bar having a plurality of notches spaced longitudinally of the lower side thereof engageable successively by said connecting member, said handle bar being pivotable in said both directions at each position of engagement with said ratchet bar, and wherein the remote end of said ratchet bar is connected to battery bracket means, successive pivotal movement in one direction from successive positions of adjustment of said handle bar in relation to said ratchet bar effecting an extraction of the battery from the vehicle onto said base assembly.

4,055,261

RE-STACKING DEVICE FOR STACKING PARTIAL STACKS OF SHEET MATERIAL TO FORM A COMPLETE STACK

Willi A. Schneider, Pfisterholzli 9, CH-8606 Greifensee, Zurich, Switzerland

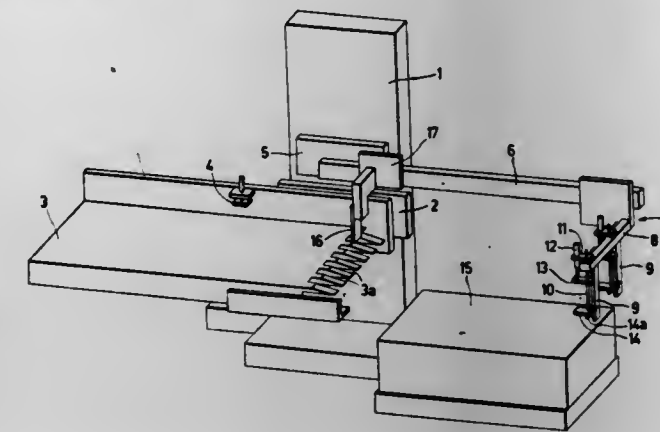
Filed Dec. 2, 1975, Ser. No. 637,036

Claims priority, application Switzerland, Dec. 16, 1974, 16662/74

Int. Cl.² B65G 57/10

U.S. Cl. 214—6 G

9 Claims



1. A re-stacking device for stacking partial stacks of sheet material into a complete stack, including a machine support, a slide adapted for raising and lowering on said machine support, a table top for receiving said partial stacks supported on said slide so as to be horizontally movable back and forth between two end positions, and a clamping unit arranged at the point where an edge of said table top is in one of said end positions, said clamping unit comprising at least one gripper with upper and lower clamping jaws having horizontally extending clamping surfaces, at least one slit being provided in the said edge of said table top for receiving said lower clamping jaw, said upper and lower clamping jaws being mounted so as to move vertically in unison and said upper clamping jaw being adapted for vertically raising and lowering relative to said lower jaw, for clamping an edge of a partial stack on the said edge of said table top without relative horizontal displacement between said table top and said partial stack before the latter is clamped between said clamping jaws.

tractor centerline, crossmembers at opposite ends of the side beams, a relatively narrow and elongate transmission case mounted between the side beams to form a bottom wall, and an upper member disposed between the side beams to define a top wall of a lower compartment area of the frame and a bottom wall of an upper compartment area of the vehicle, the upper compartment comprising an operator's compartment disposed between the lift arms of the vehicle, including a seat portion mounted on the upper member, the relatively narrow transmission case having opposite side walls laterally displaced sufficiently from the side beams of the main frame so as to provide operator's space on opposite sides of the transmission case between the side beams and the case at a forward vertical extension of the upper compartment, an engine, hydraulic drive means powered by said engine contained within said lower compartment, a pair of spaced stub axles projecting from the sides of the elongate case at opposite ends of said case, wheels driven by said hydraulic drive means rotatably mounted on said stub axles, a pair of upright members disposed outwardly of said side beams and projecting upwardly from adjacent the rear of each side beam on each side of said engine and providing at the upper ends thereof respective pivotal mounts, and a boom assembly comprising a pair of lift arms pivotally attached at said pivotal mountings and extending forwardly along each side and downwardly at the front in the lowered position, the lift arms mounting a material handling means at the lower end thereof, whereby provision of operator's space on opposite sides of the transmission case forward of the seat enables the operator to straddle the transmission case when he is seated in the vehicle, thereby lowering the operator profile for the vehicle.

4,055,263

FREIGHT HANDLING METHOD

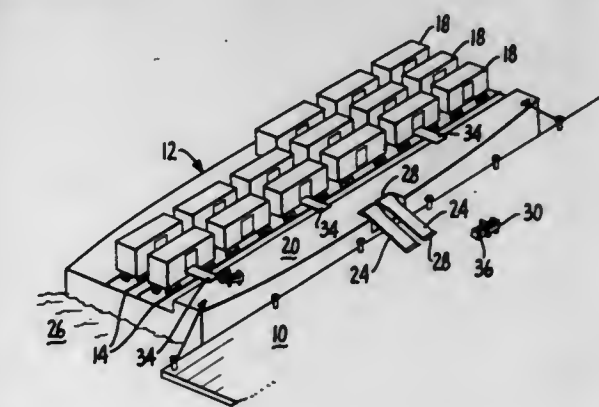
James W. Freeman, San Pablo, Calif., assignor to Naylor, Neal & Uilkema, San Francisco, Calif., a part interest

Filed May 28, 1976, Ser. No. 690,978

Int. Cl.² B65G 63/00

U.S. Cl. 214—152

4 Claims



1. A freight handling method comprising loading freight cars onto a railroad car carrier vessel at a railhead transfer facility, moving said vessel to a dock having a freight storage facility associated therewith, loading said cars with freight from said freight storage facility, moving said vessel with its loaded freight cars to a railhead transfer facility, and moving said cars off of said vessel over said transfer facility for subsequent train makeup and destination shipping.

4,055,262

LOADER MAIN FRAME FOR SKID STEER LOADER

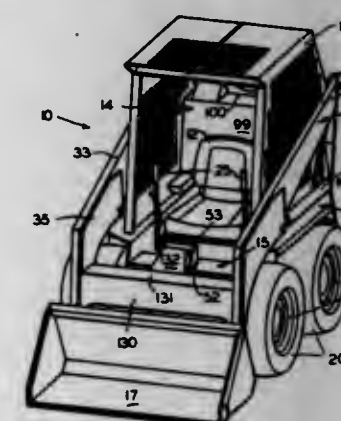
James J. Bauer, Lisbon; Larry E. Albright, Gwinner, both of N. Dak.; James L. Werner, Lamar, Mo.; Thomas M. Sagaser, and Lonnie D. Hoechst, both of Gwinner, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 2, 1976, Ser. No. 654,256

Int. Cl.² L02F 3/62

U.S. Cl. 214—140

16 Claims



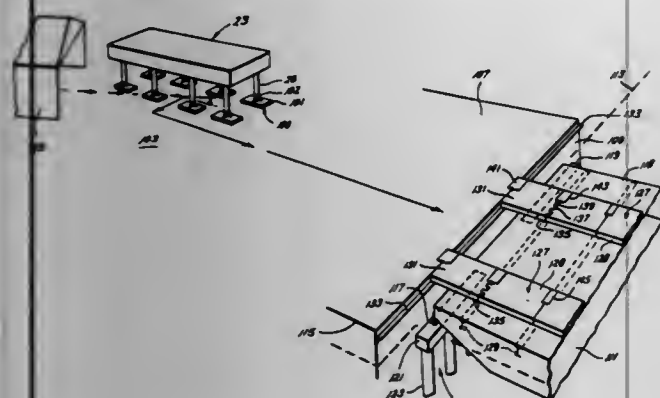
1. A skid steer loader vehicle and vehicle main frame in combination, the main frame comprising laterally spaced, longitudinally extending side beams on opposite sides of the

4,055,264

DECK SECTION LOADING

Phillip Andrew Abbott, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.
 Filed Aug. 4, 1975, Ser. No. 601,661
 Int. Cl.² B63B 35/42; B65G 67/58
 U.S. Cl. 214—152

20 Claims



1. Method of transferring a load to a vessel grounded at a certain land based site comprising the steps of grounding only that portion of the vessel which is adjacent to the site, providing a fluid bearing path on the vessel and extending between the vessel and the site, floating the load along the path onto the vessel on fluid bearings, grounding the load on the vessel, and floating the vessel, the vessel being grounded by ballasting, and prior to load transfer the vessel being ballasted sufficiently to maintain itself level to within plus or minus two percent inclination during load transfer.

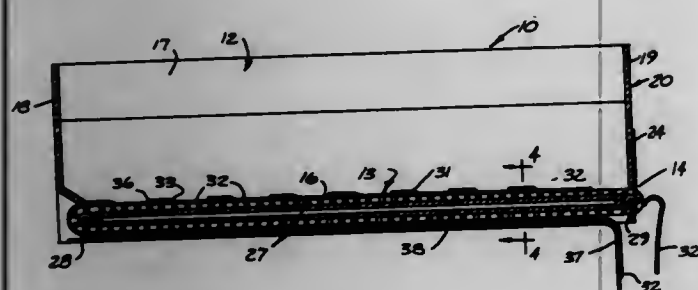
4,055,265
BULK BED

Leonard J. Eisenman, Box A, Eisenman Road, Boise, Idaho 83706

Filed Sept. 10, 1976, Ser. No. 722,040
 Int. Cl.² B60P 1/38; B65G 17/12

U.S. Cl. 214—17 D

4 Claims



1. A bulk bed for receiving and discharging loads of bulk agricultural products, comprising:
 a central elongated floor having a horizontal upper surface bounded by parallel side edges;
 a pair of longitudinal side walls converging downwardly and inwardly to the respective side edges of the floor;
 upright front and rear end walls joined to the side walls at the respective opposite ends thereof;
 said floor, side walls and front and rear end walls presenting an upwardly open bin for the storage or transport of bulk agricultural products;
 access means formed at the rear end wall and leading upward from the floor for selectively opening the interior of the bin at the rear end thereof for discharging bulk agricultural products therefrom;

drive sprocket means rotatably mounted to said bin about a transverse horizontal axis adjacent the rear end wall;
 idler sprocket means rotatably mounted to said bin about a transverse horizontal axis adjacent the front end wall;
 endless chain conveyor means entrained in meshing engagement about said drive sprocket means and said idler sprocket means, thereby forming coplanar working flights slidably supported along the full length of the floor adjacent the side edges thereof and parallel return flights beneath said floor, the working flights leading from a forward end at said idler sprocket means to a rear discharge end at said drive sprocket means;
 power means operatively connected to said drive sprocket means for moving said endless chain conveyor means in a direction such that the working flights move rearwardly along the floor;
 a plurality of flexible conveyor belt sections fixed to said endless chain conveyor means and covering the working flights thereof, each belt section along the working flights having a leading edge facing toward the rear end wall and fastened to said chain conveyor means and a free trailing edge facing toward the front end wall and loosely lapped over the leading edge of a successive belt section located adjacent to it along the working flight of said endless chain conveyor means;
 transverse support bars mounted to said endless chain conveyor means at longitudinally spaced locations thereon for supporting the overlapped belt sections as they move along the working flight; and
 supporting plate means fixed below and parallel to the floor, said plate means extending substantially the full length of the floor and having an upper surface leading to a downwardly bent rear section positioned forwardly adjacent to the rear discharge end of the conveyor working flight, said supporting plate means being adapted to be slidably engaged by successive belt sections on the endless chain conveyor means after movement over said drive sprocket means for shifting the belt sections to an overlapped condition and supporting them in such condition as they move along the return flights of said chain conveyor means to said idler sprocket means.

4,055,266

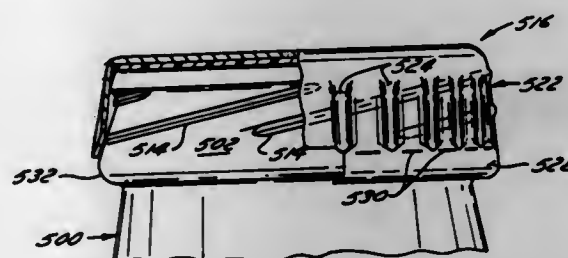
COMBINATION CROWN TWIST-OFF CLOSURE CAPP

Arnaldo Amabili, 7680 Dollier Street, St. Leonard, Quebec, Canada

Filed Oct. 26, 1976, Ser. No. 735,781
 Int. Cl.² B65D 41/34

U.S. Cl. 215—252

10 Claims



1. A closure cap for use with a container having an externally threaded neck and a locking shoulder, said closure cap comprising a top, a peripheral skirt depending from the top, said skirt being corrugated and having threads formed thereon for mating engagement with the threaded neck of the container, and a plurality of flanges integral with and depending from said skirt, each flange being spaced from an adjacent flange by a distance sufficient to permit use of an opening device on a free marginal edge of said skirt between adjacent flanges, each of said flanges being adapted to engage the locking shoulder of said container, each of said flanges having at least one vertical line of weakening formed therein which rupture or spread on removal of said closure by an unscrewing motion to divide each flange into segments which flare out-

wardly by a camming action of the locking shoulder upon removal of the closure cap.

4,055,267

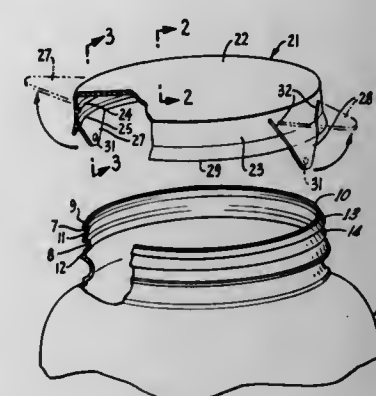
CAP FOR A WIDEMOUTHED CONTAINER

Richard L. Blair, 249 Mattson Ave., Los Gatos, Calif. 95030
 Filed Sept. 13, 1976, Ser. No. 722,483

Int. Cl.² B65D 41/48

U.S. Cl. 215—254

1 Claim



1. In combination, a container having a neck having an annular end with a substantially circular upper corner and a downward tapering lower curvature ending in a minimum diameter portion, a first and a second annular recess spaced from each other and below said minimum diameter portion; and a cap of a flexible plastic material deformable to accommodate minor variations in bottle dimensions and to permit said cap to stretch over said minimum diameter portion, said cap being preformed and having substantially uniform wall thickness throughout, said cap comprising a flat top disc having a diameter about equal to that of said neck, a depending skirt extending below said minimum diameter portion and having a pair of inwardly extending annular projections each fitting snugly in sealing engagement in one of said annular recesses, and pairs of depending tabs connected to said skirt to extend below said skirt on opposite sides thereof, said skirt being weakened by two pair of score lines extending from each pair of tabs and which are located on the outside surface of said skirt to prevent leakage from the bottle, said score lines being positioned on opposite sides of said tab and extending upwardly toward said flat top disc and diverging outwardly from each other and terminating in the skirt just above said minimum diameter portion and below said corner said skirt being tearable along each pair of score lines to open said cap, said cap in position on said neck sealing said neck against either input or output of any substance, said cap when torn along said score lines permitting removal of said cap from said neck and ready replacement thereof on said neck to reseal said bottle.

4,055,268

CRYOGENIC STORAGE CONTAINER

Alfred Barthel, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 18, 1975, Ser. No. 633,087
 Int. Cl.² B65D 25/18

U.S. Cl. 220—9 C

9 Claims



1. A container for storing materials at low temperatures comprising an inner vessel for holding such material; a larger outer gas-tight casing having rigid self-supporting walls around said inner vessel of such size to form an intervening evacuated load-free space at an absolute pressure less than

about 0.5 micron mercury, said space containing multi-layered thermal insulation comprising thin flexible sheet radiation barriers being supported by and in alternating relation with low conductive fibrous sheet layers in the permanently pre-compacted form weighing less than 2 grams/ft² and being comprised of fibers having 3–40 microns effective diameter and an intrinsic thermal conductivity of less than 0.2 BTU/hr-ft²-F/ft, said fibers being arranged in overlaying crossing relationship in planes parallel to the sheet surface with at least 1% (by number) of the fibers being heat softenable and heat self-bonded directly to each other at some of the cross-points without external binder, and said fibrous sheet layers undulating within the spacing between adjacent radiation shields over a transverse distance substantially wider than its thickness, contacting first one shield than the other facing shield.

4,055,269

TANK FOR HOLDING LIQUID

Joseph John Hurley, Paisley, Scotland, assignor to J. & P. Coats Limited, Glasgow, Scotland

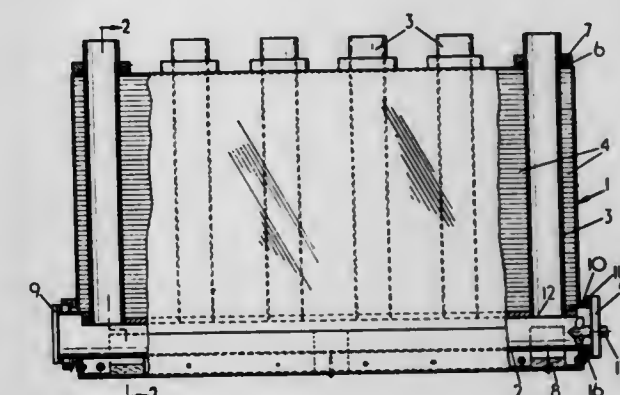
Filed May 17, 1976, Ser. No. 686,906

Claims priority, application United Kingdom, May 20, 1975, 21424/75

Int. Cl.² B65D 7/22, 25/18

U.S. Cl. 220—10

6 Claims



1. A tank for holding liquid comprising a casing, an elongated horizontal chamber disposed in the lower half of said casing, removable closure means accessible from the exterior of the casing for closing the ends of the chamber, a plurality of parallel vertical tubular shafts open at the top projecting upwardly from the chamber to the top of said casing and thermal insulating material surrounding the chamber and the vertical shafts within the casing.

4,055,270

MULTIPLE CHAMBER PACKAGE

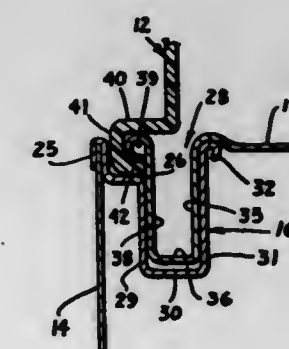
J. Larry Underwood, c/o Underwood Mold Co., Inc., 104 Dixie Drive, Dixie Industrial Park, Woodstock, Ga. 30188

Filed May 12, 1976, Ser. No. 685,680

Int. Cl.² B65D 51/18, 43/06

U.S. Cl. 220—23

5 Claims



1. An assembly of two container in which an auxiliary container is connected to a first container and it closure member,

comprising a first container having an open end bordered by an outer wall, a closure member closing said first container, said closure member and first container having interengaging means to secure said closure member to said first container radially inwardly of said outer wall, said closure member having a radially outwardly projecting rim, a second auxiliary container having an open end bounded by a wall formation, said wall formation surrounding and closely fitting said rim and have a peripherally extending bead formation projecting radially inwardly from the periphery of said wall formation at said open end and underlying said rim, said wall formation at the open end of said second container closely fitting in the wall at the open end of said first container and being confined between said rim and said wall at the open end of said first container, said rim of said closure member overlying said bead formation to prevent separation of said containers when said closure member is secured to said first container.

4,055,271

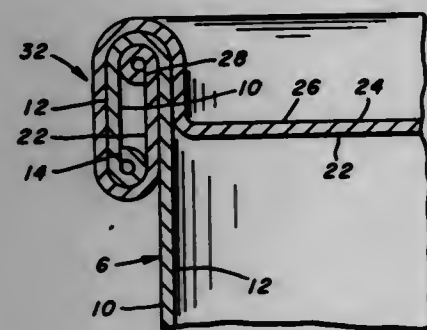
SHEET METAL CONTAINER

Howard W. Kronenwetter, Tarentum, and Freddy R. Schultz, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed June 22, 1976, Ser. No. 698,587
Int. Cl.² B65D 7/42

U.S. Cl. 220-64

3 Claims



1. A sheet metal container comprising:
a body member with interior and exterior surfaces protectively coated and the edge surfaces uncoated, having a body flange extending generally radially outwardly of the longitudinal axis of the container at the end thereof, the terminal end of said body flange being curled such that the entire uncoated edge surface is disposed inside the curl, and at least a portion of the interior surface of the curled body flange is butting against the exterior metal surface of the body member, and

an end member having a different electrode potential than said body member with interior and exterior surfaces protectively coated and the edge surfaces uncoated, having a wall fitting within the body member and an end flange extending generally radially outwardly of the longitudinal axis of the container at the end thereof, the terminal end of said end flange being curled such that the entire uncoated edge surface is disposed inside the curl, and at least a portion of the exterior surface of the curled end flange is butting against the interior metal surface of the end member, said curled end flange subsequently rolled into a double seam with the curled body flange.

4,055,272

CONTAINERS

Ronald E. Beese, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

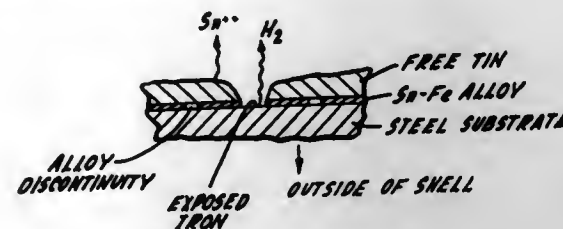
Division of Ser. No. 645,685, Dec. 31, 1975, Pat. No. 4,033,274.
This application July 2, 1976, Ser. No. 702,344
Int. Cl.² B65D 25/14

U.S. Cl. 220-64

4 Claims

1. A drawn, seamless, closed bottom container of shell form drawn from a steel starting blank having an adherent layer of tin, characterized, at least on the inside, by an in-situ formed

undrawn substantially continuous layer of tin-iron alloy next to the steel weighing at least 0.03 pounds per BB, and a substan-



tially continuous layer of unalloyed tin next to the tin-iron alloy layer.

4,055,273

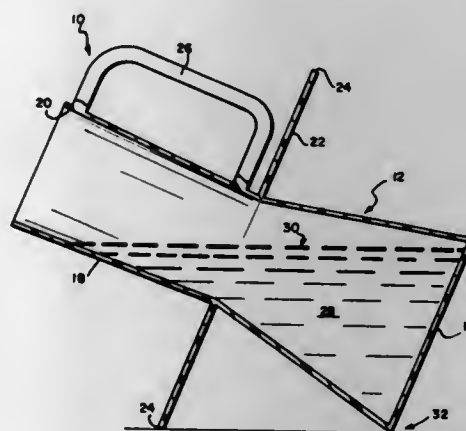
SPILL-RESISTANT CONTAINER

Dennis J. Jones, Loogootee, Ind., assignor to Tumble Not Tumbler, Inc., Loogootee, Ind.

Filed June 4, 1976, Ser. No. 693,102
Int. Cl.² B65D 7/42

U.S. Cl. 220-70

11 Claims



1. A spill-resistant container comprising a truncated conical base with a bottom wall and upstanding side walls, said base being for receiving and holding a quantity of a liquid; a neck extending upwardly from the upper extents of the base side walls, said neck terminating at its upper end to form a relatively wide-mouthed opening having a cross sectional dimension substantially less than the cross sectional dimension of said base at the bottom wall thereof; and a ring carried on the container generally at the top of said base and generally intermediate the height of the container, said ring extending radially outwardly from the container and having an outside diameter dimension generally equalling the container height to support the container when tipped in a partially upright position to prevent spillage of liquid therefrom.

4,055,274

DUAL LID FOR CLOSING COUPLED OPENINGS

Gunter Waldenmeier, Karlsruhe, and Wilhelm Hempelmann, Leopoldshafen, both of Germany, assignors to Gesellschaft für Kernforschung m.b.H., Karlsruhe, Germany

Filed Aug. 17, 1976, Ser. No. 715,171

Claims priority, application Germany, Sept. 12, 1975, 2540722
Int. Cl.² B65D 45/00, 51/18

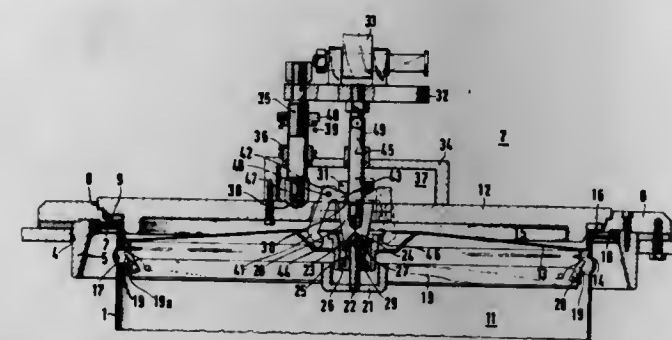
U.S. Cl. 220-256

5 Claims

1. In a dual lid assembly for closing first and second coupled openings, the lid assembly including a first lid for closing fluid-tight the first opening and a second lid for closing fluid-tight the second opening, the two lids being entirely separable from one another and each having a lid axis; lid connecting means for coupling fluid-tight the two lids to one another; first actuating means coupled to the lid connecting means for operating the lid connecting means by an externally-applied force; lid locking means for tightening the first lid to a wall defining the first opening; second actuating means coupled to the lid

locking means for operating the lid locking means by an externally-applied force; the improvement comprising:

- a bearing unit attached fluid-tight to the first lid in the center thereof;
- a circumferential collar attached to said bearing unit, said circumferential collar being arranged at that side of said first lid which is oriented away from said first opening when said first lid is in position thereon; said circumferential collar projecting radially from said bearing unit with respect to the axis of said first lid;
- a centering hub arranged in alignment with and displaceable parallel to the axis of said second lid;



- hub supporting means attached to said centering hub and secured to said second lid;
- means defining a circumferential channel provided in said centering hub; and
- a plurality of clamps movably supported on said second lid; each clamp having an actuating portion projecting into said channel for moving said clamps into operative and inoperative positions by respective opposite axial motions of said centering hub; each clamp having a claw portion spaced from the respective actuating portion; in said operative position said clamps engaging, with their claw portion, behind said circumferential collar for securing said first and second lids to one another.

4,055,275

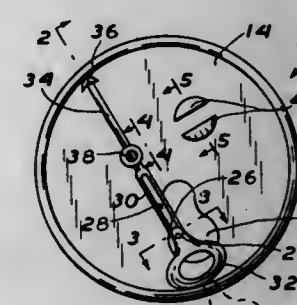
RETAINABLE TAB CONSTRUCTION FOR SEALED CANS

Herbert Gontar, 6 Westchester Ave., Pound Ridge, N.Y. 10576

Filed Jan. 3, 1977, Ser. No. 756,368
Int. Cl.² B65D 41/32

U.S. Cl. 220-269

14 Claims



1. A sealed can comprising: a top, side walls, and a bottom defining a sealed interior compartment, the top having a weakened section defining a tab adapted to be disassociated from the top to provide access to the interior compartment, a first key engaging means extending from the weakened section, an elongated substantially rigid key, first connecting means for slidably connecting the key and key engaging means to facilitate manual engagement of the key and digital manipulation thereof to sever the tab from the top to provide a top opening defined by the weakened section, a second key engaging means extending from the top, and second connecting means for shifting the key and severed tab away from the opening to

permit access to the interior compartment without interference from the key and severed tab.

4,055,276

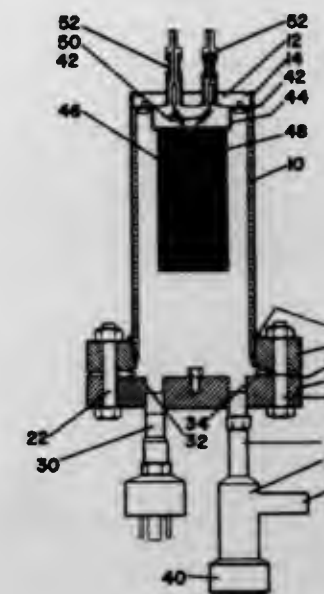
CONTAINER FOR HYDROGEN ISOTOPES

David E. Solomon, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Jan. 16, 1975, Ser. No. 541,447
Int. Cl.² B67B 7/24

U.S. Cl. 222-3

7 Claims



1. A portable container for the storage, shipping and dispensing of hydrogen isotopic gases, which comprises:
 - a hollow housing having opening means for the ingress and egress of hydrogen isotopic gas;
 - a mass of sorber material in said hollow housing composed of activated zirconium aluminate which forms a stable solid material with the gas to be stored;
 - means to control the ingress and egress of gas to and from said housing;
 - means associated with and carried by said container to heat said sorber material to drive sorbed gas from the housing; and
 - means externally of and carried by said container to connect said heater to an energy source.

4,055,277

FLUID DISPENSING ANTI-BURGLARY DEVICE

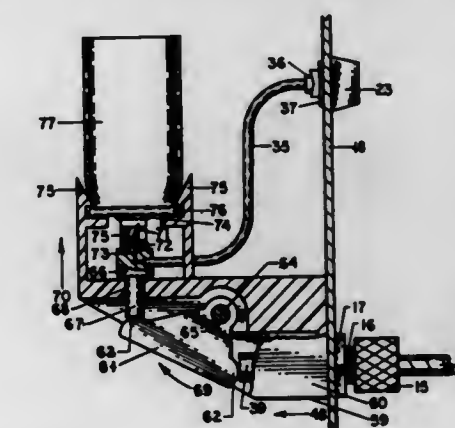
Charles R. Fegley, 1606 Frush Valley Road, Laureldale, Pa. 19605, and Anderson F. Johnson, Jr., 535 Grings Hill Road, Sinking Spring, Pa. 19608

Filed Mar. 18, 1976, Ser. No. 668,275

The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.
Int. Cl.² B65D 83/14

U.S. Cl. 222-5

11 Claims



1. A fluid dispensing anti-burglar device, the device comprising:

- a. A body member having means for mounting said device;
 b. a pressurized container having a fluid-dispensing element adapted to release fluid under pressure from said pressurized container when actuated;
 c. means for supporting said pressurized container in said body member;
 d. a passageway for directing the fluid discharge after release;
 e. dispensing element actuating means mounted in said body member and adapted to engage and actuate said fluid-dispensing element;
 f. spring means biased to force said fluid-dispensing element and said dispensing element actuating means into engagement with each other thereby causing said fluid-dispensing element to be actuated;
 g. a security cable comprising, a means for fastening said security cable to an object at one end thereof and to said dispensing element actuating means on the other end thereof, said dispensing element actuating means mounted for movement between a non-actuation position and a release position, said security cable holding said dispensing element actuating means in said non-actuating position and adapted to releasably retain said dispensing element actuating means in a cocked position in which said fluid-dispensing element and said dispensing element actuating means are separated from each other, said dispensing element actuating means to move to said release position when said security cable is severed with whereby said spring means is released from its cocked position causing said fluid-dispensing element to be actuated, and fluid is released from said pressurized container to pass through said passageway.

4,055,278

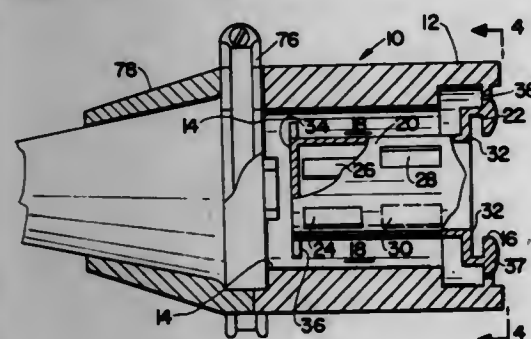
DISPENSING SHOWER HEAD

Joseph A. Seymour, Haverhill, Mass., assignor to Lawrence Peika, Associates, Inc., New York, N.Y.

Filed Aug. 24, 1976, Ser. No. 717,132

Int. Cl.² B67D 5/60

U.S. Cl. 222-42



1. A dispensing shower head comprising an enclosure for attachment to a water supply, said enclosure having an influent opening and an effluent opening, a flow path being provided between said influent and said effluent opening in said enclosure, a shower spray on said effluent opening, a container positioned in said flow path and secured to said enclosure, said container having side walls and an end wall positioned opposite said influent opening, said container also having an opening accessible through said enclosure, a plurality of port means in said container, said port means opening into said flow path, a cartridge removably insertable in said container through said container opening, a plurality of chambers in said cartridge each chamber registerable with one of said port means, said plurality of port means and said plurality of chambers being arranged so that when one of said port means is in registration with one of said chambers, the other of said port means is not in registration with the other of said chambers and said container side walls seal off the other of said chambers from said flow path, said container is cylindrically shaped and said container is positioned in said enclosure so that the longitudinal axis of said container passing through said container end wall

and said container opening is substantially parallel to said flow path, said port means are positioned in the side wall of said container, said cartridge is cylindrically shaped and rotatably mounted in said container so that the longitudinal axis of said cartridge and the longitudinal axis of said container are substantially in registration with one another, said chamber is rotatable to register with said port means.

4,055,279

LIQUID DISPENSER FOR A MOTOR VEHICLE

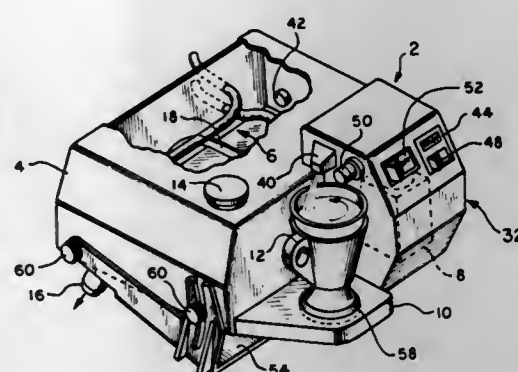
Dominic J. Lapera, and Joseph Lapera, both of 1801 Maplewood Drive, Lindenhurst, Ill. 60046

Filed Oct. 15, 1975, Ser. No. 622,756

Int. Cl.² B67D 5/62

U.S. Cl. 222-54

5 Claims



1. A hot liquid dispenser for use in a motor vehicle having a liquid cooled engine, comprising: a unitary housing; a liquid storage tank within the housing; a heating coil within the storage tank having inner and outer co-axial tubes, the ends of the inner tube extending through the outer walls of the storage tank and the housing for connection with the engine's liquid cooling system for heating the stored liquid with a portion of the coolant, the outer tube being spaced from the inner tube by a small annular air gap, the ends of the outer tube extending outside the storage tank and the housing to provide a means for draining any coolant that might leak through the inner tube; an electric pump within the housing having an inlet tube extending into the lower portion of the storage tank and an outlet tube extending out of the housing for dispensing liquid from the storage tank; a thermal sensor extending into the lower portion of the storage tank to automatically determine if the liquid within the tank is at or above a minimum preset acceptable dispensing temperature substantially below the liquid's boiling point; a thermal sensor switch coupled with the thermal sensor, the switch being electrically connected in series between the pump and an external electrical power supply to prevent the stored liquid from being dispensed unless the liquid is at or above the preset minimum acceptable dispensing temperature; and a means attached to the housing for mounting the dispenser in the vehicle's passenger compartment.

4,055,280

DIVERTER VALVE ASSEMBLY FOR ICE DISTRIBUTION SYSTEMS

Vance L. Kohl, and Joseph R. Spinner, both of Albert Lea, Minn., assignors to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed June 1, 1976, Ser. No. 691,355

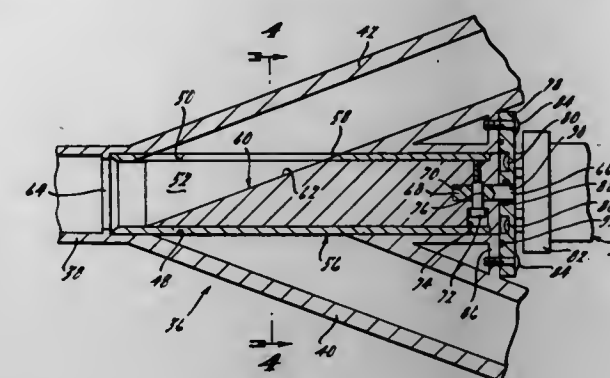
Int. Cl.² B65H 3/60

U.S. Cl. 222-70

16 Claims

1. A diverter valve assembly for an ice distributing system including an ice source and first and second ice delivery stations, said valve assembly comprising a generally cylindrically-shaped valve body having an inlet section communicable with the ice source and first and second outlet sections

communicable with the first and second delivery stations, respectively, said valve body having a central cylindrical valve chamber communicable with said inlet and outlet sections and having a rotatable valve element located coaxially therein, said valve element being of a generally cylindrical shape and having an outer diameter approximately equal to the diameter of said valve chamber having an ice blocking portion and an ice deflecting portion, and



electrically energized motor means for selectively rotating said valve element between a first position wherein said blocking portion prevents the transfer of ice from said inlet section to said first outlet section and said deflecting portion permits the transfer of ice from said inlet section to said second outlet section, at a second position wherein said blocking portion prevents the transfer of ice from said inlet section to said second outlet section and said deflecting portion permits the transfer of ice from said inlet section to said first outlet section.

4,055,281

FILLING UNIT WITH AIR-OPERATED SPOOL VALVE SYSTEM

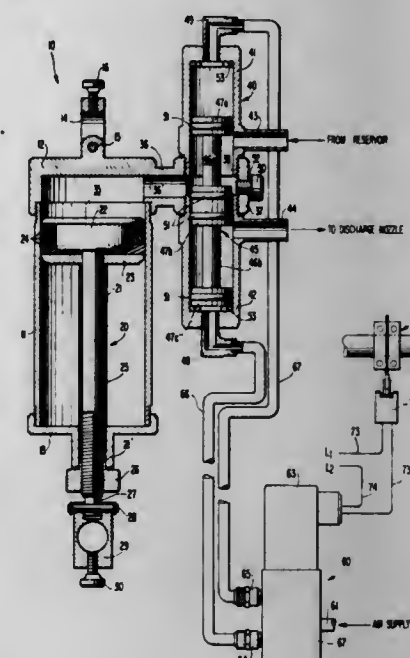
Sidney Rosen, Baltimore, and Richard Nelson Bennett, Arbutus, both of Md., assignors to National Instrument Company, Baltimore, Md.

Filed June 11, 1976, Ser. No. 694,930

Int. Cl.² G01F 11/06

U.S. Cl. 222-309

31 Claims



1. A valve system for a high-speed filling machine which includes a filling unit with pump means including a reciprocating metering piston defining a variable pump space and actuating means for said filling unit, said filling unit being adapted to be connected with connecting tube means to enable connection of a reservoir containing the product to be filled with discharge nozzle means, and said filling unit being operable to suck in the product to be filled during the suction stroke of the

metering piston of its pump means by way of an intake section of said tube means and to discharge the product under pressure during the discharge stroke of the metering piston through the nozzle means by way of a discharge section of said tube means, characterized by spool valve means alongside said pump means including a spool-valve piston member and two connecting means valved by the spool-valve piston member for connection with said intake and discharge sections, said spool-valve means being operable to open the flow path from the connecting means for the intake section to the pump space of the pump means and interrupt the flow path from the pump space to the connecting means for the discharge section during the suction stroke of the pump means and to open the flow path from the pump space to the connecting means for the discharge section and to interrupt the flow path from the connecting means for the intake section to the pump space during the discharge stroke of the pump means, solenoid valve means adapted to be connected with its input to a source of a pneumatic medium under pressure and operatively connected with at least one output thereof to the spool-valve means so as to selectively displace the spool-valve piston member by selective feed of the pneumatic medium under pressure, an energizing circuit for said solenoid valve means including switch means, and means for closing said switch means in dependence on the angular position of said actuating means.

4,055,282

CONTAINER WITH ONE-PIECE NECK AND DISCHARGE CONTROLLER

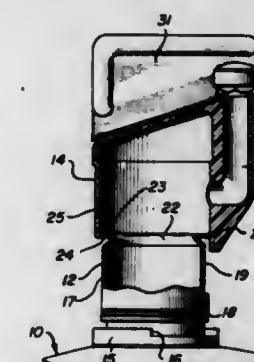
Henry Komendowski, Des Plaines, Ill., assignor to Automatic Liquid Packaging, Inc., Elk Grove Village, Ill.

Filed Apr. 19, 1976, Ser. No. 678,220

Int. Cl.² B65D 47/10

U.S. Cl. 222-421

19 Claims

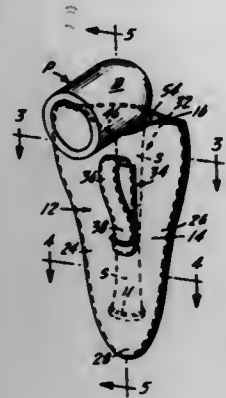


1. A hermetically sealed plastic container having a body portion, a neck portion and a dispensing head all integrally formed,
 a. said neck portion having a side wall which is of a predetermined outside diameter;
 b. said dispensing head being integrally molded with and atop said neck portion and having an inside diameter which substantially corresponds with the outside diameter of said neck portion so as to slidably and frictionally receive said neck portion therein;
 c. a severable annular groove provided between said neck portion and said dispensing head, said dispensing head being severed from said neck portion and the latter being received therein by exerting a downward force on said dispensing head to sever said annular groove and to forcibly urge said dispensing head about said neck portion;
 d. a dispensing spout with an inlet opening formed in said dispensing head;
 e. at least one indentation in said side wall of said neck portion for providing a communicating channel between the side wall of said neck portion and said dispensing head which is in communication with said dispensing spout when said dispensing head is disposed about said neck portion, whereby a product can be dispensed from said container through said neck portion, said communicating

channel and into said dispensing spout from which the product is expelled.

4,055,283 HOLDER FOR A SMOKING-PIPE

Adam L. Habler, 4851 Gandy Blvd. 15-2nd, Tampa, Fla. 33611
Filed May 12, 1975, Ser. No. 576,707
Int. Cl.² A45C 11/00
U.S. Cl. 224-5 R



1. A holder for smoking-pipe having a substantially straight stem and a bowl, comprising:

a substantially flat, substantially rigid sheath having
a. substantially rigid front and back walls each of a single material thickness, in opposed, substantially parallel relationship, the interior surface of one of said walls having a high friction surface area, said walls having top edges unconnected along substantially the entirety of their lengths and which define a mouth, longitudinal side edge portions, and a bottom edge portion, said side edge portions adjoining said bottom edge portion, and said portions in combination with said walls and said top edges, defining a cavity for receiving a substantially straight pipe stem, and

b. fastening means connected to the outer surface of one of the walls, for fastening the holder to a support in a manner that the pipe stem normally points downward toward the sheath bottom edge, the walls being sufficiently close spatially to each other and sufficiently taut laterally from side edge portion to side edge portion and transversely from wall to wall, that when the pipe stem is inserted through the mouth substantially fully into a cavity in a manner that the pipe bit is substantially parallel to the front and back walls, the interior surfaces of the walls, including the high friction surface area, engage and frictionally pinch-hold the upper and lower surfaces of the pipe stem sufficiently firmly that the pipe stem is firmly retained in the cavity even when the sheath is pointed downward, and,

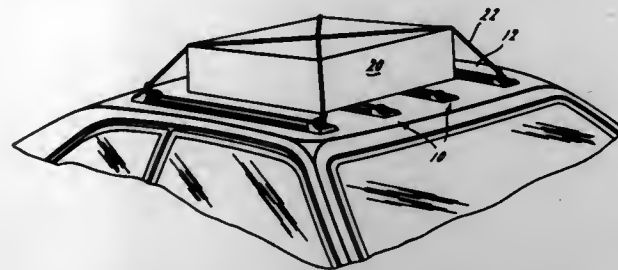
c. as an individual element, a flexible hood removably connected to the sheath, adapted to be conformed to substantially the shape of the pipe bowl, the sheath and the hood having means for removably connecting the hood to the sheath, and the hood providing protection for the bowl and cooperating with the walls in retaining the stem in the cavity when the sheath mouth is pointed downward.

4,055,284 VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lake Shore Drive, Grosse Pointe Shores, Mich. 48236
Continuation-in-part of Ser. No. 486,415, June 8, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,643
Int. Cl.² B60R 9/04
U.S. Cl. 224-42.1 D

1. In an article carrier for an automotive vehicle, an article supporting slat adapted to be mounted in contiguous relation to a surface portion of the vehicle, said slat having a longitudinally extending upwardly facing

article supporting surface provided with a central upwardly presenting, longitudinally extending groove having converging side walls,
a one-piece combination end cap and tie-down member interfitted with a terminal end of said slat and adapted to facilitate securing articles upon said surface, said one-piece combination member including,
a. a first portion defining an eyelet opening for receiving an article securing means,

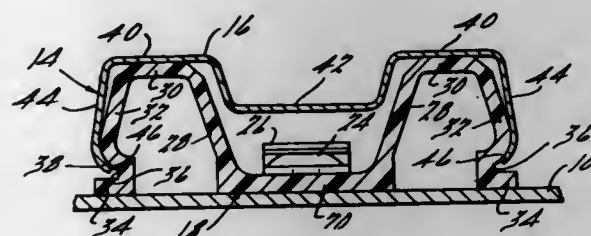


b. a second portion having sides closing the adjacent end of said groove, said eyelet opening being spaced from said second portion to receive the article securing means,
c. a third portion downwardly presenting from said second portion, said third portion being complementary in cross-sectional shape to said groove and adapted to be received at least in part within said groove at said terminal end of said slot, and fastening means securing said combination member to said slat.

4,055,285 ARTICLE SUPPORTING SLAT

John A. Bott, 931 Lake Shore Drive, Grosse Pointe Shores, Mich. 48236
Continuation of Ser. No. 486,416, July 8, 1974, abandoned. This application July 6, 1976, Ser. No. 702,756
Int. Cl.² B60R 9/04
U.S. Cl. 224-42.1 D

4 Claims

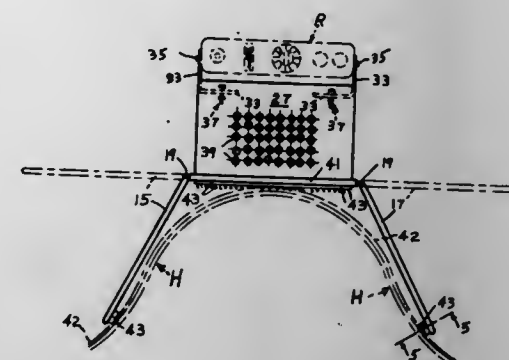


1. In a luggage carrier for a car top, a load supporting slat having an extruded body provided with a central web and with an inverted channel portion at each side, the bottom of the outer sides of the channel portions extending below the web, the outer walls of the inverted channel portions remaining stationary when the bottoms thereof engage the car top and the web is moved downwardly into engagement with the top, wherein sloping webs are provided at the top of each of the inverted channel portions which move into substantial planar relation when the outer sides of the extruded body are relatively moved upwardly as the central web is moved down to engage the car top, said webs to provide support in a vertical direction for a metal molding, means securing the central web to the car top, and a metal molding having a downwardly offset central web and inwardly downwardly presenting channels at the sides, the uppermost portions of each of said metal molding channels supported by the planar tops of the adjacent respective portions of the body, the outer sides of the metal molding channels engaging a substantial portion of the outer sides of the channels of the body to prevent the extruded body from bulging outwardly when the carrier is loaded.

4,055,286 PORTABLE MOUNT FOR RADIOS IN MOTOR VEHICLES

Charles F. Schmid, 3408 S. Fourth St., Springfield, Ill. 62703
Filed Dec. 22, 1975, Ser. No. 643,616
Int. Cl.² B60R 11/02
U.S. Cl. 224-42.42 R

6 Claims

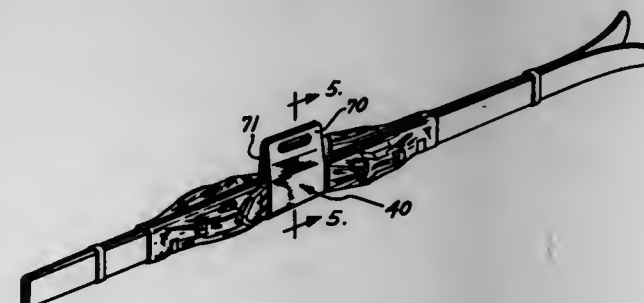


1. In a mounting means for quickly and easily attachably and detachably supporting a radio or like device over a hump in a floor defining a drive-shaft tunnel of a motor vehicle, the improvement comprising: a base lamina adapted to overlie the ridge of said hump, a lateral lamina swingably attached to each side margin of said base lamina in such manner that said laminae can relatively closely embrace the ridge and substantial side portions of said hump, continuous hinges for effecting said swingable attachment, channel molding strips protectively embracing the outer edges of said base and lateral laminae, support structure attached to said base lamina and adapted for semi-permanent mounting of a radio or like device thereto, and means for quickly and easily attaching said laminae to spaced regions of said floor and said hump, said attaching means being flat strips adhesively bonded to the under faces of portions of said channel molding strips on all of said laminae, said flat strips having numerous small Velcro-type hooks projecting from their exposed under surfaces and cohesively engageable with nap or like structure on the surfaces of said floor and said hump.

4,055,287 PROTECTIVE COVERINGS FOR SNOW SKI BINDINGS WITH CARRYING CASE

Charles E. Champenois, Jr., 22 Woodcrest Road, R.D. No. 1, Boonton, N.J. 07005
Filed Sept. 16, 1976, Ser. No. 723,782
Int. Cl.² B65D 45/04
U.S. Cl. 224-45 S

6 Claims



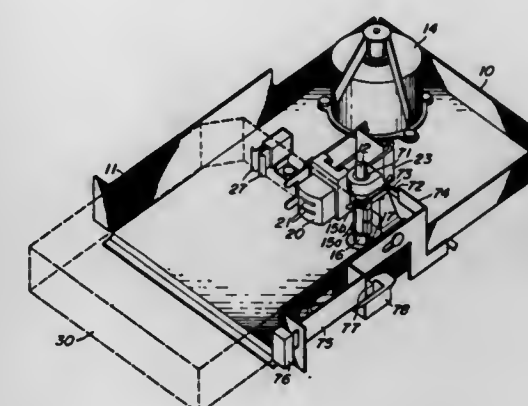
4. In combination,
a pair of removable coverings for protecting snow-ski bindings, said coverings being constructed from a flexible sheet which may be arranged in a rectangular, multiply, folded configuration,
a pouch having an interior compartment shaped to receive and conform to said pair of coverings in said folded configuration, and

handles attached to opposing edges of said pouch to form a sling for carrying skis by hand.

4,055,288 FRONT DRIVE CARTRIDGE-TAPE PLAYER SYSTEM WITH FAST FORWARD AND REVERSE MODES

Melvin Arthur Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Division of Ser. No. 563,947, May 31, 1975, Pat. No. 4,034,925.
This application May 26, 1976, Ser. No. 690,122
Int. Cl.² G11B 23/10
U.S. Cl. 226-1

13 Claims



1. In a tape player having a rotatably driven cylindrical capstan vertically oriented and positioned to rotatably drive the tape in a received tape cartridge at a rate dependent on capstan diameter, the method of selectively increasing the rate of tape drive comprising the steps of:

a. providing a plurality of crescents, each crescent having an inner face, an outer face and a vertical dimension the inner face of predetermined curvature to encircle greater than 180° of the of the capstan circumference while revealing a substantial arc on the capstan surface, the outer face of predetermined curvature, the vertical height predeterminedly fixed,
b. locating the crescents in a predetermined location on the capstan whereby each crescent is slidably rotatable thereabout,
c. decoupling and aligning the crescents in a first selected mode whereby capstan rotation is decoupled from the crescents and the crescents are aligned to allow the capstan surface to drivably engage the tape, and
d. coupling and aligning the crescents in a second selected mode whereby the crescents rotate with the capstan to drivably engage the tape, the crescents aligned in a predetermined configuration effectively increasing the capstan diameter.

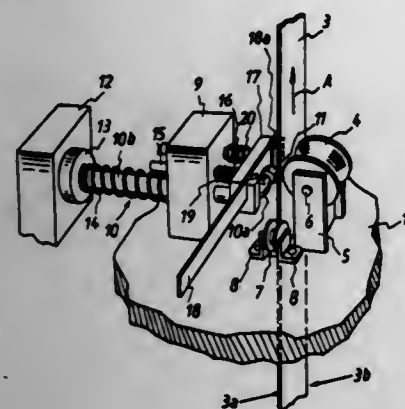
4,055,289 PHOTOGRAPHIC APPARATUS

Michael Kaiser, Germaring, and Ludwig Schaffer, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Mar. 11, 1976, Ser. No. 666,005
Claims priority, application Germany, Mar. 22, 1975, 2512826
Int. Cl.² B65H 17/34
U.S. Cl. 226-92

14 Claims

14. In a photographic apparatus, particularly a developing apparatus, a combination comprising a travelling leader tape having transversely spaced edges; a carrier to which material to be advanced by said leader tape is to be attached, said carrier being formed with a channel; first means for holding said carrier in position proximal to said leader tape; and second means for causing said leader tape to become lodged in said channel in sprung condition, so that the leader tape engages and entrains said carrier, said second means comprising deforming means including a deforming element mounted adjacent one major surface of said leader tape for deforming said

leader tape transversely of its direction of travel so that said edges become spaced from one another by a distance smaller than the width of said channel, effecting entry of said leader tape into said channel, and thereupon terminating said deflection so that said leader tape becomes sprung in said channel and



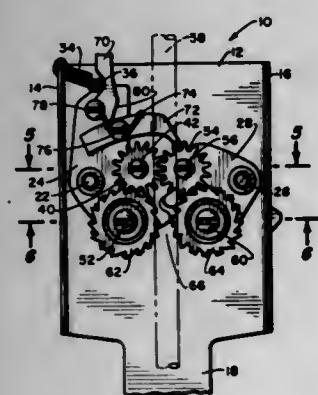
said carrier thus becomes connected to said leader tape for travel with the same, said deforming means further including a presser element mounted adjacent the opposite major surface of said leader tape for movement towards said deforming element so as to press said leader tape towards the same.

4,055,290 ROPE PULLING DEVICE

Floyd O. Elsas, 458 Arroyo Road, Santa Barbara, Calif. 93110
Filed Feb. 11, 1977, Ser. No. 767,758
Int. Cl.² B65H 17/26

U.S. Cl. 226-128

8 Claims



1. A rope pulling device comprising:

- a housing including first means to facilitate attachment to an exterior object;
- a first plate pivotally mounted upon said housing;
- a second plate pivotally mounted upon said housing, cam means interconnecting said first and second plates;
- a drive gear rotatably mounted on said housing, said drive gear being in continuous engagement with a first driven gear and through an idler gear to a second driven gear, said first driven gear being rotatably mounted on said first plate, said second driven gear being rotatably mounted upon said second plate, said first driven gear connected to a first cog wheel causing simultaneous rotation therewith, said second driven gear connected to a second cog wheel causing simultaneous rotation therewith, said first cog wheel being spaced from said second cog wheel and movable relative thereto by pivoting of said first and said second plates;
- handle means rotatably mounted on said housing and fixed to cause rotation of said drive gear;
- biasing means interconnecting said first plate and said housing, said biasing means exerting a continuous bias upon said first plate tending to maintain both said first and second plates in the position with said cog wheels having minimum spacing therebetween; and
- whereby upon manual rotation of said handle means said drive gear is rotated causing simultaneous reverse direc-

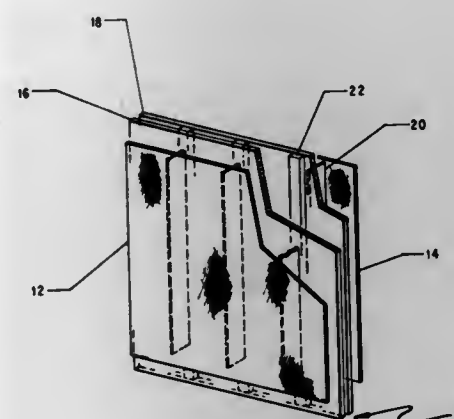
tion, identical velocity rotational movement of said first and second driven gears and therefore said first and second cog wheels, whereby a rope located between said first and second cog wheels is moved linearly in respect to said housing.

4,055,291 EXPLOSION BONDING OF BIPOLAR ELECTRODE BACKPLATES

Edward J. Peters, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio
Continuation of Ser. No. 640,643, Dec. 15, 1975, abandoned.
This application Jan. 21, 1977, Ser. No. 761,268
Int. Cl.² B23K 21/00

U.S. Cl. 228-108

4 Claims



1. A method for mechanically and electrically connecting the anode and cathode backplates of a bipolar electrode comprising the steps of: placing a spaced series of strips of solid copper electrical conductor in a spaced relation of at least 0.001 inch (0.0254 mm) from an anode backplate made of a valve metal and parallel thereto; placing a layer of detonating explosive having a detonation velocity of less than 120 percent of the sonic velocity of the metal having the highest sonic velocity in the system, on the outside surface of one of the metal layers; initiating the explosive so that detonation is propagated parallel to the spaced series of strips of solid copper electrical conductor such that the pressure on collision of the spaced series of strips of solid copper electrical conductor with the anode backplate is greater than the elastic limit of the metal having the lowest elastic limit in the system; and connecting the cathode backplate having a metallic makeup selected from the group of iron, mild steel, stainless steel or nickel to the spaced series of strips of solid copper electrical conductor such that about 10 percent of the total area of the anode backplate or the cathode backplate is bonded to the strips of solid copper electrical conductor to provide the current conducting properties while the remaining area is an air space between the strips of solid copper electrical conductor to provide a means for the hydrogen to vent before it attacks the anode backplate.

4,055,292 CARTON WITH INTEGRAL SEPARABLE MEASURING VESSEL

Minoru Hosoya, Tokyo, Japan, assignor to Kao Soap Co., Ltd., Tokyo, Japan

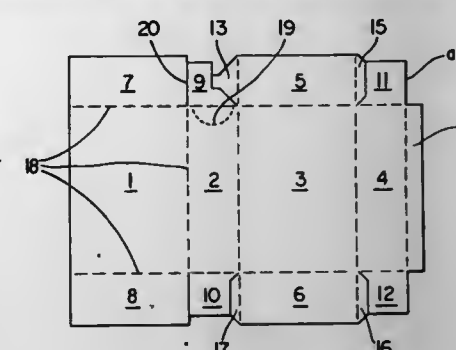
Filed Feb. 11, 1977, Ser. No. 767,680
Int. Cl.² B65D 5/76

U.S. Cl. 229-17 M

12 Claims

1. In a carton having side panels and end walls defining a closed chamber, the improvement which comprises: said carton has an external flap overlapping one of said side panels and

end walls and integral with said carton, said flap having lines of separation providing the side wall and bottom wall of a mea-



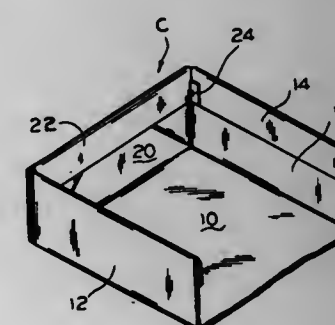
suring vessel which can be separated from the carton and then erected to form the measuring vessel.

4,055,293 TRAY WITH REINFORCED WALLS

Melchior M. Stramaglia, Castro Valley, Calif., assignor to Container Corporation of America, Chicago, Ill.
Filed Feb. 4, 1977, Ser. No. 765,761
Int. Cl.² B65D 5/22, 5/24

U.S. Cl. 229-31 FS

2 Claims



1. In a tray type folding carton formed from a unitary blank of foldable sheet material such as paperboard, the combination of:

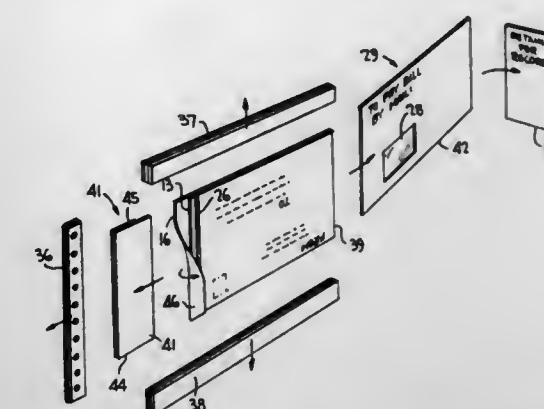
- a. a bottom wall having opposed pairs of side and end walls foldably joined to and upstanding from opposed side and end edges thereof, and foldably joined to each other to form a box-like structure open at the top;
- b. gusset means at each corner of said carton, each including a pair of generally triangular gusset panels foldably joined to each other and to respective end edges and side edges of adjacent side and end walls and folded into face-to-face engagement with inner surfaces of said end walls;
- c. said side walls each including an outer panel foldably joined at its lower edge to a side edge of said bottom wall and an inner panel foldably joined at one edge to an upper edge of said outer panel and being folded inwardly and downwardly into face-to-face engagement with said outer panel;
- d. said end walls each including:
 - i. an outer panel foldably joined at its lower edge to an end edge of said bottom wall;
 - ii. an inner panel of substantially less height than the height of said end wall outer panel, foldably joined at one edge to an upper edge of said end wall outer panel and folded inwardly and downwardly to overlie an upper marginal portion of said end wall outer panel;
 - iii. an intermediate panel foldably joined at one edge to a lower edge of said end wall inner panel and folded outwardly and upwardly to lie between said end wall outer and inner panels to provide reinforcement for said end wall and thereby minimize bowing thereof.
- e. means forming an interlocking connection between adjacent side and end walls at the corners of said carton.

963 O.G.-48

4,055,294 COMBINED MAILER AND RETURN ENVELOPE ASSEMBLY

John E. Traise, 885 Onondaga St., Lewiston, N.Y. 14092
Filed Dec. 11, 1975, Ser. No. 639,826
Int. Cl.² B65D 27/10, 27/06, 27/34
U.S. Cl. 229-69

3 Claims



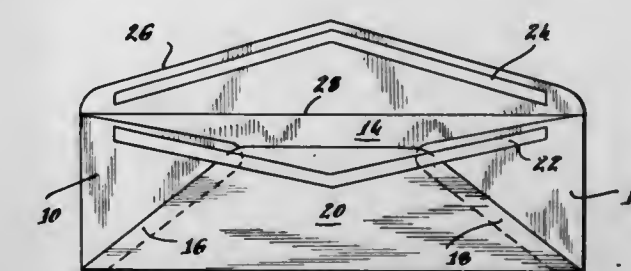
1. A combined mailer and return envelope assembly, comprising a continuous web having spaced and parallel transverse lines of weakening therealong for separating said web into individual units, said web having first and second spaced and parallel longitudinal fold lines therein defining adjacent first, second and third web portions, said first and third portions respectively overlying said second and first portions upon being folded along said respective first and second fold lines, said first and second portions of each said unit being adhesively secured together by adhesive means defining a pocket of a return envelope opening toward said first fold line, said third portion of each said unit being removably secured to said first portion and having an end lying adjacent said first fold line, a detachable end stub in said overlying web portions and including said end of said third portion, said second portion of each said unit having a first section adjacent said stub and a flap detachably secured to said section, said first portion of each said unit having a second section detachably secured thereto and overlying said first section as well as said flap, whereby removal of said stub facilitates removal of said third portion and exposes said return envelope, and removal of said sections exposes said flap for closing said return envelope packet.

4,055,295 SELF-SEALING ENVELOPE AND METHOD OF MAKING SAME

Robert Cohn, Millbrae, Calif., assignor to Champion International Corporation, Stamford, Conn.
Filed Sept. 15, 1976, Ser. No. 723,236
Int. Cl.² B65D 27/14

U.S. Cl. 229-80

4 Claims



1. A method of making self-sealing envelopes from paper blanks including the steps of: folding and sealing a body for the envelope using an adhesive having a predetermined dielectric constant, and allowing said adhesive to at least partially dry; subsequently, applying a first strip of moist latex material to the body of the envelope and a second strip of moist latex

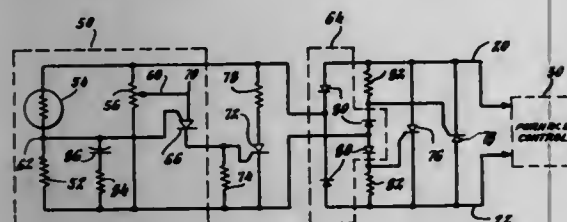
material to an attached flap in a position in which the second strip registers with the first strip when the flap is folded against the body of the envelope, the latex material having a dielectric constant approximately the same or less than the dielectric constant of the adhesive; and drying the envelope in a dielectric heating chamber.

4,055,296

ELECTRONIC TEMPERATURE CONTROL SYSTEM FOR THERMOSTATIC CONTROL

Robert J. Buck, 1063 Church Hill Road, Fairfield, Conn. 06430
Filed Mar. 25, 1976, Ser. No. 670,352
Int. Cl.² G05D 23/24; H03K 17/60
U.S. Cl. 236—1 C

11 Claims



1. A temperature control system for thermostatic control of a standard two-wire voltage relay control mechanism without the presence of amplifiers and circuitry requiring a power source other than the low voltage relay control mechanism and the calibration of which is unaffected by relay voltage variations comprising a circuit having two main terminals, one terminal being adapted for connection to terminal of an alternating current operated relay of the low voltage heating and/or cooling system relay control mechanism, the circuit comprising a temperature sensing circuit including a temperature responsive thermistor and potentiometer adjustable in response to a desired temperature setting, a programmable unijunction transistor (PUT) the gate of which is connected to the thermistor and the anode of which is connected to the potentiometer wiper, a diode bridge connected across the system circuit main terminals and to the temperature sensing circuit and a SCR thyristor connected across the output of the diode bridge and to the cathode of the programmable unijunction transistor to conduct current during alternate half cycles of the alternating current through opposite legs of the bridge.

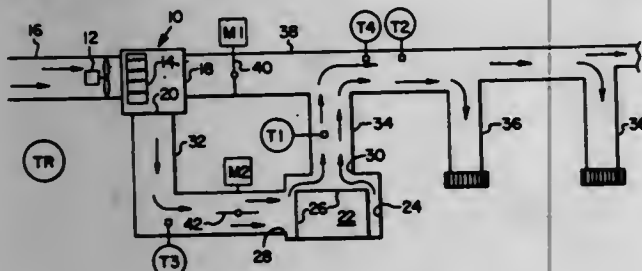
4,055,297

FORCED AIR HEATING SYSTEM UTILIZING FIREPLACE AS PRIMARY HEAT SOURCE

Sherman E. Lee, Rte. 1, Box 69A, Newberg, Oreg. 97132
Filed Oct. 18, 1976, Ser. No. 733,315
Int. Cl.² F23N 0/00

U.S. Cl. 236—11

13 Claims



1. A forced air heating system for heating the rooms of a building comprising:
a. motorized fan means for circulating air;
b. a forced air furnace connected to said fan means having heating means for selectively heating air circulated through said furnace by said fan means and furnace exhaust means for exhausting said circulated air from said furnace;
c. a fireplace;
d. air heating chamber means adjacent said fireplace and

connected to said fan means for receiving heat from said fireplace and thereby heating air circulated through said chamber means, said chamber means having means defining a chamber exhaust port for exhausting said circulated air from said chamber means;

e. air outlet register means for delivering heated air to the rooms of said building; and

f. a pair of separate parallel duct means connecting said air outlet register means to each of said chamber exhaust port and furnace exhaust means respectively for conducting circulating air to said air outlet register means from either one of said chamber means and furnace without intermediate passage of said air through the other.

4,055,298

THERMALLY RESPONSIVE BY-PASS VALVE DEVICE PROVIDING MAXIMUM FLOW AREA

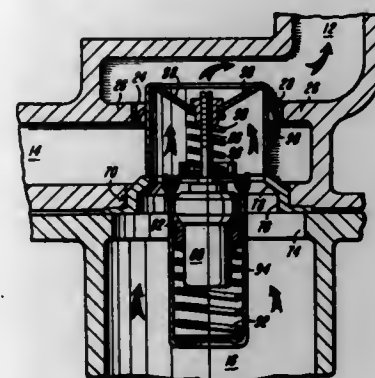
Earl L. Wilson, Wellesley, Mass., assignor to Standard-Thomson Corporation, Waltham, Mass.

Filed Jan. 19, 1976, Ser. No. 650,151

Int. Cl.² F01P 7/02

U.S. Cl. 236—34.5

6 Claims



1. Thermally responsive valve mechanism for the cooling system of an automotive engine which has a plurality of flow passages, there being a first flow passage, a second flow passage, and a third flow passage, there being a first wall between the first flow passage and the second flow passage with an opening of a given dimension in the first wall, there being a second wall between the second flow passage and the third flow passage, the opening in the second wall having a greater dimension than the opening in the first wall, there being continuous fluid flow through the opening in the second wall during operation of the engine, the improvement comprising:

an annular valve seat member within the opening in the second wall, the annular valve seat member having a downstream opening which has a dimension substantially equal to the given dimension of the opening in the first wall, the annular valve seat member having an upstream opening which is greater than the downstream opening thereof, the valve seat member having an internal wall of gradually decreasing dimension between the upstream opening thereof and the downstream opening thereof,

a hollow cylindrical valve member slidably axially movable within the opening in the first wall, the hollow cylindrical valve member being engageable with the valve seat member to encompass the downstream opening and to close communication between the third flow passage and the second flow passage while providing communication between the third flow passage and the first flow passage, the hollow cylindrical valve member being movable to spaced relationship from the valve seat member to permit communication between the third flow passage and the second flow passage,

thermally responsive actuator means having a portion encompassed by the internal wall of the valve seat member, the thermally responsive actuator means having a movable portion, means attaching the movable portion of the thermally responsive actuator means to the hollow cylindrical valve member for axial movement thereof, the

thermally responsive actuator means having a portion of greater cross-sectional dimension and a portion of lesser cross-sectional dimension, the portion of greater cross-sectional dimension being at a position encompassed by a part of the internal wall of the valve seat member which has a greater dimension, and the thermally responsive actuator means having a portion of lesser cross-sectional dimension encompassed by a part of the internal wall of the valve seat member which has a lesser dimension, so that the area for fluid flow at the downstream opening of the annular valve seat member is at least equal to the area for fluid flow at the upstream opening of the annular valve seat member.

5. Thermally responsive valve mechanism for a cooling system of an internal combustion engine in which the system is provided with conduit structure having wall members forming a first flow passage, a second flow passage, and a third flow passage, there being a first opening between the second and first flow passages, and a second opening between the second and third flow passages, the first opening being greater than the second opening, the openings being in alignment, there being continuous fluid flow through the second opening during operation of the engine, the improvement comprising:

a hollow cylindrical closure member slidably axially movable within the second opening, the hollow cylindrical closure member having opposed open ends,

an annular valve seat member within the second opening and forming a fluid port therethrough, the annular valve seat member having a flow inlet opening and a flow exit opening, the flow exit opening being substantially equal to the second opening, the flow inlet opening being substantially greater than the flow exit opening, the annular valve seat member having an annular engagement surface encompassing the flow exit opening thereof and engageable by an end of the hollow cylindrical closure member to close communication between the first flow passage and the second flow passage while providing communication between the first flow passage and the third flow passage, the annular valve seat member having an internal wall surface of gradually increasing dimension between the exit opening and the entrance opening thereof,

a thermally responsive actuator device having a larger area portion encompassed by a larger diameter portion of the internal wall surface of the annular valve seat member, the thermally responsive actuator device having a smaller area portion encompassed by a smaller diameter portion of the internal wall surface of the annular valve seat member, so that the area for fluid flow at the flow exit opening of the annular valve seat member is at least equal to the area for fluid flow at the flow inlet opening of the annular valve seat member, the thermally responsive actuator member having a portion attached to the hollow cylindrical closure member for movement thereof.

4,055,299

ENERGY SOURCE FOR LARGE HEATING SYSTEMS

Lars Norberg, and Erik Olsson, both of Finspong, Sweden, assignors to Stal-Laval Turbin AB, Finspong, Sweden

Filed Aug. 4, 1976, Ser. No. 711,676

Claims priority, application Sweden, Aug. 5, 1975, 7508803
Int. Cl.² G05D 23/00

U.S. Cl. 237—2 B

2 Claims

1. An energy source for a heating system of the type having a flowing medium to be heated, comprising:

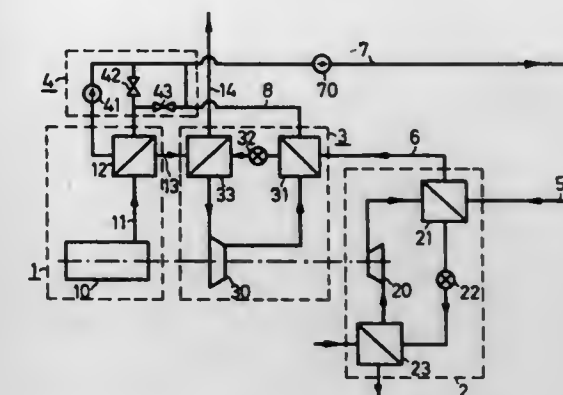
a first heat pump having a first evaporator for withdrawing heat from the surrounding environment, a first compressor, and a first condenser for rejecting heat to said medium to be heated;

a second heat pump having a second evaporator, a second compressor and a second condenser for rejecting heat to said medium to be heated;

a combustion engine drivingly connected to said first and

second compressors, said engine having a first exhaust gas outlet;

a heat exchanger connected to receive exhaust gases from said first outlet and to reject heat from said gases to said medium to be heated, said heat exchanger having a second



exhaust gas outlet for said gases, said second outlet being connected to direct said gases from said first heat exchanger to said second evaporator whereby fluid flowing in said second evaporator is heated as heat is withdrawn from said exhaust gases.

4,055,300

EQUIPMENT FOR SPRAYING PAINT AND THE LIKE

Michel Binoche, Paris, France, assignor to SKM, Stains, France

Filed Oct. 30, 1975, Ser. No. 627,052

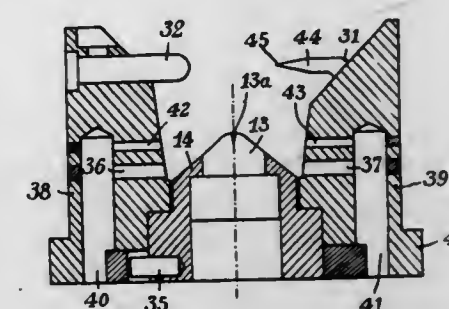
Claims priority, application France, Nov. 14, 1974, 74.37534;
Mar. 10, 1975, 75.07362

The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.

Int. Cl.² B05B 5/02

U.S. Cl. 239—15

12 Claims



1. Equipment for spraying paint or similar products comprising a spray gun comprising:

a. an atomizing nozzle adapted to project a flat fan-like jet of liquid, said nozzle having a frustoconical surface configuration with a vertex angle within the range of 80° to 110° with a front surface symmetrical in relation to the plane of said flat liquid jet and

b. a pair of lateral jets of compressed air disposed symmetrically in relation to and directed towards said atomizing nozzle at points slightly sufficiently set back from the front end of the atomizing nozzle to create air sheets after rebounding from the nozzle surface which are coaxial to a jet of paint sprayed from said nozzle, said air jets meeting each other while clamping the sheet of paint sprayed from said nozzle.

4,055,301

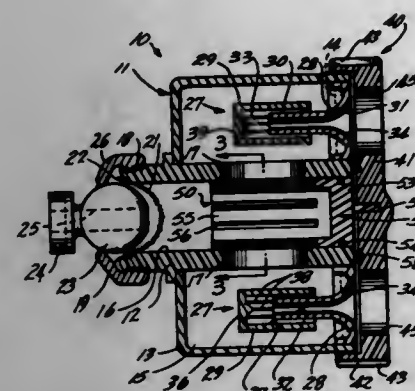
SHOWER HEAD WITH DIVERGENT IMPACT EFFECT NOZZLE

John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corporation, Burbank, Calif.

Filed July 19, 1976, Ser. No. 706,465
Int. Cl.² B05B 1/08; 1/16

U.S. Cl. 239—101

14 Claims



1. A shower head comprising
 - a body defining therein a cavity and having a front face defining an opening therein,
 - means coupled to the body adapting the body to be connected to a source of water for flow of water from the source into the cavity,
 - a nozzle disposed in the cavity with a discharge end thereof mounted in alignment with the opening for discharge of water from the cavity only through the nozzle, the nozzle having no moving parts and being arranged to produce a randomly directionally unstable discharge characteristic in water discharged therefrom during use, and
 - modulating means mounted to the body operable by a user of the shower head for modulating the effective force of water discharged by the nozzle, the modulating means including a plate disposed externally of the body adjacent a front face thereof, a slot aperture through the plate and disposed in the plate for registry of all portions thereof at different times with the opening in response to movement of the plate relative to the body, and screen means including mesh screening of at least two different effective meshes disposed in only a portion of the slot aperture, the modulating means having a first position in which the unscreened portion of the slot aperture registers with the opening and in which alignment of the screened portion of the slot aperture with the opening is a modulating position of the modulating means relative to the body.

4,055,302

LIQUID SPRAY NOZZLE HAVING A RANDOMLY DIRECTIONALLY UNSTABLE DISCHARGE CHARACTERISTIC AND COUNTERFLOW INTERNAL FLOW PATTERN

John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corporation, Burbank, Calif.

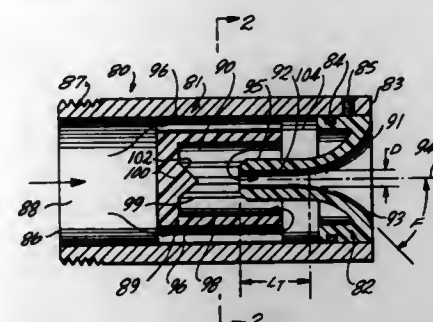
Filed July 19, 1976, Ser. No. 706,464
Int. Cl.² B05B 1/08

U.S. Cl. 239—102

27 Claims

1. A nozzle for producing a randomly directionally unstable liquid discharge comprising a body defining therein a chamber having a liquid inlet thereto and a liquid outlet duct therefrom to the exterior of the body, the liquid flow area of the inlet to the chamber being at least as great as the minimum liquid flow area of the outlet duct, the liquid inlet to the chamber being defined for flow of liquid into the chamber in a direction substantially opposite to the direction of liquid flow from the chamber through the outlet duct, the chamber being defined cooperatively with the inlet and the outlet duct for substantially linear flow of liquid through the outlet duct during operation of the nozzle, the outlet duct having a straight throat portion of constant diameter communicating from the

chamber to a flared section portion of the duct, the duct throat portion having a ratio of length to diameter in the range from about $\frac{1}{4}$ to about 18, the diameter of the duct second portion increasing proceeding along the duct from the chamber from a



diameter equal to that of the duct throat portion, the angle of flare of the duct second portion relative to the axis of the throat at the intersection of the duct throat and second portions being at least 2° and no greater than 6°.

4,055,303

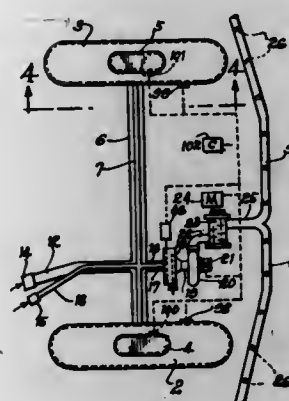
AGRICHEMICAL SPRAYING SYSTEM

Erben G. Brown, San Marcos, Calif., assignor to Golden State Helicopter, Inc., San Marcos, Calif.

Filed Feb. 5, 1976, Ser. No. 655,341
Int. Cl.² B05B 1/20, 17/02, 7/26; B01F 7/08

U.S. Cl. 239—142

5 Claims



1. In combination with an aircraft, an apparatus for continuous formation and spraying of an invert emulsion from at least one water phase and at least one oil phase, wherein at least one of said phases contains an active agrochemical agent, which comprises:
 - at least two concentric, vented, funnel-shaped tanks on one side of the aircraft;
 - at least two similar funnel-shaped tanks on the other side of the aircraft;
 - an outlet on the bottom of each tank;
 - a cross-tube connecting each outlet to the outlet of the similar tank at the opposite side of the aircraft each pair of interconnected tanks holding one of said phase;
 - a filling pipe connected to each cross-tube;
 - one multifluid valve assembly for co-mingling said phases into a premix comprising:
 - at least two inlets each leading to a channel controlled by a common on-off gate formed by a plate sliding across said channels to completely close them,
 - a separate metering gate across each said channel formed by a plate having a hole in its center, sliding across said channel to partially close it, and
 - a common outlet area connected to all said channels;
 - conduit means, for delivering each one of said phases to said valve assembly, branching off each cross-tube, each leading to one of the inlets of said valve assembly;
 - a single low speed pump means;
 - a mechanical stirring means for turning said premix into an invert emulsion comprising:

a chamber having an inlet and an outlet, and a plurality of rotary agitators mounted within said chamber; at least one spray-forming means; conduit means for delivering said premix to said pump means and from said pump means to said mechanical stirring means; and conduit means for delivering said invert emulsion to said spray forming means.

4,055,304

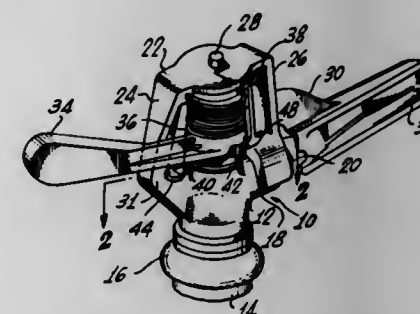
AUXILIARY BRAKING MEANS FOR IMPACT ARM SPRINKLERS

Robert L. Munson, San Dimas, Calif., assignor to Rain Bird Sprinkler Mfg. Corporation, Glendora, Calif.

Filed June 24, 1976, Ser. No. 699,354
Int. Cl.² B05B 3/00

U.S. Cl. 239—230

13 Claims



1. In an impact type rotary sprinkler having a body rotatably mounted on a fluid supply conduit, an impact arm rotatably mounted on said body for rotary oscillation about said body, an armspring carried by said body for urging said impact arm into contact with a portion of said body, a nozzle carried by said body oriented to direct a discharge stream against said arm to cause rotation thereof out of contact with said body and away from said stream, said armspring resisting said rotation and causing said arm to reverse its direction of rotation and to impact said body to impart an increment of rotation thereto in a forward direction, the improvement comprising:

auxiliary means carried by said body for supplementing the action of said armspring, and for preventing said impact arm from imparting any rotation to said body in a reverse direction, said means being activated by said arm after it has rotated through a predetermined arc, whereby said auxiliary means operates to prevent reverse rotation of said body when the rotational force applied to said arm by said discharge stream exceeds predetermined limits.

4,055,305

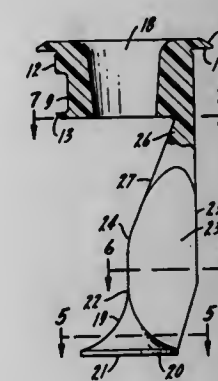
NON-CLOG WATER DISTRIBUTION NOZZLE

Joseph Michael Schwinn, Healdsburg, Calif., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed May 5, 1976, Ser. No. 683,586
Int. Cl.² B05B 1/26

U.S. Cl. 239—524

10 Claims



1. A gravity liquid spray nozzle comprising at its upper end a tubular member for placement in a liquid discharge opening, a hole through said tubular member for directing non-pressurized

liquid into a downwardly flowing stream, a single conical baffle that creates a circular spray pattern, said baffle having a sharp point at its upper end spaced below the center of said hole, the spray creating surface of said conical baffle being defined by an arc of a circle rotated about an axis passing through said center of said hole, and a baffle supporting arm extending downwardly from said tubular member and being connected to said conical surface, said arm tapering to a knife-like terminal edge which merges into said sharp point of said conical surface, said edge extending upwardly from said point at the central axis of said nozzle in said stream of liquid flowing downwardly under the influence of gravity.

4,055,306

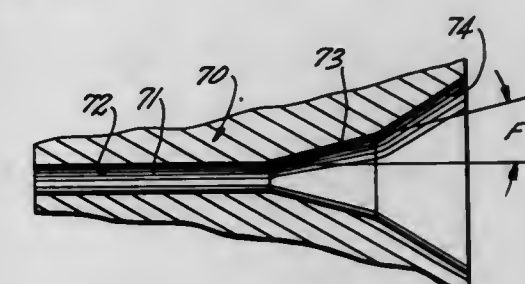
LIQUID SPRAY NOZZLE HAVING A RANDOMLY DIRECTIONALLY UNSTABLE DISCHARGE CHARACTERISTIC

John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corporation, Burbank, Calif.

Filed July 19, 1976, Ser. No. 706,466
Int. Cl.² B05B 1/08

U.S. Cl. 239—601

24 Claims



1. A nozzle for producing a randomly directionally unstable liquid discharge comprising a body defining therein a chamber having a liquid inlet thereto and a liquid outlet duct from the chamber to the exterior of the body, the liquid flow area of the inlet to the chamber being at least as great as the minimum liquid flow area of the outlet duct, the chamber being defined cooperatively with the inlet and the outlet duct for substantially linear flow of liquid through the outlet duct during operation of the nozzle, the outlet duct having a straight throat portion of constant diameter communicating from the chamber to a flared second portion of the duct, the duct throat portion having a ratio of length to diameter in the range of from about 4 to about 18, the diameter of the duct second portion increasing proceeding along the duct from the chamber from a diameter equal to that of the duct throat portion, the angle of flare of the duct second portion relative to the axis of the throat at the intersection of the duct throat and second portions being at least 2° and no greater than 6°.

4,055,307

MATERIAL PROCESSING APPARATUS

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

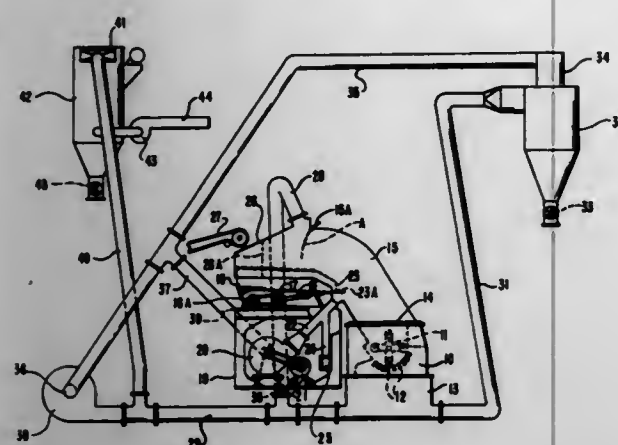
Filed Aug. 16, 1976, Ser. No. 714,623
Int. Cl.² B02C 23/14

U.S. Cl. 241—48

8 Claims

1. Material processing apparatus comprising: a housing having a material inlet and an outlet; a material reducing mill connected into said housing at said outlet and said mill having a discharge chamber for reduced material; reduced material separator means having an inlet connected into said discharge chamber and also having an outlet; air moving means having a suction inlet connected to said outlet of said separator means and a discharge connected to said discharge chamber, the air from said air moving means transporting the reduced material to said separator means and returning air from said separator means outlet to said air moving means; conduit means connecting said housing into said air moving means discharge in advance of said discharge chamber to by-pass said mill, whereby

material in said housing is continually transported to said separator means through said discharge chamber, and means con-



necting into said air moving means discharge in advance of said connection to said discharge chamber to reduce the pressure in the apparatus to less than ambient.

4,055,308

FOOD COMMUNITING DEVICE

Peter Ackeret, Kunsnacht, Switzerland, assignor to Salter Housewares Limited, West Bromwich, England

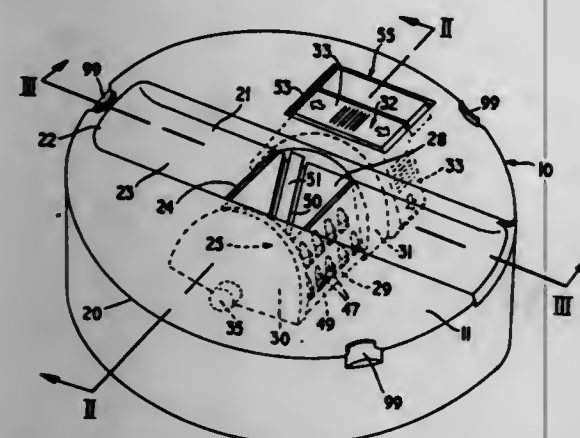
Filed Feb. 26, 1976, Ser. No. 661,477

Claims priority, application United Kingdom, Feb. 26, 1975, 7946/75

Int. Cl.² B02C 18/18

U.S. Cl. 241-100

31 Claims



1. A device for use in comminuting solid food bodies by rasping, grating or cutting carried out by manually moving each food body under pressure over a stationary comminuting unit, said device comprising:

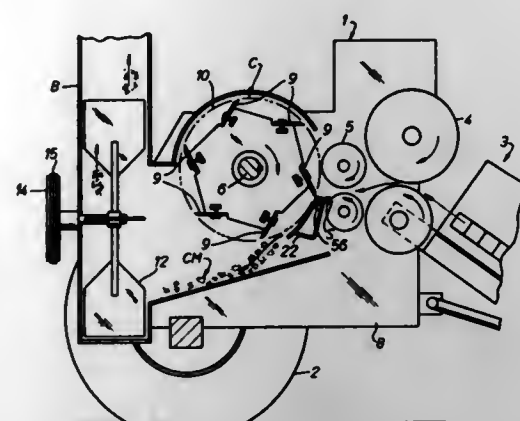
- a comminuted food material collector bowl;
- a lid structure which detachably fits upon and covers said bowl;
- a channel extending across said lid structure defining a food body guideway bounded by lateral guide surfaces and a base surface integral with said lid structure;
- a slot aperture in the base surface of said channel guideway intermediate its ends;
- at least three different comminuting units of substantially planar configuration movably mounted and housed in said lid structure, said different comminuting units having comminuting elements of different comminuting characteristics and each having apertures for passage therethrough of comminuted food material fragments; and
- means for selectively presetting each comminuting unit by displacement within said lid structure from a protectively shielded out-of-use position to an exposed operative working position in registry with said slot aperture in the channel guideway ready for use.

4,055,309
ADJUSTABLE CUTTER BAR SUPPORT
Phillip F. Fleming, and Steven J. Campbell, both of West Bend, Wis., assignors to Gehl Company, West Bend, Wis.

Filed Oct. 12, 1976, Ser. No. 731,121
Int. Cl.² B02C 18/16

U.S. Cl. 241-221

13 Claims



1. In a forage harvester of the type having a rotatable chopping cylinder and an elongated shear bar having a longitudinal axis, located adjacent said chopping cylinder for cutting cooperation therewith, means for adjusting a central portion of said shear bar toward and away from said chopping cylinder, said means comprising an elongated shiftable member having an axis parallel to the longitudinal axis of said elongated shear bar and having one portion engagable with said central portion of said bar, whereby shifting of said member causes corresponding movement of said central portion of said cutter bar toward and away from said cylinder, means for shifting said elongated shiftable member to any one of a plurality of adjusted positions, said elongated shiftable member comprising a shaft rotatable about said axis and including a projection extending therefrom and engagable with said central portion, and further including means for releasably securing said shiftable member against shiftable movement.

4,055,310

TAPING DEVICE IN COIL WINDERS

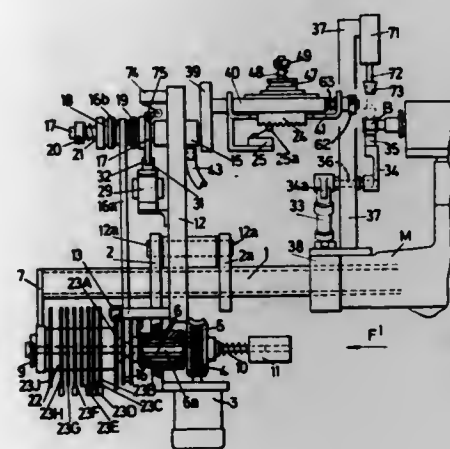
Francesco Bonaiti, Saronno (Varese), Italy, assignor to Tekma Kinomat S.p.A., Caronno Pertusella, Italy

Filed July 8, 1974, Ser. No. 486,681

Int. Cl.² H01F 41/12

U.S. Cl. 242-7.08

11 Claims



1. A coil winding machine comprising in combination a stepwise rotating table and a plurality of supports distributed about the periphery of the rotating table, each support carrying at least one coil core, and means for applying and winding a discrete length of insulating adhesive tape on the periphery of a coil wound on each said core, said means comprising:

- a support plate, means mounting the support plate on the machine for rotation about the axis of a said wound coil,

and a reel of feed tape mounted freely rotatable on said support plate;

means mounted on the machine for causing said support plate to oscillate from a rest position, away from the wound coil, to a working position in proximity to said coil;

first guide means, mounted on said support plate in such a position that, with the support plate in said working position, said guide means is closely adjacent said wound coil, said first guide means guiding said tape in a plane parallel to the axis of said coil;

second guide means, disposed at a short distance from the first guide means and also mounted on said support plate, the tape running between said first and said second guide means along a first path substantially perpendicular to the axis of the wound coil, said tape running also between said second guide means and said reel, along a second path substantially parallel to the axis of the said coil;

means mounted on the machine for retaining the free end of the tape against the periphery of the wound coil; means actuating the last-named means when the winding of said tape starts;

means mounted on the machine for cutting off said discrete length of the tape; and means actuating the last-named means after the winding of at least one turn of tape.

4,055,311

DEVICE FOR WINDING UP YARNS

Jurgen Bock, Bobingen, Germany, and Hans-Jürgen Strutz, Spartanburg, S.C., assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

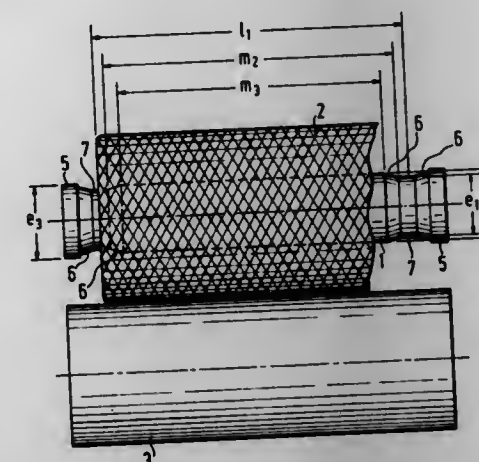
Filed June 27, 1975, Ser. No. 591,303

Claims priority, application Germany, July 4, 1974, 2432166

Int. Cl.² B65H 54/40, 75/18

U.S. Cl. 242-18 DD

1 Claim



1. A device for winding up yarns on empty bobbins which comprises an empty bobbin rotating on a clamping device, a friction roll contacting the surface of the empty bobbin, a traversing device for the yarn to be wound up, the diameter of the empty bobbin decreasing relative to the center of the empty bobbin in the vicinity of reverse travel of the traversing device, the empty bobbin diameters and the length of the empty bobbin and the winding on the bobbin corresponding to the following unbalanced equations:

$$a) 0.05 \text{ mm} \leq e_2 - e_1 \leq 4 \text{ mm and}$$

$$b) \frac{l_1 - m_3}{l_1} \leq 1, \text{ and}$$

$$c) \frac{l_1 - m_2}{l_1} \leq 0.3,$$

where

l_1 is the length of the winding on the bobbin,
 m_2 is the smallest distance between the sections of the small-

est bobbin tube diameter at the points of reverse travel of the traversing device,

m_3 is the length of the section of unchanged diameter in the center of the empty bobbin between the two sections of decreasing empty bobbin diameter

e_1 is the empty bobbin diameter at the point of reverse travel, and

e_2 is the maximum empty bobbin diameter between the points of reverse travel of the traversing device, and both ends of the empty bobbin being provided with starter rings the diameter e_3 of which exceeds the diameter e_2 by less than 2mm, preferably less than 1.4 mm.

4,055,312

PROCESS AND EQUIPMENT FOR THE MANUFACTURE OF YARN OR THREAD ON A REEL MACHINE

Florian Lucke, Stuttgart, Germany, assignor to Croon & Lucke Maschinenfabrik GmbH & Co. KG, Germany

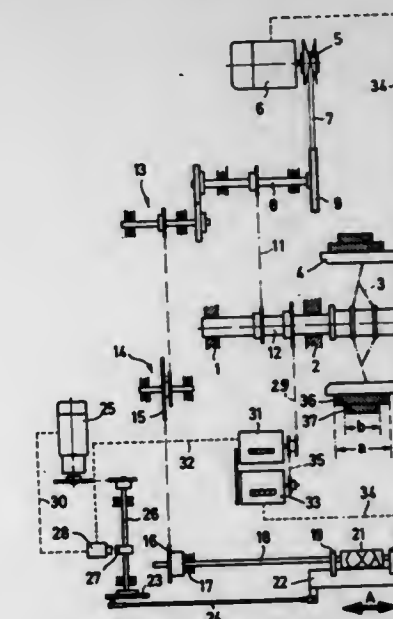
Filed Nov. 24, 1975, Ser. No. 634,617

Claims priority, application Germany, Dec. 21, 1974, 2460845

Int. Cl.² B65H 54/28

U.S. Cl. 242-43.1

5 Claims



1. In a yarn or thread spooling apparatus comprising a rotary driven reel basket and yarn or thread laying means for guiding said yarn or thread along superimposed layers of predetermined width wound about said reel basket, the improvement comprising reciprocating support means for said yarn or thread laying means for spooling said yarn or thread along superimposed layers of a larger width than said predetermined width, means for counting a first number of revolutions of said reel basket, means operated by said counting means for shutting off said reciprocating support means after said first number of revolutions, and means for shutting off said rotary driven reel basket upon completion of a predetermined second number of revolutions.

4,055,313

APPARATUS FOR EXCHANGING REWOUND ROLLS IN A ROLL SLITTING AND REWINDING MACHINE

Toshiaki Yamaguchi; Keizo Narita, and Hideo Mukai, all of Kyoto, Japan, assignors to Nishimura Seisakusho Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 393,835, Sept. 4, 1973, abandoned. This application July 18, 1975, Ser. No. 597,402

Int. Cl.² B65H 35/02

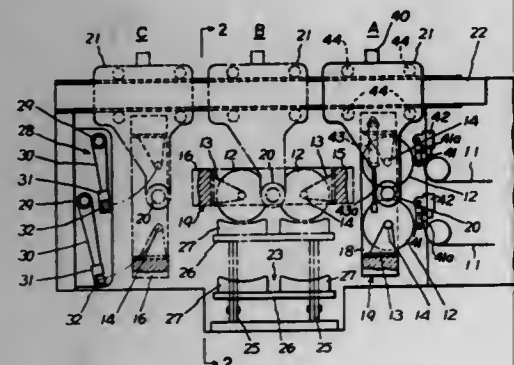
U.S. Cl. 242-56.4

12 Claims

1. An apparatus for rewinding slitted material from a slitting machine and exchanging rewound rolls, comprising:

- a frame;
- a plurality of slitted rewinding roll support means mounted onto said frame and arranged in two horizontally extend-

ing rows, each of said roll support means including a rewinding core rotatably and detachably mounted to said roll support means for receiving slitted material from a slitting machine and drive means for winding said core; a carrier rotatably supporting said frame; pivotal support means between said carrier and said frame for pivotally supporting said frame on said carrier about a horizontal axis of said frame; said horizontal axis being intermediate of and generally parallel to said two rows of slitted strip rewinding roll supporting means; guide means adapted to provide a track for allowing forward and retracted movement of said carrier; roller means on said carrier for mounting said carrier on said guide means;



means for positioning said carrier along said guide means from a forward position substantially adjacent said slitting machine for a rewinding operation, to a retracted position for a roll removal operation; and means for rotating said frame approximately 90° about said horizontal axis from a first rotary position in which said two rows of said rewinding cores on said rewinding roll support means define a generally vertical plane, to a second rotary position in which said two rows of said rewinding cores define a generally horizontal plane, such that when said carrier is in said forward position, said frame is in said first rotary position to allow all of said rewinding cores to rewind slitted material simultaneously and when said carrier is in said retracted position, said frame is in said second rotary position for said roll removing operation.

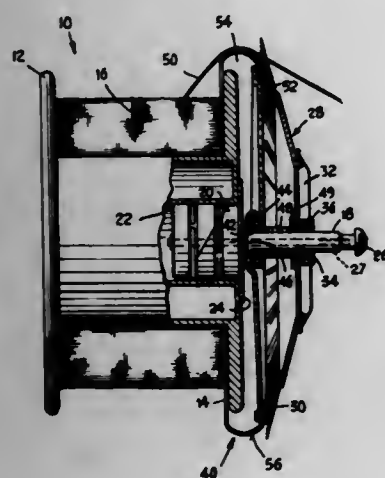
4,055,314

WIRE PAY-OFF CAP ASSEMBLY FOR WIRE SPOOLS
Joseph J. Kovaleski, Easton, Conn., assignor to Wyrepak Industries, Inc., Bridgeport, Conn.

Filed Sept. 17, 1976, Ser. No. 725,095
Int. Cl.² B65H 49/00

U.S. Cl. 242—128

9 Claims



1. A wire pay-off cap assembly for use with wire-filled, flanged spools to control the unreeling of wire past the ends thereof, comprising in combination:

- a. a support member,
- b. a stationary circular brush carried by said support member

and having radially extending tines disposed adjacent the rim of one flange of the spool, and
c. a freely rotatable wheel carried by the support member, d. said wheel being constituted of at least two separate pieces, one piece comprising a disk-like body having a bearing at its center for engagement with the support member, and the other of said pieces comprising a wheel flange having an annular exterior surface for sliding contact with a strand of wire being unreeling, and
e. cooperable attachment means on the body and wheel flange for releasably securing the two together whereby the flange, when worn or damaged, can be readily replaced without removing the body from the support member.

4,055,315

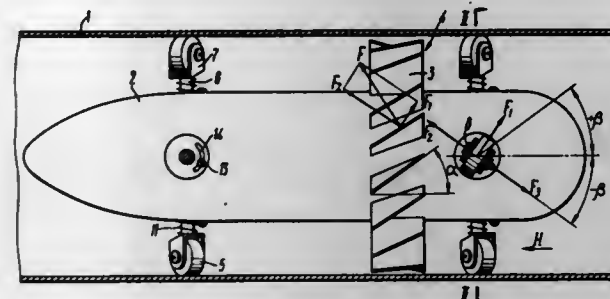
DEVICE FOR PIPELINE TRANSPORTATION OF LOADS BY FLUID FLOW

Konstantin Shalvovich Gvelesiani, ulitsa Pekina, 21, kv. 84; Zauri Mikhailovich Kadzhelashvili, ulitsa Mikeladze, 20, kv. 12; Alexandr Shalvovich Tskvitinidze, poselok TEVZ, kvartal 11, korpus 30, kv. 71; Otari Shalvovich Tusishvili, ulitsa Telavskaya, 17; Andrei Illarionovich Sherezadashvili, ulitsa Saakadze, 24; Gamlet Varlamovich Khabuliani, prospekt Vazha-Pshavela, kvartal IV, korpus 3, kv. 7; Lia Nakhshonovna Bakhanova, ulitsa Lermontova, 1, and Otari Vardenovich Tatishvili, Gldansky massiv, I mikroraiion, korpus 20a, kv. 83, all of Tbilisi, U.S.S.R.

Filed Apr. 14, 1976, Ser. No. 676,713
Int. Cl.² B65G 51/06

U.S. Cl. 243—33

12 Claims



1. A device for pipeline transportation of loads by the flow of fluid comprising: a body; a turbine wheel mounted on said body; blades of said turbine wheel set at an acute angle to the direction of the fluid flow; supporting rollers arranged at least in two rows and capable of moving radially with respect to the pipeline axis; said supporting rollers of at least one row mechanically linked with said turbine wheel; said supporting rollers of the other row mounted on said body; axles of said supporting rollers connected with said turbine wheel and set at an angle to the direction of the fluid flow, the value of said angle depending on the direction of movement of the device in the fluid flow.

4,055,316

METHOD AND EQUIPMENT FOR AERIAL TRANSPORT
John Lester Chipper, Bates Street, Rabaul, Papua, and Donald Bruce Owner, Taurama Road, Port Moresby, Papua, both of New Guinea

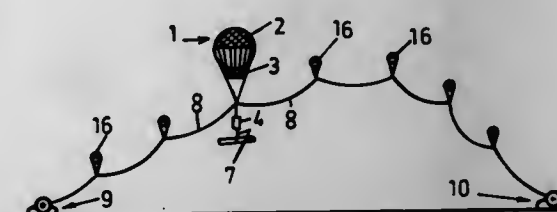
Filed Apr. 7, 1976, Ser. No. 674,635
Int. Cl.² B64B 1/50

U.S. Cl. 244—33

6 Claims

1. A method of aerially transporting loads between two sites, said method including the steps of locating a winch assembly at each of said two sites, attaching a ballasted inflated lift balloon by a cable to each winch assembly so that the lift balloon can be moved from one site to the other by winding cable on to a winch of one assembly and releasing cable from the winch of the other assembly, connecting removable support balloons to each cable to support the cable above any obstacles between

sites, winching the lift balloon to one site whilst progressively removing and adding support balloons to the respective cables, loading the lift balloon at one site by suspending a load from the lift balloon, ejecting an amount of ballast corresponding to the load added to the lift balloon, winching the lift balloon to the other site whilst removing and adding support balloons to the respective cables, removing the load from the lift balloon at said other site and reballasting the lift balloon and repeating the steps as above to return the ballasted balloon to said one site.



2. Equipment for aerial transport of loads between two sites comprising an inflated lift balloon, a dischargeable ballast holder connected to said balloon for ballast thereof, means for attachment of said load to said balloon, two winch assemblies each of which includes a winch, cables connecting the lift balloon to said winch assemblies and to each site, means for storing support balloons at each site, means for coupling said support balloons to said cables connecting said lift balloon to each said site, and means at at least one of the sites to add ballast to the ballast holder.

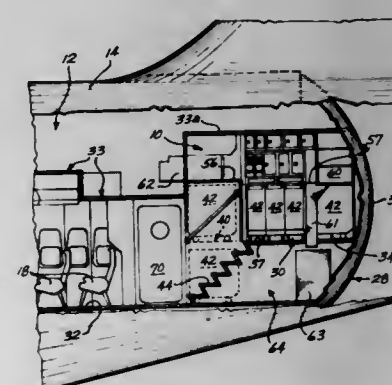
4,055,317

AFT MAIN DECK SPLIT LEVEL GALLEY
Rashad S. Greiss, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 30, 1976, Ser. No. 701,109
Int. Cl.² B64D 11/04

U.S. Cl. 244—118 P

11 Claims



1. In an airplane fuselage having a passenger deck, a ceiling, an aft end, and an aft pressure bulkhead, said bulkhead defining a concave recess in the rearward direction, said passenger deck abutting said bulkhead adjacent the bottom thereof, an improved galley for storing and preparing food for service to passengers on board said passenger deck comprising:

- a personnel supporting floor positioned adjacent said bulkhead, said floor being spaced above said passenger deck and being positioned below said ceiling by a distance sufficient to allow average head room for personnel standing on said floor, said floor abutting said bulkhead at a location thereon spaced rearwardly from the location at which said passenger deck abuts said bulkhead,
- means for connecting said floor with said passenger deck for providing access for personnel between said floor and said passenger deck, and
- means located on said floor for storing food-containing modules and for preparing food for service to passengers on said passenger deck.

4,055,318

CONSTRUCTION ELEMENT

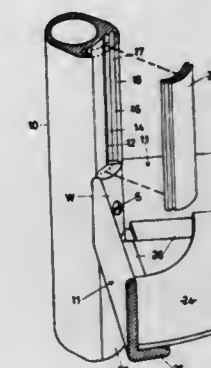
Herbert John Duckett, New Plymouth, New Zealand, assignor to Tasman Joinery Company Limited, New Plymouth, New Zealand

Filed Sept. 23, 1976, Ser. No. 726,008
Claims priority, application New Zealand, Oct. 24, 1975, 179053

Int. Cl.² A47G 29/02

U.S. Cl. 248—243

8 Claims



1. A construction joint comprising: a continuous length of the tube, rod or other extruded or rolled section, having on its periphery two seatings, each of said seatings including a tongue and a pair of substantially perpendicular abutment faces adjacent said tongue; two strips, each strip having a forward edge at one end thereof, each strip including a groove; and a screwably connected wedge, said two seatings being adapted to hold said one end of each of said two strips at a pre-determined angle to the line of the continuous length and to hold said wedge between said two strips, such that the two strips are firmly held into the seatings, each of said abutment faces engaging with said forward edge corner of one of said strips each of said tongues interlocking with said groove in one of said strips.

4,055,319

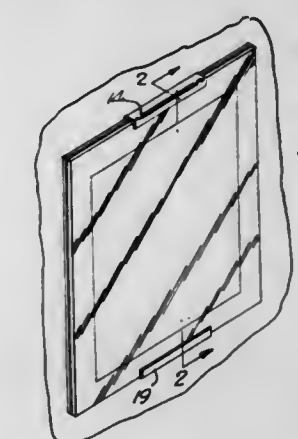
METAL PICTURE HANGER

Walter E. Pendock, 2910 Erie Blvd. East, Syracuse, N.Y. 13224
Filed July 21, 1976, Ser. No. 707,359

Int. Cl.² A47G 1/16

U.S. Cl. 248—491

1 Claim



1. A metal picture hanger for holding a picture, stiff backing and cover glass comprising an elongate top U-shaped channel having front and rear spaced parallel legs with the rear leg internally reverted to form a hook, said top channel adapted to enclose the top edges of said picture, said backing and said glass, an elongate bottom U-shaped channel having front and rear spaced parallel legs with the rear leg internally reverted to form a hook, said bottom channel adapted to enclose the bottom edges of said picture, said backing and said glass, a wire secured at one end to the hook of one of said channels, a tension spring secured at one end to said wire and at the opposite

end to the other of said channels, said spring and said wire securing said channels against disengagement, a braided portion adjacent the upper end of said wire, a hanger card threaded on said wire and engaging said braided portion, said card having a hole to receive a mounting nail for hanging the picture on a wall.

4,055,320

CHAIR CLAMP AND RESTRAINT

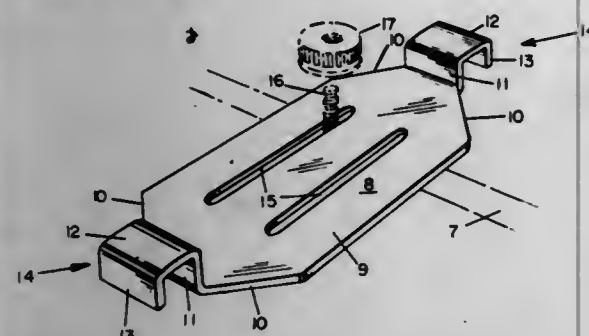
Robert J. Bengtsson, Colorado Springs, Colo., assignor to AMI Industries, Inc., Colorado Springs, Colo.

Filed Aug. 17, 1976, Ser. No. 715,125

Int. Cl.² A47C 7/00

U.S. Cl. 248—501

4 Claims



1. In combination with a chair having legs and leg frame members, said frame members connecting the front and rear legs, and a mounting track on a mounting surface for said chair, of a chair mounting bracket extending at right angles to said track and spans said leg frame members, said bracket including a generally flat midsection, generally inverted U-shaped clamp means at opposing ends of said bracket, apertured means in said midsection, and bolt means anchored in said track received in said apertured means, said clamp means fitting over and interengaging with said leg frame members whereby said chair is slidably adjustable relative to said bracket and track during reciprocal movement of said chair but restrained from other movements.

4,055,321

INSIDE CONCRETE COREWALL FORM WITH PARTICULAR THREE-WAY HINGE ASSEMBLIES THEREFOR

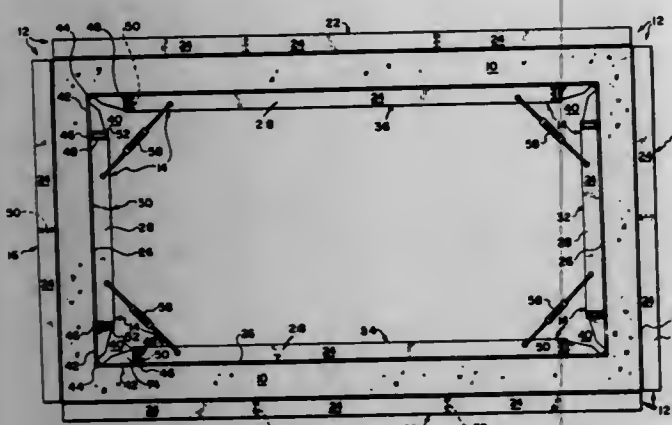
Vernon R. Schimmel, Arlington Heights, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Dec. 6, 1976, Ser. No. 736,860

Int. Cl.² E04G 15/06; B28B 7/30

U.S. Cl. 249—182

11 Claims



1. An inside articulated and collapsible concrete form for a rectangular corewall, said form comprising four form sides arranged in quadrilateral relationship, each side including an outwardly disposed facing with a marginal reinforcing frame having side and end rails, and a three-way corner hinge assembly operatively connecting each pair of adjacent end rails together, each hinge assembly embodying a pair of elongated main hinge leaves having their proximate ends hingedly connected together for swinging movement of the leaves toward

and away from each other between an extended position wherein such leaves define a right angle, and a collapsed position wherein such leaves define an acute angle, and a pair of secondary hinge leaves having their proximate ends hingedly connected to the distal ends of said main hinge leaves, and means for fixedly securing each of said secondary hinge leaves to the adjacent end rail, said main hinge leaves, when in their right angular relationship, serving to maintain the form in a fully expanded condition wherein each of said facings is coplanar with one main hinge leaf of each adjacent hinge assembly so that the peripheral outline of the form as a whole conforms to the outline of the inner surfaces of the corewall which is to be formed, said main hinge leaves of the hinge assemblies, when assuming identical acute angle relationships, serving to maintain said form sides in a quadrilateral right angular relationship and with their facings spaced inwards of said peripheral outline of the form when in its extended position.

4,055,322

PERMEABLE LINER HAVING CONCRETE SETTING RETARDANT

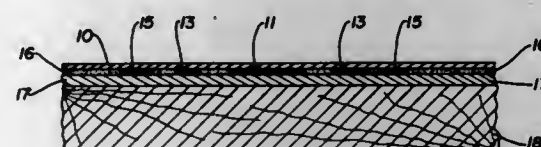
Hugh I. Cassidy, 2845 Yorba, San Francisco, Calif. 94116

Filed Nov. 13, 1975, Ser. No. 631,485

Int. Cl.² B28B 7/36

U.S. Cl. 249—187 R

8 Claims



1. An article for preparing concrete with a textured pattern on the surface thereof comprising:
 - A. a water permeable membrane,
 - B. a pattern on one side of said membrane with said pattern delineated by a water soluble retardant which retards setting of cement, and
 - C. a waterproof film coating said pattern and bonded to said membrane immediately adjacent to the delineation of said pattern.

4,055,323

BUTTERFLY VALVE

Jean Gachot, 26 bis, Avenue de Paris, Soisy-sous-Montmorency, Val-d'Oise, France

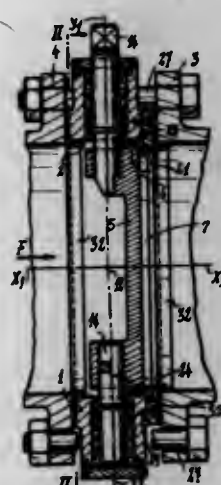
Filed Feb. 12, 1976, Ser. No. 657,536

Claims priority, application France, Feb. 18, 1975, 75.04967

Int. Cl.² F16K 1/22

U.S. Cl. 251—306

2 Claims



1. A butterfly valve having a body pierced by a passage designed to come into position opposite to two adjacent portions of a piping system, a valve closure disc mounted for

rotation within the valve passage about an axis which is transverse to said passage and displaced with respect to its axis of rotation, the valve disc having at its periphery an annular edge portion having a convex profile associated with an annular seal which is mounted so as to project within the valve passage, said seal comprising a removable metallic ring coated at least partially with plastic material, the ring having a substantially cylindrical plastic-coated metal mouthpiece mounted within one end portion of the valve passage, the internal surface of said mouthpiece being such as to have a profile which is flared in the direction of the axis of the valve disc whose peripheral edge portion is capable of bearing against said internal surface in fluid-tight manner, retaining means for maintaining the ring within said valve passage in a predetermined position with respect to said valve disc, said ring having an L-section profile metal radial flange integral with the mouthpiece and having a larger diameter than said mouthpiece, the two faces of said flange being capable of bearing in fluid-tight manner against the valve body at the end of the valve passage and against the flange of an adjacent pipe section, the metal mouthpiece of the metallic ring which is mounted within the valve passage being slotted to provide radial elasticity of said mouthpiece, an outer cylindrical surface of said metal mouthpiece being plastic coated and in fluid-tight contact with said one end portion of the valve passage.

member resilient collars, and resiliently supported for rotation by resilient valve seating and sealing members at the top and bottom regions of said valve member; and d. means to engage said valve member and rotate same while thus supported.

4,055,325

LUBRICANT POCKET FOR PRESSED IN GATE VALVE SEAT

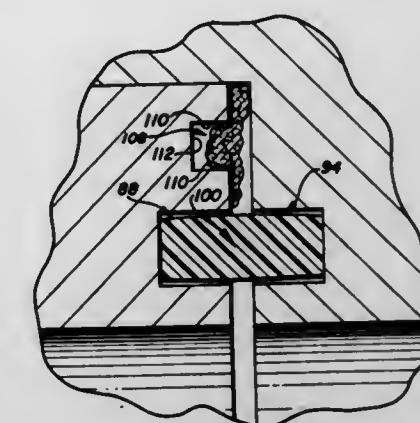
Larry A. Vyvial, Richmond, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,239

Int. Cl.² F16K 3/30; B23P 17/00

U.S. Cl. 251—328

5 Claims



3. A gate valve structure comprising a valve body having a valve chamber therein and an upstream flow passage communicating with the valve chamber, a gate valve mounted within the valve chamber for movement between open and closed positions, said valve body having an annular recessed portion about the upstream flow passage and a circumferential groove in the recessed portion facing the valve chamber, a generally cylindrical seal about the upstream flow passage and fitting within the recessed portion in face-to-face abutting contact with the recessed portion, and a deformable seal of an elongate cross-section positioned within said groove and filling between 80 and 100% of the total cross-sectional area of the groove, said seal upon being inserted within the groove being deformed when the seat is fitted in face-to-face abutting contact within the recessed portion to fill substantially the entire cross-sectional area of the groove, said seat having a relatively small annular channel in outer concentric relation to said relatively large circumferential groove to provide a lubricant pocket for lubricant forced along the inner peripheral surface defining the associated recess when the seat is pressed within the recess thereby to remove the lubricant from the adjacent recess surfaces and permit face-to-face abutting metal-to-metal contact between the seat and valve body without the seat being spaced from the body by a layer of lubricant.

4,055,324

PLUG VALVE ASSEMBLY

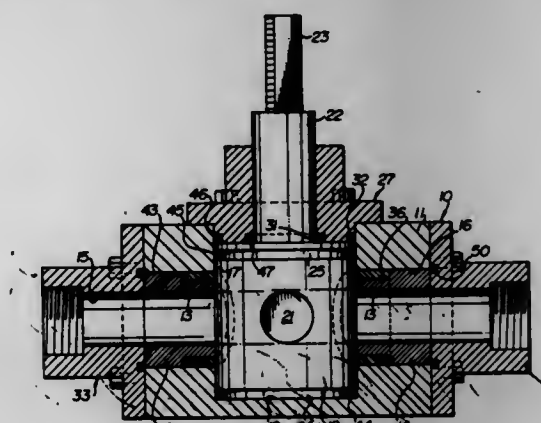
John F. Hughes, 91 d'Avignon, Dollard des Ormeaux, Quebec, and Stanislaw Dalkin, 3236 - 7th St., Chomedey, Quebec, both of Canada

Filed Apr. 29, 1976, Ser. No. 681,697

Int. Cl.² F16K 5/00

U.S. Cl. 251—309

7 Claims



1. A plug valve assembly comprising:
 - a. a housing having aligned generally cylindrical inlet and outlet ports in the side walls thereof, a cylindrical valve chamber therebetween having its vertical axis normal to the axes of said ports and being closed by end walls;
 - b. generally cylindrical valve sealing members slidably mounted in the cylindrical walls of said ports, each said sealing member having a main body portion with a concave end face portion adjacent said valve chamber and an axial bore extending therethrough, said main body portion having an annular recess on the cylindrical surface thereof extending from said concave end to an annular abutment intermediate the length of said main body portion and a generally tubular resilient collar slidably mounted on the recessed portion of said main body, said collar having a thickness substantially equal to the depth of said recess and having a concave end portion protruding beyond the concave end of the main body portion by a distance of about 0.025 to 0.25 mm;
 - c. a cylindrical valve member having at least one transverse port therethrough positioned within said chamber with an annular gap of about 0.025 to 0.25 mm between the cylindrical valve member and the cylindrical wall of the valve chamber, said valve member being in resiliently sealing engagement with the concave end portions of the sealing

4,055,326

NEEDLE VALVE MEMBER FOR A CONTROL DEVICE AND METHOD OF MAKING THE SAME

William J. Sanders, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 25, 1976, Ser. No. 661,059

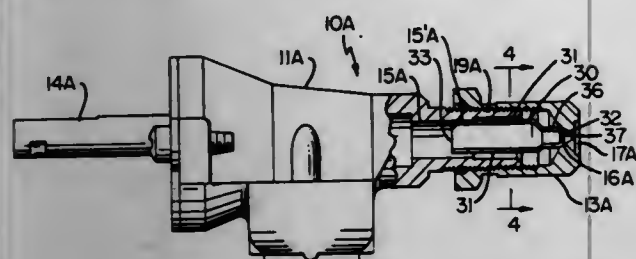
Int. Cl.² F16K 31/00

U.S. Cl. 251—351

12 Claims

1. In a control device having a passage means provided with a valve seat for fuel flow therethrough and a needle valve member for cooperating with said valve seat for controlling the fuel flow therethrough while providing a minimum controlled fuel flow through said valve seat when said needle valve member is fully seated against said valve seat, the improvement wherein said needle valve member comprises a drawn one-piece elongated substantially cup-shaped member having tubular side wall means and a substantially flat end wall

means closing off one end of said tubular side wall means and being substantially transverse thereto, said end wall means being adapted to close against said valve seat and having an opening therethrough to cause said minimum flow through said valve seat when seated thereagainst, said cup-shaped member having said side wall means so arranged relative to said passage means that fuel is adapted to flow through said passage means and external of said side wall means to said



valve seat, said side wall means having a substantially triangular transverse cross-sectional configuration while said passage means has a substantially circular transverse cross-sectional configuration, said cup-shaped member having said side wall means stepped down adjacent said end wall means to define a reduced cylinder section between said triangular configuration and said end wall means so that said end wall means is cantilevered in said passage means.

4,055,327

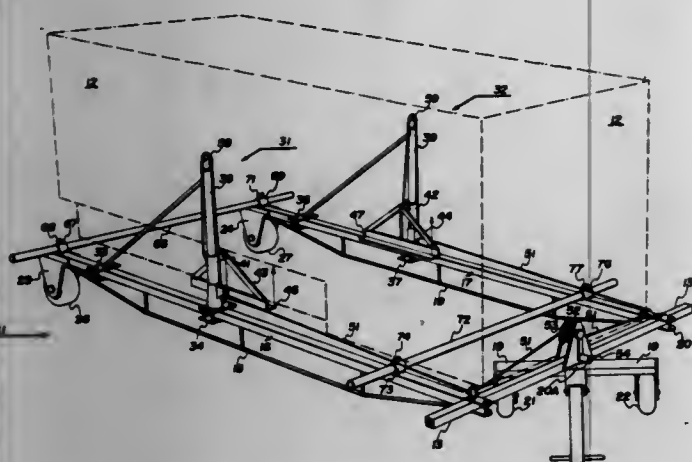
CAMPER LIFTER DEVICE

Henry R. Burgi, 1193 Florida St., Imperial Beach, Calif. 92032
Continuation of Ser. No. 620,946, Oct. 9, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 763,791

Int. Cl.² B66F 7/26

U.S. Cl. 254-47

2 Claims



1. A lifter device for lifting and transporting campers comprising:

- a frame having first and second side members and an end member, said first and second side members and end member being substantially co-planar, said end member being adjustably attached to said first and second side members;
- first and second lifting assemblies slidably attached to said first and second side members, respectively, whereby said first and second lifting assemblies are forwardly and reversibly adjustable to a camper carried thereon, said first and second lifting assemblies including first and second lifting bars, respectively;
- a lifting cable assembly coupled to said first and second lifting bars and operable for raising and lowering said lifting bars on said lifting assembly; and
- first and second structural members removably attached on top of said first and second side members, said first and second structural members being inwardly and outwardly adjustably secured and positioned for carrying said camper thereon.

4,055,328

BALE-TIE JOINER TOOL

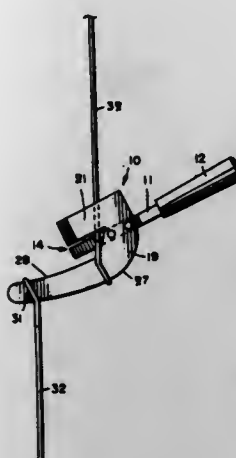
Emil Simich, Chicago, Ill., assignor to A. J. Gerrard & Company, Des Plaines, Ill.

Filed Nov. 5, 1976, Ser. No. 739,197

Int. Cl.² B66F 19/00

U.S. Cl. 254-79

8 Claims



1. A bale-tie joiner tool for use in engaging and interlocking together the upper and lower pre-formed looped ends of the bale-tie wire extending around a compressed bale, including in combination:

- elongated shaft means,
- handle means mounted on one end of said shaft means, and
- tool means mounted on said other end of said shaft means opposite said handle means, said tool means including bracket means having first and second tab members thereon extending forwardly of said other end of said shaft means, said second tab member being engageable with the upper and lower looped ends of the bale-tie wire when the joiner tool is in a horizontal at rest position, the pivotal clockwise movement of the joiner tool to a vertical actuated position thereby causing the lower looped end to be cammed towards and become engaged with the upper looped end, and the pivotal return of the joiner tool to the horizontal at rest position thereby causing the upper and lower looped ends of the wire to be interlocked together.

4,055,329

SCISSORS JACK

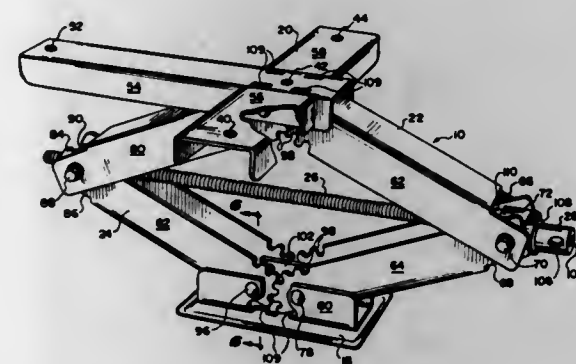
Grover M. Hammond, Streamwood, Ill., assignor to Leisure Manufacturing Co., Inc., Des Plaines, Ill.

Filed July 19, 1976, Ser. No. 706,787

Int. Cl.² B66F 3/00

U.S. Cl. 254-86 R

9 Claims



1. A scissors jack comprising:
a baseplate including a first channel-shaped member secured to said plate with the channel thereof opening upwardly of said plate;
means adapted to be mounted permanently to the bottom of a vehicle including a second channel-shaped member aligned substantially parallel with said first channel-shaped member and having its channel opening down-

wardly towards the baseplate, said mounting means including

a third and a fourth channel-shaped member having their channels opening downwardly, secured to opposite sides of said second channel-shaped member and aligned with one another substantially normal to said second channel-shaped member;

opposed pairs of channel-shaped scissors arms vertically aligned with said channel-shaped members and each pair of said arms being hingedly secured together at one end thereof to form a pivot point, the ends of each pair opposite its pivot point having teeth formed therein, the teeth of the upper arms being intermeshed and the upper arms being hingedly connected to said second channel-shaped member, and having their channels opening downwardly, the teeth of the lower arms being intermeshed and the lower arms being hingedly connected to said first channel-shaped member and having their channels opening upwardly, the toothed ends of the upper arms being disposed for pivotal movement within the channel of the second channel-shaped member and the toothed ends of the lower arms being disposed for pivotal movement within the channel of the first channel-shaped member;

a bushing mounted for limited swinging movement at one pivot point and a nut mounted for limited swinging movement at the other pivot point;

a threaded rod extending between the pivot points and journaled in the bushing for free rotation therein while threadedly engaging in the nut;

means for rotating the rod;

means for preventing axial movement of the rod relative to the bushing, the length of the rod being greater than the distance between pivot points when the scissors arms are closed to their maximum extent;

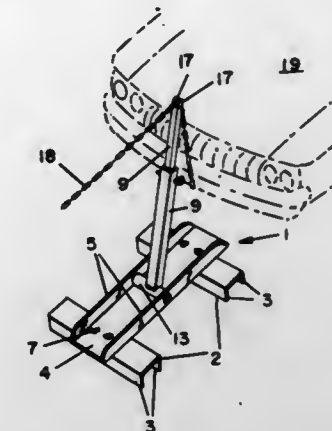
means for protecting said threaded rod when said scissors arms are closed to their maximum extent;

rotation of the rod serving to open or close the scissors arms whereby to vary the vertical spacing between the first and second channel-shaped members without changing the parallel disposition of one relative to the other;

engagement means for keeping said teeth intermeshed at all positions of said scissors arms and for relieving stress on said hinged connections of said first and second channel-shaped members;

said scissors arms hingedly connected within said first and second channel-shaped members by oppositely positioned pairs of individual pin means, each engaging one side of the hingedly connected scissors arms; and
said engagement means including straps secured between opposite ones of each pair of pin means in said first and second channel-shaped members.

pivot said lever upwardly to raise and free the vehicle and thereafter cause said lever to collapse forwardly to disengage



said chain and permit continued uninterrupted forward travel of the vehicle.

4,055,331

METHOD OF CLEANING STACK GAS AND USING SAME FOR GENERATION OF ELECTRIC POWER

Karl-Rudolf Hegemann, Essen-Bergerhausen, Germany, assignor to Gottfried Bischoff Bau Kompl. Gasreinigungs und Wasserruckkulanlagen Kommanditgesellschaft, Essen, Germany

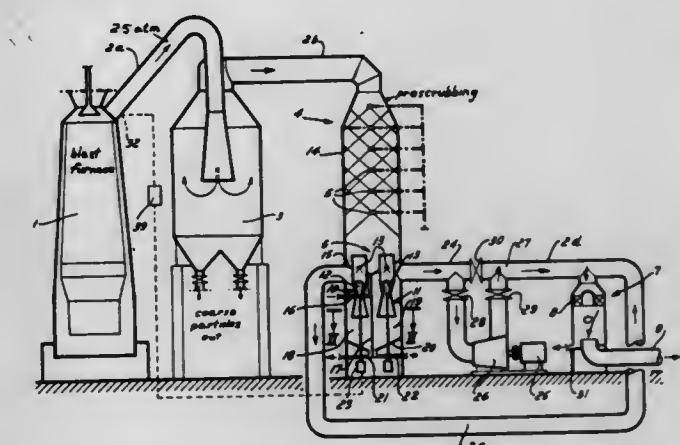
Continuation-in-part of Ser. No. 520,920, Nov. 4, 1974, Pat. No. 4,007,025. This application June 4, 1976, Ser. No. 692,731

Claims priority, application Germany, Nov. 6, 1973, 2355457; Aug. 20, 1974, 2439758; Aug. 20, 1974, 2439757

Int. Cl.² C21B 7/22

U.S. Cl. 266-44

4 Claims



1. A method of cleaning stack gas under pressure from a blast furnace, said method comprising the steps of:
continuously collecting said gas at said furnace;
removing particulate material from said gas; thereafter washing the collected gas;
thereafter passing a portion of the washed collected gas through a variable cross section annular-gap washer and passing the remainder of said gas through another annular-gap washer and directly thereafter through an expansion turbine, said remainder of said gas driving said turbine;
varying the flow cross section of said variable annular-gap washer in accordance with the pressure of said gas at said blast furnace so as to maintain said pressure constant, said variable annular-gap washer constituting the sole controller of the back pressure of said blast furnace;
driving an electric generator with said turbine; and
combining said portion and said remainder of said gas downstream of said washers and said turbine.

4,055,330

LIFTING DEVICE FOR RAISING AND FREEING STUCK VEHICLES

Donald A. Chapman, 14997 S. Furrow Road, Larkspur, Colo. 80118

Filed Mar. 15, 1977, Ser. No. 777,823

Int. Cl.² B66F 3/00

U.S. Cl. 254-131

6 Claims

1. A lifting device for raising and freeing stuck vehicles comprising a pair of relatively wide flat spaced channelled supporting plates, a relatively wide flat channelled base plate spanning and removably interconnected to said supporting plates, an elongated square shaped tubular lever, a square shaped upper section telescopically received in said lever, a transverse tubular bearing on the lower end of said lever, said bearing positioned on said base plate and receiving hinge pin means therein for pivotally connecting said lever thereto, means on the upper end of said upper lever section for receiving a towing chain therethrough for connection to a vehicle to be raised and towed, whereby a pull exerted on said chain will

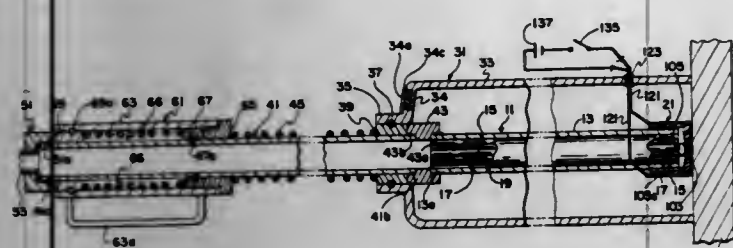
4,055,332

CUTTING TORCH ARRANGEMENT

Patrick E. Sweeney, Baltimore, Md., assignor to AAI Corporation, Cockeysville, Md.
Division of Ser. No. 628,009, Nov. 3, 1975. This application Aug. 30, 1976, Ser. No. 718,717
Int. Cl.² B23K 7/10

U.S. Cl. 266—48

12 Claims



1. A cutting torch arrangement comprising a thermal bar comprising a burner pipe having combustible rod-like elements extending along a length thereof, with longitudinal gas passageways formed therebetween for feeding of oxygen gas along the interior of said pipe and enabling igniting and burning of one end of said thermal bar, and a protective annular shroud/shield longitudinally movable disposed over and along the forward ignitable end of said burner pipe, said shroud/shield having an open forward end, means for moving said burner pipe forwardly within and toward said open end of said shroud/shield as said bar is burned at said one end, a feed pipe, securing means for removably securing said burner pipe to said feed pipe in gas flow-enabling relation, said feed pipe slidable and within and along said shroud/shield, said securing means being disposed within said shroud/shield, and a compression spring disposed longitudinally of said burner pipe and having its forward end acting in force-transmitting relation to said shroud/shield for resiliently urging said shroud/shield against a target structure.

4,055,333

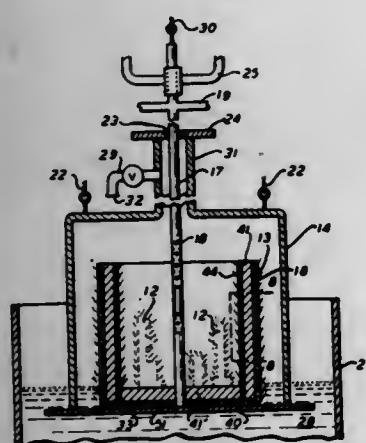
APPARATUS FOR HEAT TREATING WORK

William E. Engelhard, Owego, N.Y., assignor to Owego Heat Treat, Inc., Apalachin, N.Y.
Division of Ser. No. 592,040, June 30, 1975, Pat. No. 3,972,751, which is a continuation-in-part of Ser. No. 380,067, July 17, 1973, abandoned. This application June 4, 1976, Ser. No. 682,491

Int. Cl.² C21D 1/62

U.S. Cl. 266—130

19 Claims



1. In an apparatus for cooling work which has been preheated and positioned in a work holder; quenching medium means proportioned to freely receive said work holder therein,

means for positioning said work holder in said quenching medium means, said work holder including a wall apertured for flow of said quenching medium therethrough and onto the work in said work holder, to cool said work, a plurality of heat exchange units, and means so positioning said units on said wall, whereby, on positioning said work holder and work in said quenching medium, said medium will flow through said apertured wall of said work holder and onto and around said heat exchange units and into the work holder and onto said work, and cooling the same.

4,055,334

RECYCLE BURNER SYSTEM

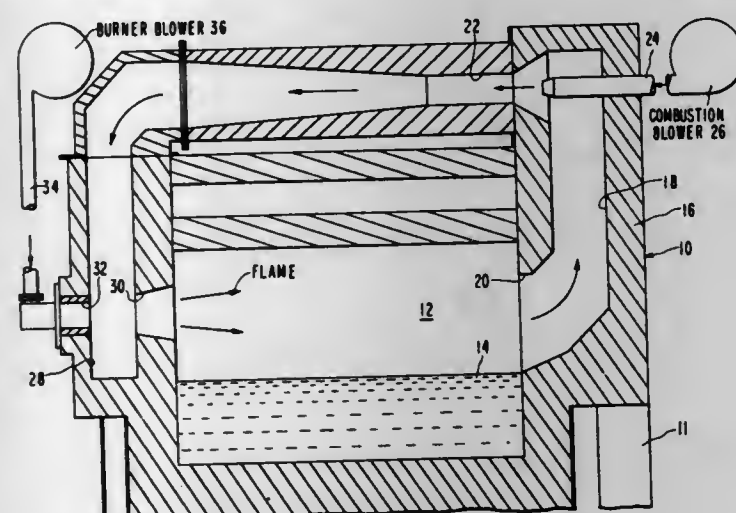
Wilbur E. Stephens, Redwood City, Calif., assignor to Alumax Inc., San Mateo, Calif.

Filed Feb. 9, 1976, Ser. No. 656,265

Int. Cl.² F27B 3/22

U.S. Cl. 266—138

4 Claims



1. An improved furnace of the type having a closed furnace chamber for containing a bath of molten metal, the furnace chamber having a main burner port, and burner means for establishing a flame path over the bath of molten metal by admitting fuel and oxygen to the interior of the chamber through the main burner port wherein the improvement comprises burner means which introduces both fuel and only a portion of the oxygen requirement for total combustion of the fuel, a passage external to the furnace chamber for recycling exhaust gases from the furnace chamber back to the main burner port, and eductor means for introducing the additional oxygen necessary for complete combustion into the recycling passage under pressure and in a direction to propel the exhaust gases in the recycling passage towards the main burner port, whereby the oxygen added into the recycling passage by the eductor means is preheated by mixing with the furnace chamber exhaust gases and the flame path is lengthened.

4,055,335

TRANSFORMATION OF TOP-BLOWN STEEL CONVERTER VESSEL TO BOTTOM-BLOWN TYPE

Howard M. Fisher, New Castle, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.
Division of Ser. No. 261,823, June 12, 1972, Pat. No. 3,810,297.

This application Feb. 1, 1974, Ser. No. 438,586

Int. Cl.² C21C 5/46, 5/50

U.S. Cl. 266—245

2 Claims

- <

secured to another drill string member; drilling fluid passage means within the tubular body and the mandrel for the passage of drilling fluid; and an annular sealed chamber within the tubular body above the mandrel containing pressurized fluid for absorbing load and shock, the improvement which comprises in combination:

annular and axially spaced seals between the mandrel and a lower portion of the tubular body to define a lubricant cavity sealed from the chamber to lubricate said seals; lubricant passage means for supplying lubricant from an exterior source to said lubricant cavity; and grease fitting means communicating with said lubricant cavity to introduce and retain lubricant within said lubricant passages and cavity at a selected pressure greater than ambient.

4,055,339

SORTER APPARATUS

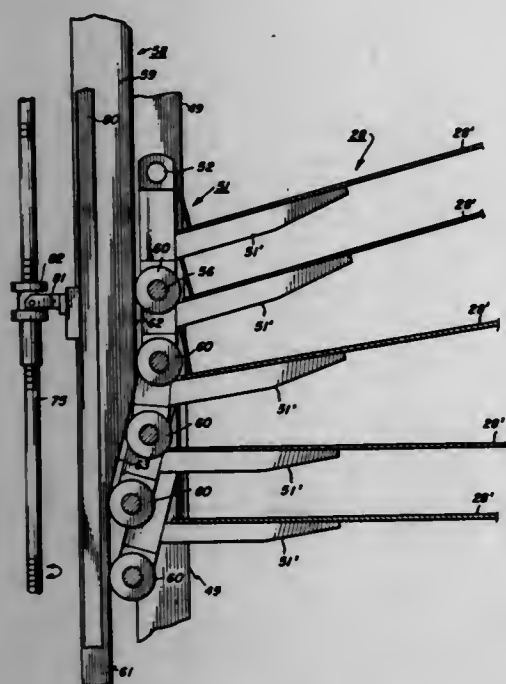
John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 27, 1977, Ser. No. 763,276

Int. Cl.² B65H 39/10

U.S. Cl. 271-173

3 Claims



1. Improved sorting apparatus comprising:
a frame;
a plurality of bin members arranged in a vertical array supported for sliding and pivotal movement relative to said frame;
means for moving said bin members relative to said frame;
an elongated cam member coextensive with the vertical array of bins, said cam member having a predetermined camming profile which extends in a vertical direction then inclines to define a ramp at a sheet entering station associated with said moving bin members, and then extends in a vertical direction for the remaining extent thereof;
said bin members each having cam follower means associated therewith positioned to move in contact with said cam member whereby as each of said bin members is moved past the sheet entering station pivotable movement is imparted thereto to effect spreading movement between said bin members thereat.

4,055,340

ASSISTED PNEUMATIC TRANSPORT AND REGISTRATION APPARATUS

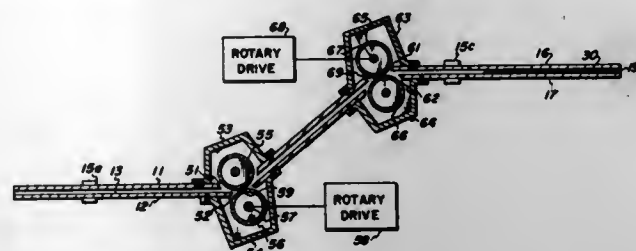
Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 636,334

Int. Cl.² B65H 29/24

U.S. Cl. 271-236

14 Claims



1. Apparatus for transporting a sheet through at least one curved path and for registering the sheet with respect to perpendicularly related axes, the sheet having a length and width within predetermined ranges, comprising:
a. a sleeve for internally accommodating said sheet, said sleeve extending along the curved path, at least one point on an inner narrow wall of the sleeve being aligned in parallel with one of the axes;
b. a stop located at one end of the sleeve, the stop having at least one point aligned in parallel with the other of the axes;
c. means for guiding the sheet past corners of said at least one curved path; and
d. means for providing in the sleeve a fluid stream having velocity components normal to each of the axes, whereby when a sheet is placed in the sleeve the stream moves the sheet into said means (c) and into abutment with each of said points;
said means for guiding including a first opening at a corner of a curved path in the top wide wall of the sleeve, a second opening, located opposite the first opening on the bottom wide wall of the sleeve, a first rotatably mounted roller extending into the sleeve through one of the openings, a second rotatably mounted roller extending into the other opening of the sleeve and engaging the first roller to provide a nip, and means for driving one of the rollers.

4,055,341

TILTING MAZE RACE GAME

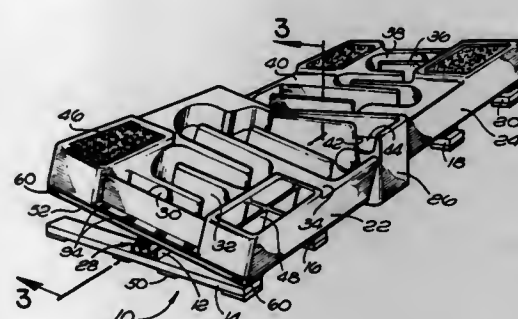
Daniel G. Martinez, Sylmar, Calif., assignor to Gilbert Sacks Enterprises, Inc., El Monte, Calif.

Filed Aug. 13, 1976, Ser. No. 714,056

Int. Cl.² A63B 71/04; A63F 9/14

U.S. Cl. 273-86 C

11 Claims



1. A game apparatus for use by at least two players simultaneously comprising:
a. a base member;
b. first and second platforms pivotally engaging said base member in spaced apart relationship thereon, each of said platforms defining a tortuous path through which a ball may travel; and
c. a ball receiving member fixedly mounted upon said base

between said platforms and defining first and second openings therein, said first opening aligning with the tortuous path in said first platform and the second opening aligning with the tortuous path in said second platform, the lowermost part of said first opening and the surface of said tortuous path in said first platform are aligned only when said first platform is in a predetermined tilted position and the lowermost part of said second opening and the surface of said tortuous path in said second platform are aligned only when said second platform is in a predetermined tilted position.

4,055,342

BASEBALL GAME AMUSEMENT DEVICE

Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Co., Ltd., Tokyo, Japan

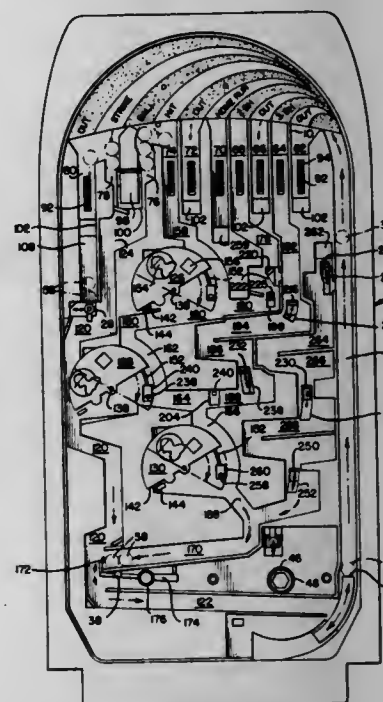
Filed Dec. 8, 1976, Ser. No. 748,677

Claims priority, application Japan, Sept. 8, 1976, 51-107396

Int. Cl.² A63F 7/06

U.S. Cl. 273-88

10 Claims



9. In a baseball game amusement device of the type having a mechanism for propelling balls within a casing into a target are provided with indicia corresponding to the various functions performed during the playing of baseball, and a baseball diamond provided with indicia designating first, second, and third bases and passageways operatively connecting said target zones and said bases, the improvement comprising a plate member associated with each of said first, second and third bases, means mounting said plate to said casing to rotate between a first position wherein indicia thereon is exposed to the view of the player indicating that said base is occupied and a second position wherein said indicia is not exposed to view, means provided on said plate for catching one of said balls causing said plate to move from said second position to said first position, and an actuating member associated with each of said plates, each having means mounting said actuating member to said casing for rotation, a first rod extending from said actuating member to a position preventing a ball from leaving said means for catching said balls when its associated plate is in said first position, and rod means extending into said passageways which when contacted by a ball passing therethrough causes said actuating member to rotate moving said first rod permitting a ball to leave said means for catching said balls provided on said plate.

4,055,343

SURFACE PROJECTILE GAME APPARATUS

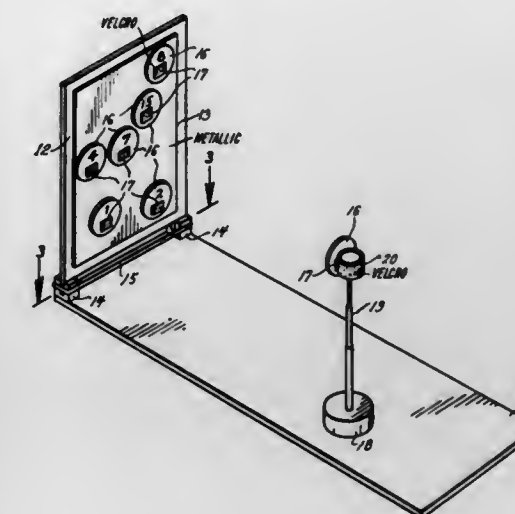
Edwin G. Stuart, 308 Patterson Lane, Florissant, Mo. 63031

Filed May 21, 1976, Ser. No. 688,742

Int. Cl.² A63F 9/14

U.S. Cl. 273-108

9 Claims



1. A game apparatus comprising, in combination, an elongated horizontal game playing surface, a game board having an adherent surface, support means at one end of said game playing surface supporting said game board in a substantially vertical plane such that said adherent surface is facing in the direction of the other end of said game playing surface, a rebound means; said rebound means being affixed between at least two points at said one end of said game playing surface immediately in front of, near, and across the base of said game board, a game piece transporter; said game piece transporter having a substantially flat bottom surface and a shaft extending substantially vertically upward therefrom, said shaft having a vertically adjustable adherent means mounted thereon, a game piece having opposite sides; said game piece having adherent means on one of its sides permitting releasable affixation to said adherent surface on said game board and adherent means on the side opposite said one side permitting releasable affixation to said adherent means mounted on said shaft; the adherence between said adherent means on said game board and said one side of said game piece being greater than the adherence between the adherent means on said shaft and said adherent means on said side opposite said one side of said game piece such that when said game piece is attached to said adherent means on said shaft and said game piece transporter is propelled from said other end of said game playing surface and into said rebound means said game piece will be deposited upon said game board adherent surface as said game transporter is rebounded towards said other end of game playing surface of said rebound means.

4,055,344

ROTATING MAZE GAME DEVICE

Claude Soucie, 6807 60th St., Ridgewood, N.Y. 11227

Filed May 14, 1976, Ser. No. 686,458

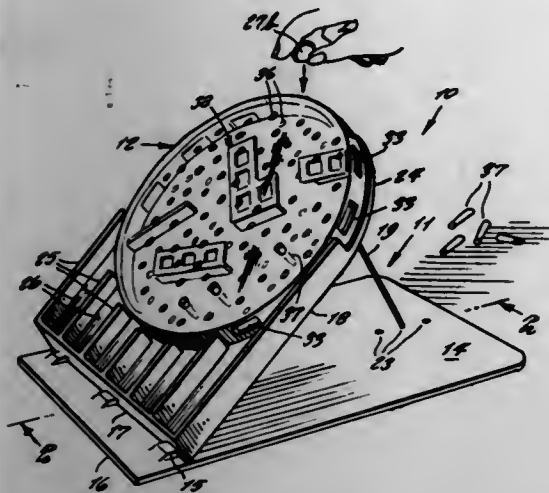
Int. Cl.² A63B 71/04; A63F 5/02, 7/02

U.S. Cl. 273-110

2 Claims

1. A rotating maze game device, comprising in combination, an easel, a rotatable maze supported pivotally thereupon, and playing pieces for travel through said maze; wherein said easel comprises a horizontal base panel, an inclined panel supported at an inclined angle upon said base panel by means of a brace, and means for adjusting said inclined angle; wherein said maze comprises a circular housing supported pivotally free at the center upon a pivot secured upon said inclined panel, said housing comprising a case and transparent cover that snap fit together for easy opening, to form a central compartment, side walls of said case and cover having aligned openings serving as entrances and exits for said playing pieces, and aligned open-

ings in upper and lower sides of said housing for supporting obstructions in selective positions inside said housing compartment for said playing pieces; wherein certain said obstructions comprise adjustable taper pins; wherein other of said obstructions comprise houses each of which consists of a side wall of



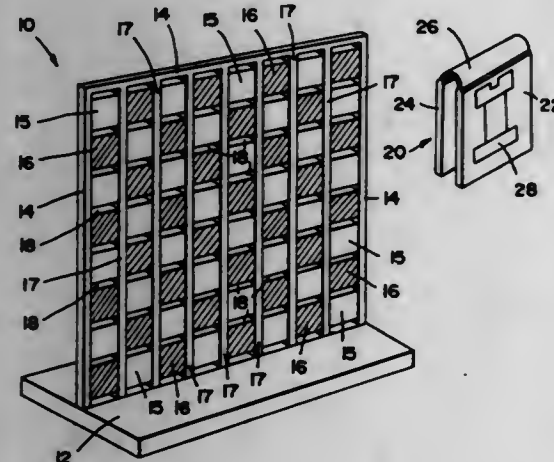
any straight or bent shape and a separate opaque top wall having window openings therethrough, a lower edge of said house side walls having downward extending pegs for insertion into said opening through said lower side of said housing, while said opaque top wall is adhered to an underside of said housing top wall.

4,055,345 GAME APPARATUS

Vaclav Havlik, 888 Foster City Blvd., Foster City, Calif. 94402
Filed Oct. 23, 1975, Ser. No. 625,185
Int. Cl.² A63F 3/02

U.S. Cl. 273—131 AC

13 Claims



1. Game apparatus comprising in combination a game board of given area and thickness and having opposed substantially parallel major surfaces, a plurality of individual slots through said game board defining a given number of playing fields arranged with respect to each other in a planar array of rows and columns of given areas of the opposed major surfaces of said game board, said major surfaces of said playing fields each having an area less than said given area of said array divided by said given number of said playing fields, material disposed between and interconnecting all adjacent corners of said playing fields in said array; and a plurality of game pieces each comprising a pair of indicia bearing bodies, the indicia on a respective one of said pair of indicia bearing bodies of each game piece being the same as the indicia on the respective other one of said pair of indicia bearing bodies of said game piece, and means joining said bodies to each other at one of their ends, said means joining said bodies of each of said game pieces allowing said bodies to extend in mutually parallel planes spaced from each other by a distance at least equal to and not much greater than said given thickness of said game board, at least one of the material forming said interconnected

adjacent corners of said playing fields in said array, said means joining said pair of indicia bearing bodies of each of said plurality of game pieces and said plurality of playing fields being flexible.

4,055,346 TABLE WAR GAME APPARATUS

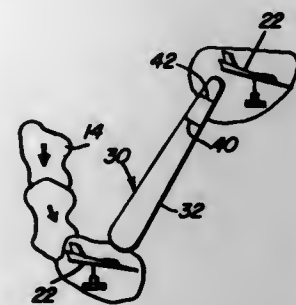
Marcos Garcia-Kuenzli, P.O. Box 2212, Hato Rey Station, San Juan, P.R. 00919

Filed Apr. 5, 1976, Ser. No. 673,469

Int. Cl.² A63F 3/04

U.S. Cl. 273—131 BB

7 Claims



3. A game device comprising a game board having a generally planar playing surface, a map of a geographical area depicted on said playing surface by indicia, a plurality of irregularly-shaped discrete areas delineated on the playing surface by perimeter lines defining the boundaries of the areas, said areas being contiguous, with certain groups of areas being distinguishably colored to designate obstruction areas and target areas, the obstruction areas and target areas representing mountain areas and cities, respectively, and a plurality of game pieces positionable on the game board with each game piece having a supporting platform positionable on the various discrete areas on the game board to enable the game pieces to be moved along the game board, the platforms being distinguishably colored to indicate the vertical position of a game piece supported by that platform, wherein the game pieces are miniature aircraft, and the color system of the platforms indicate the flight altitude of the aircraft supported by the platform, wherein the aircraft are separated into two groups which are distinguishably colored to be used by opponents playing a game with an equal number of areas designated as cities being assigned to each player, whereby the aircraft may attack the aircraft of opponents or bomb cities of opponents by maneuvering aircraft to change altitude by utilizing differently colored platforms and by moving from area to area during each player's turn in which a predetermined number of actions may be taken by each aircraft, and a measuring device means for determining whether an attacking aircraft has properly approached an attacked aircraft by determining whether the distance between the area of the attacking aircraft and the area of the attacked aircraft is between a first and a second distance, and for determining whether a missile fired by the attacking aircraft hits or misses the attacked aircraft by determining whether the distance between the area of the attacking aircraft and the area of the attacked aircraft is between said first distance and a third distance which is between the first and second distances.

4,055,347 BOARD GAME APPARATUS

Lois A. Kreischer, 8 Indian Trail Court, Novato, Calif. 94947
Filed June 24, 1976, Ser. No. 699,350

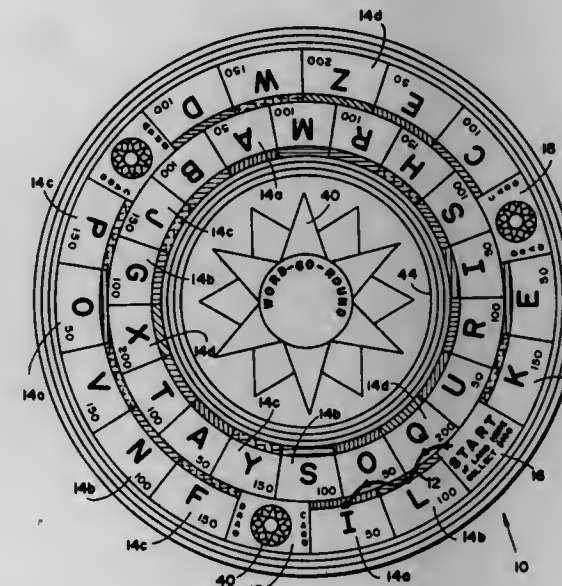
Int. Cl.² A63F 3/00

U.S. Cl. 273—135 D

9 Claims

1. Game apparatus comprising:
a game board;
a track on said game board having a series of spaces forming

a continuous path along which a game piece is moveable in increments;
each of certain of said track spaces representing a letter of the alphabet;
a plurality of marker tiles, each having thereon a letter of the alphabet and indicia of a monetary value assigned to that letter, there being at least two groups of letter tiles valued in accordance with the frequency of their appearance in words of a language;
a second playing board for each player;
each second playing board having delineated thereon a limited number of horizontal and vertical rows of spaces for placement of said tiles thereon by said each player;



at least two dice each with numbering indicia on the sides thereof to be thrown so that moves along said track may be made, selectively, at the election of the player throwing, in increments corresponding to the numbers thrown, taken separately or as sums thereof; and
a quantity of play money for rewarding the formation on said second playing board of complete words from letters on said tiles as indicated by the sum of the monetary values thereon;
each complete word so formed to be horizontally and vertically spaced from others on the limited spaces of a player's own second playing board unless horizontal and vertical words are linked by a common letter.

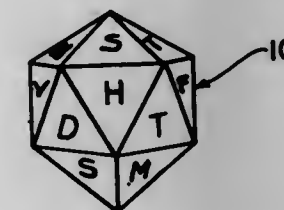
4,055,348 WORD BUILDING GAME

Pettersen B. Marzoni, Jr., P.O. Box 11598, Aspen, Colo. 81611
Filed Oct. 10, 1975, Ser. No. 621,340

Int. Cl.² A63F 9/04

U.S. Cl. 273—146

3 Claims



1. Game apparatus comprising a chance device having five chance elements, the chance device including means defining a plurality of indicia-bearing areas, each chance element having twenty indicia-bearing areas, a set of indicia characters having a distinct character for representing each consonant of the English alphabet, there being at least one indicia character on each of said discrete indicia-bearing areas as follows:
indicia representing the consonant R on 12% of the indicia-bearing areas,
indicia representing the consonant T on 11% of the indicia-bearing areas,

indicia representing the consonant N on 11% of the indicia-bearing areas,
indicia representing the consonant L on 9% of the indicia-bearing areas,
indicia representing the consonant S on 9% of the indicia-bearing areas,
indicia representing the consonant D on 9% of the indicia-bearing areas,
indicia representing the consonant C on 6% of the indicia-bearing areas,
indicia representing the consonant P on 5% of the indicia-bearing areas,
indicia representing the consonant G on 5% of the indicia-bearing areas,
indicia representing the consonant M on 5% of the indicia-bearing areas,
indicia representing the consonant H on 4% of the indicia-bearing areas,
indicia representing the consonant F on 3% of the indicia-bearing areas,
indicia representing the consonant B on 3% of the indicia-bearing areas,
indicia representing the consonant W on 2% of the indicia-bearing areas,
indicia representing the consonant V on 2% of the indicia-bearing areas,
indicia representing the consonant K on 2% of the indicia-bearing areas,
indicia representing the consonant X on 1% of the indicia-bearing areas,
and indicia representing the consonants J, Q and Z on 1% of the indicia-bearing areas.

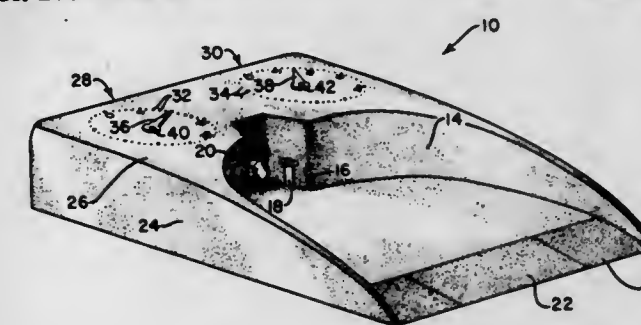
4,055,349 GOLF PUTTING PRACTICE DEVICE HAVING MECHANICAL CALCULATORS

Archie F. Hunt, Rte. 2 Box 140, Marietta, S.C. 29661, and Jack J. Moss, 640 Ardeleigh Drive, Akron, Ohio 44303
Filed Apr. 21, 1976, Ser. No. 679,061

Int. Cl.² A63B 69/36

U.S. Cl. 273—179 A

10 Claims



1. A device for aiding one in improving his golf putting skill, comprising:
a wall having a receptacle therein and partially encompassing an arcuate bottom surface, said bottom surface having a depressable tongue positioned at a front portion thereof;
a first mechanical counter comprising a first ratchet wheel and pawl assembly; and
a mechanical linkage comprising a lever arm operatively connected at one end to said tongue and having a first beveled surface at the other end thereof, said pawl having a second beveled surface thereon in juxtaposition to said first beveled surface, depression of said tongue actuating said counter via said linkage.

4,055,350

CHANGER PIN FOR A RECORD CHANGER

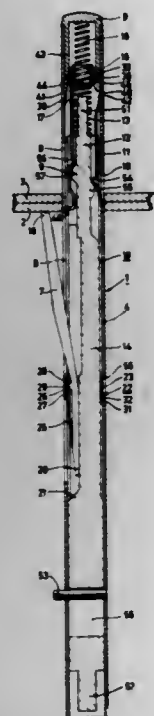
Robertus Jozefus Maria Verhoeven, and Daniel Ong, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1976, Ser. No. 677,211

Claims priority, application Netherlands, May 7, 1975, 7505356

Int. Cl.² G11B 17/04

U.S. Cl. 274—10 S



3. A changer spindle for a record changer having a changer mechanism suitable for changing and completely independently supporting a plurality of phonograph records comprising:

a cylindrical sleeve having at least three axially extending lifter slots therethrough, circumferentially spaced at a same axial location, and an upper end;

an end cap;

means connecting said end cap to said sleeve at said upper end;

a single control slide mounted within said sleeve; means responsive to axial position of said slide for supporting a stack of phonograph records on said sleeve from below a lowermost record of the stack, and for withdrawing said support;

means for holding down the lowermost record against upward lifting force;

a record lifting member comprising an integral axially split tubular record lifting ring having at least three axially extending lifting fingers, said fingers having distal ends bent outwardly and arranged to project at least into said sleeve slots, said fingers each having an intermediate inwardly projecting portion, at least one finger comprising an integral blocking cam adjacent its distal end, said cam having surfaces extending transversely to the axial direction of said finger, a respective slot in said sleeve has a locally widened portion at the location of said cam, said finger being in a lowered position;

a movable ring support clamped within said split ring;

said single control slide having means for operatively controlling said record hold-down means in response to axial position of said slide, an upper end of said slide engageable upon initial axial motion with said ring support means for positioning said blocking cam in said locally widened portion in the absence of a record on said support means whereby upon axial movement of said slide during a changing cycle, engagement of the upper end of said slide with said ring support prevents further movement of said slide; and comprising

a spring urging said ring support away from said upper end of said slide; and

means for biasing said ring support away from said end cap.

4,055,351

RESETTABLE TOY PHONOGRAPH

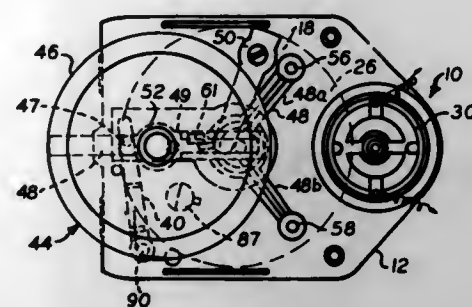
Alexander W. Hughes, Jr., 19 Wardell Circle, Oceanport, N.J. 07757

Filed Dec. 6, 1976, Ser. No. 747,485

Int. Cl.² G11B 17/06; A63H 3/33

4 Claims U.S. Cl. 274—15 R

17 Claims



17. In a toy phonograph comprising a housing, said housing comprising a base, a turntable rotatably mounted on said base for rotation a phonograph record mounted on said turntable about an axis of rotation, a pickup arm pivoted at one end engageable with a playing surface of said phonograph record, said phonograph record having a periphery, a first spring means, said pickup arm being constantly placed under a force of said first spring means which urges said pickup arm toward the periphery of said phonograph record, a speaker cone means resiliently mounted on said housing above said pickup arm, and second spring means resiliently urging said speaker cone means into contact with said pickup arm with a biasing force for pressing said pickup arm into engagement with said phonograph record for reproducing recorded sound from said phonograph record playing surface; the improvement comprising a first cam means axially mounted on said turntable axis of rotation and fixedly rotatable therewith, a second cam means nestable with said first cam means for rotation therewith when in nested engagement therewith, said second cam means being a floating cam means comprising at least one lower peripheral cam surface sloped with respect to said turntable, said first cam means having at least one congruent upper peripheral cam surface nestable with said second cam means at least one peripheral cam surface, third spring means resiliently urging said second floating cam means at least one lower peripheral cam surface into nesting engagement with said first cam means at least one upper peripheral cam surface, said second floating cam means comprising a first protrusion extending outwardly therefrom beneath said speaker cone means parallel to said phonograph record playing surface and being normally biased out of engagement with said speaker cone means by said third spring means, said pickup arm comprising a second protrusion extending upwardly therefrom substantially normal to said phonograph record playing surface and being pivotally movable with said pickup arm, said speaker cone means comprising a lift bar means for enabling said speaker cone means to be urged out of engagement with said pickup arm by said second cam means as said nestable cam surfaces are driven out of nesting engagement, said second spring means resiliently urging said lift bar means into supporting contact with said pickup arm second protrusion, said lift bar means comprising a third protrusion extending downwardly therefrom substantially normal to said phonograph record playing surface and normally disposable above said rotating first protrusion when said lift bar means is in said supporting contact with said pickup arm second protrusion, said second protrusion being pivotally movable with said pickup arm, said lift bar means further comprising means to drop said lift bar towards said phonograph record when said pickup arm is adjacent the end of said phonograph record recording, causing said first and third protrusions to engage halting rotation of said second floating cam means, said turntable and said first cam means still

being rotatable when said first and third protrusions are in engagement, said rotating first cam means at least one upper peripheral cam surface being driven out of nesting engagement with said second cam means at least one lower peripheral cam surface during rotation of said turntable when said first and third protrusions are in engagement, said second cam means at least one sloped lower peripheral cam surface rising up said at least one sloped first peripheral cam surface as said cam surfaces are driven out of said nesting engagement to enable sufficient contact of said second cam means with said speaker cone means to overcome said second spring means biasing force and urge said speaker cone means out of engagement with said pickup arm to raise said lift bar means above said second protrusion and enable said pickup arm to be resiliently reset to the periphery of said phonograph record by said first spring means while returning said lift bar means to said supporting contact with said pickup arm second protrusion, thereby disengaging said first and third protrusions, said lift bar means further comprising an extension portion thereof extending out of said housing for enabling manual resilient reset of said pickup arm to the periphery of said phonograph record by said first spring at any position of said pickup arm along said phonograph record playing surface by lifting said extension portion.

4,055,352

SEALING MEANS FOR A LONGITUDINALLY DISPLACEABLE ROD

Fernand Michel Allinquant, 53, Avenue Le Notre, and Jacques Gabriel Allinquant, 12, Avenue Aroutet, both of 92330 Sceaux, France

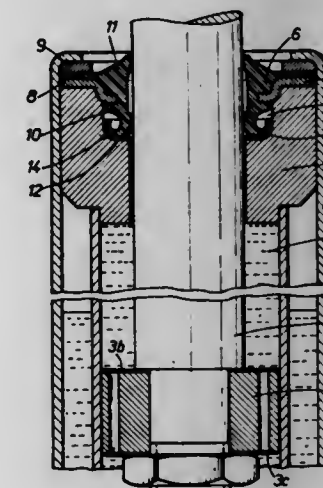
Filed Apr. 13, 1976, Ser. No. 676,512

Claims priority, application France, Apr. 18, 1975, 75.12133

Int. Cl.² F16J 15/32

U.S. Cl. 277—152

3 Claims



1. A sealing device for maintaining a liquid seal for a rod mounted in a liquid containing chamber, comprising: gland means, wherein said gland means is configured to define a concentric cavity;

a resilient sealing element having a main body portion of generally cylindrical form having at one end thereof a relatively short cylindrical skirt which, in use, is bent or turned back to define an annular chamber surrounding one end of said main body portion, and wherein the main body portion has a barrel-shaped inner surface and the skirt is connected to the main body portion by an outwardly flared portion, said main body portion further including an annular inwardly extending lip at a second end thereof remote from said skirt and an annular inwardly extending rib intermediate said lip and said skirt, wherein said lip and said rib have approximately equal normal diameters; and said flange means for retaining said sealing means in a fixed position with respect to said gland means and said chamber, wherein said skirt of said sealing means is curved

outwardly with respect to said rod and forms an annular chamber within said cavity.

4,055,353

CLAMPING DEVICE, ESPECIALLY FOR ROCK OR CONCRETE DRILLS

Hans Bieri, Pfaffikon, Switzerland, assignor to Hydrostress Aktiengesellschaft, Pfaffikon, Switzerland

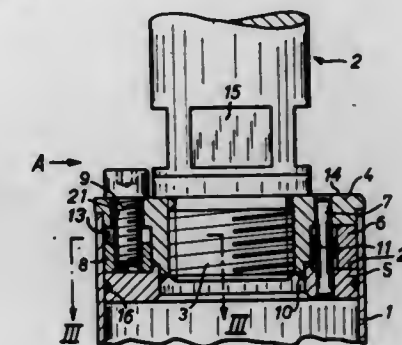
Filed Aug. 16, 1976, Ser. No. 714,772

Claims priority, application Switzerland, Aug. 19, 1975, 10765/75

Int. Cl.² B23B 27/00

U.S. Cl. 279—2 R

9 Claims



1. A clamping device for releasably connecting a drive member in a force transmitting manner to a tubular drive member, comprising a centering means concentrically fitting into said tubular drive member, means securing said drive member to said centering means, a ring space in said centering means, clamping ring means located in said ring space, axially extending slot means in said clamping ring means, wedging means axially shiftable in said slot means, clamping screw means cooperating with said wedging means to shift the latter in said slot means whereby said clamping ring means is forced to expand radially outwardly against the inner surface of said tubular driven member when said clamping screw means is tightened.

4,055,354

HIKERS CART

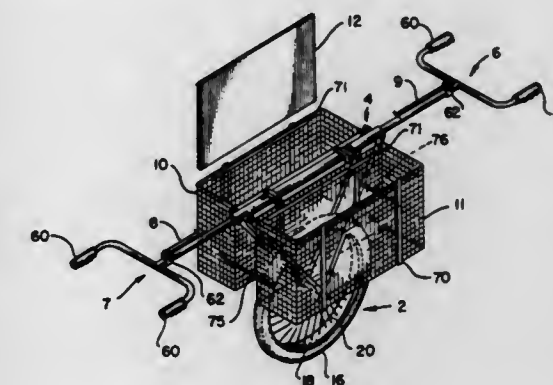
Donald M. Sharpe, 18962 Chadbourne Lane, Santa Ana, Calif. 92706

Filed Aug. 4, 1976, Ser. No. 711,659

Int. Cl.² B62B 1/20

U.S. Cl. 280—47.31

13 Claims



1. A device for transporting a load comprising: a single wheel;

an elongated frame disposed directly over the wheel and extending forward and rearward of said wheel;

means extending down from said frame alongside said wheel mounting said frame on the wheel for travel therewith;

said mounting means extending no more than about several inches laterally of said wheel;

handle means at each end of the frame for use by two persons to direct and propel the wheel;

a pair of containers mounted on said frame and disposed on opposite sides of said wheel for retaining a load.

4,055,355

ROAD VEHICLES

Christopher Daniel Dowling Hickey, 5 Heathside, Hinchley Wood, Esher, Surrey, England.

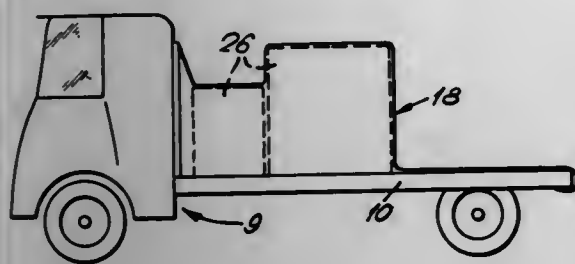
Filed Mar. 24, 1976, Ser. No. 669,989

Claims priority, application United Kingdom, Mar. 27, 1975, 13112/75

Int. Cl.² B60P 7/00

U.S. Cl. 280—179 A

10 Claims



1. A road vehicle including a vehicle body having an air-impermeable support surface for receiving a load, an air-impermeable rigid upright headboard at one end of said support surface, said headboard having an aperture therein, an air-impermeable flexible oversheet for covering, in use, the load supported by the support surface to form with the support surface a restriction to air flowing into the space formed between the oversheet and the support surface, said oversheet being secured to said headboard, and means for continuously applying suction to said aperture to partially evacuate said space and thereby to collapse the oversheet around the load to restrain the load from movement with respect to the support surface.

4,055,356

SAFETY SKI BINDING

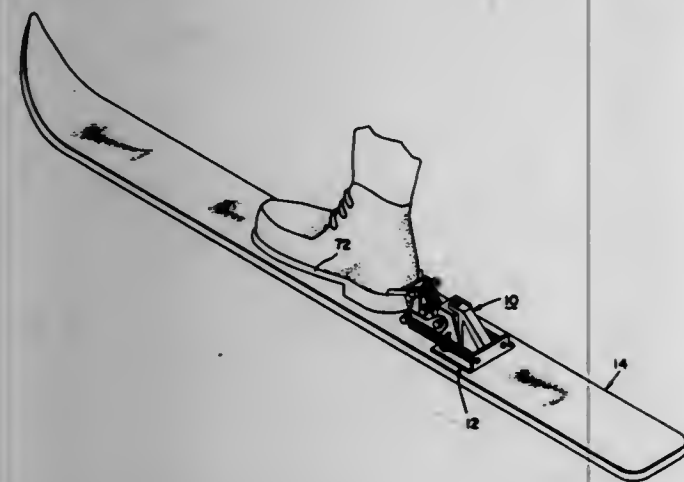
Hans de Groot, 309 Wildman Arms, Swarthmore, Pa. 19081

Filed May 17, 1976, Ser. No. 686,899

Int. Cl.² A63C 9/08

U.S. Cl. 280—628

47 Claims



1. A safety ski binding including
 - a. a boot retaining member for engaging a ski boot at the heel or toe thereof;
 - b. operating means operably connected to the boot retaining member and movable between a locked position for forcing the retaining member against the boot to retain the boot on the ski, and an unlocked position for releasing the retaining member from the boot to permit the ski boot to separate from the ski;
 - c. support means for the operating means movable relative to a ski in two directions;
 - d. first biasing means for resisting the displacement of the support means relative to the ski in one of said two directions;

- e. second biasing means for resisting the displacement of the support means in the other of said two directions;
- f. actuated means movable to unlock the operating means for permitting said operating means to move into its unlocked position for releasing the retaining member from the ski boot when the support means moves a certain distance in either one or both of said two directions.

4,055,357

COLLAPSIBLE CARRY-ALL CART

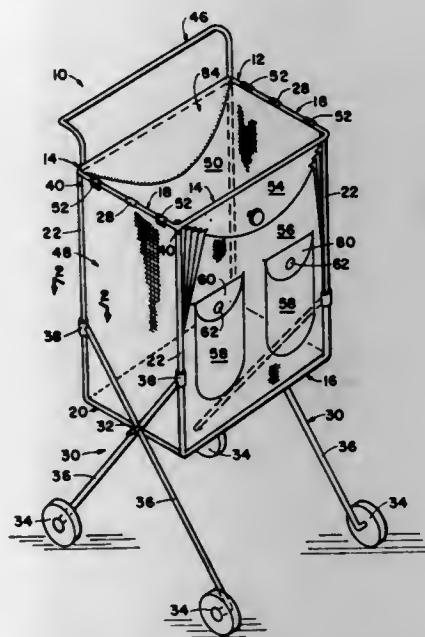
Viera Sorocin, 77 Quebec Avenue, Apt. 1025, Toronto, Ontario, Canada

Filed Apr. 5, 1976, Ser. No. 673,373

Int. Cl.² B62B 11/00

U.S. Cl. 280—641

5 Claims



1. A collapsible carry-all cart comprising:
 - a frame including upper and lower front and rear transversely extending elongated members, retractable upper and lower pairs of elongated spaced parallel side members secured therewith, and upright corner post members connected between the respective junctures of the upper and lower transverse and side members;
 - a pair of leg members carried slidably respectively by the upright post members at the sides of the frame, said pair of leg members each including a pair of leg elements having a wheel member mounted rotatably at the lower end thereof and a collar at the other end thereof, said collars being slidably mounted on the corresponding post members, and said leg elements being pivotally connected to each other at a location intermediate the ends thereof;
 - a handle element carried by said frame projecting upwardly therefrom at the rear thereof;
 - and a cover member secured to said frame and depending therefrom to provide a storage compartment.

4,055,358

NITRO-PHTHALIDES, THEIR MANUFACTURE AND THEIR USE IN RECORDING SYSTEMS

Robert Garner, Ramsbottom, England, and Jean Claude Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

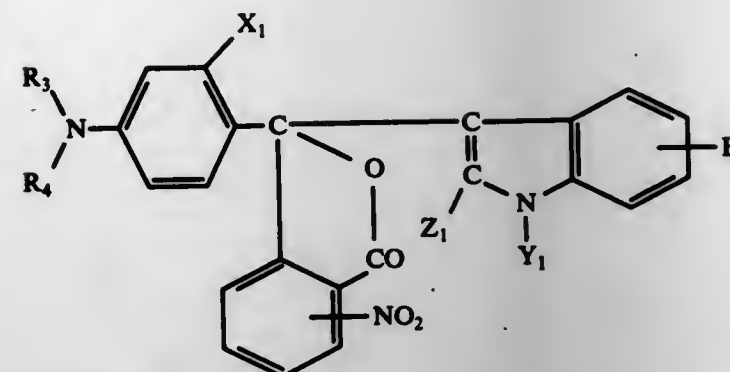
Continuation of Ser. No. 471,393, May 20, 1974, abandoned.

This application Mar. 15, 1976, Ser. No. 666,860
Claims priority, application United Kingdom, May 21, 1973, 24080/73Int. Cl.² B41L 1/36; C07D 209/20

U.S. Cl. 282—27.5

17 Claims

1. A nitro-phthalide of the formula



wherein X₁ represents alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 12 carbon atoms or alkanoyloxy with 2 to 4 carbon atoms, Z₁ represents hydrogen, benzyl or alkyl with 1 to 12 carbon atoms, R₃ and R₄ each represents hydrogen, alkyl with 1 to 12 carbon atoms or benzyl and B₁ represents hydrogen, chlorine, nitro, amino, mono- or dialkylamino with 1 to 4 carbon atoms in each alkyl part and mixtures of nitro isomers thereof.

11. Pressure-sensitive copying paper system containing included in its colour-reactant system a colour former as defined in claim 1.

17. A process for making copies with a pressure-sensitive copying paper containing microcapsules, and an electron acceptor, each capsule containing a colour former, wherein the colour former is a nitro-phthalide as defined in claim 1.

4,055,359

QUICK-CONNECT TUBULAR COUPLINGS

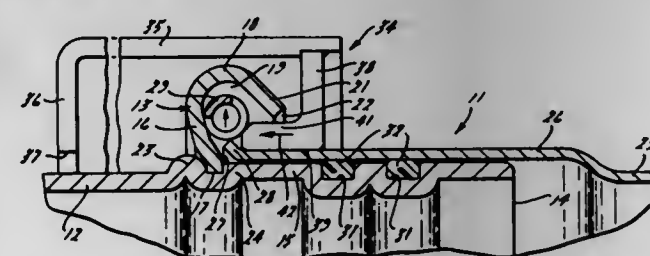
Irvin E. McWethy, Gravette, Ark., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 17, 1975, Ser. No. 632,874

Int. Cl.² F16L 35/00

U.S. Cl. 285—39

7 Claims



1. A tubular coupling comprising:
 - a first tube having an end portion,
 - a cage means mounted externally on the end portion in axially inwardly spaced relation to the terminal end of the latter,
 - the cage means having a radial base portion having a circular aperture through which the tube end portion projects, a curved wall forming an annular chamber and a circular flange angularly inclined toward the tube end portion in the general direction of the terminal end of the latter, the flange terminating in radially spaced relation to the tube end portion surface,
 - retention means on the first tube end portion engaged with the base portion of the cage means to hold the latter against axial displacement,
 - a second tube having an end portion telescopically mounted on the first tube end portion and having an outwardly inclined flare at its terminal end,
 - the flared end projecting into the cage means through the space between the surface of the first tube end portion and the cage means flange,
 - the inclined outer surface of the flared end of the second tube making an angle with the longitudinal axis of the second tube which is substantially the same as the angle

made to the same axis by the inner surface of the inclined flange, circular spring means contained within the cage means interposed between the second tube end portion flare and the cage means flange preventing axial withdrawal of the second tube end portion from the cage means and thereby preventing telescopic disengagement of the second tube from the first tube, and "O" ring means externally mounted on the first tube end portion between the terminal end of the latter and the retention means to prevent leakage between the telescoped tube end portions.

4,055,360

SECURITY LOCK

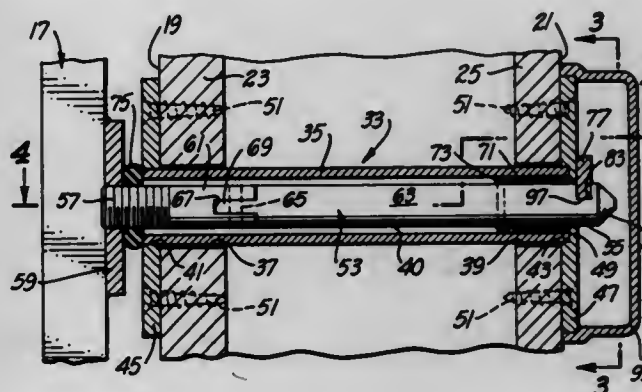
Bartello C. Russi, 2925 Mendoza Drive, Costa Mesa, Calif. 96702

Filed Apr. 21, 1976, Ser. No. 678,908

Int. Cl.² E05C 3/14

U.S. Cl. 292—228

2 Claims



1. A security lock for a first member comprising:
 - a tube having inner and outer ends and a passage extending between said ends thereof;
 - a shaft including at least first and second shaft sections and attaching means for attaching said shaft sections together for pivotal movement relative to each other, said shaft having outer and inner end portions;
 - said shaft having a first position in which it is received in said passage of said tube with the inner end portion of the shaft projecting beyond the inner end of said tube and with the attaching means being within said passage of said tube, said outer end being attachable to the first member;
 - latching means including said inner end portion of said shaft for releasably locking the shaft in the first position whereby upon release of the latch means said shaft is released to move toward the outer end of the tube;
 - said latching means including a locking member, means for mounting the locking member for pivotal movement toward and away from said inner end portion of said shaft at least when said shaft is in said first position, resilient means for urging the locking member toward the inner end portion of the shaft at least when said shaft is in said first position, and cooperating surfaces on said inner end portion and said locking member for retaining said shaft in said first position;
 - cam means on at least one of said locking member and said inner end portion of said shaft responsive to movement of the shaft toward the first position to cam the locking member away from the shaft;
 - abutment means for preventing the locking member from pivoting to a position in which the cam means is ineffective to cam the locking member away from the shaft as the shaft moves toward the first position;
 - a mounting plate adjacent the inner end of the tube, said mounting plate having an aperture therein through which the inner end portion of the shaft can project, said locking member being pivotally mounted on said mounting plate.

and said abutment means being carried by the mounting plate;
a seal for sealing between the tube and the shaft; and
resilient means in said tube for urging the shaft toward the outer end of the tube.

4,055,361

DOOR LOCK ATTACHMENT

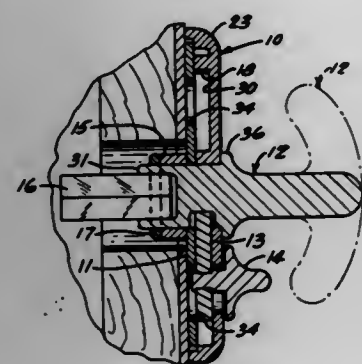
Adolph Moses, 8 E. 83rd. St., New York, N.Y. 10028

Filed Oct. 14, 1975, Ser. No. 622,405

Int. Cl.² E05B 13/00

U.S. Cl. 292—359

8 Claims



1. A thumb knob and stop assembly including a spindle for cooperation with a door latch assembly comprising a body, means carried by the body for affixing it to a door, said body having a hole surrounded by a boss, a thumb-knob having a cylindrical hub rotably disposed and retained within the hole in said boss, a spindle coupling said hub and the door latch assembly when said body is secured to the door, said body having a slot lying along a line intercepting the axis of said hub, an actuating knob having a pin projecting therefrom and extending through said slot, said slidable knob being movable between first and second positions lengthwise of said slot, a stop member carried by said pin, said body further comprising spaced means lying along said line and forming a recess slidably engaging a first end of said stop, a recess in said boss also lying along said line and slidably receiving the other end of said stop member, whereby said stop member is restricted to sliding movement, a recess in said hub, said other end of said stop when in said first position extending through said boss and into the recess in said hub and restricting rotation thereof and in said second position being retracted from engagement with said hub, said stop further including biasing means and spring means contacting said biasing means whereby said spring means will maintain said stop in either its first or second positions.

4,055,362

BUMPER ASSEMBLY FOR A ROLLING CART

Frederick R. Becker, III, Dallas, Pa., assignor to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Filed June 18, 1976, Ser. No. 697,699

Int. Cl.² B60R 19/02

U.S. Cl. 293—62

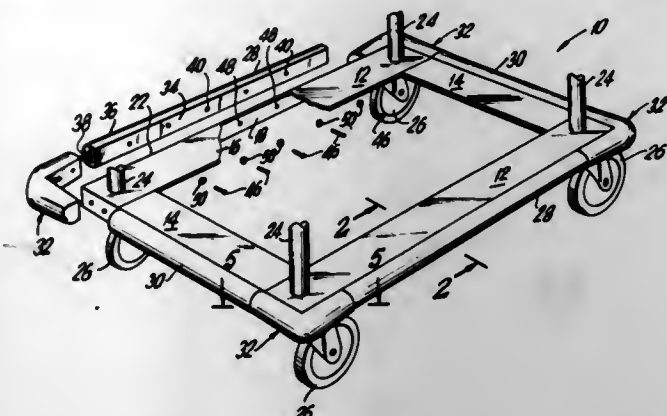
17 Claims

1. A bumper assembly for a rolling cart and the like, said bumper assembly comprising:

- support means including a pair of elongated, spaced apart side and end sections defining a frame having inside and outside peripheral surfaces;
- a pair of resilient side bumper strips and a pair of resilient end bumper strips mounted on the outside surfaces of said side and end sections of said support means, respectively, with outwardly facing surfaces of said side and end bumper strips being unbroken;
- a plurality of resilient corner bumper members interfitted intermediately in corner spaced defined by adjacent ends of said side and end bumper strips with each of said corner bumper members being disposed between an associated

one of said side bumper strips and an associated one of said end bumper strips; and

- fastener means having a head section and a shank section for securing said corner bumper members to each corner of said support means defined by adjacent ends of one of said side and end sections of said support means, the head



section of each said fastener means being on the inside surface of said support means and said shank section of each said fastener means extending through a portion of said support means and terminating in an interior of said respective corner bumper member, the outwardly facing surface on each said corner bumper member being unbroken.

4,055,363

SANITARY DEVICE FOR PICKING UP ANIMAL DROPPINGS

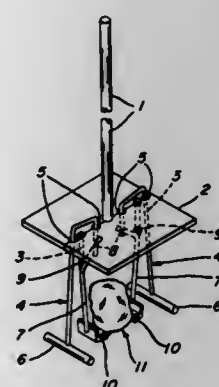
Pete Mandich, 1103 Sheffield Ave., Alliquipa, Pa. 15001

Filed Feb. 28, 1977, Ser. No. 772,772

Int. Cl.² A01K 29/00

U.S. Cl. 294—19 R

5 Claims



1. A portable device for picking up objects without having ones' hands come into contact with the said object comprising:

- A first assemblage including a first folded elongated strip projecting angularly from and secured to the lower end of a first angular operating rod, which operating rod is pivotally connected at its bend to a frame and pivotally connected at its opposite end to a second operating rod which second operating rod is an inverted U-shape having its lower end extended to a point in an approximate plane with the said elongated strip.
- A second assemblage including a second folded elongated strip projecting angularly from and secured to the lower end of a third angular operating rod which operating rod is pivotally connected at its bend to a frame and pivotally connected at its opposite end to a fourth operating rod, which fourth operating rod is an inverted U-shape having its lower end extended to a point in an approximate plane with the said elongated strips.
- A third assemblage including a frame in which the said first and third operating rods are connected for holding the said rods in such a position to allow the said folded elongated strips to move towards each other and away

from each other with the manipulation of the operating rods.

- A bag having a first blade-like member attached to its open end which first blade-like member is detachably attached to the first elongated strip and a second blade-like member attached to its open end which second blade-like member is detachably attached to the second elongated strip so that the inverted bag is selectively opened and closed by the movements of the folded elongated strips resulting from the manipulation of the said operating rods.

4,055,364

LIFTING DEVICE FOR BATTERIES AND THE LIKE

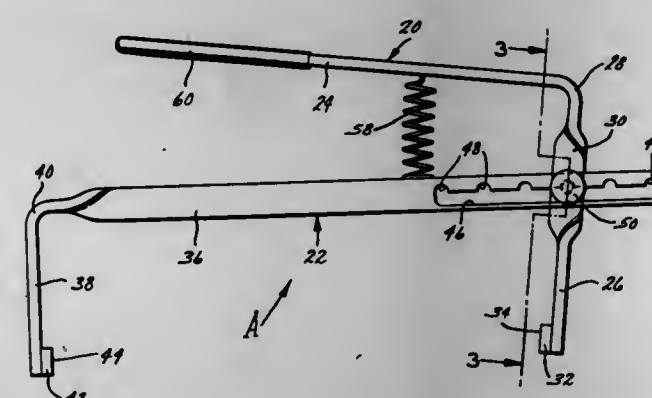
Max Breite, 810 Spring Ave., St. Charles, Mo. 63301

Filed Sept. 23, 1976, Ser. No. 725,867

Int. Cl.² B65G 7/12

U.S. Cl. 294—63 B

10 Claims



1. A tool for lifting a battery or other object having upright walls, said tool comprising: a first gripping member in the form of a rigid and unitary structure having an upright end leg and a handle extended from the upper end of the end leg with the handle being presented at an angle to that end leg, the end leg having a gripping surface at its lower end; a second gripping member in the form of a rigid and unitary structure having an upright end leg and a connecting portion extended generally horizontally from the upper end of that end leg and being located below the handle on the first gripping member, the end leg of the second gripping member having a gripping surface at its lower end with that gripping surface being located opposite the gripping surface on the end leg of the first member, the connecting portion of the second member being located adjacent to the end leg of the first member where the connecting portion is provided with a slot and a plurality of spaced apart notches which open into the slot, the slot extending in the direction of the connecting portion; and a pin extended through the slot in the connecting portion and secured in the end leg of first member, the pin being sized to fit in the notches of the slots to enable the first member to pivot relative to the second member at any one of the notches, whereby an upwardly directed force exerted on the handle will cause the gripping surfaces of the two gripping members to move together so that the battery may be clamped between them, the pin further being sized to slide along the slot from one notch to the other so that the spacing between the end legs of the two gripping members may be varied, whereby the tool may be adjusted to accommodate batteries of varying widths.

4,055,365

CHOKER ASSEMBLY

James David Kucherry, Rte. 1, Bonners Ferry, Idaho 83805

Filed Mar. 22, 1976, Ser. No. 669,096

Int. Cl.² B66C 1/34; F16G 11/04

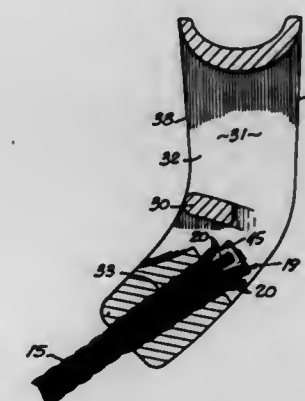
U.S. Cl. 294—78 R

4 Claims

1. A choker assembly slidably mountable to a ferrule ended logging winchline, comprising:

- a choker rope formed of a length of interwoven wire rope

having a central core strand surrounded by a plurality of outer interwoven twisted strands;
a choker ferrule fixed at one end of the rope;
a choker hook slidably mounted on the choker rope and adapted to releasably receive the choker ferrule;
slider means for releasably mounting the remaining end of the choker rope to the winchline;
wherein the slider means includes an elongated longitudinally curved slider body having an enlarged winchline receiving opening formed transversely through one end and a choker rope receiving opening formed longitudinally through the other end of the slider means and in open communication with the winchline receiving opening for receiving the remaining choker rope end there-through;
wherein the choker rope receiving opening tapers from an



enlarged open end opening into the winchline receiving opening to a reduced open end at the terminus of the slider body;
wherein the choker rope receiving opening includes spiral grooves complementary to the outer twisted strands of the choker rope; and
a wedge means separate from the slider body which includes a conical sleeve of sufficient size to be mountable into the tapered choker rope receiving opening by access through the enlarged winchline receiving opening in which the conical sleeve has a longitudinal base for slipping over the central core strand and a conical exterior surface for spreading the outer interwoven strands radially outward into the spiral grooves to releasably grip the outer strands in the choker rope receiving opening and thereby prevent the remaining end of the choker rope from being drawn through the choker rope receiving opening.

4,055,366

ELEVATING ROOFS

David Lee, Northchurch House, Northchurch, England

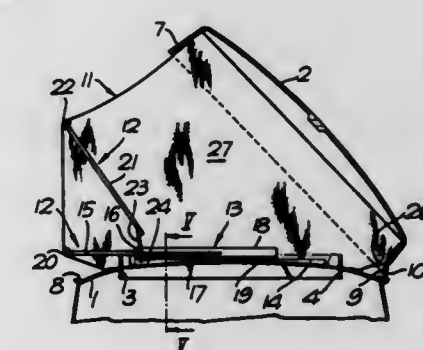
Filed Oct. 6, 1975, Ser. No. 619,627

Claims priority, application United Kingdom, Oct. 8, 1974, 43465/74

U.S. Cl. 296—23 G

Int. Cl.² B60D 3/34

9 Claims



1. For use in conjunction with a vehicle including a roof and a substantially rectangular opening in said roof, an elevating

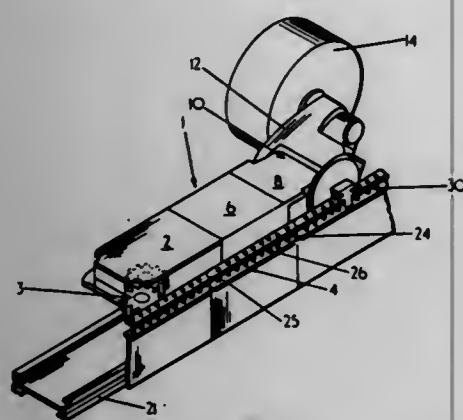
roof comprising in combination a rigid substantially rectangular member which is adapted to be hinged along one edge to said roof for movement between a lowered position covering said substantially rectangular opening and a raised position where it provides one wall of a covered area, a foldable material extending between corresponding edges of said rigid member and said substantially rectangular area which, in use, is unfolded in the raised position of said rigid member to provide the other walls of said covered area, a framework comprising first and second generally U-shaped members comprising a pair of movable arms and a bridge member attached to said arms at one end thereof, said first generally U-shaped member being supported in a plane above and substantially parallel to the plane of said rectangular opening with its arm ends opposite its said bridge member mounted in guides located adjacent each said transverse edge of said opening and the ends of said second generally U-shaped member opposite its said bridge member loosely embracing the limbs of said first generally U-shaped member, said foldable material being attached to said bridge members and being shaped and arranged in conjunction with said framework, the arrangement being such that when said rigid member is raised the frame members are substantially simultaneously moved to partial raised positions, whereby the ends of said second generally U-shaped member can be moved outwardly to engage against abutments provided on the first member, and whereby continued outward movement of said second generally U-shaped member urges both frame members to their respective limit positions where they support the said foldable material in a position overhanging the edge of said rectangular opening, such that a region of said elevating roof associated with said covered wall area overhangs said rectangular opening to provide at least for a lower part of the elevated roof an area which is greater in plan than the area of the roof opening.

4,055,367

LONGWALL MACHINE WITH CAPTIVATING BRACKET
William Joseph Jarvis, Bestwood, England, assignor to Coal Industry (Patents) Limited, London, England
Filed July 27, 1976, Ser. No. 709,243
Claims priority, application United Kingdom, Aug. 13, 1975, 33445/75

Int. Cl.² E21C 27/36

U.S. Cl. 299—53



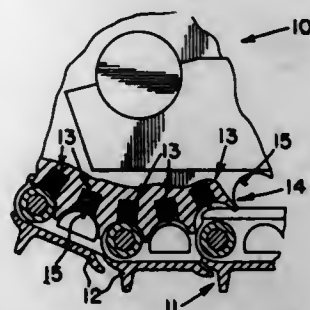
1. Mine equipment for trapping or captivating a ranging arm mining machine to a guide extending along one side of the machine along a working face, the machine including a body, a support trunnion connected to the body, and a cutter-carrying ranging arm mounted on the support trunnion, including a bracket assembly securable to the support trunnion, the bracket assembly comprising a first component for attachment to the support trunnion and a second component for extending around the guide such that in use when the bracket assembly is mounted on the support trunnion the machine is trapped to or captivated to the guide.

4,055,368 BIASING ELEMENT HAVING ONE OR MORE FORCE STAGES

John W. Sogge, Cedar Rapids, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 28, 1976, Ser. No. 680,815
Int. Cl.² B62D 55/12

U.S. Cl. 305—57

6 Claims



1. A biasing element, comprising:
a housing having resilient walls, an axis, and a chamber, said walls being outwardly movable in response to a force of a preselected magnitude;
a compressible force transmitting material positioned within the housing chamber, said force transmitting material transmitting said force outwardly against the housing walls;
means for maintaining the force transmitting material within the housing;
a piston positioned in the housing and being movable through the chamber between a first position at which the piston is urging against the force transmitting material and a second position at which the force transmitting material is moved by the piston into forcible contact with the resilient housing walls and said housing walls are moved outwardly in response to said forcible contact by said force transmitting material being at said preselected magnitude; and
a Belleville spring positioned in the chamber between the piston and force transmitting material.

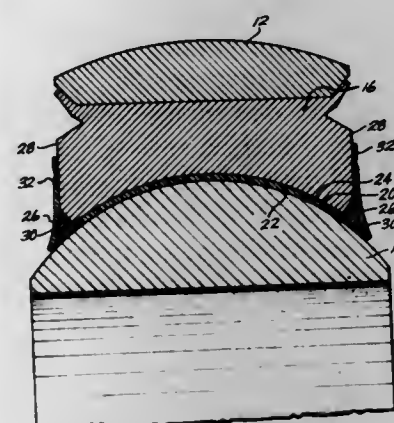
4,055,369

SEAL FOR A SPHERICAL BEARING

William Fred Lynn, and Gordon Marvin Walker, both of Renton, Wash., assignors to The Boeing Company, Seattle, Wash.
Filed May 12, 1975, Ser. No. 576,491
Int. Cl.² F16C 33/72, 33/74

U.S. Cl. 308—187.1

8 Claims



6. A seal for a self-aligning bearing having matching spherical surfaces between an inner and an outer race comprising: a ring to extend from the spherical surface of the inner race to a side of the outer race, said ring rigidly attached to the side of the outer race and of a depth to bow outward toward ring inner diameter and to permit about 5 degree misalignment of the bearing; a chamfer located on the side of the outer race and

under the ring; and a resilient sealing material filling the space therebetween.

4,055,370

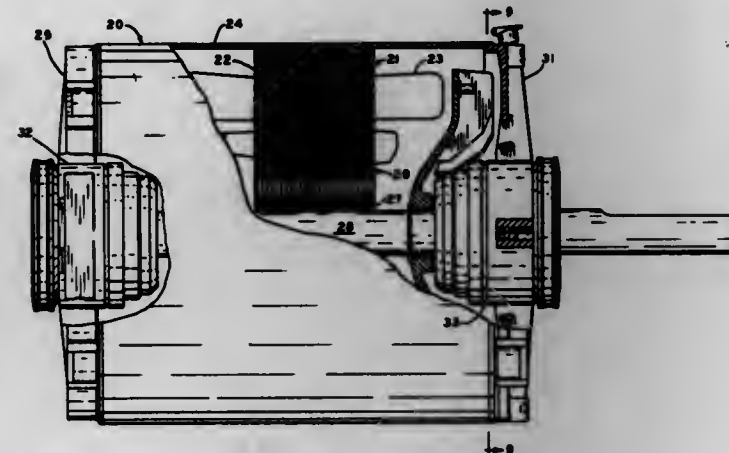
DYNAMOELECTRIC MACHINE LUBRICATION SYSTEM AND METHOD OF ASSEMBLING THE SAME
Eldon R. Cunningham, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 9, 1976, Ser. No. 694,307

Int. Cl.² H02K 5/16; F16C 33/74

U.S. Cl. 308—36.1

17 Claims



1. A dynamoelectric machine bearing and lubrication system comprising: an axially extending bearing having a centrally disposed lubricant feed window, a notch at each end thereof, and circumferentially extending capillary walls that establish circumferentially extending capillaries at each end of the bearing about a shaft accommodated in the bearing; and oil wicking means that includes a feeding tab disposed in the lubricant feed window, a first pick-up tip disposed in a first notch, and a second pick-up tip disposed in a second notch; said first pick-up tip and second pick-up tip each being in oil feeding communication with the feeding tab and in oil absorbing relation with a circumferentially extending capillary, whereby end leakage oil from the bearing is recirculated through the pick-up tips to the feeding tab.

4,055,371

BALL BEARING HAVING STAGGERED BALLS

Horst Manfred Ernst, Eltingshausen; Armin Olschewski, Schweinfurt; Rainer Schurger, Schwanfeld; Lothar Walter, Schweinfurt; Manfred Brandenstein, Aschfeld, and Erich Burkl, Stammheim, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

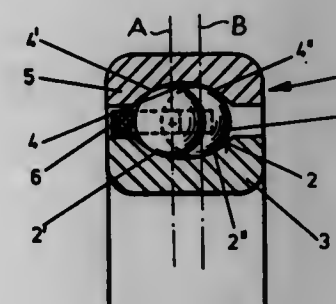
Filed June 7, 1976, Ser. No. 693,509

Claims priority, application Germany, June 26, 1975, 7520254[U]

Int. Cl.² F16C 33/40

U.S. Cl. 308—201

8 Claims



1. In a radial ball bearing having inner and outer bearing rings with an inner race and an outer race respectively, a plurality of balls in said inner and outer races and adapted to roll therein, and a cage for holding said balls spaced apart from one another; the improvement comprising means for holding said balls spaced from one another alternately in the axial direction of said bearing, whereby a first group of said balls

engages one side of said inner and outer races and a second group of said balls engages the opposite side surfaces of the same said inner and outer races to inhibit axial play in said ball bearing.

4,055,372

STORAGE RECEPTACLE FOR MAGNETIC TAPE CASSETTE

Keizaburo Tozawa, Tokyo; Hideo Amatsu; Shinichiro Takahashi, both of Yokohama; Kazumi Fujimoto, Hoya, and Kishio Ikeda, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

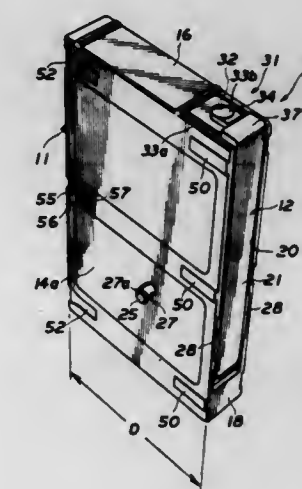
Filed Apr. 6, 1976, Ser. No. 674,211

Claims priority, application Japan, June 24, 1975, 50-77913

Int. Cl.² A47B 81/06

U.S. Cl. 312—15

18 Claims



1. A storage receptacle for a magnetic tape cassette comprising:
a housing including spaced apart, parallel side walls which between their forward edges, define an opening of said housing;
a holder for embracing a magnetic tape cassette and which is movable with the cassette therein through said opening of the housing between said side walls of the latter; and
pivot means connecting said holder with said housing for swinging movement relative to the latter between an opened position in which said holder projects forwardly from said housing for receiving and relinquishing a cassette, and a closed position in which said holder cooperates with said housing for enclosing a cassette in said holder;
said pivot means defining a fulcrum for said swinging movement of the holder which is spaced rearwardly from the center of gravity of said holder with a cassette therein in all positions of said holder and which is shifted forwardly in respect to said housing in the course of the swinging movement of said holder from said closed position to said opened position.

4,055,373

FURNITURE CONSTRUCTION SYSTEM

Peter B. Andresen; Claus Winter, both of Hamburg, and Siegfried H. Hendel, Mannheim, all of Germany, assignors to Inbauprodukt Innenausbau-systeme GmbH & Co., KG, Hamburg, Germany

Filed Oct. 6, 1975, Ser. No. 620,184

Claims priority, application Germany, Oct. 4, 1974, 2447414

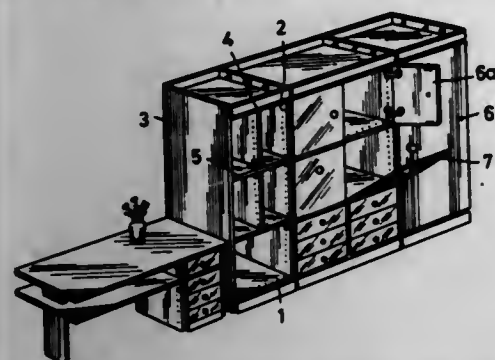
Int. Cl.² A47B 87/00

U.S. Cl. 312—263

4 Claims

1. In a furniture construction system in which furniture is made from a plurality of plate elements arranged horizontally and vertically according to choice, of the same thickness and each plate element having hole rows in the region of two oppositely lying edges of the plate element, angle brackets for

fixing the plate elements to one another, and fixing elements such as screws for fixing the brackets to the plate elements, the improvement which comprises making the distances between centers of the holes in the hole rows the same as the thickness of the plate elements, and setting the first and last holes of at



least one plate element at a distance from the edge of the plate element equal to the thickness thereof and the first and last holes of at least one other plate element at a distance from the edge of the plate element of half the thickness of the plate element.

4,055,374

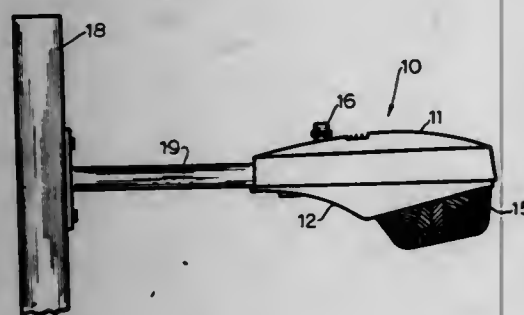
LAMP FIXTURE CONVERSION METHOD

Womack Hardy Barber, Jr., 613 Parkview Drive, Durham, N.C. 27712

Filed Sept. 10, 1976, Ser. No. 722,224
Int. Cl.² H01J 9/50

U.S. Cl. 316-2

5 Claims



1. A method of converting a lamp fixture of the type containing a mercury vapor lamp to a fixture containing a low pressure sodium lamp comprising the steps of
 - a. removing the fixture from its respective mounting location;
 - b. inverting the fixture and removing the fixture lower housing half and associated lens;
 - c. removing the mercury vapor lamp from its socket in said fixture;
 - d. anchoring the fixture reflector to the fixture housing to prevent relative movement between the reflector and the housing during the conversion operation;
 - e. removing the mercury vapor lamp socket and any associated socket seals;
 - f. removing any electrical components associated with the mercury vapor lamp operation not compatible with low pressure sodium lamp operation and replacing the same with electrical components compatible with the desired low pressure sodium lamp operation;
 - g. affixing a bracket to the inner wall surface of the upper housing half rearward of said reflector, said bracket mounting a sodium lamp socket external of said reflector and aligned with the existing socket opening in the reflector and said bracket having a forward member engaging said reflector;
 - h. installing a low pressure sodium lamp in its respective socket, whereby such sodium lamp extends from its socket external of the reflector to a point proximate the forward end of the reflector; and
 - i. replacing the fixture lower housing half and lens while

aligning the seal portion of said reflector with the mating portion on said lens.

4,055,375

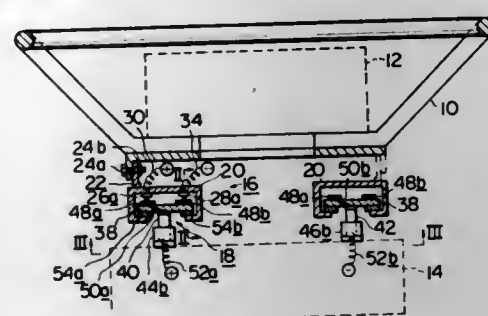
ELECTRIC CONTACTING DEVICE

Naoki Ogawa, and Kazuo Ikawa, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 27, 1976, Ser. No. 690,790
Claims priority, application Japan, May 29, 1975, 50-71468
Int. Cl.² H01R 39/00

U.S. Cl. 339-6 R

19 Claims



1. An electric contacting device for providing continuous electric connection between first and second electric devices respectively mounted on a rotatable member rotatable about its axis and a relatively stationary member, said electric contacting device comprising:
 - a first annular member coaxially securedly mounted on said rotatable member;
 - a second annular member adapted to connect to said relatively stationary member so as to be coaxially spaced apart from said first annular member;
 - a first conductive annular plate coaxially mounted on said second annular member and electrically connected to said second electric device; and
 - at least two first conductive spring arms mounted on said first annular member on a first imaginary annular portion which is coaxial with said first annular member, said first conductive spring arms being urged into sliding contact with said first conductive annular plate at the free ends thereof and electrically connected to said first electric device, further said first conductive spring arms being different in size to each other so as to respectively have different characteristic frequencies.

4,055,376

CALIBRATION RETICLE FOR MEASURING MICROSCOPES

Gunter W. Daberko, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Oct. 2, 1975, Ser. No. 618,981

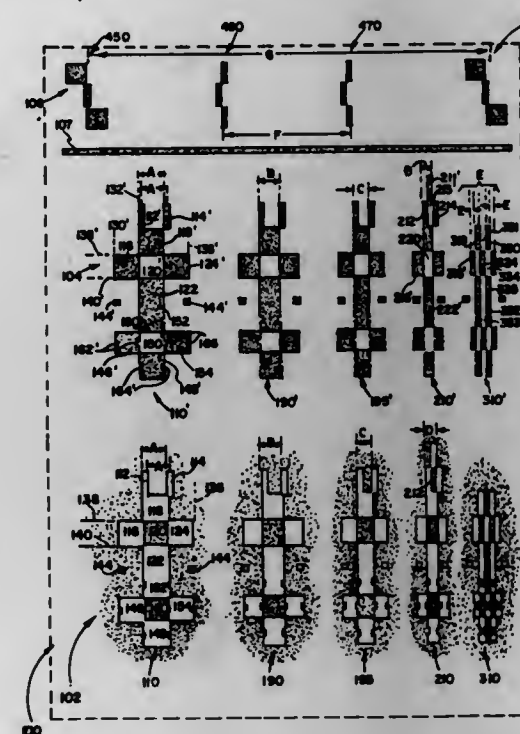
Int. Cl.² G02B 27/32

U.S. Cl. 350-10

13 Claims

1. A calibration reticle for a measuring microscope comprising:
 - a plurality of areas of a first contrast value;
 - a plurality of areas of a second contrast value, said second contrast value different from said first contrast value;
 - said areas of said first and second contrast values arranged to establish within said calibration reticle at least two parallel, calibration reference lines spaced from each other by a known distance;
 - each said calibration reference line defined with respect to at least two boundary lines from which it is equidistant;
 - each said boundary line defined by a portion of the boundary between an area of said first contrast value and an area of said second contrast value, said at least two boundary lines with respect to which a given calibration reference line is defined comprising:

- a first boundary line defined by a portion of a boundary between
 - a first localized region which has said first contrast value, at least substantially all of said first localized region being on a first side of said given calibration reference line; and
 - a second localized region which has said second contrast value, at least substantially all of said second localized region being on a second side of said given calibration reference line; and



- a second boundary line defined by a portion of a boundary between
 - a third localized region which has said first contrast value, at least substantially all of said third localized region being on said second side of said given calibration reference line; and
 - a fourth localized region which has said second contrast value, at least substantially all of said fourth localized region being on said first side of said given calibration reference line.

4,055,377

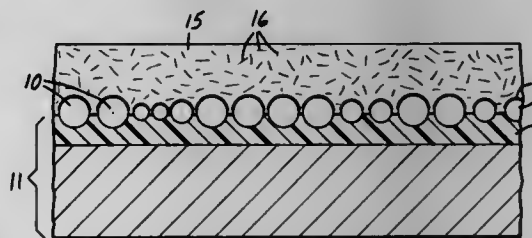
MAGNETICALLY ORIENTABLE RETROREFLECTORIZATION PARTICLES

Randall L. Erickson, North Oaks, and Terry R. Bailey, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 3, 1976, Ser. No. 711,140
Int. Cl.² G02B 5/128

U.S. Cl. 350-105

20 Claims



1. A mass of discrete retroreflectorization particles useful for forming a retroreflective coating on a substrate, the individual particles each comprising at least one transparent microsphere, specular reflective means in optical connection with a first portion of the microsphere so as to provide retroreflection of light incident on the opposed portion of the microsphere, and a magnetic layer underlying the specular reflective means and having a magnetic axis parallel to the optical axis on which said first and opposed portions of the microsphere are aligned, whereby when the particles are coated onto a substrate in the

presence of a magnetic field having flux lines of appropriate polarity perpendicular to the substrate, the particles tend to become aligned in a common direction that retroreflects light incident on the coating.

4,055,378

SILICONE CONTACT LENS WITH HYDROPHILIC SURFACE TREATMENT

Paul Feneberg, Planegg, and Ulrich Krekeler, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

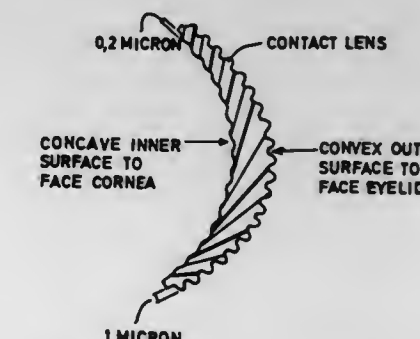
Continuation-in-part of Ser. No. 517,096, Oct. 22, 1974, Pat. No. 3,959,105, which is a continuation-in-part of Ser. No. 318,853, Dec. 27, 1972, abandoned. This application Apr. 10, 1975, Ser. No. 566,603

Claims priority, application Germany, Dec. 31, 1971, 2165805; Oct. 25, 1973, 2353495; Apr. 11, 1975, 2417660
The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.² G02C 7/04

U.S. Cl. 351-160

24 Claims



1. A contact lens, comprising a body which includes a silicone elastomer and silicone dioxide as a filler, said body having a concave surface adapted to face the cornea of an eye, and said body having a convex surface adapted to face the eyelid, said convex surface possessing hydrophilic characteristics, and the contact angle for said convex surface being smaller than the contact angle for said concave surface, said contact angles being measured with distilled water, and said contact angle for said concave surface having a value such that said body is movable relative to the cornea of an eye when said body is positioned on the cornea, said convex surface having been made hydrophilic by a treatment which included subjecting said convex surface to the action of activated gas ions in an atmosphere consisting at least predominantly of oxygen when said convex surface had an outer layer of said silicon elastomer, and said gas ions having impinged first regions of said outer layer and having had an energy such that said outer layer was destroyed at said first regions and the silicon dioxide filler of said body was exposed at said first regions, said gas ions also having impinged second regions of said outer layer and having had an energy such that said outer layer transformed to silicon dioxide at said second regions, and said convex surface having undergone an improvement in the hydrophilic characteristics thereof due to the exposure of the silicon dioxide filler at said first regions and the transformation to silicon dioxide at said second regions.

4,055,379

MULTIFOCAL LENS

John Talley Winthrop, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

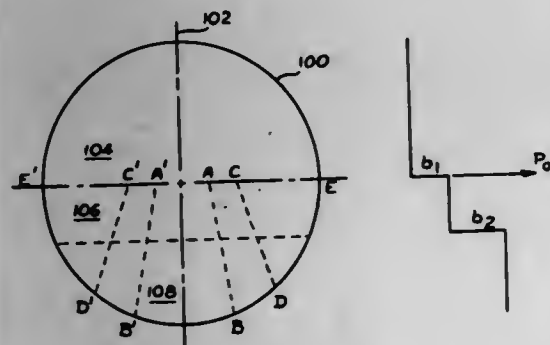
Continuation-in-part of Ser. No. 389,044, Aug. 16, 1973, abandoned. This application Dec. 8, 1975, Ser. No. 638,870
Int. Cl.² G02C 7/06

U.S. Cl. 351-171

10 Claims

1. A multifocal ophthalmic lens having invisible divisions

between viewing zones comprising a lens body having a refractive surface being characterized by a smooth, unbroken principal meridional curve lying along the refractive surface in a generally vertical direction and dividing the refractive surface into two similar lateral portions, the curvature of the principal meridional curve varying to provide a predetermined plurality of levels of constant dioptric focal power according to a predetermined law thereby dividing the refractive surface into a like plurality of viewing zones in vertical juxtaposition, each pair of juxtaposed viewing zones having a boundary therebetween, the uppermost viewing zone having a first constant dioptric focal power and being adapted for viewing distant objects over the full width of the multifocal ophthalmic lens, the remaining viewing zones being divided into at least three horizontally disposed areas, the centermost area in each of the remaining viewing zones being of a constant dioptric focal power higher than the constant dioptric focal power at the principal meridional curve in the viewing zone juxtaposed thereabove, the two outermost of said areas in each of the remaining



viewing zones being of such aspherical curvature that at a boundary the relative heights of the viewing zones forming the boundary are constant along the boundary throughout the width of each outermost area and each having a surface curved substantially in accordance with the equation

$$(Z^2/6 \times \delta y) =$$

where y and x represent horizontal and vertical directions respectively which define a plane, and Z is height of said curved surface from said plane, said surface comprising a portion of a surface of revolution whose axis of revolution is vertical and lies in a common plane with said principal meridional curve to optically compensate for skew distortion so that at all points thereon the principal axes of astigmatism lie in vertical and horizontal planes to permit a wearer of the lens to perceive horizontal and vertical lines in the visual environment as being horizontal and vertical, and

the boundaries between the viewing zones being blended by sagging process so that all connections between viewing zone surfaces are continuous and boundaries of the zones are invisible.

4,055,380

TRANSFER CHARGE MAINTAINING SYSTEM

Stephen Borostyan, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1975, Ser. No. 626,888

Int. Cl.² G03G 15/04R

U.S. Cl. 355-3 R

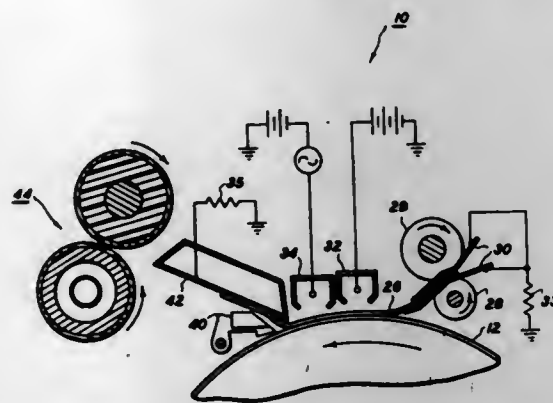
2 Claims

1. In an electrostatic copying apparatus in which imaging material is transferred from an image support surface to overlying variable resistance copy members in a transfer station by electrical transfer means which deposit transfer charges on the copy member, and in which electrically conductive copy member guide members outside of the transfer station conductively contact the copy member while the copy member is in the transfer station and thereby can receive leak-

age currents of said transfer charges through said copy member affecting the transfer of said imaging material, the improvement wherein:

self-biasing means are provided for automatically self-biasing said conductive guide members to a voltage level proportional to the level of said leakage current of transfer charges through the copy member to said conductive guide members,

wherein said self-biasing means consists solely of 100 to 400 megohm resistance means electrically connecting between said conductive guide members and electrical ground to conduct said leakage current of transfer charges



therethrough to self-bias said conductive guide members to a voltage level proportional to said transfer charge leakage current to said conductive guide members generated across said resistance means only by said transfer charge leakage current therethrough from said conductive guide members, said self-biased voltage level being sufficiently high to effectively suppress the conduction of said transfer charge leakage currents to said conductive guide members, and said resistance means providing the only electrical connection between said conductive guide members and electrical ground.

4,055,381

CARD HOLDER

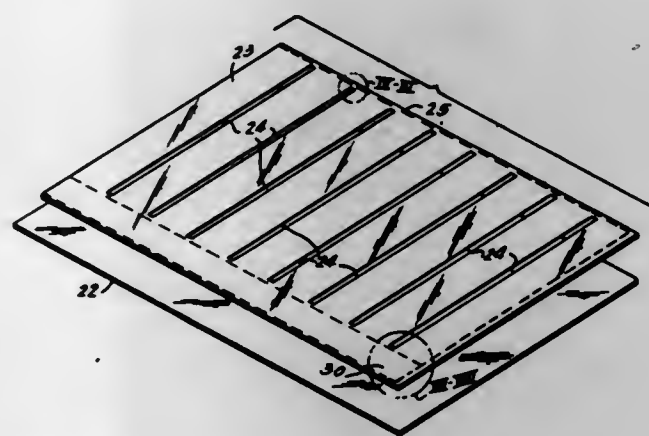
John B. Lauer, and Betty Alma Wade, both of Houston, Tex., assignors to John B. Lauer, Houston, Tex.

Filed Jan. 7, 1976, Ser. No. 647,100

Int. Cl.² G03B 27/62; A47F 7/00

U.S. Cl. 355-75

1 Claim



1. A holder for supporting data carrying cards comprising: a substantially rectangular backing sheet of fusible material, a front sheet substantially matching in size the backing sheet and also being made of fusible material, said front sheet having a series of horizontal vertically spaced slots formed therein alternating with a series of rectangular solid portions of said front sheet, said front sheet and said backing sheet being aligned and fused together along left and right vertical seams thereby leaving said slot substantially free, fused seams securing lower edges of said front sheet to said

backing sheet leaving the upper slot edges of said front sheet free and forming upwardly opening pockets between said front sheet and said backing sheet with the lower edges of said pockets closed, whereby cards can be supported in the pockets with their lower edges supported along the lower closed edges of the pockets and with the upper portions of the cards projecting above the upper slot edges, a set of a cards of greater height than said pockets, one of said cards being engaged in each selected pocket, lower portions of each respective card being concealed by upper portions of cards projecting from lower pockets in which the overlapping cards are engaged, said front sheet being made of a clear transparent material, an opaque member engaged in the pocket of any card which does not have its lower portion overlappingly concealed by a card in a lower pocket,

whereby confidential matter on the concealed portions of the card can be retained in confidence while non-confidential data on the upper portion of the cards can be reproduced in conventional office copiers, said front sheet having a vertical integral material portion at one vertical border thereof and being co-extensive with the vertical length thereof,

right and left vertical seams fused on opposite sides of said integral material portion between said front sheet and said backing sheet to form a row identification pocket adjacent said other pockets for receiving a row identification strip,

said front sheet having a horizontal integral material portion at one horizontal border thereof and being co-extensive with at least the horizontal length of said spaced slots,

and upper and lower horizontal seams fused on opposite sides of said horizontal integral material portion to form a column identification pocket for receiving a column identification strip.

4,055,382

TESTING METHOD FOR THE SEPARATE DETERMINATION OF VARYING WORK SURFACE FLAWS AND ARRANGEMENT FOR SAID METHOD

Paul Ziekman, Bilthoven, and Jan A. P. van Riet, Nieuwegein, both of Netherlands, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

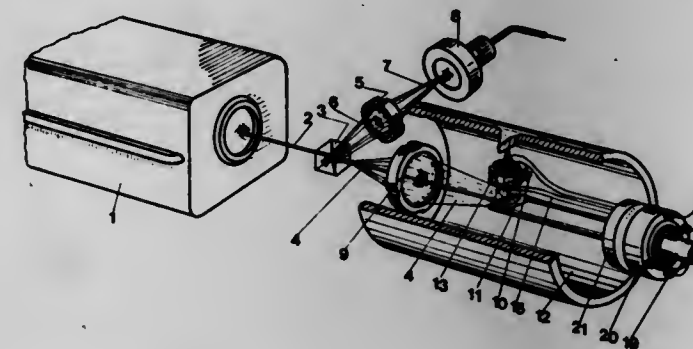
Filed Jan. 27, 1976, Ser. No. 652,734

Claims priority, application Netherlands, Jan. 29, 1975, 7501009

Int. Cl.² G01N 21/48

U.S. Cl. 356-210

5 Claims



1. A method for the automatic checking of machined part surfaces for surface flaws comprising the steps of confocally directing a plurality of parallel bundled light rays onto the surface to be checked by means of optical instruments, whereby said light rays are reflected by said surface with varying intensity and in accordance with the nature of said surface, redirecting a portion of said light rays, via said optical instruments, towards at least one light-sensitive element which converts the reflected light energy into electrical signals, and further including the step of separately evaluating the reflected

amount of light, for variation in intensity and dispersion, in order to indicate a plurality of different types of surface flaws.

4,055,383

METHOD OF AND ASSEMBLY FOR MEASURING EQUIVALENT SPHERE ILLUMINATION

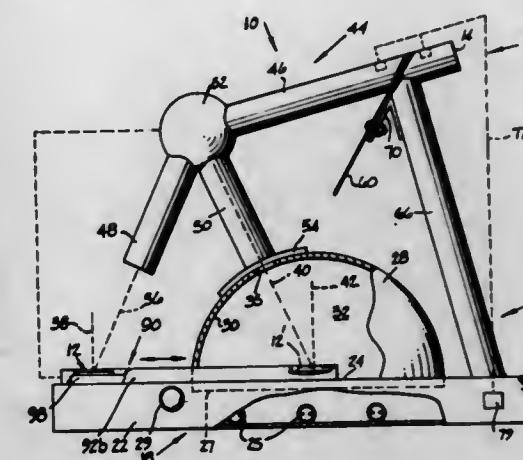
Robert Dale Zeller, and Daryl Dean Sullivan, both of Newark, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Feb. 20, 1976, Ser. No. 659,616

Int. Cl.² G01J 1/10

U.S. Cl. 356-229

14 Claims



1. A method of determining the amount of equivalent sphere illumination on a task as viewed from a given viewing point, said method including (a) locating said task and a contrasting colored reference in a lighted first area, said task and reference being oriented in a fixed way as viewed from said viewing point, (b) at said viewing point, viewing said task and reference through adjustable light filtering means, (c) adjusting said light filtering means to an adjusted position to provide specific visibility of said task from said viewing point and through said filtering means while causing the luminance of said reference at least to appear unfiltered as viewed through said adjusted filtering means from a predetermined point behind said filtering means regardless of the adjusted position of said light filtering means, (d) positioning a task and a reference in a second area, said last-mentioned task and reference, as viewed from as associated viewing point, being oriented in substantially the same way as said task and reference are oriented in said first area as viewed from said given viewing point, (e) illuminating said task and reference in said second area with sphere illumination, (f) with said light filtering means fixed in said adjusted position, viewing said task and reference in said second area through said filtering means from said associated viewing point, (g) varying the intensity of sphere illumination on said task and reference in said second area until the visibility of said task, as viewed from said associated viewing point through said filtering means, is substantially equal to said specific visibility while causing the luminance of said reference in said second area at least to appear unfiltered as viewed through said filtering means from an associated predetermined point, and (h) thereafter, measuring the intensity of sphere illumination of said second task, the improvement comprising:

- using a single task and reference as both said task and reference in said first area and said task and reference in said second area; and
- moving said single task from said first area to said second area after said step of adjusting said light filtering means.

4,055,384

ROOFING APPARATUS

Augustine M. Palzer, 3919 - 52nd Ave. North, Brooklyn Center, Minn. 55429

Filed Oct. 4, 1976, Ser. No. 729,378

Int. Cl.² A46B 11/00, 17/02

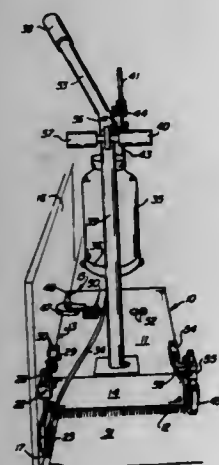
U.S. Cl. 401-48

8 Claims

1. A portable apparatus for cementing edges of lengths of

sheet material in adherent relationship over a roof, comprising a horizontally oriented base structure having contact means at its lower surface for applying pressure upon said sheet material, said base structure having one substantially straight lateral side and having a leading edge and a trailing edge, a brush member for applying cementing fluid underneath an edge of said sheet material, bracket means anchored on said base structure for holding said brush member forwardly beyond the leading edge of said base structure, a nozzle for discharging cementing fluid into said brush member, conduit means for conveying cementing fluid to said nozzle, and handle means for guiding said apparatus in movement along an edge of sheet material, said apparatus being additionally characterized in that:

a. said brush member consists essentially of a substantially flat layer of bristles held at their heel end by a substantially flattened ferrule having an angular section at the portion thereof adjacent said heel end of said bristles, said angular section of said ferrule being at an angle with respect to the main body of said ferrule so that said flat layer of bristles projects laterally away from one lateral side of said main body, the angular configuration between said main body and said bristles of said brush member being between about 90° and 104°,



- b. said bracket means comprises a ferrule holder for holding said main body of said flattened ferrule in vertical orientation at a location substantially parallel and adjacent to an imaginary vertical plane defined as a vertical plane which extends parallel and adjacent to said one substantially straight lateral side of said base structure, said main body of said flattened ferrule being held in said ferrule holder with said bristles of said brush member extending from the lower end and extending laterally from said main body in a direction away from said imaginary vertical plane on the same side thereof as said base structure,
- c. said nozzle is mounted on said apparatus for discharge of said cementing fluid within said angular configuration of said brush member at the heel end of the bristles thereof, and
- d. said base structure is free of any element which projects laterally outward therefrom beyond said imaginary vertical plane at any location along said one substantially straight lateral side of said base structure, whereby said combination of structural features renders said apparatus effective for sealing even the edges of sheet material located adjacent to an upstanding wall.

4,055,385

WORK PIECE CLAMP ARRANGEMENTS

Nils G. Bjors, 161 Crestview St., Barrington, Ill. 60010
Filed Nov. 17, 1975, Ser. No. 632,319

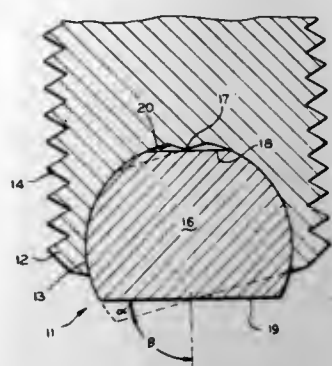
Int. Cl.² F16B 35/00

U.S. Cl. 85—1 SS

6 Claims

1. A clamping screw device for clamping work pieces, said device comprising a screw body, exterior threads on said screw body, a socket on one end of said screw body, sphere means located within said socket, the opening to said socket

being smaller than the diameter of the sphere means, whereby said sphere is retained in said socket,
a first flat surface on one side of said sphere means,
said first flat surface located outside of said socket for use in abutting said work pieces,
limiting means for limiting the rotation of said sphere within said socket,



said limiting means including substantially conical protrusion means on the wall of the socket,
said limiting means further including a cooperating surface on the portions of said sphere within said socket, and
said protrusion centrally located in said cooperating surface when said first flat surface is normal to the longitudinal axis of said clamping screw device.

4,055,386

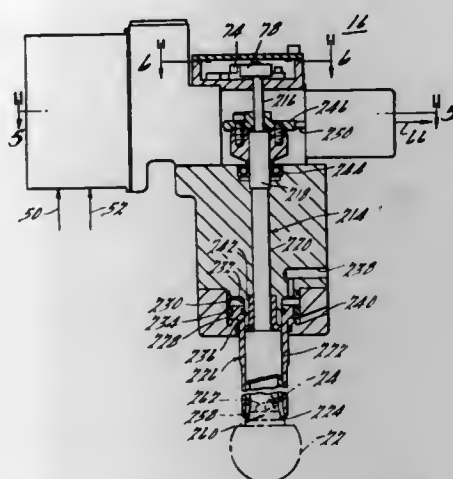
CONTROL SYSTEM FOR COMPENSATING FOR MACHINE TOOL WEAR

Lawrence L. Chynoweth, Utica, and Kurt O. Tech, Grosse Pointe Shores, both of Mich., assignors to The Cross Company, Fraser, Mich.

Continuation of Ser. No. 511,761, Oct. 3, 1974, abandoned, which is a division of Ser. No. 360,669, May 16, 1973, Pat. No. 3,914,678. This application Apr. 22, 1976, Ser. No. 679,382
Int. Cl.² B23B 39/06, 51/00

U.S. Cl. 408—13

4 Claims



1. For a machine having a tool for machining a surface of a workpiece, a rotatable member which is operatively connected with said tool in a manner to move said tool upon rotation of said rotatable member about a predetermined axis for adjusting a dimension of said machined surface of said workpiece, a tool adjusting system comprising:

engaging means for engaging said rotatable member when aligned therewith on said predetermined axis and being rotatable for rotating said rotatable member about said predetermined axis thereby moving said tool, said engaging means having a first cylindrical surface and said rotatable member having a second cylindrical surface, said engaging means being adapted for providing gripping engagement of said second cylindrical surface by said first cylindrical surface which is sufficient for rotation of said

rotatable member about said predetermined axis upon rotation of said engaging means, said first and second cylindrical surfaces being adapted so that they may be grippingly engaged for rotation of said rotatable member about said predetermined axis when aligned on said predetermined axis regardless of the rotational alignment therebetween about said axis;

angular position determining means connected to said engaging means for rotation therewith and for providing an indication of the angular position of said engaging means; and

rotating means connected to said engaging means for rotating said engaging means in accordance with said indication of the angular position of said engaging means whereby the positioning of said tool to adjust said dimension of said machined surface may be accomplished through said indication of the angular position of said engaging means since said engaging means may grippingly engage said rotatable member regardless of the rotational alignment therebetween.

4,055,387

LIQUID FUEL INJECTION PUMPING APPARATUS

James Charles Potter, London, England, assignor to CAV Limited, Birmingham, England

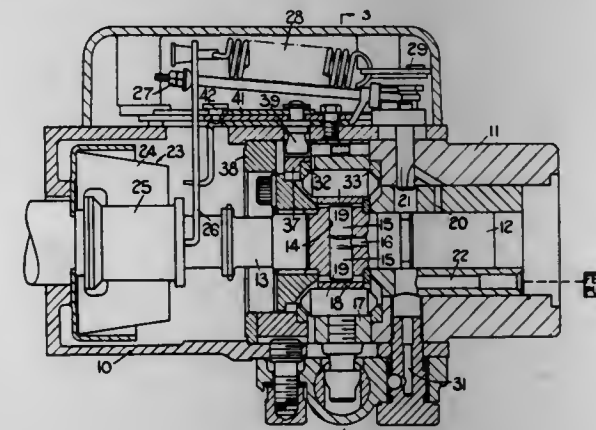
Filed Dec. 5, 1975, Ser. No. 638,156

Claims priority, application United Kingdom, Dec. 6, 1974, 52969/74

Int. Cl.² F04B 1/06, 19/02

U.S. Cl. 417—221

5 Claims



1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising a housing, an injection pump located within the housing and adapted to be driven in timed relationship with an engine with which the apparatus is associated, said injection pump including a rotary part supported within the housing, a bore defined in said rotary part, a plunger movable in said bore, an angularly adjustable cam ring surrounding said part and having angularly spaced cam lobes, a roller engaging said cam ring and positioned between the cam ring and the plunger, an outlet connected to said bore and through which fuel flows during movement of the plunger by the cam lobes, a fuel feed pump for supplying fuel to said bore to effect outward movement of the plunger in the direction opposite to that effected by the cam lobes, said fuel feed pump being driven by said rotary part, a control device for determining the amount of fuel supplied to the injection pump from said fuel feed pump, a pair of stop rings positioned at the opposite ends of the roller for limiting the outward movement of the plunger thereby to control the maximum amount of fuel which can be supplied by the injection irrespective of the setting of said control device, the spacing of said stop rings being temporarily adjustable to allow additional outward movement of the plunger so that the injection pump can supply an additional amount of fuel for starting purposes, a first ring member mounting one of said stop rings, said first ring member being axially and angularly movable within the housing, a second ring member positioned in side by

side relationship to said first ring member, means locating said second ring member against axial movement in the direction away from the other stop ring, adjustment means for providing limited angular adjustment of said second ring member, interengageable formations on the adjacent side faces of said ring members whereby relative angular movement of said ring members will result in relative axial movement thereof, a piston cylinder combination mounted on said housing, means connecting said piston to said cam ring whereby movement of the piston within the cylinder will impart angular movement to the cam ring to adjust the timing of delivery of the injection pump, passage means connecting said cylinder with the outlet of the feed pump, a peg engaged with said first member, a slot for guiding the movement of the peg between extreme positions, the peg during movement from one extreme position to the other imparting angular movement to said first ring member, the spacing of the stop rings in said one extreme position being such that the normal maximum amount of fuel can be delivered as determined by the setting of said adjustment means, and in said other extreme position the spacing of the stop rings being such that excess of fuel can be delivered, resilient means acting to bias said peg towards said one extreme position, catch means for retaining said peg in said other extreme position, said catch means including a pin member engaging said cam ring and operable by said cam ring whereby when said cam ring is moved angularly by said piston said catch means is released to allow the peg to assume said one extreme position.

4,055,388

APPARATUS FOR MOLDING A PROTECTIVE PAD

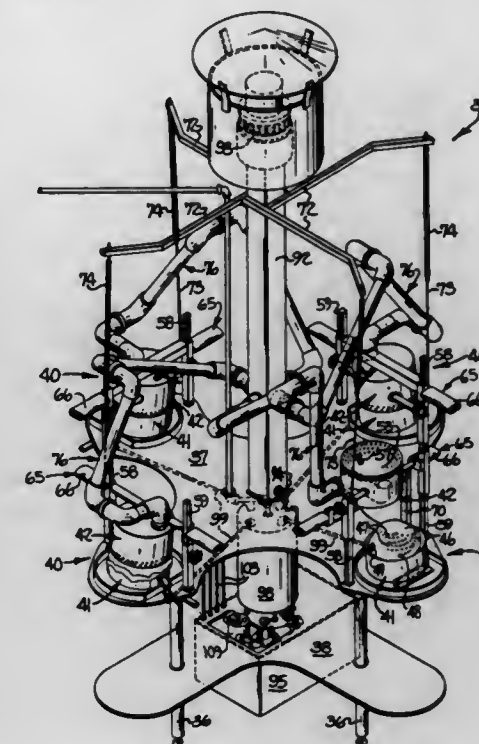
Herman S. Johns, Gastonia, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.

Division of Ser. No. 563,585, March 31, 1975, Pat. No. 3,992,238. This application Aug. 30, 1976, Ser. No. 718,666

Int. Cl.² B29C 27/14

U.S. Cl. 425—4 R

12 Claims



1. An apparatus for molding a protective pad adapted to be positioned on an elbow or heel of a patient and characterized by a generally arcuate cross-sectional configuration, said apparatus comprising

a generally convex mold surface,
a generally concave mold surface having a plurality of relatively small perforations distributed over the area thereof, means for mounting said convex and concave mold surfaces for movement with respect to each other and between a non-operative position wherein the surfaces are separated and said concave mold surface faces upwardly to permit receipt of a particulate molding material therewithin, and

an operative position wherein said convex and concave mold surfaces are in spaced apart, face to face relationship to define a mold cavity therebetween having a generally arcuate cross-sectional configuration, means for drawing a partial vacuum rearwardly of said concave mold surface such that the vacuum acts through said perforations to maintain a predetermined distribution of the molding material within the concave mold surface during the transfer of the surfaces from said non-operative position to said operative position, and means for heating the molding material when such material is positioned in said mold cavity and said surfaces are in said operative position.

4,055,389 DIE CONSTRUCTION

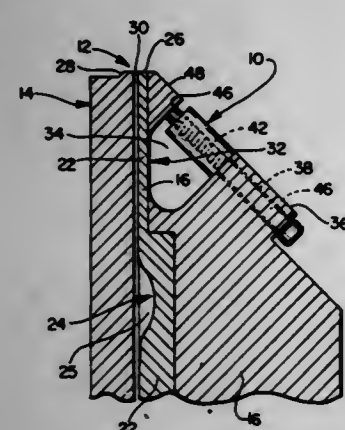
Glenn L. Hayward, Chippewa Falls, Wis., assignor to Leeson Corporation, Warwick, R.I.

Filed July 26, 1976, Ser. No. 708,615

Int. Cl.² B29F 3/04

U.S. Cl. 425-466

7 Claims



1. A die for the extrusion of thermoplastic materials comprising a plurality of metal die components positioned in face-to-face relationship to define a plastic flow channel having an exit slot for the extrusion of sheet material, at least one of said components being of bimetallic construction and having a relatively thick integral surface face layer of a metal having characteristics dissimilar from those of its underlying base, the configuration of said plastic flow channel in said one component formed essentially entirely in said surface face layer, an exit lip formed in said one die component, said exit lip in part defining said exit slot and connected to the main body of said die component by means of a connecting web, said exit lip movable about said web towards and away from the lip of the other of said die components so as to vary the thickness of said exit slot wherein at least a cross sectional portion of said web is essentially entirely formed from said surface face layer.

4,055,390 METHOD AND APPARATUS FOR PREPARING AGGLOMERATES SUITABLE FOR USE IN A BLAST FURNACE

William P. Young, LaGrange, Ill., assignor to Molten Metal Engineering Co., Hinsdale, Ill.

Filed Apr. 2, 1976, Ser. No. 673,072

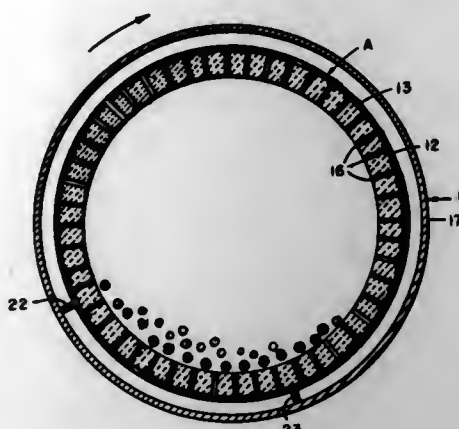
Int. Cl.² F27B 15/00; C22B 1/16

U.S. Cl. 432-14

8 Claims

1. A method for preparing agglomerates suitable for charging into a blast furnace comprising rotating a cylinder having open ends about its longitudinal axis while said axis is inclined with the horizontal, charging into the upper open end of said cylinder while said cylinder is rotating a stream of iron oxide bearing material containing 5 to 15 weight percent of combustible material, said material being in particulate form and of a size such that substantially all of said iron oxide bearing mate-

rial will pass a $\frac{1}{8}$ inch screen, whereby said iron oxide bearing material is caused to move downwardly in said cylinder in a tumbling stream toward the lower end of said cylinder, subjecting said charged material at the upper end portion of said cylinder to contact with a flame whereby to ignite said material in said portion, passing an oxygen containing gas in a confined stream to an area below said stream of material as the



material passes downwardly in said cylinder, passing said gas from said area through the wall of said cylinder and upwardly through said stream to support combustion of materials in said stream and heat said material to from 2200° F to 2600° F and discharging from the lower end of said cylinder agglomerates formed of said material during its passage through the said cylinder.

4,055,391 CRUCIBLE

Walter Schmidt, and Walter Stählin, both of Schaffhausen, Switzerland, assignors to Prolizenz AG, Chur, Switzerland

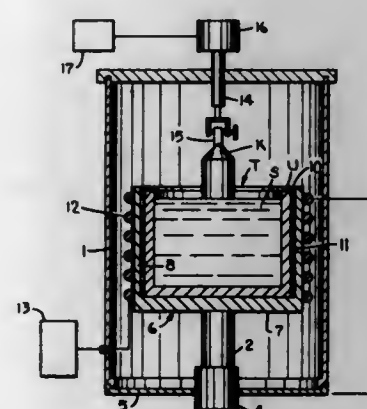
Filed Feb. 26, 1976, Ser. No. 661,433

Claims priority, application Switzerland, June 11, 1975, 7518/75

Int. Cl.² F27B 14/10; F27R 14/00

U.S. Cl. 432-264

11 Claims



1. A crucible, for use in heating a melt, comprising in combination, an outer wall and an inner wall of iridium defining an inner chamber to receive said melt; said outer and inner walls defining therebetween an outer chamber operable to receive a heat distribution medium at least partially filling said outer chamber and having a melting point above about 1500° C and which is below the melting point of said melt and a boiling point above about 1750° C which is above the melting point of said melt, said inner body separating said chambers preventing direct liquid communication between said chambers.

4,055,392

PROCESS FOR DYEING BLENDED FABRICS

Stefan Koller, Ramllinsburg; Mariellse Pacher, Munchenstein, and Karl Emmenegger, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 24, 1975, Ser. No. 571,344

Claims priority, application Switzerland, Apr. 29, 1974, 5871/74

Int. Cl.² D06P 3/82

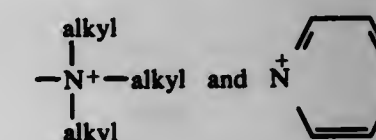
U.S. Cl. 8-21 C

12 Claims

1. A process for dyeing or printing a blend of wool and polyester fibers which comprises the use of a dye of the formula



wherein A is selected from the group consisting of



X is an anion and F is a radical of a dye of the disperse class.

4,055,393

PROPYLENE OXIDE REACTION PRODUCTS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Paul Schafer, Riehen; Heinz Abel, Reinach, both of Switzerland, and Fritz Mayer, Weil am Rhine, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,874

Claims priority, application Switzerland, Apr. 4, 1975, 4293/75

Int. Cl.² C09B 67/00; C09F 5/08; D06P 1/613

U.S. Cl. 8-62

33 Claims

1. A propylene oxide reaction product and a salt thereof obtained by reacting an adduct of

- an at least trihydric aliphatic alcohol containing 3 to 10 carbon atoms, and
 - 1,2-propylene oxide, with
 - an aliphatic dicarboxylic acid containing 2 to 10 carbon atoms, an aromatic dicarboxylic acid containing 8 to 12 carbon atoms, or an anhydride thereof, and
 - a fatty acid containing 12 to 22 carbon atoms.
33. A printing paste containing at least one dye and at least one propylene oxide reaction product of the composition stated in claim 1.

4,055,394

DIAGNOSTIC TEST CARD

Stephen B. Friedman, Claremont, Calif., and Carl B. Linnecke, 69 W. Winnie Way, Arcadia, Calif. 91006, assignors to Arizona Incorporated, Asheville, N.C.

Filed Oct. 18, 1976, Ser. No. 733,649

Int. Cl.² G01N 31/02, 33/16

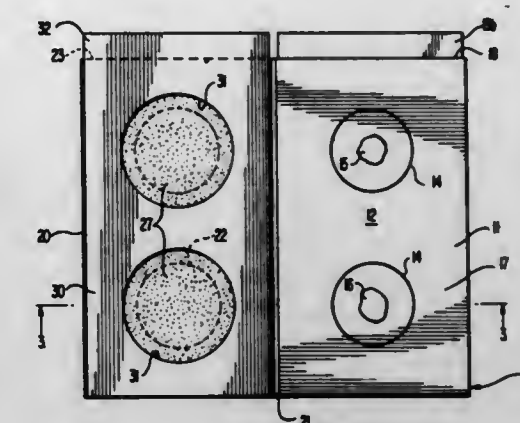
U.S. Cl. 23-253 TP

11 Claims

1. A closable test card for performing immunochemical diagnostic or serological tests on the surface thereof, comprising:

- a test surface member comprising a substantially plane strip of a substrate material having a test surface which is substantially insoluble in, impermeable to, nonabsorbent to, and wettable by aqueous media;
- a covering member coextensive in the area with said test surface member and foldable thereupon to permit preservation and visual observation of test results;
- said test surface carrying at least one circumscribed test area containing at least one deposited dried reagent pro-

viding a predetermined amount of a test reagent, which upon being moistened is reconstituted to said reagent; d. said covering member being joined to said test surface member and foldable thereover to form a closed test card, and including at least one area provided with a transparent convex viewing window, said area being positioned in such manner that when said covering member is folded over onto said test surface member said area and transpar-



ent window are in registry with said test reaction area, permitting viewing of the test area contents; e. said covering member having adhered to the inner surface thereof a continuous sheet of an absorbent material which becomes transparent upon contact with a liquid, said sheet extending across said window area, permitting viewing of the test results through said windows when the test card is closed.

4,055,395

ANALYSIS APPARATUS

Tadashi Honkawa; Kenji Fukuda, and Mikio Shimizu, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

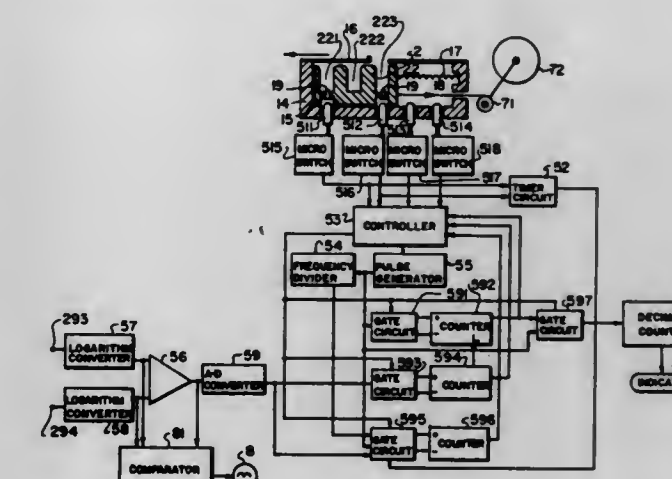
Filed Oct. 29, 1976, Ser. No. 737,094

Claims priority, application Japan, Oct. 31, 1975, 50-130404

Int. Cl.² G01N 21/24

U.S. Cl. 23-253 R

9 Claims



1. An analysis apparatus for performing various chemical analysis using containers, each of which has at least one chamber containing specific reagent and a form thereof depending upon the analysis mode to be performed, comprising: means forming a plurality of incubator chambers for successively heating the containers for various periods of time at a predetermined temperature depending on the forms of the containers that correspond to the analysis mode; means forming a measuring chamber for receiving the container after the incubation in the incubator chambers; and photometry means comprising

- a light source for radiating light of various wave length through said measuring chamber,
- photometric measuring means for detecting the light

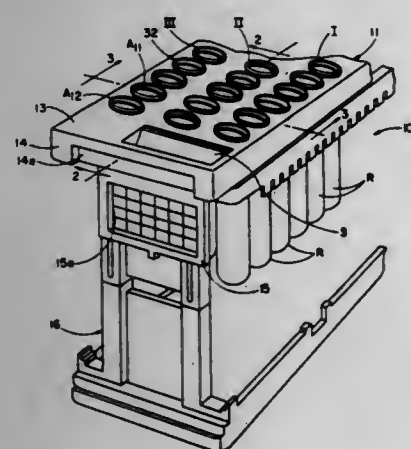
which passes through said measuring chamber and producing a correlated signal,
 c. circuitry means having a first circuit for detecting the form of the container inserted into said measuring chamber and for selecting the light to be detected by said photometric measuring means depending on the form of the container in the measuring chamber, and a second circuit for receiving signals from said photometric measuring means and transforming them into readable data, and
 d. indicator means receiving and displaying the readable data of said second circuit of said circuitry means.

4,055,396

TRAY AND CARRIER ASSEMBLY

Rolf Meyer, Des Plaines, and Manuel I. Martin, Hoffman Estates, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.
 Continuation-in-part of Ser. No. 594,939, July 11, 1975, abandoned. This application Mar. 22, 1976, Ser. No. 669,138
 Int. Cl.² B01L 9/06

U.S. Cl. 23—259



1. In an assembly for accommodating a plurality of open end tubular receptacles, said assembly including a carrier and a tray member comprising one of a larger capacity tray and a smaller capacity tray, said trays provided with a plurality of openings formed therein within which said receptacles may be retained so as to freely depend from said tray, the improvement comprising a support defined upon said carrier and subtending and engaging marginal portions of said tray member whereby the latter is adapted to be removed from said support by being lifted therefrom, said support and tray member being provided with complementary interfitting means whereby said tray member is retained thereby in a unique predetermined position and orientation with respect to said support; and a base member included in said carrier and spaced beneath and in registered relation with said support and being interconnected thereto whereby a space is formed between said support and base member when said tray member is disposed in said predetermined position and orientation for accommodating the depending receptacle portions, said base member being provided with an access opening communicating with the space.

4,055,397

APPARATUS FOR SEPARATING A SUBLIMATION PRODUCT FROM A GAS

Hobertus Johannes Gerardus van Heel, Vriezenveen, Netherlands, assignor to Ultra-Centrifuge Nederland N.V., The Hague, Netherlands

Filed June 8, 1976, Ser. No. 693,960

Claims priority, application Netherlands, June 26, 1975, 7507594

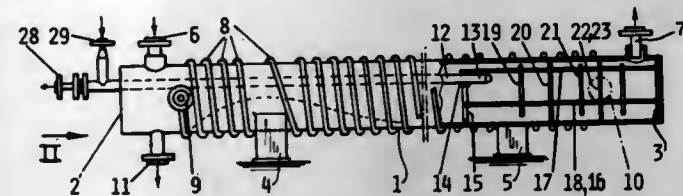
Int. Cl.² B01D 7/02

U.S. Cl. 23—264

1 Claim

1. Apparatus for separating sublimation product from a gas which contains this product in the form of vapour, comprising an elongate substantially horizontal casing having a gas inlet near one end and a gas outlet near the other end so that gas flows longitudinally through the casing; heat exchange means

cooperating with the exterior of the wall of the casing for cooling said wall below the sublimation temperature during the subliming process, means for assuring that an open channel for gas flow is maintained during the subliming process, said means comprising at least one permanently heated, elongate, rod-shaped element fitted eccentrically in the casing, said element extending in the same direction as the casing and being placed in the upper part of the casing, said heating element being manufactured of a material having good heat-conducting properties and projecting into the casing through a wall portion



8 Claims

tion over part of the length of the heating element so that heat can be supplied thereto from outside the casing, the end of the heating element which is located within the casing being supported on a baffle structure and said heating element comprising an inner tube disposed coaxially within an outer tube with an annular space therebetween, said outer tube being closed at the end located within the casing and said inner tube being open at the end located within the casing so that a heating medium can be supplied through the annular space between the tubes.

4,055,398

DUAL TEMPERATURE ISOTOPE EXCHANGE PROCESSES

Gerard J. Pauluis, Brussels, Belgium, and Alistair I. Miller, Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

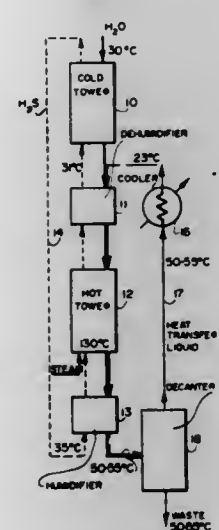
Filed May 27, 1975, Ser. No. 580,692

Claims priority, application Canada, June 17, 1974, 202594

Int. Cl.² B01D 11/04; C01B 5/02

U.S. Cl. 23—270.5 W

2 Claims



1. Apparatus for obtaining a product enriched in deuterium by dual temperature isotope exchange comprising:

- a cold tower containing isotope exchange trays with a liquid as a first phase stream passing downward and a gas as a second phase stream passing upward, through the trays in the tower in counter-current isotope exchange relationship therein,
- a hot tower containing isotope exchange trays with a liquid as a first phase stream passing downward and a gas as a second phase stream passing upward, through the trays in the tower in counter-current isotope exchange relationship therein,
- means for introducing the liquid as input to the top of the cold tower.

- a dehumidifier section,
- means for passing the said liquid from the bottom of the cold tower through the dehumidifier to the top of the hot tower,
- means for passing the said gas from the top of the hot tower through the dehumidifier to the bottom of the cold tower,
- a humidifier section,
- means for taking the said gas from the top of the cold tower and recycling it to the bottom of the hot tower via the said humidifier,
- means for passing a third-phase liquid stream through the dehumidifier and the hot tower,
- liquid separation means,
- means for taking the first phase liquid stream and the third phase liquid stream from the bottom of the hot tower and passing them through the said humidifier to the liquid separation means where the two streams are separated,
- means for taking the first phase liquid stream and passing to waste,
- means for recycling the third phase liquid stream from the liquid separator means to the top of the dehumidifier, and
- means for taking a product enriched in deuterium from the means for passing the said liquid from the bottom of the cold tower through the dehumidifier to the top of the hot tower.

a pressure provided at least in part by oxygen, hydrogen, nitrogen, oxygen plus nitrogen, or hydrogen plus nitrogen.

4,055,401

REDUCING GAS GENERATOR

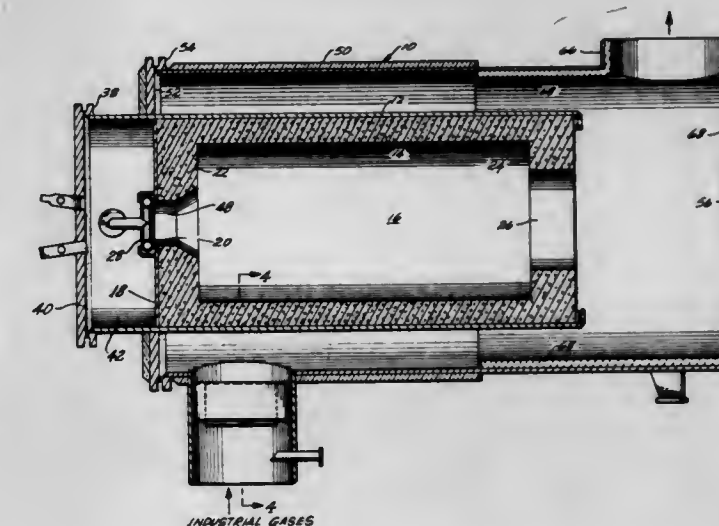
David K. Beavon, Pasadena, and Earl J. Jirus, Arcadia, both of Calif., assignors to The Ralph M. Parsons Company, Pasadena, Calif.

Filed Jan. 14, 1975, Ser. No. 540,869

Int. Cl.² F01N 3/14

U.S. Cl. 23—277 C

10 Claims

4,055,399
TRACERS IN PREDETERMINED CONCENTRATION RATIOS

David R. Parrish, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 24, 1976, Ser. No. 744,478

Int. Cl.² E21B 47/00; G01N 33/24

U.S. Cl. 23—230 EP

3 Claims

1. A method for tracing the flow of three or more slugs of fluid injected into a subsurface formation by means of a smaller number of tracers comprising:

- adding a different one of said tracers to each of a number of injected fluid slugs equal to the number of said tracers;
- adding a different preselected ratio of at least two of said tracers to each of the remaining injected fluid slugs;
- recovering a sample of fluid at a recovery point; and
- analyzing said sample to determine the concentration of each of said tracers.

4,055,400

EXTRACTING SULFUR AND ASH

Edgel P. Stambaugh, Worthington, Ohio, and George F. Sachs, Boulder, Colo., assignors to Battelle Memorial Institute, Columbus, Ohio

Continuation-in-part of Ser. No. 382,536, July 25, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,454

Int. Cl.² C10L 9/10; C10B 57/00

U.S. Cl. 44—1 R

18 Claims

1. A method of extracting a substantial proportion of the pyritic, organic, and sulfate sulfur compounds and ash present in a solid carbonaceous fuel of the coal or coke type comprising

- mixing the fuel with an aqueous alkaline solution containing a sodium, calcium, or ammonium carbonate, or a calcium or ammonium hydroxide, sulfide, or hydrosulfide, or a plurality thereof,
- heating the resulting mixture to at least about 125° C at a pressure of at least about 25 psig to leach out said sulfur compounds and ash,
- separating the easily removable leached out materials from the solid remainder of the fuel, and washing said remainder of the fuel.

4. A method as in claim 1, wherein the mixture is heated at

1. Apparatus for generating hot gas free of molecular oxygen and soot by combustion of hydrocarbon fuel and mixing the hot gas with industrial gas, comprising:

- a cylindrical combustion chamber providing an internal refractory surface and having at one end an elongated inlet opening forming a throat axially aligned with an outlet opening in an opposing end wall of the chamber, which wall provides a refractory surface, each opening being of a smaller cross-sectional area than the axial cross-sectional area of the combustion chamber, the end containing the outlet opening forming a portion of a first radiating surface;
- a concentric cylindrical jacket enclosing the outlet end and having a second planar radiating end refractory surface facing the outlet opening of the combustion chamber, a portion of the jacket surrounding the cylindrical portion of the combustion chamber to form an annular passage therebetween, said concentric cylindrical jacket extending beyond the end of the combustion chamber having the outlet to form a mixing zone;
- a windbox for introduction of an oxygen-containing gas enclosing the inlet opening of the combustion chamber;
- means for directing the oxygen-containing gas into the windbox tangentially to the axis of the combustion chamber, whereby the gas has a rotating motion in passing through the throat;
- means at the throat for forming a plurality of jets of fuel and steam directed into the combustion chamber through the throat simultaneously with passage of the rotating motion oxygen-containing gas through the throat; and
- an inlet communicating with the annular passage for introduction of the industrial gas to the jacket and an outlet in the jacket adjacent the second radiating end surface for exhaust of the industrial gas and products of combustion from the combustion chamber.

4,055,402

GASOLINE COMPOSITION

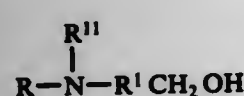
John Battersby, Frimley; Eric Simon Forbes, Lightwater, and Angus Joseph Dickson Reid, Old Windsor, all of England, assignors to The British Petroleum Company Limited, London, England
Division of Ser. No. 416,962, Nov. 19, 1973, abandoned. This application July 19, 1974, Ser. No. 489,893
Claims priority, application United Kingdom, Nov. 29, 1972, 55087/72

Int. Cl.² C10L 1/22

U.S. Cl. 44—58

5 Claims

1. A fuel composition comprising a gasoline and from 50 to 200 parts per million of a carburetor detergent compound of the formula:



wherein R is a hydrocarbyl group containing from 20 to 500 carbon atoms and derived from the polymerization of isobutene, R¹ is a polymethylene group containing 2 to 6 carbon atoms and an amino group and R¹¹ is a hydrogen or an alkyl group containing 1 to 4 carbon atoms.

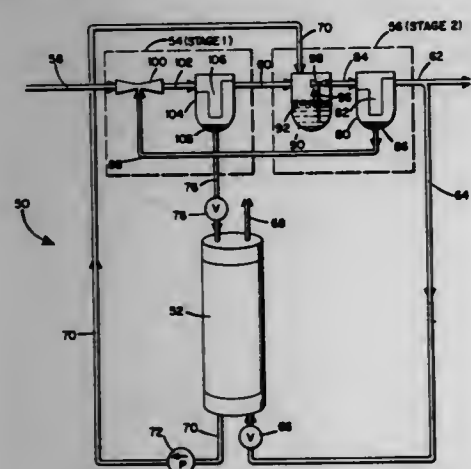
4,055,403

COMPRESSED AIR DRYER

Richard Strauss, Lexington, Mass., assignor to Whatman Reeve Angel Limited, Maidstone, England
Filed July 16, 1976, Ser. No. 705,910
Int. Cl.² B01D 53/14

U.S. Cl. 55—31

28 Claims



1. A method of drying a compressed gas stream, which method comprises:

- intimately contacting a large volume of a high-pressure, wet, compressed gas stream having a high relative humidity with a small amount of a hygroscopic liquid absorbent miscible with the water to be removed by dispersing the liquid absorbent in microdroplet form into the compressed gas stream, and separating the liquid absorbent and compressed gas by coalescing the entrained microdroplets of the liquid absorbent, to provide a wet liquid-absorbent mixture containing the water removed from the gas and a dry compressed gas stream;
- reducing the liquid-absorbent mixture to a lower pressure than the high pressure of the wet compressed gas stream;
- intimately contacting the liquid-absorbent mixture with a portion of the dry compressed gas stream at the lower pressure, and separating the liquid absorbent from the gas stream to provide a dry liquid absorbent and a lower-pressure gas stream containing the water removed from the liquid-absorbent mixture;
- recycling the dry liquid absorbent for use in the contacting of the wet compressed gas stream;

- removing the wet lower-pressure gas stream at the lower pressure; and
 - recovering a dry compressed gas stream.
21. A compressed gas dryer which comprises:
- venturi-mixing means to contact intimately by dispersion a large volume of a high-pressure, wet, compressed gas stream having a high relative humidity with a small volume of a hygroscopic liquid absorbent miscible with the water to be removed, to disperse the liquid absorbent in microdroplet form in the gas stream, and means to separate the liquid absorbent and compressed gas by coalescence, to provide a wet liquid-absorbent mixture containing the water removed from the gas and a dry compressed gas stream;
 - means to reduce the liquid-absorbent mixture to a lower pressure than the high pressure of the wet compressed gas stream;
 - means to contact intimately the liquid-absorbent mixture with a portion of the dry compressed gas stream at the lower pressure, and means to separate the liquid absorbent from the gas stream, to provide a dry liquid absorbent and a lower-pressure gas stream containing the water removed from the liquid-absorbent mixture;
 - means to recycle the dry liquid absorbent for use in the contacting of the wet compressed gas stream;
 - means to remove the wet lower-pressure gas stream at the lower pressure; and
 - means to recover a dry compressed gas stream.

4,055,404

PROCESS FOR COLLECTING PAINT SPRAY MISTS IN SPRAY PAINT OPERATION

Wolfgang Daimler, Hilmgasse 15/9, A 8010 Graz, Austria
Filed July 8, 1975, Ser. No. 593,950
Claims priority, application Germany, July 10, 1974, 2433193
Int. Cl.² B01D 47/06

U.S. Cl. 55—85

9 Claims

1. In a process for the separation of spray mists of water dilutable paints from the environment of a paint spray operation employing a water rinse or wash technique, the improvement wherein in rinse or wash water used to rinse the spray shops and/or wash the spray mist is mixed with a water-soluble, substantially non-volatile, low molecular weight, salt-like electrolyte, said electrolyte being present in an amount sufficient to provide an aqueous salt solution which, at 20° C., has a specific weight of at least 1.01, causing paint to coagulate so as to permit separation from the rinse water in known manner.

4,055,405

ACCESSORY FOR USE WITH VACUUM CLEANERS OR VACUUM-CLEANING CONDUITS

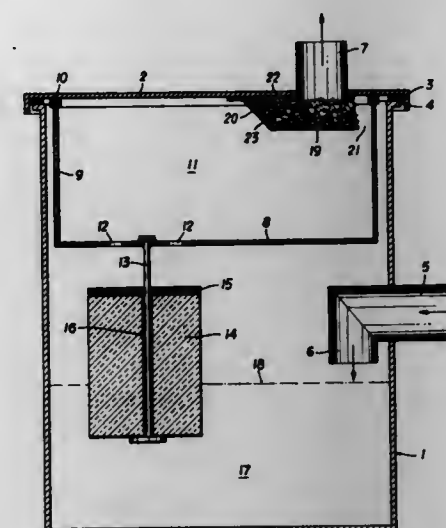
Carl Thun-Hohenstein, Vienna, Austria, assignor to Reflex Mobelpflegemittel-Erzeugung Konrad Schischlik & Sohne, Vienna, Austria
Filed Oct. 14, 1975, Ser. No. 621,792
Claims priority, application Austria, Oct. 21, 1974, 8440/74; July 7, 1975, 5220/75
Int. Cl.² A47L 7/00

U.S. Cl. 55—216

7 Claims

1. An accessory for use in a vacuum cleaner or a vacuum-cleaning conduit for collecting and holding liquid sucked up by the vacuum cleaner, comprising: a container having a reservoir for holding the liquid, a removable cover for said container and extending substantially horizontally thereover, means for dividing said container into said reservoir and a chamber above said reservoir and having a substantially horizontally extending plate, an inlet fitting connected to said cover for connecting the exterior of said reservoir to a hose leading to the suction nozzle of the vacuum cleaner or a vacuum cleaning conduit, said inlet fitting including a pipe extending vertically and having a lower end portion extending into said reservoir, an outlet fitting in said cover for connection to a hose leading to

the body of the vacuum cleaner or vacuum-cleaning conduit and communicating with said chamber, at least one passage in said plate between said chamber and said reservoir, and a float-controlled valve including a float vertically guided on



said lower end portion and a sealing plate loosely arranged on said float and adapted to close said passage to thereby shut off said chamber from said reservoir when the liquid in said reservoir reaches a predetermined level.

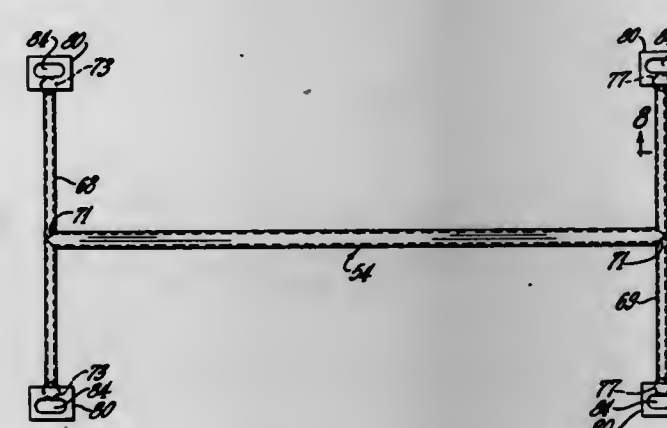
4,055,406

APPARATUS FOR MAKING GLASS FIBERS MATERIAL

Robert O. Slonaker, Pataskala, and Jack L. Emerson, Newark, both of Ohio, assignors to Owens-Corning Fiberglass Corporation, Toledo, Ohio
Filed Oct. 12, 1976, Ser. No. 731,196
Int. Cl.² C03B 37/02

U.S. Cl. 65—11 W

13 Claims



1. Apparatus for forming fibers from streams of heat-softened mineral material comprising, in combination, a stream feeder having a floor section provided with groups of orifices, means for supporting the stream feeder including a tubular support member extending lengthwise of and beneath the floor section, a body of electrically nonconducting nonmetallic material disposed between and engaging the tubular support member and the feeder floor section, a tubular member adjacent each end of the tubular support member and extending transversely of the tubular support member and in substantial parallelism with the feeder floor section, the ends of the tubular support member being joined with intermediate regions of the transversely extending tubular members, said transversely extending tubular members and the tubular support member accommodating circulating fluid for conveying heat away from the feeder floor section.

4,055,407

APPARATUS FOR THE MANUFACTURE OF FLAT GLASS HAVING A GLASS REFRACTORY DELIVERY PIECE AND METHOD OF INSTALLATION

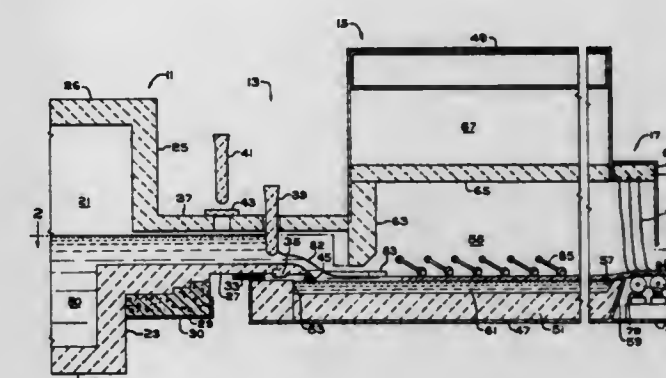
Robert B. Helthoff, Wichita Falls, Tex., and George A. Pecoraro, Lower Burrell, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 1, 1976, Ser. No. 737,318

Int. Cl.² C03B 18/02

U.S. Cl. 65—27

12 Claims



1. An apparatus for making glass comprising a glass melting, refining and conditioning furnace and a glass forming chamber containing a pool of molten metal for supporting glass while it is being formed into a continuous, dimensionally stable sheet of glass, the furnace and forming chamber being joined by a molten glass delivery facility comprising an elongated channel having a bottom positioned at an elevation spaced over the top of the molten metal, side members, a metering member over the end of said channel and wherein the channel bottom terminates with a glass supporting member that extends in a slope downwardly into contact with the molten metal in the forming chamber, said glass supporting member being a gas impervious refractory having a permeability of less than about 5×10^{-3} darcies at least in the portion thereof which contacts the molten metal.

11. A method of modifying a glass forming chamber having a lip spaced above a pool of molten metal for delivering a layer of molten glass thereto, comprising the steps of inserting a refractory lip extension piece into the headspace of a glass forming chamber maintained under substantially reducing conditions above an advancing layer of molten glass, allowing the refractory lip extension piece to approach thermal equilibrium with the molten glass and its surroundings, forcing the refractory lip extension piece downwardly through the advancing layer of molten glass, moving the refractory lip extension piece into a position in substantial contact with the lip of the chamber, beneath the molten glass and in contact with the molten metal and fixing the refractory lip extension piece in that position.

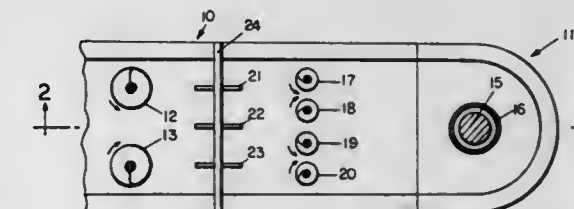
4,055,408

FOREHEARTH HOMOGENIZATION METHOD AND APPARATUS

John D. Novak, Sylvania, Ohio, and Joseph W. Sell, Cranford, N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Nov. 17, 1976, Ser. No. 742,408
Int. Cl.² C03B 9/18

U.S. Cl. 65—135

5 Claims



1. Method of mixing and blending molten glass in a forehearth, comprising the steps of:

rotating a pair of side-by-side blenders upstream of the feeder end of the forehearth, said blenders effectively raising the glass in the zone of their influence; rotating a plurality of homogenizers, spaced in a line transverse of the direction of flow of the glass in the forehearth, said homogenizers being between the blenders and the feeder, said homogenizers effectively pushing the glass downward in their zone of influence; and positioning a plurality of elongated, vertical plates with their lower edge extending adjacent to the bottom of the forehearth with the vertical plane of the face of the plates extending in the direction of the glass flow whereby glass moving from the blender zone to the homogenizer zone is attenuated by the plates and cords free glass is fed to the feeder.

2. Apparatus for mixing and blending molten glass in a forehearth, comprising:

- a pair of laterally positioned blenders upstream of the feeder end of the forehearth, said blenders effectively raising the glass in the zone of their influence;
- a plurality of homogenizers, spaced in a line transverse of the direction of flow of the glass in the forehearth, said homogenizers being positioned between the blenders and the feeder, said homogenizers effectively pushing the glass downward in their zone of influence; and
- a plurality of elongated, vertical plates immersed in the molten glass between the blenders and homogenizers, said plates being oriented with their length parallel to the direction of flow of glass in the forehearth whereby glass moving from the blender zone to the homogenizer zone is attenuated by the plates and cord free glass is fed to the feeder.

4,055,409

PYRAZOLE PLANT GROWTH REGULANTS

Alexander L. Johnson, and Philip B. Sweetser, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

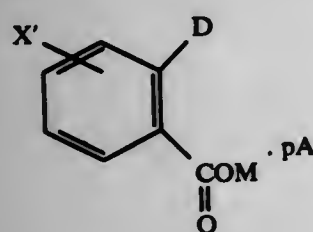
Division of Ser. No. 397,720, Sept. 17, 1973, Pat. No. 3,948,937, which is a continuation-in-part of Ser. No. 230,508, Feb. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 134,576, April 22, 1971, abandoned. This application Oct. 30, 1975, Ser. No. 627,462

Int. Cl.² A01N 5/00

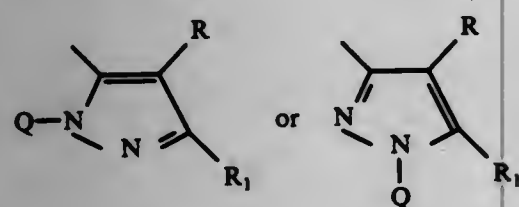
U.S. Cl. 71-76

24 Claims

1. A composition which kills or retards the growth of undesired vegetation or beneficially modifies the growth of desired plants consisting essentially of an inert diluent and an effective amount of a compound of the formula

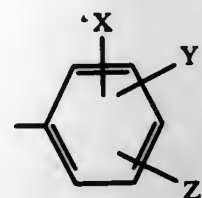


wherein D is



X' is hydrogen, fluorine, chlorine, bromine or methyl;
R is hydrogen or a group selected from $-\text{CH}_2-$, $-\text{CH}_2\text{CH}_2-$, and $-\text{CH}=\text{CH}-$ which joins the 4-position of the pyrazole ring with the 2-position of the R₁ substituent;
R₁ is sec-alkyl of three to six carbon atoms; tert-alkyl of four

to six carbon atoms, cycloalkyl of five or six carbon atoms, naphthyl, biphenyl, or



X is hydrogen, halogen, alkyl of one to four carbon atoms, hydroxy, alkoxy of one to four carbon atoms, alkylthio of one to four carbon atoms, alkylsulfonyl of one to four carbon atoms, trifluoromethyl or nitro;
Y is hydrogen, chlorine, bromine, methoxy or methyl; and Z is hydrogen, chlorine, or methyl;
Q is hydrogen, alkyl of one to four carbon atoms, alkanoyl of one to four carbon atoms, alkoxycarbonyl of two to five carbon atoms, or benzensulfonyl optionally substituted with chlorine or one of two methyls
M is hydrogen, benzyl, alkyl of one to six carbon atoms, hydroxyalkyl of two or three carbon atoms, alkoxyalkyl of three to five carbon atoms, sodium, potassium, lithium, calcium, magnesium, or



where

R₄, R₅ and R₆ are each independently hydrogen, alkyl of one to four carbon atoms or hydroxyalkyl of two to four carbon atoms; and

R₇ is hydrogen, alkyl of one to twelve carbon atoms or benzyl;

p is 0 or 1; and

A is HCl, H₂SO₄, HNO₃ and H₃PO₄

with the provisos that:

1. when M is other than hydrogen, benzyl or optionally substituted alkyl, p is 0; and
2. the total number of carbon atoms in X, Y, and Z cannot exceed 4.

4,055,410

SUBSTITUTED BROMO- OR CHLOROACETAMIDE HERBICIDES

Jiin Duey Cheng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

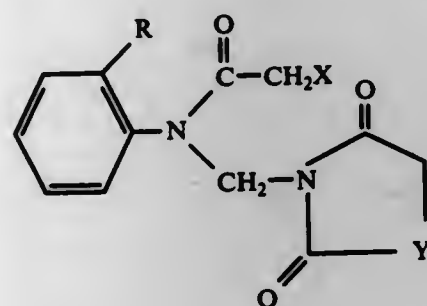
Filed Mar. 15, 1976, Ser. No. 667,279

Int. Cl.² C07D 277/04

U.S. Cl. 71-90

24 Claims

1. A compound of the formula



where

R is alkyl or alkoxy of 1 to 4 carbon atoms;

X is chlorine or bromine; and

Y is S.

7. A composition for the control of undesirable vegetation in crops consisting essentially of a herbicidally effective amount

of a compound of claim 2 and at least one of (a) a surface-active agent and (b) a solid or liquid diluent.

13. A method for the control of undesirable vegetation in crops comprising applying to the locus of such undesirable vegetation a herbicidally effective amount of a compound of claim 1.

4,055,411

AGENTS FOR INHIBITING PLANT GROWTH

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 415,209, Nov. 12, 1973, Pat. No. 3,948,914.

This application Dec. 18, 1975, Ser. No. 641,792

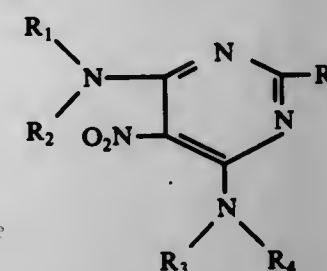
Claims priority, application Switzerland, Nov. 16, 1972, 16728/72

Int. Cl.² A01N 9/22

U.S. Cl. 71-92

8 Claims

1. A herbicidal composition comprising a herbicidally effective amount of a 5-nitropyrimidine derivative of the formula I



wherein R₁ represents alkyl with 1 to 6 carbon atoms, alkenyl with at most 5 carbon atoms, cycloalkyl with 3 to 6 carbon atoms, cyanoalkyl, or hydroxyalkyl, each having alkyls of from 1 to 6 carbon atoms, R₂ and R₃ each independently represents hydrogen or alkyl with 1 to 4 carbon atoms, R₄ represents alkyl with 2 to 6 carbon atoms or cycloalkyl with 3 to 6 carbon atoms, and R₅ represents methoxy, alkyl of 1 to 4 carbon atoms, dimethylamino or trihalomethyl, or the addition salt of such a nitro-pyrimidine derivative with non-phytotoxic inorganic or organic acids; together with a suitable inert carrier therefor.

4,055,412

PHENYLUREIDOIMIDAZOLIDINEDIONES AS PLANT PROTECTANTS

Edward Koon Wah Wat, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

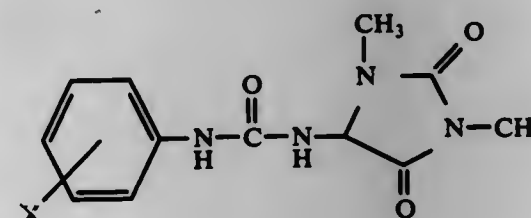
Filed Dec. 22, 1975, Ser. No. 643,392

Int. Cl.² A01N 9/22

U.S. Cl. 71-92

6 Claims

1. A method of protecting plants against damage caused by ozone consisting essentially of applying, to the plants to be protected, an effective amount of a compound of the formula:



wherein X is selected from hydrogen, fluorine, methoxy, meta-chlorine, or meta-bromine; and at least one (a) inert diluent or (b) surfactant, and wherein said plants are selected from pinto bean, orange, lemon, tobacco, grape, potato, tomato, soybean, corn, lettuce, and alfalfa plants.

4,055,413

NOVEL ORGANOTIN HERBICIDAL COMPOUNDS

Donald J. Peterson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 23,457, March 27, 1970, Pat. No. 3,725,446.

This application Jan. 10, 1973, Ser. No. 322,328

Int. Cl.² A01N 9/12

U.S. Cl. 71-97

4 Claims

1. A method of controlling undesirable vegetation which comprises applying to the locus infested with such vegetation a herbicidal amount of a compound having the formula



where R is selected from the group consisting of alkyl of from 1 to 14 carbon atoms; naphthyl; phenyl; and substituted phenyl; and each R' is alkyl of from 1 to 14 carbon atoms.

4,055,414

HERBICIDAL COMPOSITION AND METHOD OF USE

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

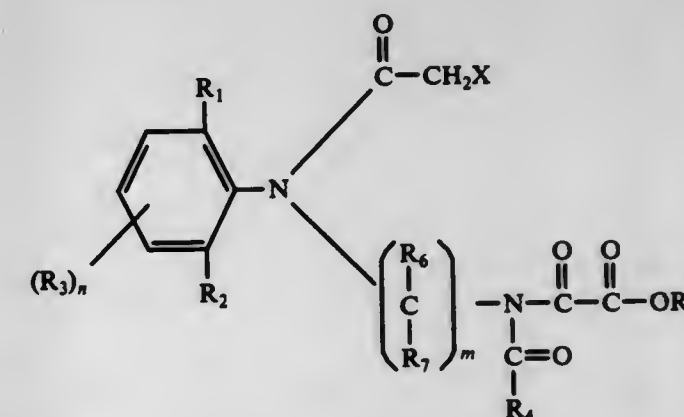
Filed Mar. 11, 1976, Ser. No. 665,972

Int. Cl.² A01N 9/20; C07C 101/447

U.S. Cl. 71-111

16 Claims

1. A compound of the formula



wherein

R₁ and R₂ are independently hydrogen, halogen, C₁₋₁₀ alkyl or alkoxy and may be the same or different;

R₃ is independently halogen, C₁₋₁₀ alkyl or alkoxy or NO₂; and when n is 2 or 3 these groups may be the same or different;

R₄ is hydrogen, alkyl, alkenyl, alkynyl, alkoxyalkyl, polyalkoxyalkyl, haloalkyl, hydroxyalkyl, haloalkenyl, oxoalkyl, alkenyloxyalkyl, each of a maximum of 18 carbon atoms; C₃₋₆ cycloalkyl; aryl, alkaryl, aralkyl, or aryloxyalkyl, each of which may be substituted with halogen, alkyl and/or nitro groups and having at least 6 and not more than 24 carbon atoms; amino or mono- and dialkylamino, monoarylamino, mono(haloaryl)amino, mono(tri-fluoromethylaryl)amino, and alkylalkoxyamino having a maximum of 10 carbon atoms;

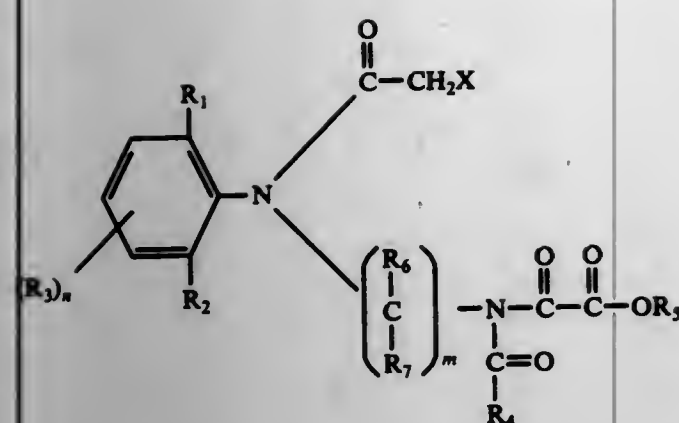
R₅ is alkyl, alkenyl, aryl, aralkyl or alkaryl having a maximum of 18 carbon atoms;

R₆ and R₇ are independently hydrogen or C₁₋₄ alkyl and may be the same or different;

X is chlorine, bromine or iodine;

m is an integer of 1 to 4 inclusive and n is an integer of 0 to 3 inclusive.

11. A method for controlling undesirable vegetation which comprises applying to the locus thereof a herbicidal composition comprising an adjuvant and an effective amount of a compound of the formula



wherein

R₁ and R₂ are independently hydrogen, halogen, C₁₋₁₀ alkyl or alkoxy and may be the same or different;
 R₃ is independently halogen, C₁₋₁₀ alkyl or alkoxy or NO₂ and when n is 2 or 3 these groups may be the same or different;
 R₄ is hydrogen, alkyl, alkenyl, alkynyl, alkoxyalkyl, polyalkoxyalkyl, haloalkyl, hydroxyalkyl, haloalkenyl, oxoalkyl, alkenyloxyalkyl, each of a maximum of 18 carbon atoms; C₃₋₆ cycloalkyl; aryl, alkaryl, aralkyl, or aryloxyalkyl, each of which may be substituted with halogen alkyl and/or nitro groups and having at least 6 and not more than 24 carbon atoms; amino or mono- and dialkylamino, monoarylamino, mono(haloaryl)amino, mono(trifluoromethylaryl)amino, and alkylalkoxyamino having a maximum of 10 carbon atoms;
 R₅ is alkyl, alkenyl, aryl, aralkyl or alkaryl having a maximum of 18 carbon atoms;
 R₆ and R₇ are independently hydrogen or C₁₋₄ alkyl and may be the same or different;
 X is chlorine, bromine or iodine,
 m is an integer of 1 to 4 inclusive and n is an integer of 0 to 3 inclusive.

4,055,415

PROCESS FOR THE REMOVAL OF ALLOYING IMPURITIES IN A SLAG-COVERED COPPER REFINING BATH

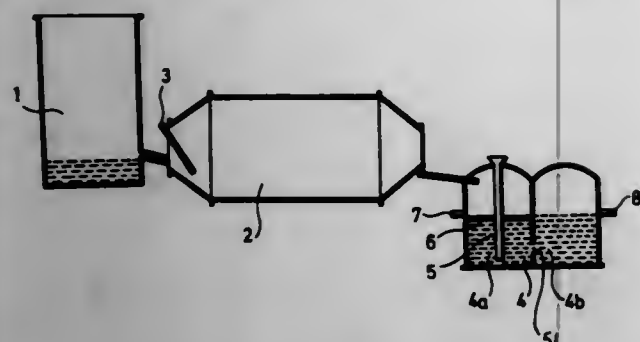
Mihály Stefan, Tibor Nagy, and Sándor Daroczi, all of Budapest, Hungary, assignors to Csepel Fémgyártó, Budapest, Csepel, Hungary

Filed Apr. 16, 1976, Ser. No. 677,777

Claims priority, application Hungary, Apr. 16, 1975, CE 1040
 Int. Cl.² C22B 15/00

U.S. Cl. 75-74

12 Claims



1. In a process for the pyrometallurgical production of high-grade copper from a starting material selected from the group consisting of blister copper and copper scraps, the process comprising the successive steps of smelting and oxidizing a charge of the starting material, slagging the smelted and oxidized charge to obtain a pre-refined copper bath, and reducing the pre-refined copper bath to complete the refining, the improvement which comprises the further steps, accomplished between the slagging and reduction steps, of forming seconds the pre-refined copper bath an artificial slag cover consisting of a mixture of an oxide of at least one first element selected from the group consisting of silicon, phosphorous and boron and an oxide of at least one second element selected from the

group consisting of titanium, aluminum, calcium, strontium, barium, magnesium, sodium, potassium and lithium, contacting the resulting covered bath with at least two elements selected from the group consisting of silicon, phosphorous, boron, titanium, aluminum, calcium, strontium, barium, magnesium, sodium, potassium and lithium, mixing the resulting bath for a first interval of at least 30 seconds, duration, maintaining the mixed bath in a rest condition for at least an additional 15 minutes, and then removing the artificial slag cover.

4,055,416

TANTALUM MODIFIED FERRITIC IRON BASE ALLOYS

Robert E. Oldrieve, Bay Village, and Charles P. Blankenship, Rocky River, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 21, 1976, Ser. No. 651,009

Int. Cl.² C22C 38/06, 38/26, 38/48

U.S. Cl. 75-124

5 Claims

1. A ferritic steel alloy having improved high temperature strength at temperatures to 1,040° C, improved oxidation resistance to 1,150° C, and good cold formability consisting essentially of, in weight percents;

15.0% to 20.0% chromium, 2.0% to 4.0% aluminum, 0.4% to 1.0% silicon, 0.4% to 1.0% titanium, 0.01% to 0.05% carbon, 0.4% to 1.5% tantalum and the balance iron.

4,055,417

HYPER-EUTECTIC ALUMINUM-SILICON BASED ALLOYS FOR CASTINGS

Yoshiro Komiyama; Kunihiro Uchida, both of Okazaki, and Masaaki Tokui, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

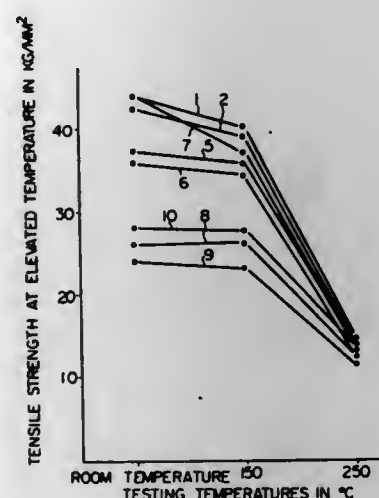
Continuation-in-part of Ser. No. 557,096, March 10, 1975, abandoned. This application May 27, 1976, Ser. No. 690,658

Claims priority, application Japan, Mar. 13, 1974, 49-28938

Int. Cl.² C22C 21/04

U.S. Cl. 75-142

6 Claims



1. A hyper-eutectic aluminum-silicon based, high strength alloy for castings, consisting essentially of 16 to 25% of silicon, 3.0 to 5.5% of copper, 0.2 to 0.8% of magnesium, 0.3 to 0.8% of manganese, not more than 0.25% of titanium, and not more than 0.3% of iron, the balance being aluminum.

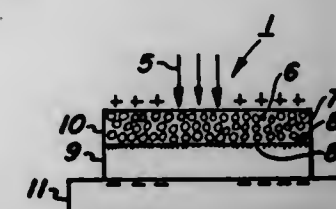
4,055,418

MIGRATION IMAGING METHOD USING AN IMAGING MEMBER EMPLOYING A SURFACE SKIN

David A. Buckley, Rochester, and Frank G. Bell, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
 Division of Ser. No. 499,716, Aug. 22, 1974, Pat. No. 3,979,210.
 This application July 23, 1975, Ser. No. 598,311

Int. Cl.² G03G 13/048

U.S. Cl. 96-1 PS



1. An imaging method comprising:

a. providing an imaged member comprising:

a first layer of electrically insulating softenable material containing a background of migration material, said first layer of softenable material overlying a second layer of electrically insulating softenable material, said second layer of softenable material containing migration material distributed in depth in said second layer of softenable material in image pattern configuration, at least one of said layers of softenable material containing a surface skin located at the entire surface of at least one of said softenable layers and at the interface between said layers of softenable material, said surface skin formed by exposing said surface of at least one of said layers of softenable material to hardening radiation sufficient to form said surface skin having a thickness from about 0.1 to about 0.5 micron;

b. removing said background of migration material by splitting said member at said interface.

4,055,419

METHOD OF DEVELOPING ELECTROSTATIC IMAGES USING WIDE LATITUDE TONER

Charles J. Voss, Addison, and Theodore Nykiel, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 513,970, Oct. 11, 1974, Pat. No. 3,997,456, which is a continuation-in-part of Ser. No. 304,030, Nov. 6, 1972, abandoned. This application Aug. 23, 1976, Ser. No. 716,744

Int. Cl.² G03G 13/10

U.S. Cl. 96-1 LY

6 Claims

1. The method of rendering visible the reverse sense electrostatic patterns contained on a surface in the form of negative electrostatic charges of varying intensity comprising contacting said surface with a liquid developer consisting of a carrier liquid having an electrical volume resistivity in excess of 10⁹ ohm cm and a dielectric constant of less than 3, said liquid carrier having suspended therein non-resinated toner pigment particles, said liquid carrier having dissolved therein a sensitizing agent selected from the group consisting of 1/4% to 20% inclusive overbased calcium sulfonate in isoparaffinic hydrocarbon solvent and 15% to 25% inclusive nitrogen substituted long chain alkenyl succinamide in isoparaffinic hydrocarbon solvent, said toner particles including phthalocyanine green, carbon black, and thioindigoid red, and having a negative polarity whereby said toner particles are attracted to the area on said surface of no less than minimum of said electrostatic charge such that toner deposition takes place onto areas defined by said electrostatic pattern where the intensity of said negative electrostatic charges has been reduced or is zero by exposure to electromagnetic radiation, wherein said toner particles are milled in the presence of said sensitizing agent and a long oil soya modified pentaerythritol alkyl resin, whereby said toner particles become dispersed and have adsorbed thereon a film of said sensitizing agent.

4,055,420

SINGLE PHASE ORGANIC PHOTOCONDUCTIVE COMPOSITION

William W. Limburg, Penfield, and Damodar M. Pai, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

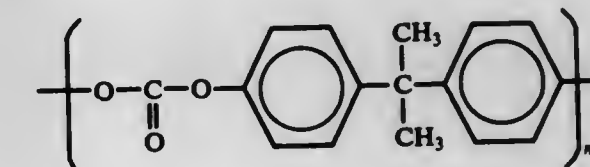
Filed Jan. 27, 1977, Ser. No. 763,275

Int. Cl.² G03Q 5/06

U.S. Cl. 96-1.5 N

6 Claims

1. An organic photoconductive composition consisting essentially of about 3.2 weight percent N-ethyl-3-tricyanovinyl-carbazole, about 32.3 weight percent 2,5-bis(N,N-dimethylaminophenyl) oxadiazole and about 64.5% of a polycarbonate resin having recurring structural units represented by the formula



where n is in the range of from about 150 to about 400.

4,055,421

SENSITIZER FOR PHOTOCONDUCTIVE SENSITIVE MATERIAL

Masafumi Ohta, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1975, Ser. No. 639,417

Claims priority, application Japan, Dec. 12, 1974, 49-142736

Int. Cl.² G03G 5/04

U.S. Cl. 96-1.6

2 Claims

1. A photoconductive material which comprises an organic photoconductor and 1,3,7-trinitrophenazine-5-oxide.

4,055,422

ADDITIVE FOR INHIBITOR REMOVING BATH

Bruce W. Wittnebel, and R. Dean Lowrey, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 28, 1975, Ser. No. 599,639

Int. Cl.² G03C 7/16, 5/32, 5/30

U.S. Cl. 96-22

7 Claims

1. A composition of matter comprising a borohydride or borane complex anhydrously associated with an aldose.

4,055,423

ORGANIC MEDIUM FOR THIN-PHASE HOLOGRAPHY

Robert Alfred Bartolini, Trenton, and Allen Bloom, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

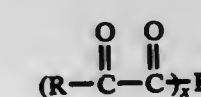
Filed Apr. 15, 1976, Ser. No. 677,437

Int. Cl.² G03C 5/04

U.S. Cl. 96-27 H

6 Claims

1. A method for recording permanent thin-phase holograms wherein holograms are recorded in only one plane which comprises changing with coherent light and without further development processing the refractive index in selected areas of a recording medium and detecting with coherent light the refractive index changes wherein the recording medium comprises a substrate having a recording layer thereon wherein the recording layer comprises an olefinically unsaturated negative photoresist polymer containing a soluble α-diketone which has the formula



wherein R and R' independently are selected from the group consisting of methyl, branched chain alkyl and cyclic hydrocarbon groups wherein the carbon atoms are part of an aromatic or aliphatic ring and R and R' together can form part of an aromatic or aliphatic ring; and x is an integer of 1 to 2.

4,055,424 NOVEL MICROFILM AND PROCESS FOR PREPARATION

Joseph Yung-Chang Chu, Fairport, and Richard Louis Schank, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 7, 1976, Ser. No. 684,323
Int. Cl.² G03C 1/71

U.S. Cl. 96—35.1

10 Claims

1. A novel microfilm comprising a transparent film substrate, an intermediate silicone elastomer which is adhesive to ink and a surface layer of a photosensitive polymer which upon exposure to activating electromagnetic radiation crosslinks and chemically attaches to the silicone elastomer to form ink accepting image areas.

5. A process for providing a microfilm structure comprising:
- providing a suitable transparent film substrate,
 - coating said substrate with an intermediate layer of a silicone elastomer gum curable or coalesceable to an ink releasing adhesive condition,
 - rendering said silicone inherently adhesive to ink,
 - coating said silicone with a surface layer of a photosensitive polymer which then exposed to actinic radiation crosslinks and combines with said silicone elastomer to form oleophilic ink accepting image areas,
 - imagewise exposing said photosensitive polymer to cause the polymer to become insoluble and combine with the silicone to form an image area
 - removing the non-exposed, light sensitive polymer to form non-imaged areas of the adhesive silicone elastomer, and
 - selectively inking the oleophilic image areas to form an imaged microfilm structure of improved image density and contrast.

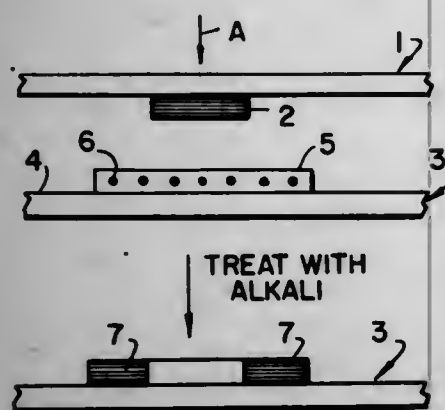
4,055,425 DIAZOTYPE MATERIAL AND GRAPHIC REPRODUCTION PROCESSES EMPLOYING THE SAME

Henry Mustacchi, London, England, assignor to GAF Corporation, New York, N.Y.

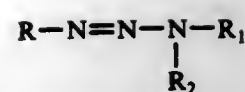
Filed Mar. 10, 1975, Ser. No. 556,971
Int. Cl.² G03C 1/58

U.S. Cl. 96—49

38 Claims



1. A diazotype material, which comprises a supported light-sensitive layer comprising a light-sensitive, water-insoluble diazoimino compound of the formula reactive



wherein R is an aryl group and R₁ and R₂ are organic radicals, which may be the same or different, or R₁ and R₂ together with the nitrogen atom to which they are attached form a 4 to 7 membered heterocyclic group, an azo coupler, and an alkaline material, said diazoimino compound, when exposed to ultraviolet light, being reactive with said azo coupler to form a visible dye product only at a pH greater than 7.

4,055,426 PROCESS FOR STABILIZING A COLOR DEVELOPING SOLUTION

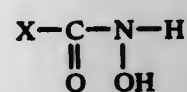
Junkichi Ogawa, Tsumoru Ishii, and Isao Shimamura, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 27, 1976, Ser. No. 718,274
Claims priority, application Japan, Aug. 27, 1975, 50-103730
Int. Cl.² G03C 7/00, 5/30

U.S. Cl. 96—66.4

18 Claims

1. A process for stabilizing a color developing solution containing one or more p-phenylenediamine derivatives which comprises adding one or more hydroxamic acid compounds represented by the following formula to the color developing solution:



wherein X represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an unsubstituted or substituted aryl group having 6 to 10 carbon atoms, an amino group, an alkylamino group having 1 to 4 carbon atoms or an arylamino group.

4,055,427 PROCESS OF HARDENING A SILVER HALIDE PHOTOGRAPHIC MATERIAL WITH A 4-CARBAMOXYLOXYPYRIDINIUM SALT

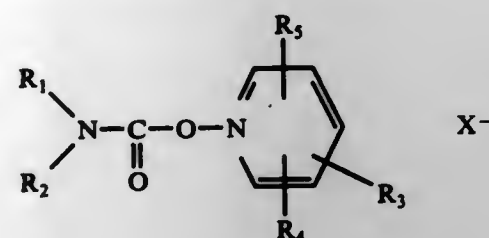
Peter Bergthaller, Cologne; Wolfgang Himmelmann; Wolfgang Sauerteig, both of Leverkusen, and Lothar Rosenhahn, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 551,069, Feb. 19, 1975, abandoned.
This application Feb. 15, 1977, Ser. No. 768,902
Claims priority, application Germany, Feb. 23, 1974, 2408814
Int. Cl.² G03C 1/30, 1/76

U.S. Cl. 96—67

11 Claims

1. A process for providing a hardened layer in a photographic material containing a light sensitive silver halide emulsion layer and at least one layer containing a binder selected from the group consisting of gelatin and homopolymers and copolymers which contain carboxyl groups coated on a support wherein the improvement comprises applying to the binder-containing layer a hardening amount of a 4-carbamoyloxypyridinium salt of the formula



in which

R₁ represents a lower alkyl or aryl group,
R₂ represents a lower alkyl group or a group

4,055,429 INHIBITOR BARRIER LAYERS FOR PHOTOGRAPHIC MATERIALS

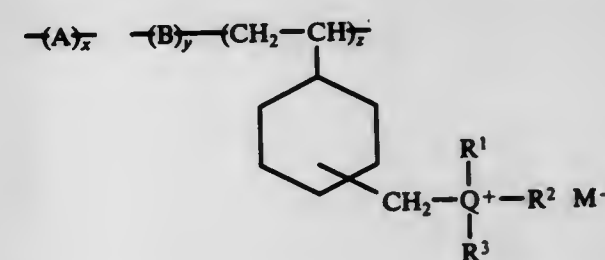
Edmund Thompson Holmes, and Gerald Allan Campbell, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,800
Int. Cl.² G03C 1/76, 1/48, 1/84

U.S. Cl. 96—74

19 Claims

1. A photographic element comprising a support having at least one layer containing a silver halide emulsion and at least one layer containing a development inhibitor scavenger, and wherein no acid dye or acid dye precursor is present, the improvement wherein said development inhibitor scavenger is a crosslinked polymer comprising units represented by the formula:



in which

R₆ represents hydrogen, or a lower alkyl or aryl group,

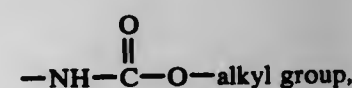
R₇ represents a lower alkyl group and

R₈ represents a lower alkyl group; or

R₁ and R₂ together represent the atoms required to complete a heterocyclic ring selected from the group consisting of pyrrolidine, morpholine-, piperidine-, perhydroazepine-, 1,2,3,4-tetrahydroquinoline- or imidazolidine-2-one ring, or

R₁ and R₂ together represent the atoms required to complete a piperazine ring in which the nitrogen that completes said piperazine ring is a member of the carbamoyl group of a second carbamoyloxypyridinium group,

R₃ represents hydrogen or halogen, or a lower alkyl, lower oxyalkyl, cyano, CONH₂ or



R₄ represents hydrogen or a lower alkyl group,

R₅ represents hydrogen or a lower alkyl group and represents an anion.

4,055,428 REDOX DYE RELEASES O-SULFONAMIDOPHENOL

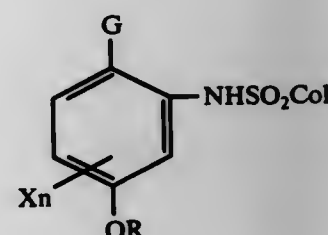
Koichi Koyama; Yukio Maekawa, and Masami Miyakawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 26, 1976, Ser. No. 670,763
Claims priority, application Japan, Mar. 28, 1975, 50-38305
Int. Cl.² G03C 1/40, 7/00, 1/76, 1/10

U.S. Cl. 96—73

28 Claims

5. A photographic unit for a color diffusion transfer process comprising a support, a photosensitive element, an image-receiving element, and an aqueous and alkaline liquid processing composition, said photosensitive element comprising at least one silver halide emulsion layer having associated therewith a dye releasing redox compound represented by the general formula



wherein

G represents a hydroxyl group or a group giving a hydroxyl group upon hydrolysis,

Col represents a dye or a group giving a dye, both being diffusible when released upon hydrolysis;

R represents an alkyl group or an aromatic group,

X represents an electron donating group substituent when n is 1, or substituents, which may be the same or different, one of said substituents being an electron donating group and the second or second and third substituents being selected from the group consisting of an electron donating group or a halogen atom, wherein X groups may form a condensed ring, excluding an aromatic ring, with each other or with OR,

n is 1, 2 or 3 and the total carbon number of X_n and R is larger than 8.

4,055,430 LIGHT SENSITIVE MATERIAL CONTAINING AN ETHYLENE COMPOUND DYE FORMER, AN ORGANIC POLYMER COMPOUND CONTAINING CHLORINE AND A PLASTICIZER

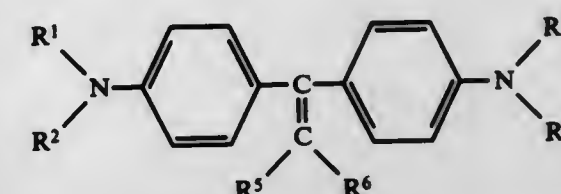
Eiichi Hasegawa, and Kenichiro Yazawa, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 17, 1976, Ser. No. 687,127
Claims priority, application Japan, May 15, 1975, 50-58281
Int. Cl.² G03C 1/52

U.S. Cl. 96—90 R

10 Claims

1. An image-forming light-sensitive composition consisting essentially of (a) an organic polymer compound containing chlorine, (b) a coloring matter-forming compound represented by the formula:



wherein R¹ through R⁴ each represent a hydrogen atom, a lower alkyl group, or an aryl group, and R⁵ to R⁶ each represent a hydrogen atom, a lower alkyl group, or R⁵ and R⁶ combine with each other to form a 5- or 6-membered carbocyclic ring, and a plasticizing amount of a liquid plasticizer selected from the group consisting of a phthalic acid ester, a straight chain dibasic acid ester, a phosphoric acid ester, a

ricinolate derived from castor oil, an epoxide, of an unsaturated aliphatic acid a tri- or tetraethylene glycol ester of a C₆ to C₁₀ aliphatic acid, a polyester based plasticizer, a citric acid ester, a glycidyl ether, a glycol or polyhydric alcohol ester of acyclic or methacrylic acid or a chlorinated paraffin hydrocarbon for said organic polymer containing chlorine and capable of dissolving the coloring matter-forming compound.

4,055,431

N-(β-CHLORO-PROPIONYL OR

ACRYLOYL)CARBAMYL OR UREIDO PIPERAZINES

Rolf Kyburz, Thun, Switzerland; Rainer Kitzing, Ilford, England, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 543,752, Jan. 24, 1975, Pat. No. 3,977,881.

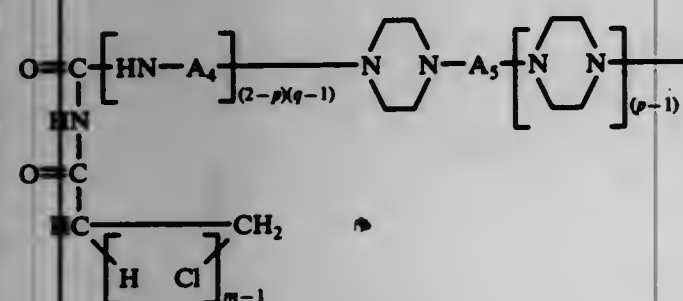
This application Apr. 29, 1976, Ser. No. 681,304

Claims priority, application Switzerland, Jan. 31, 1974, 1332/74

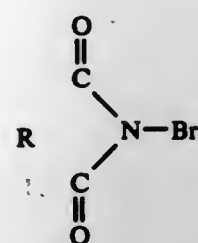
Int. Cl.² G03C 1/30; C07C 127/22; C07D 295/12; B65G 57/10

U.S. Cl. 96—111 8 Claims

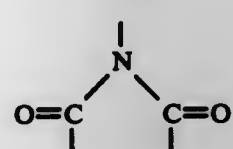
1. An acylurea compound which corresponds to the formula



a reducing agent, (d) a binder, and (e) a compound having the following general formula



wherein R is a non-metallic atomic grouping necessary to form a heterocyclic ring containing at least 2 nitrogen atoms in the ring inclusive of the nitrogen in the



moiety in the above formula.

4,055,433

OIL-OUT SELF-SHINING EMULSION COATING COMPOSITION

Ricardo Morones, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 4, 1975, Ser. No. 637,544

Int. Cl.² C09G 1/04, 1/08

U.S. Cl. 106—10 9 Claims

1. A water-in-oil emulsion coating composition comprising: 0.5–2% by weight of an ethoxylated nonionic surfactant having an ethylene oxide content of 40–100 moles of ethylene oxide having an HLB of from 16–19, said non-ionic surfactant being formed from an alcohol selected from the group consisting of fatty alcohols and alkyl-aryl alcohols;

up to 30% by weight of a hard wax having a melt point above about 80° C.; up to 30% by weight of a soft wax having a melt point below about 80° C.;

0.3–4% by weight of an emulsifier selected from oxazolines, imidazolines, quaternary ammonium compounds, fatty acid diethanolamides, mixtures of sorbitan monooleate and sorbitan monooleate plus 20 moles of ethylene oxide, and mixtures thereof;

15–70% by weight of a solvent selected from the group consisting of naptha, isoparaffinic hydrocarbon solvents having a distillation range of from 190°–540° F., hydrocarbon ethers, and chlorinated solvents; and

20–75% by weight water; wherein the total wax content of the composition is from 3–35% by weight and the non-volatile content is from about 4–40% by weight.

4,055,434

REFRACTORY FIBER COMPOSITION AND INTERMEDIATE TEMPERATURE RANGE FIBROUS INSULATION COMPOSED THEREOF

Alwin Bennett Chen, Littleton, and John Matthew Pallo, Englewood, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Apr. 23, 1976, Ser. No. 679,635

Int. Cl.² C03C 13/00; C04B 35/14

U.S. Cl. 106—50 10 Claims

1. A refractory fiber composition suitable for use as thermal insulation in temperature ranges of from 1400° F. to 2000° F., which is formed from a melt consisting essentially of 84% to 97% by weight total silica and alumina, with the silica and

alumina being present in a silica-to-alumina weight in the range of 3:2 to 1:1, and 3% to 16% by weight of a dolomitic component comprising burnt dolomite or calcium oxide and magnesium oxide.

4,055,435

GLASS COMPOSITIONS FOR OPHTHALMIC LENSES

Hiroji Sagara, Akikawa, Japan, assignor to Hoya Glass Works, Ltd., Tokyo, Japan

Filed June 2, 1976, Ser. No. 692,074

Claims priority, application Japan, June 2, 1975, 50-66270; July 10, 1975, 50-84798

Int. Cl.² C03C 3/04, 3/08

U.S. Cl. 106—52 4 Claims

1. A glass composition for an ophthalmic lens having a refractive index of at least 1.69, an Abbe value of at least 39 and a specific gravity of not more than 3.2 and consisting essentially of, in percent by weight:

- 42 to 52 SiO₂ + Al₂O₃ + B₂O₃ with 20 to 42 SiO₂, 5 to 13 Al₂O₃ and 0 to 20 B₂O₃;
- 22 to 39 CaO + MgO with 12 to 39 CaO and 0 to 20 MgO;
- 15 to 28 ZrO₂ + TiO₂ + Nb₂O₅ with 0 to 7 ZrO₂, 5 to 13 TiO₂ and 0 to 15 Nb₂O₅;
- 0 to 15 BaO + SrO + ZnO with 0 to 6 BaO, 0 to 10 SrO and 0 to 15 ZnO; and
- 0 to 10 La₂O₃ + Ta₂O₅ + WO₃ with 0 to 10 La₂O₃, 0 to 6 Ta₂O₅ and 0 to 10 WO₃.

4,055,436

GLASS FOR MANUFACTURING WHITE-COLORED GLASS-CRYSTALLINE MATERIAL

Nikolai Mikhchevich Paviushkin, ulitsa Gotvalda, 20, kv. 15; Konstantin Timofeevich Bozdarev, Nizhne-Pervomaiskaya ulitsa, 33, kv. 171, both of Moscow; Anatoly Vasilievich Strekalov, ulitsa Shmidt, 31, kv. 12, Konstantinovka Donetsk oblasti; Viktor Stepanovich Kozlovsky, ulitsa Teatralnaya, 6a, Dolgoprudny Moskovskogo oblasti; Anatoly Gavrilovich Minakov, ulitsa Levanevskogo, 18, kv. 11; Tamara Efimovna Golits, ulitsa Pushkinskaya, 18, kv. 11, both of Konstantinovka Donetsk oblasti; Ljudmila Alexeevna Orlova, ulitsa Kibalkich, 2, korpus 3, kv. 20; Pavel Dzhibrailovich Sarkisov, ulitsa Gotvalda, 20, kv. 3, both of Moscow; Mikhail Ivanovich Kozmin, ulitsa Shmidt, 31, kv. 6, and Vladimir Anatolevich Minakov, ulitsa Shmidt, 31, kv. 14, both of Konstantinovka Donetsk oblasti, all of U.S.S.R. Continuation of Ser. No. 599,601, July 28, 1975, abandoned, which is a continuation of Ser. No. 139,465, May 3, 1971, abandoned. This application Aug. 12, 1976, Ser. No. 713,896

Int. Cl.² C03C 3/04, 3/22

U.S. Cl. 106—52 1 Claim

1. A glass for manufacturing white-colored glass-crystalline material, consisting essentially of, in per cent by weight:

- SiO₂ 48–60
- Al₂O₃ 5–8
- CaO 20–30
- MgO 0.8–2.5
- MnO 0.5–1.5
- Fe₂O₃ 0.1–1
- TiO₂ 0.2–0.5
- F₂ 0.5–2
- K₂O 4–7
- Na₂O up to 1.5 and
- ZnS less than 1.

4,055,437

METHOD OF IN SITU FABRICATION OF A MONOLITHIC REFRACTORY LINING

Daniel Ralph Petrak, N. Huntington, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 649,286, Jan. 15, 1976, abandoned. This application Mar. 23, 1977, Ser. No. 780,216

Int. Cl.² C04B 35/02

U.S. Cl. 106—64 4 Claims

1. In a method of gunning refractory material on its situs of use with a minimum of rebounds to form a refractory monolith, which method includes the steps of preparing a refractory batch comprising non-basic refractory aggregate and calcium aluminate cement and tempering it, the improvement comprising mixing from about 0.5 to 25%, based upon the weight of the cement, of calcium chloride hydrate with the refractory batch and gunning the resulting batch.

4,055,438

BARIUM TITANATE CERAMIC

Shigetaka Wada, Kuwana, and Senji Atsumi, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 431,397, Jan. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 256,368, May 24, 1972, abandoned. This application July 11, 1975, Ser. No. 594,967

Claims priority, application Japan, June 2, 1971, 46-37858

Int. Cl.² C04B 35/00, 35/46

U.S. Cl. 106—73.32 12 Claims

1. A ceramic having a positive temperature coefficient of electric resistance, consisting essentially of:

- 100 parts by weight of four ingredients including
 - a. 1 mol of one barium titanate composition which is selected from the group consisting of barium titanate, 0.0001 to 0.35 mol of lead titanate and the remainder of barium titanate, 0.0001 to 0.4 mol of strontium titanate and the remainder of barium titanate, and 0.0001 to 0.15 mol of barium stannate and the remainder of barium titanate,
 - b. 0.003 to 0.05 mol of titania,
 - c. 0.003 to 0.05 mol of alumina, and
 - d. 0.005 to 0.06 mol of silica;
- 0.05 to 0.3 part by weight of at least one oxide selected from the group consisting of tantalum pentoxide and antimony pentoxide based on the preceding 100 parts by weight of ingredients (a) to (d); and
- 0.005 to 0.03 part by weight of at least one metal selected from the group consisting of manganese and copper based on the preceding 100 parts by weight of ingredients (a) to (d).
2. The ceramic according to claim 1, wherein said barium titanate composition is 0.0001 to 0.35 mol of lead titanate and the remainder of barium titanate.

4,055,439

PROCESS FOR THE MANUFACTURE OF DUSTLESS, READILY DISPERSIBLE PIGMENT GRANULES

Fridolin Babler, Allschwil; Hans Mollet, Reinach, and Gunther Zwahlen, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,617

Claims priority, application Switzerland, Sept. 13, 1974, 12519/74

Int. Cl.² C08K 5/00

U.S. Cl. 106—288 Q 15 Claims

1. A process for the manufacture of an easily isolatable, dustless, readily dispersible pigment granulate, which comprises gradually adding, at a temperature between 10°–35° C under turbulent mixture, to a suspension of 10 parts of a finely dispersed organic pigment or pigment preparation in 10–700 parts of water 2–22 parts of an organic solvent being virtually insoluble in water, and having dissolved 0.1–2.5 parts of water-

4,055,447

DIRECTIONALLY SOLIDIFIED EUTECTIC γ - γ' NICKEL-BASE SUPERALLOYS

Melvin R. Jackson, Schenectady, N.Y., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,171
Int. Cl.² C22C 19/03

U.S. Cl. 148—32

13 Claims

1. An article of manufacture having improved high temperature properties comprising a unidirectionally solidified anisotropic metallic multivariant eutectic casting containing a matrix of a γ -face-centered-cubic crystal structure nickel-base superalloy having embedded in the γ phase an aligned reinforcing fibrous γ' phase consisting primarily of a nickel-aluminum-tantalum composition which is a complex cubic L₁₂ crystal structure based on Ni₃Al.

4,055,448

FERRITE-AUSTENITE STAINLESS STEEL

Masakuni Fujikura, Nagoya, and Naohiro Abe, Chita, both of Japan, assignors to Daido Seiko Kabushiki Kaisha, Nagoya, Japan

Continuation-in-part of Ser. No. 459,364, April 9, 1974, abandoned. This application May 14, 1976, Ser. No. 686,598
Claims priority, application Japan, Apr. 10, 1973, 48-40607; Jan. 29, 1974, 49-12405

Int. Cl.² C22C 38/42

U.S. Cl. 148—38

3 Claims

1. An improved stainless steel in ferrite-austenite condition said ferrite-austenite condition being produced by solution heat treatment at a temperature of 1000°–1150° C., and composed of, by weight percent, carbon up to 0.06%, silicon up to 1.0%, manganese up to 1.5%, nickel from 3.0% to 7.0%, chromium from 21.0% to 28.0%, copper up to 3.0%, molybdenum from 1.0% to 4.0%, boron from 0.0008% to 0.0080%, niobium from 0.04% to 0.7%, titanium from 0% to 0.5%, tantalum from 0% to 0.5%, zirconium from 0% to 0.5%, nitrogen up to 0.1%, and the remainder of iron and an inevitable amounts of impurity, with the values of nickel equivalent and chromium equivalent calculated by the following equations:

$$\begin{aligned} \text{nickel equivalent} &= 40 (\text{carbon \%} + \text{nitrogen \%}) + 3 (\text{nickel \%}) + (\text{copper \%}) + 2 (\text{manganese \%}) \\ \text{chromium equivalent} &= (\text{chromium \%}) + 5.2 (\text{silicon \%}) \\ &\quad + 4.2 (\text{molybdenum \%}) + 4.5 (\text{niobium \%}) + 7.0 (\text{titanium \%}) + 3.0 (\text{tantalum \%}) + 13.0 (\text{zirconium \%}) \end{aligned}$$

satisfying the relationship below:

$$\begin{aligned} \text{nickel equivalent} &= \text{from } 15 \text{ to } 30 \\ \text{chromium equivalent} &= \text{from } 28 \text{ to } 50 \\ \text{chromium equivalent} - \text{nickel equivalent} &= \text{from } 8 \text{ to } 27. \end{aligned}$$

4,055,449

AQUEOUS BLASTING COMPOSITION WITH CRYSTAL HABIT MODIFIER

Daniel A. Wasson, Sandy City, Utah, assignor to Ireco Chemicals, Salt Lake City, Utah

Filed Aug. 11, 1976, Ser. No. 713,557
Int. Cl.² C06B 45/00

U.S. Cl. 149—2

20 Claims

1. In an aqueous blasting composition having a continuous aqueous phase and comprising inorganic oxidizer salt, liquid hydrocarbon fuel, and thickener; the improvement which comprises (a) an immiscible liquid hydrocarbon fuel selected from the group consisting of benzene, toluene, xylene, tall oil, paraffin oil, and petroleum distillates such as gasoline, kerosene, diesel fuels and fuel oils, and mixtures of any two thereof, which fuel is finely dispersed throughout the aqueous phase, and (b) a crystal habit modifier to reduce the crystal size of the oxidizer salt and thereby stabilize the fine dispersion of the immiscible liquid hydrocarbon fuel throughout the composition.

10. A method of sensitizing an aqueous blasting composition having a continuous aqueous phase; oxidizer salt at least partially dissolved in the aqueous phase; thickener; and immiscible liquid hydrocarbon fuel selected from the group consisting of benzene, toluene, xylene, tall oil, paraffin oil, and petroleum distillates such as gasoline, kerosene, diesel fuels and fuel oils, and mixtures of any two thereof, which fuel is finely and stably dispersed throughout the aqueous phase; which method includes the steps of adding to the aqueous phase, at a temperature above the crystallization temperature of the oxidizer salt in the phase, a crystal habit modifier and allowing the composition to cool.

4,055,450

EXPLOSIVE COMPOSITION CONTAINING AMINE SOLVATING AGENT

Vladimir Sujansky, Burwood, Australia, assignor to ICI Australia Limited, Australia

Filed Sept. 17, 1976, Ser. No. 724,214
Claims priority, application Australia, Oct. 10, 1975, 3535/69
Int. Cl.² C06B 31/30

U.S. Cl. 149—60

15 Claims

1. A gelled explosive composition which is essentially non-aqueous comprising firstly from 50 to 90% w/w of inorganic oxygen releasing salt material selected from the group consisting of the nitrate, chlorate and perchlorate of the group consisting of the alkali metals, the alkaline earth metals and ammonium; secondly from 0 to 5% w/w of water; thirdly from 0.1 to 5% w/w of gum selected from the group consisting of galactomannan gums and derivatives thereof; and fourthly as a solvating agent for said gum from 1 to 30% w/w of an amine in liquid form.

4,055,451

COMPOSITE MATERIALS

Alan Gray Cockbain, Inglewood Church Road, Evenley, near Brackley, Northamptonshire, England; Michael John Latimer, 355, Birchfield Road East, Northampton, Northamptonshire, England, and Norman Lawrence Parr, 2, Surbiton Court, St. Andrews Square, Surbiton, Surrey, England

Division of Ser. No. 501,439, Aug. 28, 1974, abandoned. This application May 21, 1976, Ser. No. 688,556
Claims priority, application United Kingdom, Aug. 31, 1973, 41189/73

Int. Cl.² C04B 35/64, 37/02

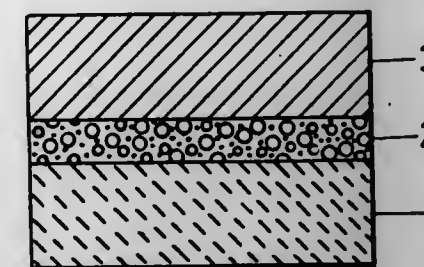
U.S. Cl. 156—89

5 Claims

1. A method of making a ceramic/metal composite, the method of comprising the steps of:

1. Sintering ceramic granules onto at least a part of the surface of a ceramic body to form a porous layer thereon.
2. Heating a metallic member to a temperature just below its melting point, and

3. Hot-pressing the said metallic member onto the said porous layer until the said metallic member is at least partially infiltrated into, and is interlocked with, the pores of the said porous layer.

**4,055,452
METHOD AND APPARATUS FOR SEVERING AND EDGE-SEALING THERMOPLASTIC FILMS, AND PRODUCT**

Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580

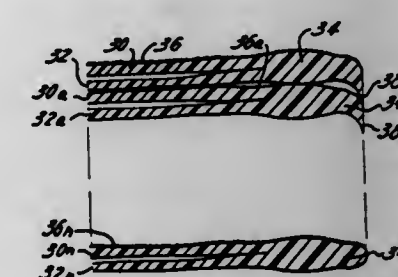
Continuation of Ser. No. 326,278, Jan. 24, 1973, Pat. No. 3,933,563, and a continuation-in-part of Ser. No. 256,850, May 25, 1972, abandoned. This application Jan. 19, 1976, Ser. No. 650,468

The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.² B32B 31/00

U.S. Cl. 156—251

7 Claims



1. The method of making an article, including the steps of assembling at least one set of thermoplastic heat-sealable films, each film of said set having heat-sealable material that tends to become thickened when exposed to heat-sealing temperature and the assembled films of said set having their heat-sealable materials disposed against each other, heating a blade well above the fusion temperature of the heat-sealable material, applying the blade with pressure against one face of the assembled films while so heated and while supporting the films opposite the edge of the blade against such pressure, the amount of pressure and the sharpness of the blade being less than that needed to effect die-cutting of the films in the absence of film-fusing heat, the blade thus providing severed edges of the films, and holding said films of each set together and heating to heat-sealing temperature marginal portions of the films along the severed edges far greater in width than the combined initial thickness of the set of films and thereby forming a wide marginal seal, said heating of the marginal portions of the films being effected both by exposing the films to the heated blade as aforesaid during severing and by subjecting at least one face of said set of films over the width of said marginal portions to heat-sealing temperature that diminishes progressively away from the blade to and beyond a juncture where the unsealed films merge into the marginal seal, said holding being accomplished with pressure limited so as to accommodate substantial thickening of at least part of the width of the seal, whereby the seal formed between the films of said set is of substantially greater thickness than the initial thickness of the set of films, said greater thickness extending across the seal outward from said juncture for a distance greater than said initial thickness.

4,055,453

PROCESS FOR PRODUCING LAMINATED BITUMINOUS ROOFING MEMBRANE

Eiichi Tajima; Kaname Yamamoto, and Takayoshi Imai, all of Tokyo, Japan, assignors to Tajima Roofing Co., Ltd., Tokyo, Japan

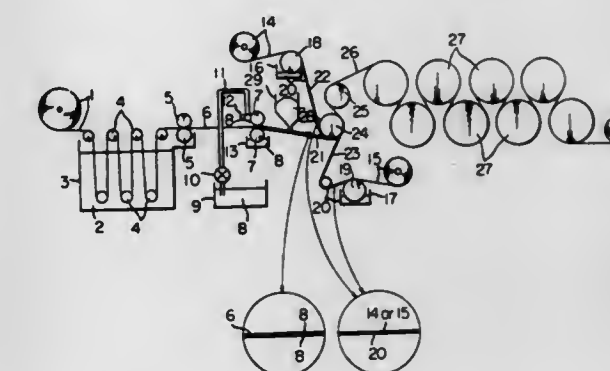
Continuation of Ser. No. 331,602, Feb. 12, 1973, abandoned.

This application May 8, 1975, Ser. No. 575,539

Claims priority, application Japan, Feb. 19, 1972, 47-016906
Int. Cl.² B32B 7/10; C09J 3/30, 5/04

U.S. Cl. 156—279

15 Claims



1. A process for producing a self-adhesive, multi-layer, laminated, bituminous, roofing membrane suitable for cold application to a substrate, which comprises the step of:

- a. continuously moving a continuous web of a flexible base sheet through a first coating device and therein coating at least a part of at least one surface of said base sheet with a continuous surface coating layer of substantially uniform thickness of hot molten roofing bitumen in a viscous liquid state, said roofing bitumen having the property that it is substantially solid at ambient application temperature to form a waterproof layer on said base sheet;
- b. separately from step (a) but simultaneously therewith, continuously moving a continuous web of a flexible release sheet through a second coating device and therein coating substantially the entirety of only one releasable surface of said release sheet with a continuous surface coating layer of substantially uniform thickness of hot molten compound bitumen in a viscous liquid state, said compound bitumen consisting essentially of bitumen and about 5 to 95 percent by weight of substance selected from the group consisting of rubber, thermoplastic resin and mixtures thereof, said compound bitumen having the property that it possesses a high tackiness at ambient application temperature;
- c. immediately after steps (a) and (b) and while said surface coating layers on the coated webs obtained in steps (a) and (b) are still in a molten state, continuously conjointly moving said coated webs around and in supported relationship on a circumferentially elongated portion of the periphery of a roller with one of said coated webs being disposed with its sheet in surface contact with said circumferentially elongated portion of the periphery of said roller and with its surface coating layer facing outwardly away from said roller and with the other of said coated webs having its surface coating layer disposed in face-to-face opposing relationship to said surface coating layer of said one coated web and with its sheet being disposed outwardly therefrom, and drawing said other web into contact with said one web and thereby uniting said surface coating layers in direct face-to-face contact as said webs move together around said circumferentially elongated portion of said roller, said uniting of said surface coating layers being effected in the absence of an external compression force applied to the sheet of said other web whereby to form a unitary roofing membrane consisting essentially of the products of steps (a) and (b) wherein said coating layers are between said base sheet and said release sheet and are united thereto and to each other; and then
- d. continuously moving said unitary roofing membrane

through a cooling device whereby to solidify said coating layers.

4,055,454

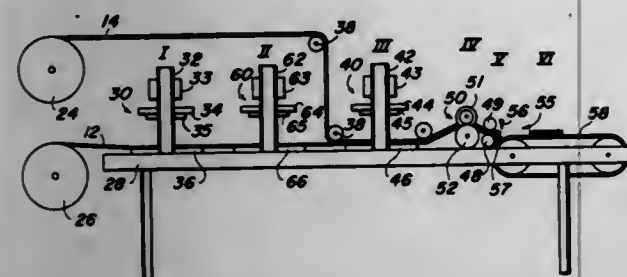
PROCESS FOR FORMING PEELABLE SEALS

Louis Lawrence Laske, Grayslake, Ill., assignor to Vonco Products, Inc., Lake Villa, Ill.
Continuation-in-part of Ser. No. 499,621, Aug. 22, 1974, Pat. No. 3,926,311. This application Dec. 15, 1975, Ser. No. 641,151. The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.² A61B 19/02

U.S. Cl. 156—290

9 Claims



1. A method for forming peelable seals between uncoated spunbonded olefin sheet material and a synthetic polymeric thermoplastic sheet material comprising maintaining a substantial portion of said spunbonded olefin sheet untreated and breakable, modifying the surface of the spunbonded olefin sheet in the area of the desired peelable seal by pretreatment with heat and pressure to substantially eliminate high spots and internal weaknesses to render the sealing area susceptible to having said synthetic polymeric thermoplastic material peelably joined thereto in said pretreated area by conventional heat-pressure sealing, and peelably sealing said pretreated spunbonded olefin sheet to said synthetic polymeric thermoplastic sheet material by conventional heat-pressure sealing only in said pretreated area.

4,055,455

APPARATUS FOR LINING AND TESTING CONTAINER CLOSURES

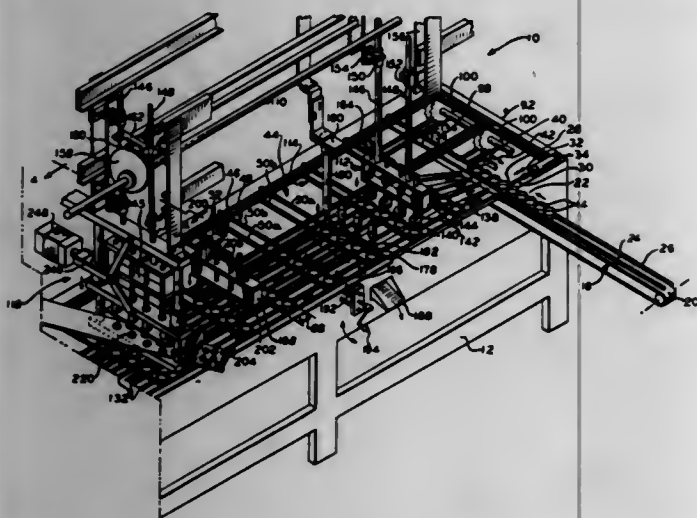
Walter McDonald, Landing, Norbert F. Seitel, Gillette, and Richard A. Burger, Pompton Lakes, all of N.J., assignors to Norwalk Design, Inc., Whippany, N.J.

Filed July 26, 1976, Ser. No. 708,691

Int. Cl.² B65C 9/40; G01M 3/32

U.S. Cl. 156—351

22 Claims



1. Apparatus for lining and testing container closures comprising in combination:
means for forming an infeed stream of said closures;
means interacting with closure stream for forming groups of closures;
conveyor means for accepting said closure groups and con-

veying said groups through said apparatus as a plurality of parallel moving processing lines of closures;
shell integrity test station means in said processing lines for testing the shell integrity of said closures;
first rejection station means for displacing from said processing lines closures determined to be defective at said shell integrity testing station;
seal emplacement station means downstream from said first rejection station means, for emplacing seals in closures proceeding thereto from said rejection station;
sealing testing station means downstream from said seal emplacement station means for testing the sealing characteristics of closures proceeding thereto;
second rejection station means downstream of said sealing testing station means, for rejecting closures determined to be defective at said sealing testing station means; and
discharge station means downstream of said second rejection station means, for receiving closures successfully proceeding past said second rejection station means.

4,055,456

IMPULSE HEAT-SEALING MACHINE

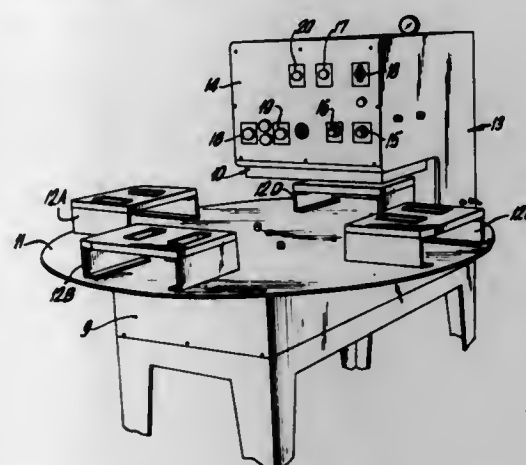
Frank Carnegie, Jr., Montville, N.J., assignor to Camid International, New York, N.Y.

Filed Aug. 4, 1976, Ser. No. 711,597

Int. Cl.² B32B 31/00

U.S. Cl. 156—366

8 Claims



1. A machine for sealing together and severing two or more plastic resin films, comprising:
a base plate upon which the films are positioned;
a platen movable relative to the base plate and movable toward and away from the films on the base plate;
compression means to press said platen toward said films at selected times;
a sealing die mounted on said platen and comprising a heat resistant and electrically insulative rigid substrate, a heat sealing element of etched metal foil having a uniform thickness bonded to said substrate, the width of said heat sealing element being many times its thickness and being sufficiently wide and at least one-sixteenth inch in width to form a liquid leakproof seal of said films, said heat sealing element having a curved portion to form a curved seal, a non-stick layer covering said heat sealing element;
control means connecting said heater element to a source of voltage for selected short times of less than 5 seconds for impulse resistance heating of said sealing element;
an electrical resistance knife mounted on said platen and close to said heat sealing element to sever the films by melting, said knife having a curved edge parallel to the curve of said heat sealing element to sever said films along a curved line;
means connecting said knife to a source of voltage to heat said knife and thereby melt and sever said film.

4,055,457

METHOD FOR GROWING ABSORPTION-FREE ALKALI METAL HALIDE SINGLE CRYSTALS

Carl F. Swinehart, University Heights, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

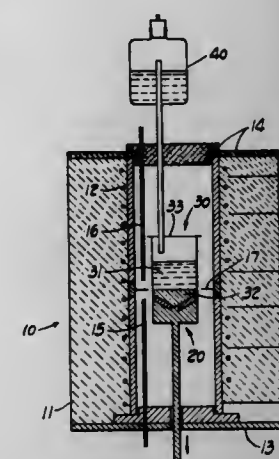
Continuation-in-part of Ser. No. 434,364, Jan. 17, 1974,

abandoned. This application Aug. 20, 1976, Ser. No. 716,051

Int. Cl.² B01J 17/06, 17/08; C01D 3/04, 3/10

U.S. Cl. 156—616 R

4 Claims U.S. Cl. 162—192



1. In a Stockbarger or Kyropoulos method of growing an essentially single crystal ingot from a melt consisting of a bromide, chloride or mixture thereof, of an alkali metal of Group IA of the Periodic Table, said melt contaminated with a silicate impurity, the improvement comprising confining said melt in a siliceous crucible, contacting said melt with a metal silicate-forming scavenger selected from the group consisting of (a) a bromide of a Group IIA metal when said melt is predominantly a bromide, (b) a chloride of a Group IIA metal when said melt is predominantly a chloride, and (c) a rare earth metal selected from europium, ytterbium and samarium added to said melt in melt-soluble form, reacting said scavenger with the silicate impurity in said melt, and removing the silicate impurity by depositing the same as a coating on the crucible to produce an ingot free of infrared absorption due to silicate impurity.

4,055,458

ETCHING GLASS WITH HF AND FLUORINE-CONTAINING SURFACTANT

Hans Niederprum, Monheim; Heinz Günter Klein, Cologne, and Johann-Nikolaus Meussdoerffer, Blecher, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 30, 1976, Ser. No. 709,995

Claims priority, application Germany, Aug. 7, 1975, 2535333; Dec. 15, 1975, 2556429

Int. Cl.² C03C 15/00, 25/06

U.S. Cl. 156—663

3 Claims

1. In the etching of glass wherein glass is contacted with an aqueous etching bath containing hydrofluoric acid, and the glass is thereafter removed from the bath and rinsed, the improvement which comprises dissolving in the etching bath an acid-resistant quaternary ammonium perfluoroalkane sulfonate wetting agent of the formula $R_FSO_3 - NR^1R^2R^3R^4+$, wherein R_F is a linear or branched aliphatic perfluoroalkyl radical with from 6 to 12 carbon atoms, and R^1 , R^2 , R^3 and R^4 each independently is an alkyl or aralkyl radical of up to 18 carbon atoms, or two or three of R^1 , R^2 and R^3 are attached to form a ring through the nitrogen atom.

4,055,459

METHOD AND APPARATUS FOR PREVENTING THE ADHERENCE OF POLARIZED FOREIGN PARTICLES TO PAPER MACHINE COMPONENTS

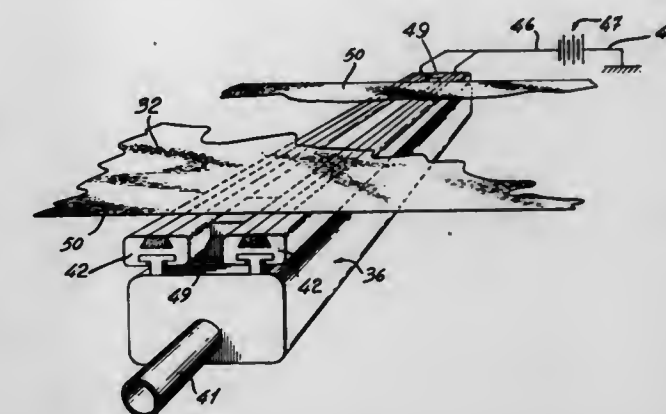
Francis Brian Best, Pointe Claire, Canada, assignor to JWI Ltd., Canada

Filed June 28, 1976, Ser. No. 700,520

Int. Cl.² D21F 1/52, 1/54

U.S. Cl. 162—192

10 Claims



1. A method of preventing the accumulation of polarized foreign particles on a fabric support surface of support elements positioned in contact with a moving fabric in a paper-making machine on which there is supported a pulp stock having polarized foreign particles comprising connecting an electrical charge to a conductive portion of said support elements, said electrical charge being of like polarity to said polarized foreign particles whereby said polarized foreign particles will be repelled from at least a portion of said fabric support surface.

4,055,460

PAPER MACHINE SHAKE

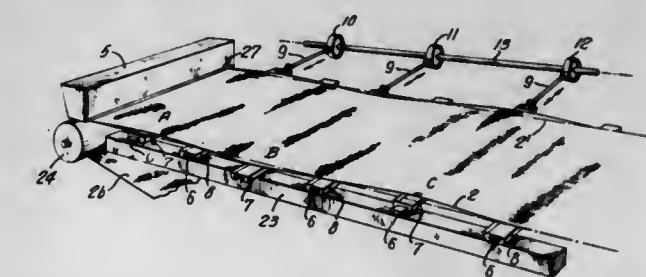
John Gordon Buchanan, Pointe Claire, Canada, assignor to JWI Ltd., Montreal, Canada

Continuation of Ser. No. 667,947, March 18, 1976, abandoned, which is a continuation of Ser. No. 495,777, Aug. 8, 1974, abandoned. This application Dec. 23, 1976, Ser. No. 753,791

Int. Cl.² D21F 1/20

U.S. Cl. 162—209

19 Claims



10. The method of producing paper and ensuring a uniform repetitive quality of the paper comprising the steps of:
providing a paper making machine with a Fourdrinier section having an endless forming fabric belt which has an upper stock carrying run having a natural frequency of lateral vibration;
depositing paper stock on the upper run of the endless belt;
determining the natural frequency of the upper stock carrying run of the endless fabric belt;
driving the endless belt in the machine direction while depositing wet paper making stock at the upstream end of the fabric;
providing at least one foil member, having a continuous, uninterrupted, flat top supporting surface portion over the entire length thereof, and disposing the foil member such that the top surface portion is in frictional engagement with the under surface of the upper run of the endless fabric belt;

applying a lateral force on the under surface of the upper run of the endless fabric belt by vibrating the foil member in a cross machine direction to thereby cause the upper run of said endless fabric belt to vibrate uniformly; characterized in that the foil member is vibrated at a frequency harmonically related to a frequency substantially equal to the said natural frequency of the stock carrying upper run of the belt.

4,055,461

PAPER MACHINE WITH SINGLE-WIRE AND CURVED TWIN-WIRE FORMERS

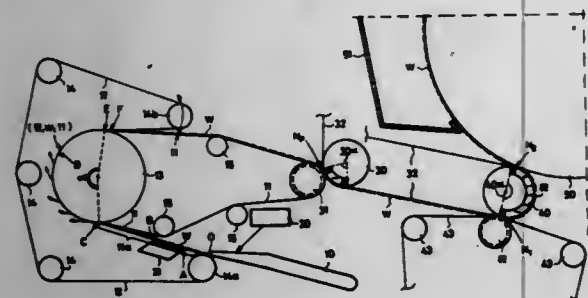
Risto Turunen, Jyväskylä, Finland, assignor to Valmet Oy, Finland

Filed Sept. 15, 1976, Ser. No. 723,225

Claims priority, application Finland, Sept. 17, 1975, 752603
Int. Cl.² D21F 9/00

U.S. Cl. 162—290

2 Claims



1. In a paper machine, inner and outer endless fabric means and a smooth forming roll around which said inner and outer fabric means are lapped with said inner endless fabric means situated between said outer endless fabric means and said forming roll and forming with said outer endless fabric means a twin-wire former where said inner and outer fabric means are lapped around said forming roll, said outer endless fabric means having an elongated portion situated in advance of the twin-wire former and spaced from said inner endless fabric means while travelling with the latter toward said smooth forming roll to meet said inner endless fabric means at said forming roll to form therewith the initial part of the twin-wire former, headbox means cooperating with said elongated portion of said outer endless fabric means stock which starts web formation on said elongated portion of said outer endless fabric means in the manner of a single-wire former so that the web has partially formed on said elongated portion of said outer endless fabric means prior to reaching the twin-wire former where the partially formed web is further compacted between the inner and outer endless fabric means, dewatering means cooperating with said elongated portion of said outer endless fabric means for draining water from the web formed on said elongated portion of said outer endless fabric means to an extent greater than if said dewatering means were not utilized, whereby the web reaches the twin-wire former in a condition according to which the web has dried to a substantial extent beyond that resulting only from gravitational watering at said elongated portion of said outer endless fabric means, with the drainage from the web being continued at the twin-wire former due to centrifugal force outwardly through the outer endless fabric means, whereby the web is gradually dried until reaching the end of the twin-wire former distant from said elongated portion of said outer endless fabric means, said inner and outer endless fabric means again becoming spaced from each other at the latter end of said twin-wire former and said smooth forming roll transferring the web to said inner endless fabric means for travel therewith beyond said twin-wire former due to the normal table roll effect, and pick-up means cooperating with said inner endless fabric means at a portion thereof distant from said smooth forming roll for picking up the web from said inner endless fabric means and directing the web along a path of travel to press and dryer sections of the

paper machine, said pick-up means including a pair of rolls and a pick-up felt, said inner endless fabric means being guided around one of said pair of rolls while said pick-up felt is guided around the other of said pair of rolls and pressed thereby toward said inner endless fabric means for engaging the web thereon, said other of said pair of rolls including a suction means for detaching the web from said inner endless fabric means and transferring the web to said pick-up felt for travel therewith beyond said other of said pair of rolls, a pair of press rolls forming part of a press section of the paper machine and defining between themselves a first press nip, said pick-up felt travelling between said pair of press rolls for transporting the web to said first press nip, said pair of press rolls including an upper press roll around which said pick-up felt is guided and the other of said pair of press rolls being a lower press roll and having a recessed surface, the press section including a lower felt engaging said lower press roll and travelling through said first press nip together with the web and said pick-up felt, said upper press roll including a suction means causing the web to travel with said pick-up felt around said upper press roll while said lower felt travels by itself beyond said first press nip, the dryer section of the machine including a Yankee cylinder defining with said upper press roll a second press nip through which the pick-up felt travels for transferring the web in closed conduction up to said second press nip.

4,055,462

APPARATUS FOR FORMING A FIBER ORIENTED HANDSHEET

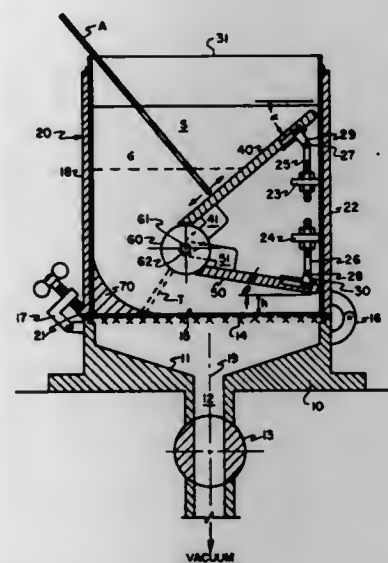
Thomas C. Hsu, and John L. Miller, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,625

Int. Cl.² D21F 13/02

U.S. Cl. 162—382

5 Claims



1. An apparatus for forming a paper handsheet having a substantially unidirectional fiber orientation from a dilute slurry of paper pulp comprising a pulp reservoir vessel constructed substantially symmetrical about a vertical drain axis, a sink vessel disposed beneath said pulp vessel, a horizontal forming wire separating said pulp vessel from said sink vessel, a valved conduit drain from said sink, the improvement comprising: substantially rectangular thin liner means of substantially uniform section transverse of said drain axis inserted within said pulp vessel, and first and second flow guide surfaces within said liner means forming a two-dimensional convergent nozzle therein having a planar throat area positioned in the proximity of said forming wire and asymmetrical of said drain axis, the plane of said throat disposed at an acute angle relative to said drain axis.

4,055,463

AUTOMATIC MOTION INHIBIT SYSTEM FOR A NUCLEAR POWER GENERATING SYSTEM

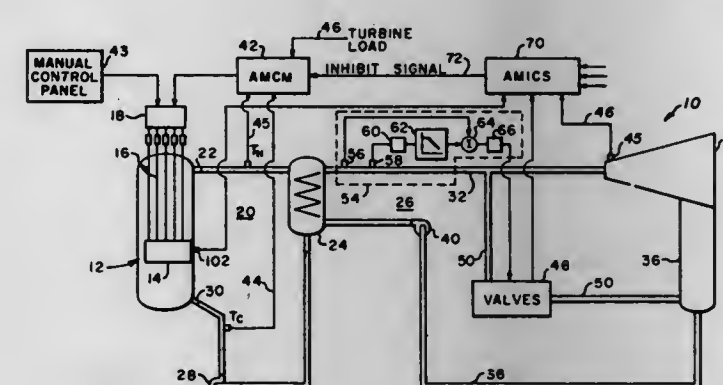
Jose Marcelo Torres, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 18, 1975, Ser. No. 605,707

Int. Cl.² G21C 7/00

U.S. Cl. 176—24 R

10 Claims



1. A nuclear power generating system comprising: coolant vapor generating apparatus including a nuclear reactor having a nuclear core and a plurality of control elements movable within said core for controlling the power output thereof; a turbine for receiving coolant vapor produced by said vapor generating apparatus; coolant circuitry for connecting said vapor generating apparatus and said turbine including means for delivering vapor to said turbine; coolant vapor relief means in said coolant circuitry operable to cause at least some of the coolant vapor to be diverted from said turbine; means for generating a power demand signal proportional to the quantity of coolant vapor required by said turbine; means responsive to said reactor for generating a reactor power output signal commensurate with the reactor power output; automatic motion control means responsive to power demand and the power output of said nuclear core for automatically controlling the motion of said control elements within said nuclear core to adjust the power output of said nuclear core to be equal to turbine load; means responsive to said coolant vapor relief means for producing a total capacity signal proportional to the power level corresponding to the total capacity of said coolant vapor relief means to divert coolant vapor from said turbine; means responsive to said power demand signal and said total capacity signal for producing a signal proportional to the sum of said power demand signal and said total capacity signal, said resultant signal being the reactor power level setpoint signal; means responsive to said power output signal and said reactor power level setpoint signal for comparing said power output signal and said reactor power level setpoint signal and for generating a signal indicative of the condition where the final reactor power level setpoint exceeds the reactor power, said signal being called the setpoint-greater-than-power signal; means responsive to said power demand signal for comparing the power level demand with a predetermined power level demand threshold and for generating a signal indicative of the condition where the power level demand is less than a predetermined power level demand threshold, said signal being called the demand-less-than-threshold signal; means responsive to at least said demand-less-than-threshold signal and said setpoint-greater-than-power signal for generating a motion inhibit signal at least when both said demand-less-than-threshold signal and said setpoint-greater-than-power signal are present; and

means responsive to said motion inhibit signal for inhibiting operation of said automatic control means.

4,055,464

HEAT-INSULATING STRUCTURE

Guy Lemercler, Le Puy Sainte Reparde, France, assignor to Commissariat a l'Energie Atomique, Paris, France

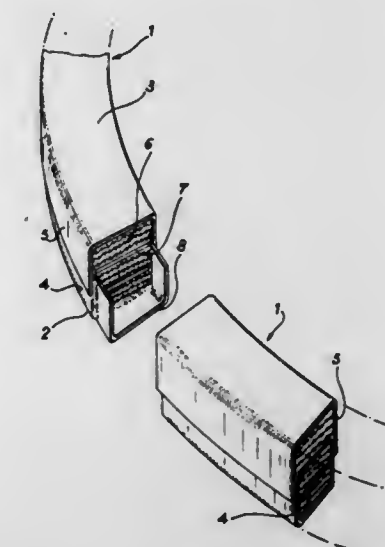
Filed July 22, 1976, Ser. No. 707,556

Claims priority, application France, July 24, 1975, 75.23152

Int. Cl.² G21C 15/10

U.S. Cl. 176—87

7 Claims



1. A heat-insulating structure for use in the wall of a containment vessel for a nuclear reactor forming a heat source comprising a plurality of elements, two sectional members of substantial length for each of said elements, said elements being disposed in juxtaposed relation in line two angular end portions for each of said two sectional members engaged one inside the other, parallel faces for said elements having a small clearance space between said parallel faces, at least one of said angular portions of two successive ones of said elements being shaped for interengagement of said elements with play along their length, and a flexible packing of metallic material between said sectional members whereby said sectional members work in pairs, along the length and in the direction of engagement of said members.

4,055,465

DEVICE FOR THERMAL INSULATION OF A VESSEL WALL

Guy Lemercler, Le Puy Sainte Reparde, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed July 22, 1976, Ser. No. 707,557

Claims priority, application France, July 24, 1975, 75.23153

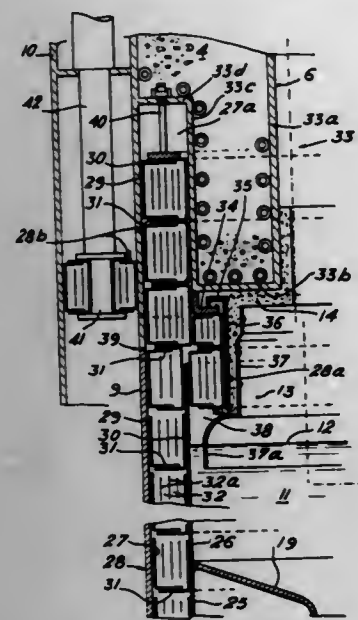
Int. Cl.² G21C 9/00

U.S. Cl. 176—87

7 Claims

1. A device for thermal insulation of a vessel and especially of the internal wall of the primary vessel of a liquid metal cooled fast reactor, within an annular space delimited between the primary vessel and an inner vessel which is enclosed by said primary vessel and has a free extremity, wherein said device comprises a plurality of superposed resilient heat-insulating elements, said elements being such as to extend circumferentially around the common axis of the two vessels, the primary vessel and the inner vessel having a common vertical axis, the primary vessel being suspended from a horizontal vault roof which delimits with the level of liquid metal within the inner vessel a space filled with an insulating layer of inert gas charged with liquid metal aerosols, the free end of the

inner vessel being protected from the insulating gas layer by a cylindrical baffle-plate mounted beneath the vault roof and



coaxial with the inner vessel, said baffle-plate being immersed in the liquid metal.

4,055,466 CULTURE MEDIUM FOR TISSUE CULTURE TECHNIQUES

Harry L. Torney; Helen T. Torney, both of Indianapolis, Ind., and Dale E. Bordt, Des Moines, Iowa, assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 377,838, July 9, 1973, Pat. No. 3,887,430, which is a continuation of Ser. No. 229,219, Feb. 24, 1972, abandoned, which is a continuation of Ser. No. 58,203, July 24, 1970, abandoned. This application May 30, 1975, Ser. No. 582,462

The portion of the term of this patent subsequent to June 3, 1992, has been disclaimed.
Int. Cl.² C12B 3/00

U.S. Cl. 195—1.7

3 Claims

1. In a serum-free, protein-free, culture medium composition for the propagation of animal tissue cells in tissue culture, the composition comprising a buffered aqueous solution of sugars, amino acids, mineral salts and vitamins, the improvement wherein the culture medium further comprises a growth-enhancing amount of a strongly basic anion-exchange resin obtained by reacting trimethylamine with a halomethylated polymer prepared by reacting chloromethyl methyl ether in the presence of a zinc chloride catalyst with beads of a copolymer of about 90 percent of styrene and 2 percent of divinylbenzene and a water-soluble lipid source selected from the group consisting of polysorbate 60 and polysorbate 80 in an amount of from about 0.001 to about 0.100 parts by volume of lipid source per 100 parts by volume of medium.

4,055,467
ENZYMATIC DISPERSION OF BIOLOGICAL SLIMES
Ronald J. Christensen, Westmont, and George J. Zivtins, Schaumburg, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 20, 1976, Ser. No. 752,226

Int. Cl.² C12B 1/00; D21F 1/66

U.S. Cl. 195—2

2 Claims

1. A method for preventing slimes from being deposited on solid surfaces in contact with industrial process waters which comprises treating these waters with at least 3 ppm of the enzyme, Rhozyme HP-150, a pentosanase-hexosanase.

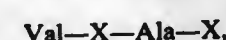
4,055,468
PROCESSES FOR PRODUCING PHYSIOLOGICALLY
ACTIVE PEPTIDE AND ITS N-ACYL DERIVATIVES
Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Takaaki Aoyagi, Fujisawa; Akira Takamatsu, Yokohama; Taiji Inui, Chigasaki; Hiroshi Tone, Fujisawa, and Hajime Morishima, Tokyo, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

Division of Ser. No. 551,459, Feb. 20, 1975, abandoned. This application Nov. 3, 1976, Ser. No. 738,193
Claims priority, application Japan, Feb. 28, 1974, 49-23953; Mar. 12, 1974, 49-28849; Apr. 10, 1974, 49-40696; Dec. 17, 1974, 49-145208; Dec. 19, 1974, 49-146474
Int. Cl.² C12D 13/06

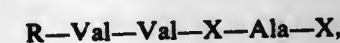
U.S. Cl. 195—29

6 Claims

1. A process for producing a tetrapeptide of the formula:



wherein Val is L-valine, X is amino-3-hydroxy-6-methylheptanoic acid or a salt or an ester thereof and Ala is L-alanine, and the carboxyl group of the X between Val and Ala being bound to the amino group of Ala to form a peptide bond and the amino group of the X between Val and Ala being bound to the carboxyl group of Val to form a peptide bond, the amino group of the other X being bound to the carboxyl group of Ala to form a peptide bond, and the carboxyl group of the other X being free or esterified or bound to a cation to form a salt which comprises decomposing an N-acyl peptide of the general formula:



wherein Val, Ala and X are the same as previously defined, and R is an acyl radical having carbon atoms of 2 to 8 or an acyl radical partially substituted by one or more hydroxyl groups or halogen atoms or a C-terminal of an esterified carboxyl group, and the amino group of the Val adjacent to X being bound to the carboxyl group of the other Val to form a peptide bond and the carboxyl group of the R being bound to the amino group of the Val to form an amide bond,

specifically to carboxylic acid, L-valine and Val—X—Ala—X by contacting said N-acyl peptide with an enzyme produced by a microorganism.

4,055,469
PURIFICATION OF MICROBIAL ENZYME EXTRACTS
USING SYNTHETIC POLYELECTROLYTES
Roy Eugene Snoko, Webster, and Gerald Wayne Klein, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

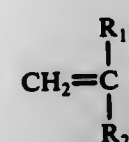
Filed Dec. 10, 1976, Ser. No. 749,647

Int. Cl.² C07G 7/028

U.S. Cl. 195—66 R

14 Claims

1. A method for purifying a microbial enzyme extract, comprising the step of precipitating nucleic acids and unwanted protein by adding to the extract an effective amount of a water-soluble, cationic polymer comprised of a cationic monomer having the formula



wherein R₁ is a hydrogen atom or a lower alkyl group, and R₂ is a nitrogen containing group capable of carrying a positive electrical charge when the polymer is dissolved in an aqueous solution having a pH value not greater than about the pK_a of the polymer.

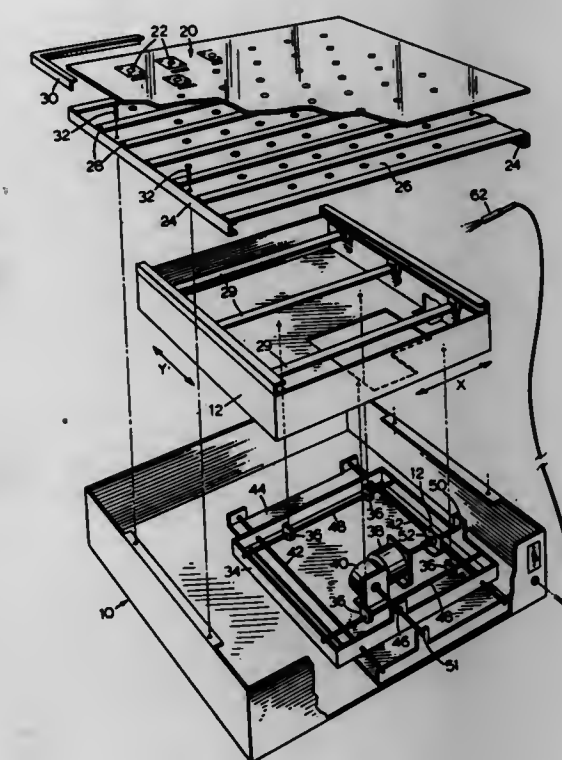
4,055,470
DEVICE FOR EXAMINING BIOLOGICAL SPECIMENS
Edward Thomas Sheaff, and Norman Alexander Hinton, both of Toronto, Canada, assignors to K-Vet Limited, Cambridge, Canada

Filed June 9, 1976, Ser. No. 694,077

Claims priority, application Canada, June 10, 1975, 229154
Int. Cl.² C12K 1/00

U.S. Cl. 195—127

4 Claims

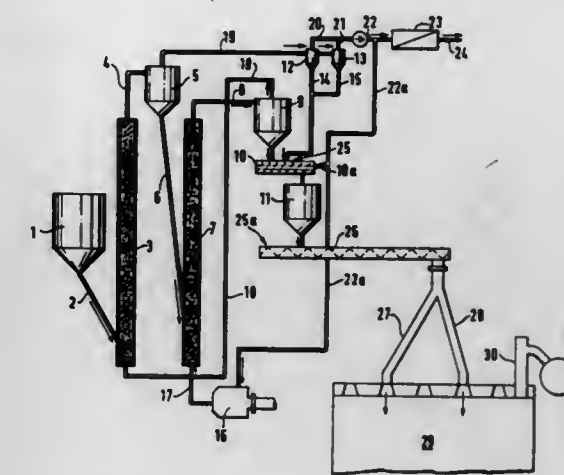


1. In a device for reading and recording the sensitivity of a series of specimens wherein a test plate is inoculated with a series of specimen organisms at predetermined spaced sites thereon, incubated, and the clone at each site examined to determine whether the organism is sensitive or resistant to the test antibiotic or positive or negative with respect to a test biochemical having a frame, a mount for a plurality of test plates arranged in a predetermined pattern, mounting means for mounting said mount in said frame for movement along an X axis and Y axis, control means for moving said mount in said mounting means along the X axis and the Y axis, a viewing plate on said frame above said mount, a viewing system for each plate on said mount terminating in a viewing opening at said viewing plate for viewing the specimens one at a time on its respective plate in said mount, said control means being adapted to move said mount in said mounting means as aforesaid with preset sequential incremental movements to move each of the series of specimens and each plate into the field of its respective viewing system in turn for viewing through said lens system the improvement which comprises a positive signal terminal on said plate adjacent each viewing opening of said viewing means, a negative signal terminal on said plate adjacent each viewing opening of said viewing means, manually operable means for actuating said positive and said negative signal terminals, means for transmitting signals from said positive signal terminal and from said negative signal terminal to signal recording means, and means on said viewing plate for indicating when a signal from said positive or said negative signal terminals has been transmitted to said recording means by said means for transmitting signals.

4,055,471
METHOD OF RESTRICTING THE FORMATION OF
DUST WHEN FEEDING COAL INTO COKE OVENS
Kurt-Günther Beck; Wolfgang Rohde; Diethard Habermehl, and Werner Siebert, all of Essen, Germany, assignors to Bergwerksverband GmbH, Essen, Germany
Filed Jan. 6, 1976, Ser. No. 646,751
Claims priority, application Germany, Jan. 9, 1975, 2500606
Int. Cl.² C10B 57/04

U.S. Cl. 201—20

8 Claims



1. A method of inhibiting dust formation while feeding coal into a coking chamber, comprising preheating coal, and subsequently contacting said coal with an aqueous solution of 30-70% by weight of waste sulfite liquor in amounts of about 0.5 to 1.0 parts by weight of said solution per 1000 parts by weight of said coal.

4,055,472
METHOD OF PREPARING NICKEL ALLOY PARTS FOR
PLATING

Ivan Gene Freshcorn, Kenton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Sept. 15, 1976, Ser. No. 723,319

Int. Cl.² C25D 5/40

U.S. Cl. 204—32 R

7 Claims

1. A method of preparing a nickel alloy part for plating, including the steps of immersing the part in an electrolyte bath, connecting the part as the anode in an electric circuit which when energized causes current flow to take place from said part outward into the bath, energizing said circuit and establishing and maintaining said current flow for a period of time sufficient to etch the part surface, etched metal being oxidized during the period of current flow, discontinuing current flow and after the current flow has been discontinued allowing the part to remain soaking in the same said electrolyte bath for a period of time sufficient to dissolve formed metallic oxides, removing the part from said bath, and while said part is substantially free of metallic oxides depositing on the surface thereof a plating base material penetrating and interlocking with etched surface portions of said part.

4,055,473
PROCESS AND APPARATUS FOR SOLAR
DISTILLATION
Harold R. Hay, 2424 Wilshire Blvd., Los Angeles, Calif. 90057
Continuation-in-part of Ser. No. 120,183, March 2, 1971, Pat. No. 3,846,251. This application Nov. 4, 1974, Ser. No. 520,852
Int. Cl.² B01D 1/00

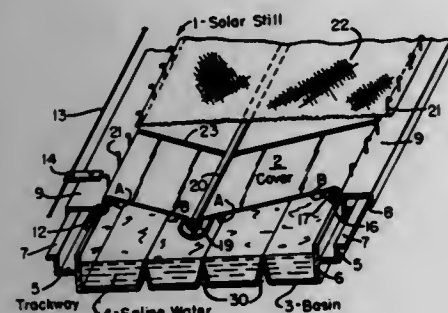
U.S. Cl. 202—234

15 Claims

1. A distillation apparatus comprising a solar still having in combination at least one distilland-retaining component within at least one rigid side wall, a cover capable of transmitting solar radiation to convert distilland to vapor of a liquid condensed to distillate removed by a collector, and the improvement which comprises a cover-fastening means made movable

in a trackway forming part of said side wall of said distilland-retaining component having:

- a first element with a first portion into which the cover is fastened by a spline of material softer than that from which said first element is formed and having a portion of the spline interposed between the cover and said first portion;
- a second portion of the first element in the form of an interlocking means which engages a corresponding interlocking means on a second element of said cover-fastening means which second element comprises a portion of a rigid trackway attached to said rigid side wall;



- a weighting means applied to the cover to create cover tension which maintains said first and second elements in interlocking engagement and improves the effect of a vapor sealing means interposed between said first and second elements in their interlocking engagement; and
- a cover-moving means attached to the first element and operating in a trackway forming a portion of a sidewall also integrated with a rain- and a condensate-collecting trough, said cover-moving means and trackway permitting the cover to be moved in its operating shape while maintaining said first and second elements in a substantially interlocked engagement, from a first location over the distilland-retaining component to a second position exposing said distilland-retaining component.

4,055,474

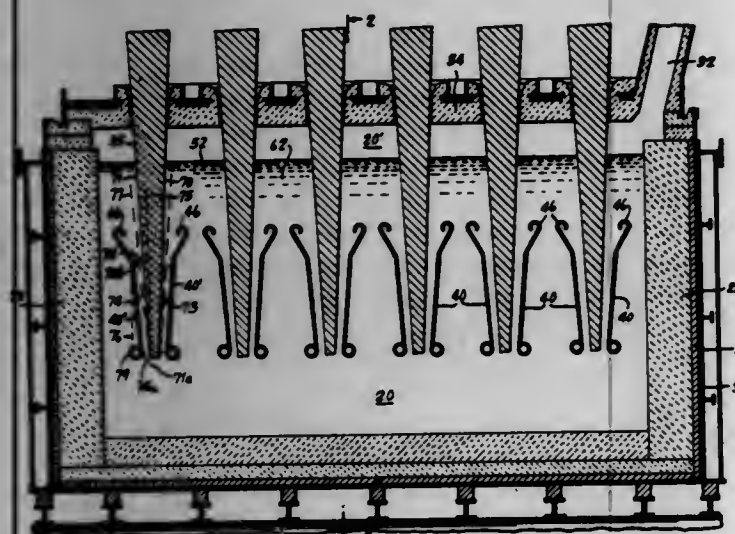
PROCEDURES AND APPARATUS FOR ELECTROLYTIC PRODUCTION OF METALS

Otello Giuseppe Silvotti, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Nov. 10, 1975, Ser. No. 630,459
Int. Cl.² C25C 3/04

U.S. Cl. 204—70

8 Claims



1. Procedure for electrolysis of magnesium chloride to produce free magnesium metal, including the step of maintaining, in an enclosed cell chamber, a molten electrolytic bath containing magnesium chloride for electrolysis, free magnesium metal being lighter than said bath; and passing direct electric current through the bath between at least one anode and at least one cathode in contact with the bath for depositing free magnesium metal at said one

cathode for upward flow along said cathode and evolving chlorine gas at said one anode for upward travel through said bath within an envelope diverging upwardly at a substantially constant slope;

wherein the improvement comprises:

- said current-passing step comprising passing current through said bath between a major surface of said one anode that slants upwardly toward said one cathode throughout the active vertical extent of said one anode major surface with a slope greater than the slope of said envelope, and a major surface of said one cathode that faces and slants upwardly away from said one anode major surface throughout the active vertical extent of said one cathode major surface with a slope not more than about equal to the slope of said envelope, the lower extremity of the active vertical extent of said one cathode major surface being spaced from said one anode major surface by a distance sufficient to prevent contact and recombination of magnesium metal and chlorine gas respectively released at said last-mentioned cathode and anode surfaces, while maintaining a circulating flow of the bath directed entirely upwardly throughout a space defined between said last-mentioned cathode and anode surfaces and downwardly along a return flow path external to said space.

4,055,475

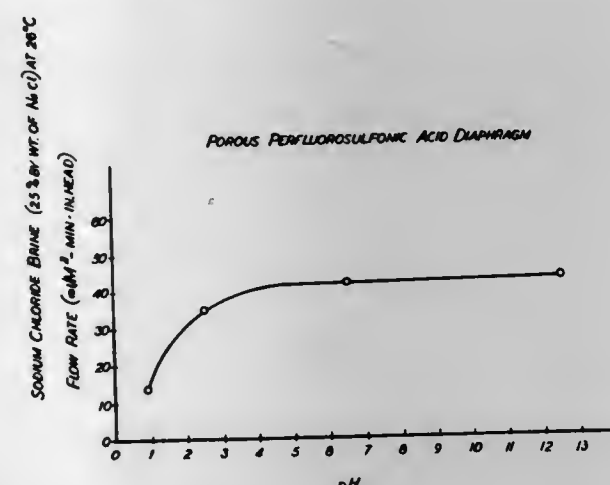
METHOD FOR OPERATING ELECTROLYTIC DIAPHRAGM CELLS

Ronald L. Dotson; David D. Justice, and Han C. Kuo, all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 24, 1976, Ser. No. 660,959
Int. Cl.² C25B 1/26; C25C 1/16

U.S. Cl. 204—98

11 Claims



1. In a method for controlling the flow properties of a porous diaphragm in an electrolytic cell for producing chlorine gas and a caustic liquor by the electrolysis of an alkali metal chloride solution, said electrolytic cell comprised of an anode compartment containing said alkali metal chloride solution and a cathode compartment containing said caustic liquor, said anode compartment separated from said cathode compartment by said porous diaphragm consisting essentially of a perfluoro-sulfonic acid ion exchange resin having an acid form and an alkali metal salt form, said method being characterized by the improvement which comprises maintaining the pH of said alkali metal chloride solution in said anode compartment at from about 3.0 to about 5.0.

4,055,476

METHOD FOR LOWERING CHLORATE CONTENT OF ALKALI METAL HYDROXIDES

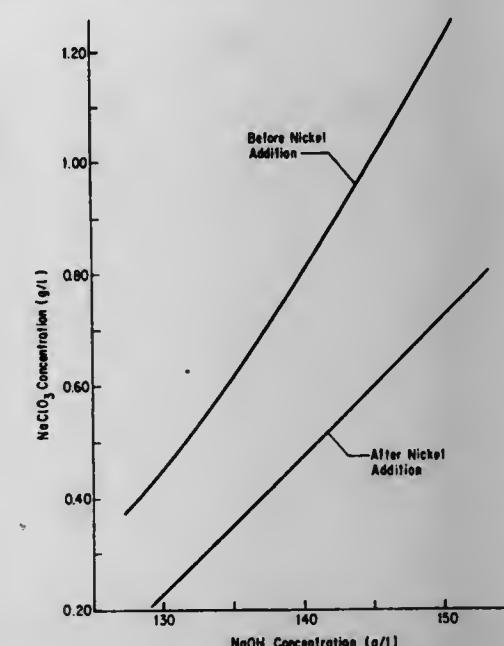
Leo L. Benezra, Mentor; David W. Hill; Arnold Riihimaki, both of Painesville, and Shan-Pu Tsai, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jan. 21, 1977, Ser. No. 760,910

Int. Cl.² C25B 1/16, 1/26

U.S. Cl. 204—98

6 Claims



1. An improved method of minimizing chlorate contamination of alkali metal hydroxides made by electrolysis of alkali metal halide solution in an electrolytic cell wherein the anode compartment is separated from the cathode compartment by a porous, liquid permeable diaphragm, said improvement comprising periodically adding dissolved nickel values to the brine feed of said electrolytic cell and precipitating said nickel values on and in the porous, liquid permeable diaphragm.

4,055,477

ELECTROLYZING BRINE USING AN ANODE COATED WITH AN INTERMETALLIC COMPOUND

Harlan B. Johnson, Rittman, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 515,938, Oct. 18, 1974, Pat. No. 4,007,107.
This application Oct. 22, 1976, Ser. No. 734,849

Int. Cl.² C25B 11/06, 11/10, 1/20

U.S. Cl. 204—98

15 Claims

1. In a method of electrolyzing brine wherein brine is fed to an electrolytic cell having an anode and a cathode, an electrical current passes from the anode to the cathode, and chlorine is evolved at the anode, the improvement wherein said anode comprises:

an electroconductive substrate; and

an electroconductive layer comprising an intermetallic compound of a platinum group metal and a transition metal chosen from the group consisting of RuTi, RuV, Ru₂Zr, NbRu, RuTa, Mo₂Ru₃, W₃Ru₂, RuCr₂, Sn₂Ru, Rh₃Ti, Rh₃V, Rh₃Zr, Rh₃Nb, Rh₃Ta, RhCr₃, Rh₃Sn, Rh₃Pb, OsTi, OsV, OsZr, Nb₂Os₂, Mo₁₉Os_{10.5}, Ta₂Os, WO₂, Cr₂Oe, TiIr₃, VIr₃, ZrIr₂, Ir₃Nb, Mo₃Ir, TaIr₃, HfIrNi, Cr₃Ir, Mn₃Ir, IrSn₂, Pt₃Ti, Pt₃V, Pt₃Zr, Pt₃Nb, Pt₃Mo, Pt₃Ta, Pt₃Fe, PtCr₂, Pt₂Sn₃, PbPt₃, PbPt₂, PbPt₁, Ti₃Re₁, Si₂, Re₃V, Re₂Zr, NbRe, MoRe, TaRe, WRe, Re₃Fe₂, Re₂Co₅Si_{1.3}, CrRe, Mn₃Re₂, TiPd₃, Pd₃V, Pd₃Zr, PdTa, FePd₃, Pd₃Mn₂, PdSn₃Pd₃Pb, and mixtures thereof, on said substrate.

4,055,478

COULOMETRIC TITRATOR

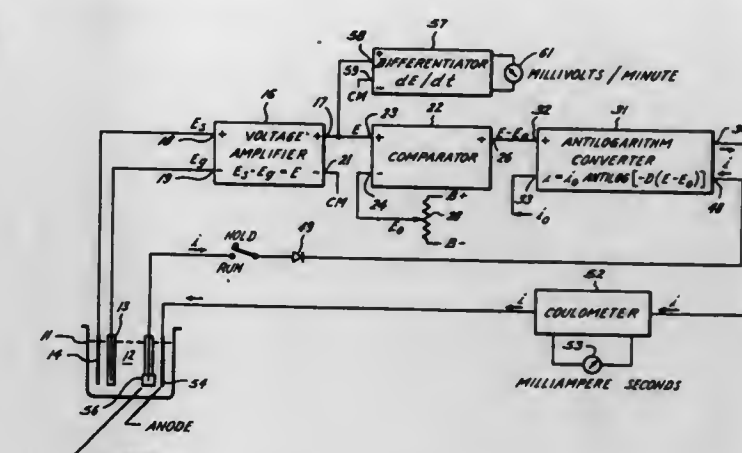
Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 22, 1975, Ser. No. 643,064

Int. Cl.² G01N 27/44

U.S. Cl. 204—195 T

6 Claims



1. A coulometric titrator for determining the amount of a specific ion in a sample solution by the reaction with a reactive ion comprising:

- a cell for containing said sample solution and including electrodes for immersion in said solution, said electrodes including a reference electrode providing a first signal voltage and a specific ion sensing electrode providing a second signal voltage representing the logarithm of the concentration of the specific ion in said sample solution;
- differential input amplifier means having as inputs said first and second signal voltages from said reference and specific ion sensing electrodes and said differential input amplifier having as its output an error signal voltage representing the difference between said first and second signal voltages;
- reference means providing a reference voltage for the specific ion in the solution indicative of a particular rate of change of the second signal voltage while said rate of change of the second signal voltage is constant;
- comparator means receiving as inputs said error signal voltage and said reference voltage and providing as its output a sensor signal voltage representing the difference between said error signal and reference voltages;
- antilogarithm converter means receiving said sensor signal voltage and having an output signal that is proportional to the antilogarithm of said sensor signal voltage; and
- reactive ion source means in the sample solution receiving said output signal and associated with a current source providing a unidirectional current flow between an anode and a cathode immersed in the sample solution and said reactive ion source means is either the anode or the cathode with the other being inert and with the quantum rate of reactive ion introduction into the sample solution being proportional to said output signal, whereby said second signal voltage changes at a constant rate with time and said reactive ion addition changes in a logarithmically decreasing amount with time in the sample solution until the stoichiometric endpoint is approached.

4,055,479

FLUID TREATER HAVING ELECTRIC FIELD WARPING MEANS

Arthur S. King, 8021 Cherokee Lane, Leawood, Kans. 66206

Filed Aug. 10, 1976, Ser. No. 713,250

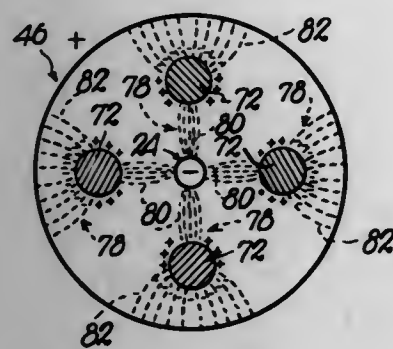
Int. Cl.² B03C 5/02

U.S. Cl. 204—302

10 Claims

1. In a device usable for treating fluids to induce precipitation of suspended solid material wherein the fluid is passed through the annular region between a tubular outer electrode and an inner electrode of substantially smaller diameter coaxi-

ally housed within the outer electrode, said electrodes being electrically insulated from one another to preclude electrical current flow across said region but to establish an electric field having radial lines of force spanning said region, the improvement comprising:



structure between the two electrodes for warping said force lines into discrete, circumferentially separated concentrations to render the field nonuniform as the region is circularly traversed.

2. In a device as claimed in claim 1, wherein said warping structure includes at least one elongated conductor extending parallel to said inner electrode within said region.

4,055,480

MULTI-PHASE SEPARATION METHODS AND APPARATUS

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 460,558, April 12, 1974, Pat. No. 3,941,679, and Ser. No. 561,168, March 24, 1975, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,888

Int. Cl.² C10G 1/04

U.S. Cl. 208—11 LE

29 Claims

1. A method of resolving a mixture or composite containing both soluble and insoluble hydrocarbonaceous materials and insoluble mineral material into separate phases two of which respectively contain said insoluble hydrocarbonaceous material and said insoluble mineral material, said method comprising the steps of: introducing said mixture or composite into a body of a liquid which contains 1,2-difluoroethane or a fluorochlorocarbon solvent for said soluble hydrocarbonaceous material and which has a specific gravity intermediate the specific gravities of said insoluble materials and is not miscible therewith, whereby said soluble hydrocarbonaceous material will dissolve in said liquid to form said third phase, one of said insoluble material will migrate toward the top of the body of liquid to form one of said two other phases, and the other of said insoluble materials will migrate toward the bottom of said body of liquid to form the other of said two phases; separately removing the insoluble material phases and said third phase from said body of liquid; and stripping the solvent from said third phase to isolate said soluble hydrocarbonaceous material.

4,055,481

TWO-STAGE PROCESS FOR MANUFACTURE OF WHITE OILS

Louis E. Kidwell, Jr., Shreveport, La., assignor to Pennzoil Company, Shreveport, La.

Filed July 23, 1976, Ser. No. 707,949

Int. Cl.² C10G 23/02

U.S. Cl. 208—89

10 Claims

1. A method for the production of pharmaceutical grade white oils having sufficient purity to pass the Hot Acid Carbonizable Substances Test and the Ultraviolet Absorbance Test, which comprises the steps of subjecting a lubricating oil feedstock having a viscosity ranging from about 60 to about 600 SUS at 37.8° C., to a first stage hydrogenation in the pres-

ence of a first stage sulfur-resistant catalyst having a metal, metal oxide or metal sulfide from Group VI-B and a metal, metal oxide or metal sulfide from Group VIII of the Periodic System of the Elements, at a temperature in the range of about 300° to about 400° C. and a pressure of from 800–4,000 psig, to produce a first stage intermediate product having a viscosity reduced from the viscosity of the starting feedstock, and then subjecting the first stage intermediate product to a second stage hydrogenation in the presence of a second stage hydrogenation catalyst consisting essentially of nickel on alumina, said catalyst having a BET surface area in the range of 130 m²/g to 190 m²/g, at a temperature ranging from 225° to 300° C., and a pressure ranging from 2,000–4,000 psig, to produce a colorless, odorless, white oil having a hot acid number of less than 16 on the Hellige Amber C Color Wheel and an ultraviolet absorbance value of less than 0.1.

4,055,482

HYDROCRACKING PROCESS WITH REJUVENATED CATALYST

Harry E. Robson, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

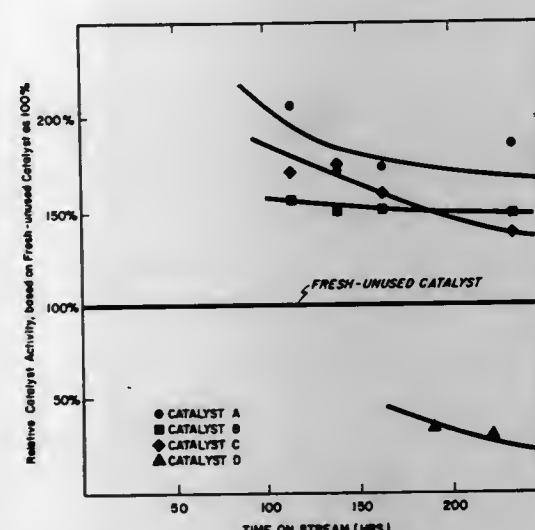
Continuation-in-part of Ser. No. 107,224, Jan. 18, 1971,

abandoned. This application July 1, 1975, Ser. No. 592,120

Int. Cl.² C10G 13/02; B01J 29/12

U.S. Cl. 208—111

10 Claims



1. A hydrocracking process which comprises contacting a hydrocarbon feedstock in the presence of hydrogen at hydrocracking conditions of temperature and pressure with a rejuvenated catalyst comprising a synthetic faujasite zeolite and a hydrogenation component, said rejuvenated catalyst (1) having previously become at least partially deactivated after being used in a hydrocracking process including periodic regeneration by contact with an oxygen-containing gas at a temperature within the range of 700° to 1100° F., and (2) having been rejuvenated to at least substantially its original fresh activity by an aqueous treating process restricted to a pH less than about 7.0, said catalyst being rejuvenated by (a) treating said partially deactivated catalyst with an aqueous solution containing ions selected from the group consisting of hydrogen ions, hydrogen precursor ions and mixtures thereof so that the alkali metal content of the zeolite component is less than the amount of alkali metal originally present in said catalyst prior to said treatment with aqueous solution; (b) washing said catalyst subsequent to said contacting; and (c) calcining said washed catalyst at a temperature within the range of about 50° to 1000° F.

4,055,483

HYDROREFINING OF HEAVY OIL WITH HYDROGEN AND ALUMINUM ALKYL COMPOUND

Joseph K. Mertzweiler, and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 2, 1976, Ser. No. 710,800

Int. Cl.² C10G 23/02

U.S. Cl. 208—213

12 Claims

1. A process for hydrorefining a heavy hydrocarbonaceous oil containing metal compounds naturally occurring in said oil, which comprises, contacting said heavy oil, in a hydrorefining zone, with hydrogen and an aluminum alkyl compound, at hydrorefining conditions, including a temperature ranging from about 500° to about 1500° F. and a pressure ranging from about 500 to about 3000 psig.

4,055,484

ELUTRIATION IN A FLUID COKING PROCESS

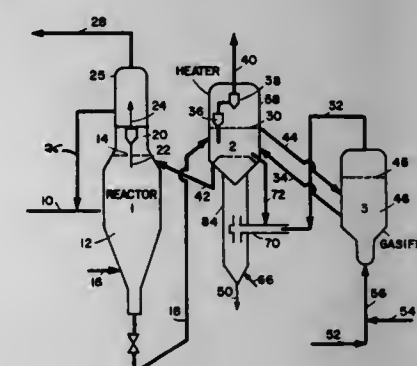
Don E. Blaser, Randolph, N.J., and Byron V. Molstedt, Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 14, 1976, Ser. No. 686,634

Int. Cl.² C10G 9/32

U.S. Cl. 208—127

6 Claims



1. In an integrated coking and gasification process which comprises the steps of:

- reacting a carbonaceous material having a Conradson carbon content of at least 5 weight percent in a coking zone containing a bed of fluidized solids maintained under fluid coking conditions to form coke, said coke depositing on said fluidized solids;
- introducing a portion of said solids with the coke deposition thereon into a heating vessel comprising an elongated lower portion and an upper enlarged portion containing a fluidized bed of solids maintained at a greater temperature than the temperature of said coking zone, to heat said portion of solids;
- recycling a first portion of heated solids from said heating vessel to said coking zone;
- introducing a second portion of heated solids from said heating vessel to a fluidized bed gasification zone;
- reacting said second portion of heated solids in said gasification zone with steam and an oxygen-containing gas to produce a hydrogen-containing gaseous stream;
- removing said hydrogen-containing gaseous stream including entrained solids from said gasification zone;
- adding a portion of solids to said hydrogen-containing gas of step (f).

the improvement which comprises:

- introducing into said lower elongated portion the solids-containing gaseous stream resulting from step (g), said gaseous stream being introduced as a relatively high velocity gaseous stream through a conduit having an outlet of smaller internal diameter than the internal diameter of said elongated lower portion;
- reducing the velocity of said gaseous stream by upwardly flowing said stream from said outlet to said upper portion of said heating vessel, whereby the larger particles of the solids are selectively removed by gravitational forces

from said gaseous stream and form a dense bed below said outlet of said gaseous stream in said lower heating vessel portion;

- maintaining the bed in said lower heater portion fluidized by passage of a fluidizing gas therethrough, and
- continuously re-entraining at least a portion of the solids from said lower heater bed into said gaseous stream.

4,055,485

METHOD FOR IMPROVING CLAY BRIGHTNESS UTILIZING MAGNETIC SEPARATION

Alan J. Nott, Crantock near Newquay, England, assignor to Anglo-American Clays Corporation, Sandersville, Ga.

Continuation-in-part of Ser. No. 513,154, Oct. 8, 1974, Pat. No. 3,974,067. This application July 28, 1976, Ser. No. 708,850

The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.² B03B 1/00

U.S. Cl. 209—3

10 Claims

1. A method for brightening a kaolin clay comprising: forming an aqueous dispersion of said clay and blunging and conditioning said dispersion to dissipate at least 10 hp/hrs of energy per ton of solids, at least said conditioning step being conducted in the presence of a fatty acid collector agent;

subjecting the resultant blunged and conditioned slurry to a froth flotation treatment to remove titaniferous impurities; and

subjecting the product from said froth flotation treatment to a wet magnetic separation to further increase the brightness of said clay by removal of discoloring contaminants in addition to said titaniferous impurities, by passing said product through a slurry-pervious ferromagnetic matrix positioned in a high intensity magnetic field, the retention time in said field being at least 15 seconds, and the said field being maintained at an average field intensity of from 7 to 22 kg.

4,055,486

METHOD AND APPARATUS FOR HANDLING SOLID FLUIDIZED PARTICLES

Charles K. Choi, Claremont, and Joseph P. Tassoney, Diamond Bar, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

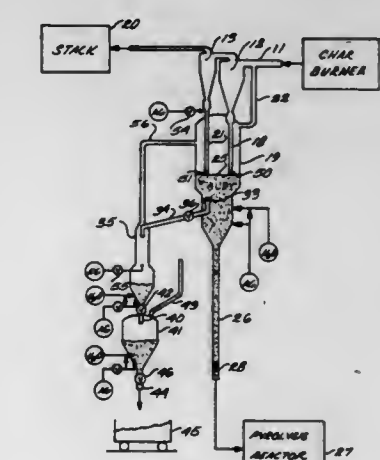
Continuation of Ser. No. 603,871, Aug. 11, 1975, abandoned.

This application July 30, 1976, Ser. No. 710,109

Int. Cl.² B07B 9/02

U.S. Cl. 209—11

35 Claims



1. Apparatus for handling solid fluidized particles, the apparatus comprising:

- a source of fluid and entrained particles including fines;
- a particle storage vessel having an outlet near its bottom;
- a particle separator having

an entrance lying above the storage vessel and connected to the source;
 a fluid exit;
 a particle exit connected to the storage vessel, and means for separating particles from fluid received at the entrance such that the fluid with a first percentage of the fines entrained therein flows to the fluid exit and the particles minus the first percentage of the fines pass through the particle exit to the storage vessel;
 means for fluidizing the particles in the storage vessel to a particular level above the outlet;
 means for removing fluidized particles with a second percentage of the fines entrained therein from the storage vessel at a point between the particular level and the outlet;
 a receiver connected to the outlet of the storage vessel to receive fluidized particles minus the first and second percentages of the fines flow from the outlet of the storage vessel; and
 means for changing at least one of the percentages of the fines.

4,055,487

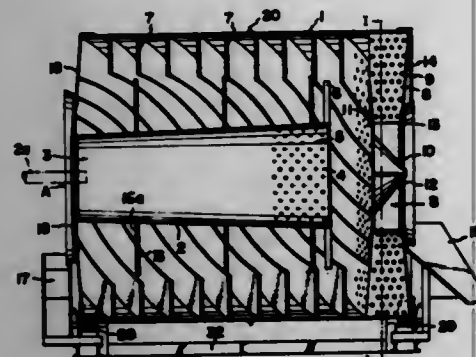
DRUM-TYPE SAND CLASSIFIER

Takao Mori, Miyazaki, Japan, assignor to Akai Kikai Kogyo Co., Ltd.

Continuation-in-part of Ser. No. 592,973, July 3, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 759,958
 Claims priority, application Japan, July 9, 1974, 49-78829; Nov. 2, 1974, 49-126858; Apr. 21, 1975, 50-50118
 Int. Cl.² B03B 5/56

U.S. Cl. 209—44

6 Claims



1. A wet-type sand classifier comprising:
 - a. a rotary drum which has a front outlet at its front end and a rear outlet at its rear end,
 - b. a feeding means for feeding muddy water containing sand into said drum, said feeding means being enclosed by said drum and disposed concentrically within said drum, and attached to said drum for rotation with said drum,
 - c. a classifying means for causing sand which is contained in said muddy water to settle onto the bottom of said drum and transferring said settled sand towards the rear end of said drum, said classifying means being disposed on the interior surface of said drum and covering the entire length of said drum, said classifying means comprising a plurality of helicoid blades of the same pitch which are fixedly secured to the inner wall of said drum at regular intervals, said helicoid blades being of a height which gradually increases toward the rear end of said drum, and a plurality of paddles radially disposed around the inner periphery of said drum at the rear end of said drum, each of said paddles having a number of apertures on the entire surface thereof for separating the water from the sand before the sand is discharged from the classifier, and
 - d. a discharging means for expelling said transferred sand from the rear outlet of said drum, said discharging means being disposed at the rear end of said drum and attached to said drum for rotation with said drum, whereby substantially water-free classified sand of a desired size range is

produced by the rotation of said drum with minimum wear of the classifier due to friction from the sand.

4,055,488

WOOD CLEANING AND SEPARATING APPARATUS

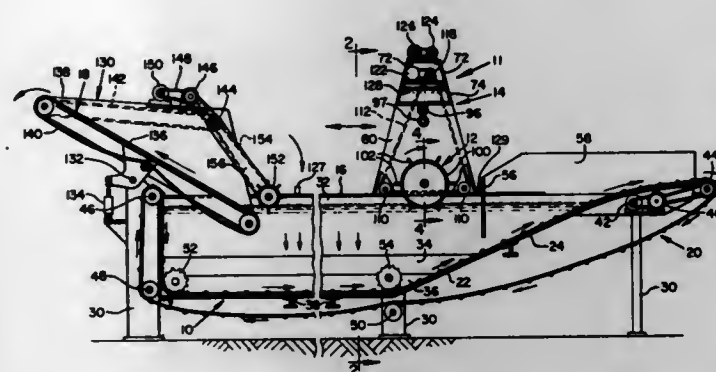
Joseph J. Siri, and John P. Knapp, both of Portland, Oreg., assignors to Siri Systems, Inc., Portland, Oreg.

Filed May 28, 1976, Ser. No. 690,849

Int. Cl.² B03B 5/28

U.S. Cl. 209—173

13 Claims



1. In a separator, a tank open at the top and containing liquid of a predetermined specific gravity, carriage means movable back and forth along said tank, agitator means carried by said carriage means, said agitator means being disposed to contact the upper portion of said liquid in said tank for breaking up and washing a floating pile of relatively heterogeneous floatable and sinkable components, reversible drive means for driving said carriage means, resistance responsive means for reversing said reversible drive means when said carriage means encounters a predetermined minimum resistance to movement along said tank, and conveyor means for removing the floatable components from said tank.

4,055,489

MAGNETIC SEPARATOR FOR SOLID WASTE

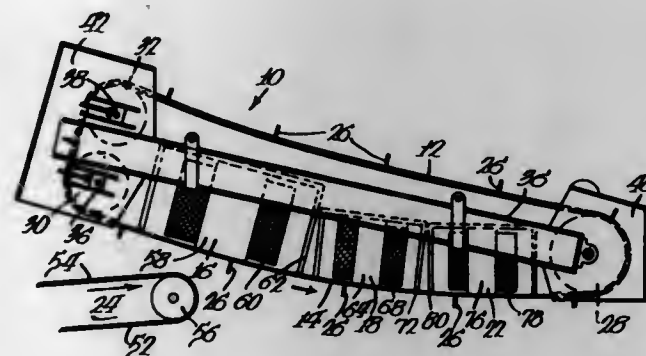
Warren G. Soley, Greenfield, Wis., assignor to Magnetics International, Inc., Maple Heights, Ohio

Filed July 21, 1975, Ser. No. 597,406

Int. Cl.² B03C 1/16

U.S. Cl. 209—223 R

23 Claims



1. A magnetic separator for extracting magnetic material from a mixture of magnetic and non-magnetic material comprising:
 - a non-magnetic material discharge zone;
 - a magnetic material discharge zone spaced from said non-magnetic discharge zone;
 - a plurality of magnets generating a series of longitudinally adjacent rows of magnetic fields, each row in said series being generated by at least one magnet, each of said mag-

nets having a core towards which said magnetic material is attracted;
 means for supplying said mixture at a position within the first row of magnetic fields in said series whereby said magnetic material within said mixture is attracted by the magnetic fields of said first row;
 at least one of said magnets having a core disposed along a longitudinal axis spanning substantially between said supply means and said magnetic material discharge zone, the remainder of said magnets having cores spaced laterally of said longitudinal axis, each of said cores defining a path of a width equal to the width of the core, none of the paths generated by at least one row of magnets in said series passing through a core in each row of said series; and
 means extending between longitudinally adjacent rows of magnetic fields for transporting said magnetic material from one row of magnetic fields in said series to the next row of magnetic fields in said series, said transporting means being situated intermediate said magnetic material and said magnets so that said magnetic material is attracted to and held in contact with said transporting means, said transporting means also transporting said magnetic material from the last magnetic field in said series to said magnetic material discharge zone, said magnetic fields being of such strength and said transporting means being so disposed relative to said magnetic fields whereby said magnetic material is agitatedly transported longitudinally and laterally from said first row of magnetic fields to said magnetic material discharge zone so that said non-magnetic material entrapped in said magnetic material is discarded in said non-magnetic material discharge zone and said magnetic material is released in said magnetic material discharge zone free of non-magnetic material.

4,055,490

ACTIVATED SLUDGE PROCESS

Tsuneo Hasegawa, and Seitaro Hasegawa, both of Kyoto, Japan, assignors to Seisukogyo Co., Ltd., Osaka, Japan

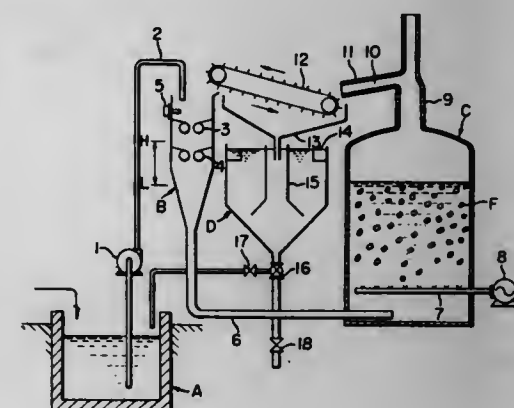
Filed June 17, 1976, Ser. No. 697,209

Claims priority, application Japan, June 24, 1976, 51-76856; June 24, 1976, 51-76857

Int. Cl.² C02C 5/10

U.S. Cl. 210—17

7 Claims



1. An activated sludge process for treating waste water, said process employing an aeration tank having at its upper end a narrowed discharge conduit of smaller transverse cross-sectional area than the transverse cross-sectional area of the main body of said aeration tank, which comprises the steps of: feeding waste water into said aeration tank and flowing an oxygen-containing gas upwardly through said waste water in said aeration tank and thence through said discharge conduit thereby aerating and agitating said waste water in the presence of a multitude of small spongy pieces, said spongy pieces being in a free flowing state suspended in the waste water in said aeration tank and having activated sludge adhering to the surfaces thereof, said spongy pieces retaining said activated sludge thereon in a condition effective to cause said waste water to be purified by said activated sludge under aerated

conditions, the flow of said gas into said discharge conduit generating an air lift effect for moving waste water and spongy pieces from the top of said aeration tank upwardly into said discharge conduit;

intermittently or continuously discharging from said aeration tank a portion of the contents of said aeration tank comprising a mixture of said spongy pieces and treated waste water, said portion being discharged through said discharge conduit by the air lift effect;
 feeding the spongy pieces discharged from said aeration tank into a head tank having pressing rolls located therein and containing the waste water that is to be fed into said aeration tank, and pressing the spongy pieces thereby removing a part of the sludge that is adhered thereto and is present in the interior thereof and then discontinuing the pressing whereby to restore the spongy pieces to a state in which they are capable of supporting treatment of waste water under aerated activated sludge conditions without proliferation of anaerobic bacteria in the interiors thereof; and then returning the thus-treated spongy pieces into said aeration tank.

4,055,491

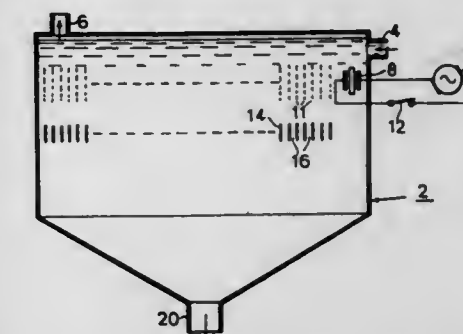
APPARATUS AND METHOD FOR REMOVING FINE PARTICLES FROM A LIQUID MEDIUM BY ULTRASONIC WAVES

Asher Porath-Furedi, 10 Kubovy St., Jerusalem, Israel
 Filed June 2, 1976, Ser. No. 691,982

Int. Cl.² B01D 35/20; B03D 3/06; C02B 1/80

U.S. Cl. 210—19

10 Claims



4. A method of removing microscopic particles from a liquid medium comprising the steps of: propagating ultrasonic waves in the horizontal direction at a frequency of over one megacycle per second through the liquid medium to cause the flocculation of the particles at spaced points in the direction of propagation of the ultrasonic waves; discontinuing the propagation of the ultrasonic waves to permit the settling by gravity of the flocculated particles through baffle means disposed below the level of propagation of the ultrasonic waves which baffle means provides a high resistance to the horizontal propagation therethrough of the ultrasonic waves and a low resistance to the vertical settling therethrough by gravity of the flocculated particles; periodically repeating propagating and discontinuing the propagation of the ultrasonic waves to periodically flocculate and then settle the particles; and removing the settled flocculated particles.

4,055,492

PROCESS FOR THE EXTRACTION OF HEAVY METALS FROM DILUTED AQUEOUS HEAVY METAL SALT SOLUTIONS

Wolfgang Rupilius, and Werner Stein, both of Dusseldorf, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Germany

Filed June 29, 1976, Ser. No. 700,865

Claims priority, application Germany, July 7, 1975, 2530244

Int. Cl.² B01D 11/04

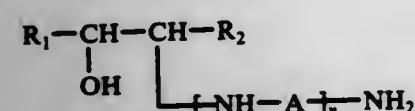
U.S. Cl. 210—21

6 Claims

1. A process for the extraction of heavy metal ions capable

of forming complexes with amines from dilute aqueous heavy metal salt solutions consisting essentially of the steps of

- dissolving from 2% to 15% by weight, based on the weight of the dilute aqueous heavy metal salt solution, of at least one vicinal aminoalkanol of the formula



wherein R_1 and R_2 are unbranched alkyl having from 1 to 17 carbon atoms and the sum of the carbon atoms in R_1 and R_2 is from 7 to 18, A is a member selected from the group consisting of alkylene having from 2 to 6 carbon atoms and methylalkylene having from 3 to 7 carbon atoms, and y is an integer from 1 to 4, with the proviso that the vicinal substituents are distributed statistically, in a dilute aqueous heavy metal salt solution in the absence of organic solvents, at a temperature below the turbidity temperature of said vicinal aminoalkanols;

- heating the solution to a temperature of at least 10° C above said turbidity temperature whereby two liquid phases are formed, and
- separating the organic phase containing the heavy metal ion.

4,055,493

METHOD FOR OPENING A HIGH-DENSITY PACKED COLUMN IN LIQUID CHROMATOGRAPHY

Shigeru Sawanishi, Masahiko Ozaki, and Kikuji Katagawa, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Nov. 29, 1976, Ser. No. 745,920

Claims priority, application Japan, Dec. 1, 1975, 50-143679

Int. Cl.² B01D 15/08

U.S. Cl. 210—31 C

1. A method for opening a high-density packed column in liquid chromatography wherein a large number of components in a solution are separated by means of a column in which a swollen gel is packed at a high density, characterized by passing air through the column while heating the column to a temperature above at least 40° C. to shrink the volume of the packed column, and then opening the column.

4,055,494

THICKENING DEVICE AND METHOD

Robert C. Emmett, Jr., Salt Lake City, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

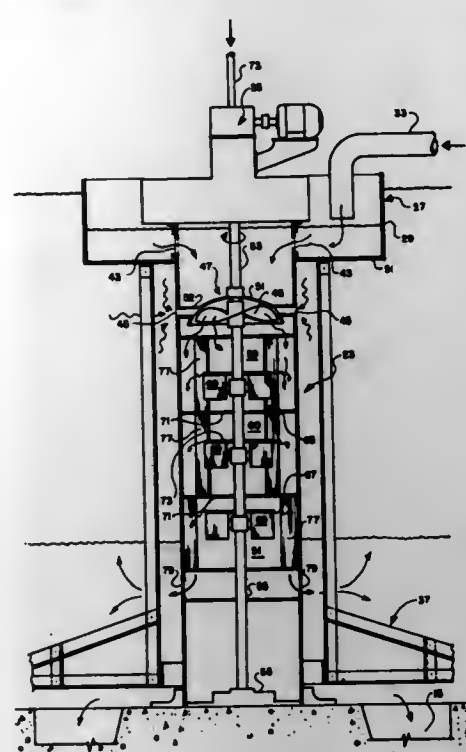
Filed Feb. 14, 1977, Ser. No. 768,315

Int. Cl.² C02B 1/20; C02C 5/02; B01D 21/01

U.S. Cl. 210—49

1. A machine for continuously separating suspended solids from a feed stream liquor by gravity settling comprising:
 - a liquid-holding tank for containing a body of liquid in generally quiescent condition;
 - an upstanding tubular column mounted within said liquid-holding tank;
 - means mounted at the upper end of said tubular column to convey a stream of feed liquor into the interior of said tubular column;
 - floculating-mixing compartments formed within said tubular column, one below another, to sequentially receive the feed liquor;
 - mixing means mounted within each of said flocculating-mixing compartments to blend the liquid therein;
 - reagent introduction means mounted within each of said flocculating-mixing compartments to disperse a chemical flocculating reagent into the compartment for enhancing the flocculation of suspended solids within the feed liquor;
 - discharge means in liquid-flow communication with the lowermost one of said flocculating-mixing compartments and with the interior of said liquid-holding tank for dis-

- charging the flocculated feed liquor into a pulp blanket stratum at the bottom of said liquid-holding tank;
- raking means including rake arms mounted within said



liquid-holding tank to urge solids settled in the pulp blanket stratum to underflow discharge; and

- overflow means mounted on said liquid-holding tank to remove clarified supernatant therefrom.

4,055,495

FORMULATION AND APPLICATION OF ALKALINE ZINC CHLORIDE COMPOSITIONS AND DETACKIFICATION OF PAINT SPRAY BOOTH WASTES

Robert K. Gabel, and Paul L. Seitz, both of Houston, Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 534,505, Dec. 19, 1974, Pat. No. 3,990,986.

This application May 24, 1976, Ser. No. 689,701

Int. Cl.² C02C 5/02

U.S. Cl. 210—52

1. A process for the clarification and detackification on paint spray booth wastes which comprises:
 - A. Adding to the paint spray booth wastes from 50 to 1,000 ppm based on the weight of water present in the waste a composition consisting essentially of
 - a. From 10-60% by weight of a water soluble metallic salt from the group consisting of zinc chloride, zinc sulfate, zinc nitrate, aluminum chloride, aluminum sulfate, ferric sulfate and ferric chloride;
 - b. From 20-70% by weight of a lower aliphatic amino alcohol selected from the group consisting of monoethanolamine, monoisopropanolamine, monopropanolamine, and monoisobutanolamine;
 - c. From 0-20% by weight of a water soluble polyether polyamine which has been prepared by the steps which comprise:
 1. Reacting a polyalkylene oxide, said alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide with a lower difunctional epoxide selected from the group consisting of epichlorohydrin, epibromohydrin and epiodohydrin in a mole ratio of hydroxyl groups present on said polyalkylene oxide to lower difunctional epoxide of from 0.5:1.0 to 1.0:0.5, said polyalkylene oxide further characterized as having a molecular weight of from 100 to 1,000 whereby a capped polyalkylene oxide is formed;
 2. Reacting the capped polyalkylene oxide of step 1 with a lower aliphatic amine having from 2-8 carbon atoms and two or more amino groups in a mole ratio of from 1:5 to 1:1 based on the number of amino

groups present on the amine compound and the number of halogens on the capped polyalkylene oxide; and then,

3. Recovering the polyether polyamine;
- d. From 20-60% by weight water.
- B. Mixing the composition of Step A with the paint spray booth waste;
- C. Allowing the composition to interact with the waste whereby the paint particles contained therein are coated by the hydroxide of the metallic salt and detackified;
- D. Recovering the metallic hydroxide coated detackified paint particles whereby the aqueous paint spray booth waste is clarified.

4,055,496

DIALYSIS APPARATUS

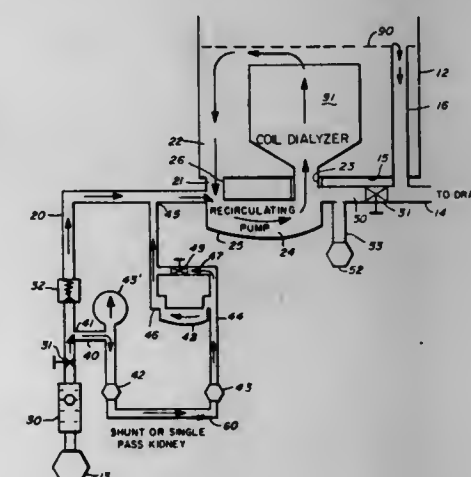
Richard A. Friedrich, Brighton, and Robert L. MacNeill, Newburyport, both of Mass., assignors to National Medical Care, Inc., Boston, Mass.

Continuation of Ser. No. 462,411, April 19, 1974, abandoned.

This application Feb. 18, 1975, Ser. No. 550,169

Int. Cl.² B01D 31/00

U.S. Cl. 210—87



1. A dialysis apparatus for selective use with single pass or single pass-recirculating artificial kidney dialyzers to provide for dialysate flow, said apparatus comprising,
 - a housing, a dialysate canister open to the atmosphere and carrying a dialysate overflow means for limiting a level of dialysate in said canister,
 - a dialysate flow conduit having a first inlet for connection to a source of fresh dialysate and an outlet opening for passing dialysate to said canister,
 - a mounting opening in said canister for detachably mechanically mounting an artificial kidney dialyzer therein,
 - recirculating pump means having a conduit interconnecting one portion of said canister with said mounting opening for permitting dialysate recirculation therethrough,
 - a first shunt dialysate conduit connected to said flow conduit at a first point intermediate said canister opening and said first inlet,
 - said shunt dialysate conduit terminating at a first shunt connector,
 - a second shunt connector spaced from said first shunt connector,
 - a second shunt dialysis conduit leading from said second shunt connector to a second point for passing dialysate to said canister,
 - said second shunt dialysate conduit having a negative pressure pump and means for adjusting the value of negative pressure produced by said pump.

963 O.G.—50

4,055,497

HOLD-DOWN MECHANISM FOR SCRAPER CONVEYOR AND SETTLING TANK

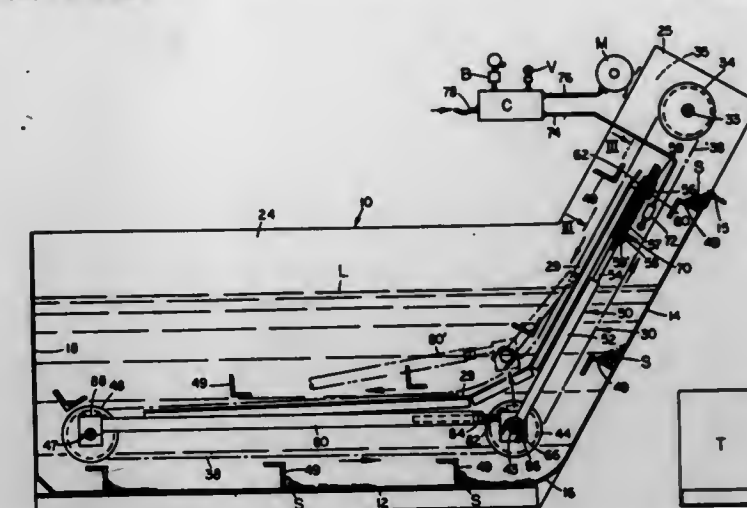
John L. Creps, Rudolph; Stephen N. McEwen, Bowling Green, and Arthur D. Myerholtz, Portage, all of Ohio, assignors to Henry Manufacturing Co., Inc., Bowling Green, Ohio

Filed Oct. 12, 1976, Ser. No. 731,307

Int. Cl.² B01D 21/18

U.S. Cl. 210—91

18 Claims



1. A hold-down mechanism for a drag-out conveyor along the bottom and the ramp side of the settling tank, comprising:
 - A. control means extending along the ramp side of said tank and being connected for slight pivotal movement at its upper end near the upper end of said ramp side and being pivotally connected at its lower end to the bend in said conveyor near the bottom of said ramp side for supporting said conveyor at said bend,
 - B. guide means in said tank engageable with the lower end of said control means, and
 - C. resilient means for urging the bend of said conveyor toward the bottom of said tank.

4,055,498

SELECTIVE FILTRATION APPARATUS

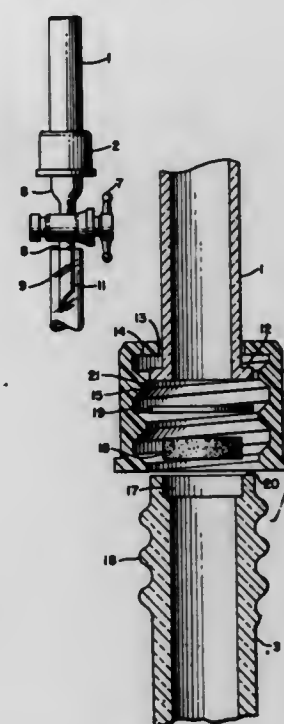
Desmond Arpad Radnoti, 670 Alta Vista, Sierra Madre, Calif. 91024

Filed Aug. 6, 1975, Ser. No. 602,406

Int. Cl.² B01D 35/00

U.S. Cl. 210—94

11 Claims



1. A filter unit comprising:
 - a reservoir;
 - a hollow cylindrical screw cap being open at one end and having a circular opening smaller in diameter than the

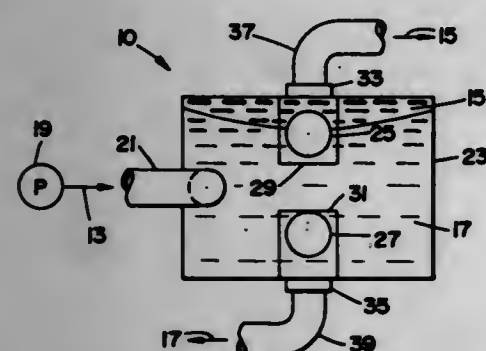
inside diameter of said screw cap in the other end, said screw cap also having internal threads formed therein; flange integrally formed on one end of said reservoir, the diameter of said flange being larger than said diameter of said circular opening in said screw cap but smaller than the inside diameter of said screw cap, said reservoir protruding through said circular opening in said screw cap, said flange preventing said reservoir from passing completely through said circular opening in said screw cap; funnel having external threads along one end thereof and a receptacle formed inside said one end, said external threads of said funnel being of such size as to mate with said internal threads of said screw cap; and filter disc housed in said receptacle, said filter unit being assembled by placing said filter disc in said receptacle and securely threading said screw cap onto said external threads of said funnel.

4,055,499 FLUID SEPARATOR

Darryl E. Lazo, 10 Zanco Way, Novato, Calif. 94947
Filed Sept. 1, 1976, Ser. No. 719,551
Int. Cl.² B01D 21/26

U.S. Cl. 210—119

4 Claims



1. A fluid separator comprising:
 - a. a closed container;
 - b. means for injecting a mixture of fluids having differing densities into said container so that said mixture is stratified;
 - c. a top outlet valve at the top of said container to connect the interior of said container to a first exhaust pipe;
 - d. a bottom outlet valve at the bottom of said container to connect the interior of said container to a second exhaust pipe;
 - e. a plurality of ball floats, one for each of said outlet valves, ballasted to sink in the less dense fluid and to float in the more dense fluid; and
 - f. a plurality of cages, one attached interiorly of said container to each of said outlet valves, each containing one of said ball floats, to keep said ball floats aligned with their respective valves such that the less dense fluid of said mixture is exhausted through said top outlet valve and the more dense fluid of said mixture is simultaneously exhausted through said bottom outlet valve depending upon the level of the interface between the fluids.

4,055,500 FILTERING APPARATUS AND QUICK-OPENING BACKWASH VALVE THEREFOR

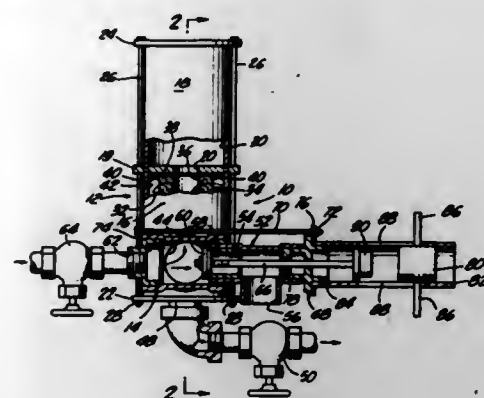
Leland L. Parker, 1018 W. Ontario St., Corona, Calif. 91720
Filed Feb. 10, 1976, Ser. No. 656,939
Int. Cl.² B01D 29/38

U.S. Cl. 210—412

25 Claims

1. Filtering apparatus comprising, in combination:
 - a. a filter having an inlet for a pressurized fluid to be filtered, and an outlet for the filtered fluid;
 - b. control valves respectively for said filter inlet and said filter outlet;
 - c. means providing a reversed flow backwash connection

through the filter from a source of pressurized filtered fluid to a point of discharge, when said filter inlet and outlet control valves are closed; and
d. a backwash poppet valve in said reversed flow connection



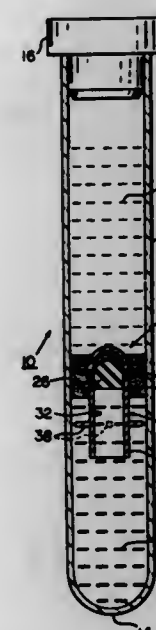
normally urged by fluid pressure to a closed position and having actuator means operable to effect a quick opening of the valve, whereby to produce an explosive surge in the backwash flow to dislodge accumulated filtered media in the filter.

4,055,501 FLUID COLLECTION DEVICE WITH PHASE PARTITIONING MEANS

William D. Cornell, Ballwin, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.
Filed Jan. 16, 1976, Ser. No. 649,881
Int. Cl.² B01D 21/26

U.S. Cl. 210—516

16 Claims



1. A blood collection device for receiving a sample of blood adapted to be centrifugally separated into a lighter phase and a heavier cellular phase comprising a closed container tube for receiving the sample of blood, means closing one end of said tube, a needle-pierceable stopper closing the other end of said tube, and a phase partitioning device within said closed tube including first and second relatively movable members having axially spaced facing surfaces and a combined average specific gravity intermediate that of the lighter phase and that of the heavier phase and with said first member having a specific gravity greater than that of said second member, and a flowable sealant disposed between said facing surfaces in direct contact with one of said members before centrifugation, said sealant having a specific gravity substantially equal to said combined average specific gravity, both of said members having a width substantially less than the inner diameter of said tube to allow fluid to readily flow by said partitioning device during separation of the phases, one of said members having a

plurality of circumferentially spaced, radially outwardly extending stabilizing means thereon for maintaining said partitioning device in a substantially predetermined orientation in said tube during centrifugation of the collection device, said partitioning means being movable to a position in said tube adjacent the interface of the phases and said sealant being squeezable generally radially outwardly from between said facing surfaces and into contact with the inner wall of said tube in response to the relative movement of said spaced surfaces of said members toward each other due to centrifugal forces during centrifugation of the collection device to provide, with said first and second members, a partition sealing the heavier phase from the lighter phase.

4,055,502 METHOD AND COMPOSITION FOR ACIDIZING SUBTERRANEAN FORMATIONS

Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Dec. 24, 1975, Ser. No. 643,984
Int. Cl.² E21B 43/27

U.S. Cl. 252—8.55 C

39 Claims

1. A method for acid treating a porous subterranean formation susceptible of attack by an acid and penetrated by a well bore, which method comprises:
 - injecting into said formation via said well bore a gelled acidic composition comprising
 - a water-thickening amount of a water-dispersible polymer having a molecular weight of at least 500,000 and selected from the group consisting of linear polyacrylamides and polymethacrylamides; partially hydrolyzed linear polyacrylamides and partially hydrolyzed linear polymethacrylamides wherein up to about 25 percent of the carboxamide groups are initially hydrolyzed to carboxyl groups; crosslinked polyacrylamides and crosslinked polymethacrylamides; partially hydrolyzed crosslinked polyacrylamides and partially hydrolyzed crosslinked polymethacrylamides wherein up to about 25 percent of the carboxamide groups are initially hydrolyzed to carboxyl groups; linear copolymers of acrylamide or methacrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide or methacrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water, and mixtures thereof;
 - an amount of a water-dispersible flavotannin gelling agent which is sufficient to cause gelation of an aqueous dispersion of the components of said composition;
 - an amount of a non-oxidizing acid which is sufficient to and capable of reacting with a significant amount of the acid-soluble components of said formation;
 - said polymer, said flavotannin gelling agent, and said acid, in the amounts used, being sufficiently compatible with each other in an aqueous dispersion thereof to permit said gelation and thus form a said composition having sufficient stability to degeneration by the heat of said formation to permit good penetration of said composition and in said formation; and
 - maintaining said composition in said formation in contact therewith for a period of time usually sufficient for the acid in said composition to react significantly with the acid-soluble components of said formation and stimulate the production of fluids therefrom.

4,055,503 LUBRICATING POWDER AND METHOD OF PRODUCING SAME AND RELATIVELY SLIDEABLE COMPONENTS

Wolfgang Anselment, Stuttgart, and Walter Gritschmeier, Waiblingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Continuation-in-part of Ser. No. 512,169, Oct. 4, 1974, abandoned. This application Apr. 13, 1976, Ser. No. 676,407
Claims priority, application Germany, Oct. 11, 1973, 2351044
Int. Cl.² C10M 7/04, 7/16

U.S. Cl. 252—12

5 Claims

1. A process of making a lubricant powder consisting essentially of a mixture of about 80% to 60% by weight of graphite and about 20% to 40% by weight of a mixture of a hardener and an unhardened epoxide resin comprising:
 - a. mixing the hardener with molten unhardened epoxide resin at a temperature insufficient to react the hardener and epoxide resin, until a homogeneous mixture is formed;
 - b. cooling said homogeneous mixture to form a solid homogeneous mixture of said hardener and unhardened epoxide resin;
 - c. breaking up said cooled solid mixture;
 - d. mixing said broken solid mixture with coarse graphite particles; and
 - e. grinding said graphite-containing mixture into particles of a maximum size of 200 micrometers.

4,055,504 STABILIZER IN A HIGH VOLTAGE INSULATION ON A POLYOLEFIN BASE

Heinz Heumann, Rheydt; Manfred Saure, Kassel; Heinz Wagner, Fulda, and Johann Wartusch, Vellmar, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main and Aeg-Telefunken Kabelwerke Aktiengesellschaft, Rheydt, both of Germany
Filed May 12, 1976, Ser. No. 685,539
Claims priority, application Germany, May 17, 1975, 2522200
Int. Cl.² H01B 3/30, 3/24

U.S. Cl. 252—63.2

12 Claims

1. A high voltage insulation polyolefin base having a stabilizing amount of a wetting agent as a stabilizer to improve the voltage stability of the polyolefin base, the wetting agent being a sulfonamide-ethylene oxide adduct having a perfluoro-alkyl group.

4,055,505 ACTIVATED PERCOMPOUND BLEACHING COMPOSITIONS

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Continuation-in-part of Ser. No. 487,889, July 12, 1974, Pat. No. 3,982,892. This application Dec. 15, 1975, Ser. No. 641,013
The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.
Int. Cl.² C11D 7/54, 7/56

U.S. Cl. 252—102

22 Claims

1. An activated percompound bleaching composition consisting essentially of, by weight, 5 to 75% of a bleaching percompound selected from the group consisting of inorganic percompounds and urea peroxide, 0.5 to 15% of an activator for such percompounds which activates the percompound to promote bleaching in an aqueous bleaching solution, said activator being selected from the group consisting of 2-[di(2-hydroxy-C₁-C₃ alkyl) amino]-4,6-dihalo-s-triazine, 2,4-di-C₁-C₄ alkoxy-6-halo-s-triazine and mixtures thereof, 5 to 75% of molecular sieve zeolite in the form of particles having a mean particle diameter in the range of 0.5 to about 12 microns which is selected from the group consisting of Type A, X, Y, L, mordenite and erionite zeolites, said zeolite containing from 1.5 to 36% by weight of water and having a cation selected from the group consisting of sodium, potassium, lithium, am-

monium and hydrogen, 0 to 40% of a water-soluble synthetic organic detergent, 0 to 50% of a water-soluble alkali metal inorganic or organic builder salt and 0 to 50% of sodium sulfate or sodium chloride, said composition containing 0.1 to 1.5 parts of activator per part of percompound and 0.2 to 10 parts of molecular sieve zeolite per part of bleaching percompound and having a pH in the range of 8 to 12 in water.

4,055,506

NOVEL FRAGRANCE COMPOSITIONS AND PERFUMED ARTICLES CONTAINING ALPHA-SUBSTITUTED ACETALDEHYDE

Alan Owen Pittet, Atlantic Highlands; Erich Manfred Klaiber, Neptune; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shester, Brooklyn, N.Y., and Joaquin Vinals, Red Bank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 598,805, July 24, 1975, Pat. No. 4,026,824, which is a continuation-in-part of Ser. No. 507,412, Sept. 19, 1974, Pat. No. 3,940,499. This application Nov. 11, 1976, Ser. No. 740,949

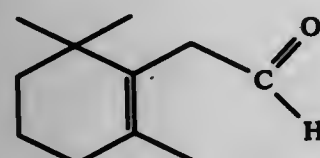
The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.² C11D 9/44

U.S. Cl. 252-132

3 Claims

1. A process for altering or enhancing the organoleptic properties of a soap which comprises adding thereto an aroma altering, modifying or enhancing amount of a composition comprising 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde having the structure:



4,055,507

METHYLPENTANE/CCLF₂CH₂CL AZEOTROPIC MIXTURES

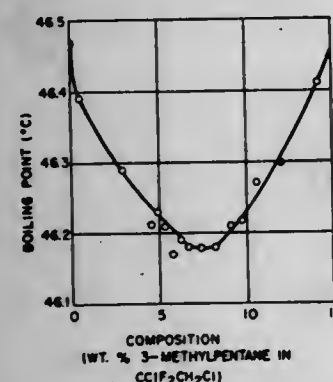
Kavay D. Dastur, Yorklyn, and Robert A. Gorski, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 31, 1975, Ser. No. 645,698

Int. Cl.² C11D 7/30, 7/24; C23G 5/02

U.S. Cl. 252-162

3 Claims



1. An azeotropic composition consisting essentially of about from 4 to 10 weight percent 3-methylpentane and about from 96 to 90 weight percent CClF₂CH₂Cl.

4,055,508

CASK HANDLING METHOD AND APPARATUS

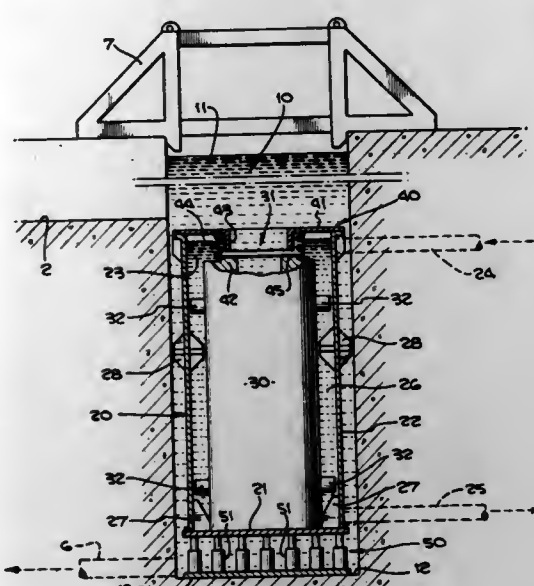
Alfred H. Yoli, New City, N.Y., and Iqbal Husain, Danbury, Conn., assignors to Automation Industries, Inc., Los Angeles, Calif.

Filed Aug. 6, 1976, Ser. No. 712,176

Int. Cl.² G21C 9/32

U.S. Cl. 252-301.1 W

15 Claims



1. Apparatus for preventing radioactive contaminated water in a well from contacting the outside of a cask to be positioned in the well to receive radioactive material being transported through the well and into the cask through an opening in the cask, comprising:

tank means positioned in the well and having an upper opening for receiving the cask lowered therethrough to be placed within said tank means; seal means between the tank means and cask for preventing water in the well from flowing into the tank means about the cask and permitting water in the well to flow into the cask through said cask opening whereby radioactive wastes can be moved through the contaminated water in the well into the cask without contaminating the outside of the cask.

4,055,509

METHOD FOR INCREASING THE WATER DISPERSIBILITY OF ALPHA ALUMINA MONOHYDRATE

Dean R. Weimer, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 291,501, Sept. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 140,945, May 6, 1971, abandoned. This application June 7, 1976, Ser. No. 693,562

Int. Cl.² B01F 3/18

U.S. Cl. 252-363.5

9 Claims

1. A method for increasing the water dispersibility of alpha-alumina monohydrate containing up to about 86 weight percent Al₂O₃, said method comprising, admixing by dry blending an amount equal to from about 0.1 to about 50 weight percent, based on the weight of the alpha alumina monohydrate, of at least one salt compound selected from the group consisting of salts having the general formula MX, wherein M is a polyvalent metal cation constituent selected from the group consisting of Sc³⁺, Y³⁺, Nd³⁺, Sn³⁺, Eu³⁺, Gd³⁺, Er³⁺, Tm³⁺, Yb³⁺, Lu³⁺, Ti³⁺, Zr³⁺, Th³⁺, Cr³⁺, U⁴⁺, Mn³⁺, Fe³⁺, Co³⁺, Ru³⁺, Pd²⁺, Pt²⁺, Au³⁺, Al³⁺, Ga³⁺, In³⁺, Sn²⁺, Sn⁴⁺, Bi³⁺, and wherein X is an anion constituent derived from a monovalent acid and is selected from the group consisting of Cl⁻, NO₃⁻, I⁻, ClO₃⁻, ClO₄⁻, Br⁻, MnO₄⁻, and phosphorous dichloride, phosphorus trichloride, phosphorous pentachloride, phosphorus tribromide, phosphorous pentabromide, and antimony pentachloride with said alpha alumina monohydrate.

4,055,510

METHOD FOR MANUFACTURING OF SPHERICAL CELLULOSE PARTICLES

Jan Peska; Jiri Stamberg, both of Prague, and Zdenko Blace, Neratovice, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed May 21, 1975; Ser. No. 579,716

Claims priority, application Czechoslovakia, May 30, 1974, 3858/74

Int. Cl.² B01J 37/00; B01D 3/00

U.S. Cl. 252-426

14 Claims

1. A method of producing spherical cellulose particles, which consists of the sequence of steps of providing a dispersion of viscose droplets in a water-immiscible liquid, heating such dispersion at a temperature of at least 30° to 100° C. with continuous agitation under stationary hydrodynamic conditions for a time sufficient to partially regenerate the cellulose in the viscose and to thereby, and solely as a result of said heating, solidify the viscose droplets into shape-stable particles, and thereafter completing the regeneration of the cellulose in such solidified viscose droplets by treatment with an added acid.

4,055,511

CATALYST FOR PREPARATION OF 4-CYANTHIAZOLE

Glenn R. Elion, Avenel, and Arthur E. Klink, Lebanon, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 15, 1976, Ser. No. 666,713

Int. Cl.² B01J 23/88, 27/10

U.S. Cl. 252-435

3 Claims

1. A catalyst composition prepared by the process of adding to a solution of chromium chloride and cobalt molybdate a compound selected from the group consisting of potassium hydroxide, ferric chloride, ammonium orthophosphate, telluric acid, potassium sulfate and vanadyl sulfate wherein the molar ratio of molybdenum:cobalt is from 1.20:1.00 to 1.05:1.00; the molar ratio of the chromium chloride:cobalt molybdate is 0.6:1 to 1.4:1 and the molar ratio of a compound selected from said group to cobalt molybdate is 0.01:1 to 0.08:1 for potassium hydroxide; 0.001:1 to 0.01:1 for ferric chloride; 0.001:1 to 0.04:1 for ammonium orthophosphate; 0.01:1 to 0.05:1 for telluric acid; 0.01:1 to 0.08:1 for potassium sulfate; and 0.01:1 to 0.08:1 for vanadyl sulfate, and drying and firing for about 12 hours at 450° C.

4,055,512

CATALYST FOR PRODUCING CYCLOOLEFIN AND METHOD FOR MAKING THE SAME

Yoichi Kageyama; Yozo Kato, both of Yokohama, and Hisao Kosugi, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 575,073, May 6, 1975, abandoned. This application July 1, 1976, Ser. No. 701,496

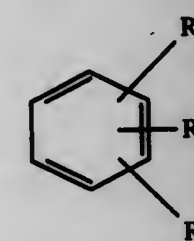
Claims priority, application Japan, May 9, 1974, 49-51596; Feb. 17, 1975, 50-19594

Int. Cl.² B01J 23/02, 23/34, 23/46, 23/74

U.S. Cl. 252-441

11 Claims

1. A catalyst for producing a cyclomonoolefin by hydrogenating an aromatic hydrocarbon of the formula:



wherein R₁, R₂ and R₃ are the same or different and each represents hydrogen or a C₁-C₃ alkyl, at 100°-200° C under a hydrogen pressure of 5-100 atm in an aqueous medium having a pH of 2-7, prepared by a process comprising:

1. immersing a carrier into a first aqueous solution contain-

ing at least one salt whose cationic component is selected from the group consisting of sodium, potassium, magnesium, calcium, barium, zinc, manganese and iron thereby obtaining a treated carrier containing said salt and separating said salt impregnated carrier from said first aqueous solution;

2. supporting at least one ruthenium or rhodium compound on said treated carrier and reducing said compound such that ruthenium or rhodium is reduced to the metallic state; and

3. immersing the carrier supporting at least one metal selected from the group consisting of rhodium and ruthenium into a second aqueous solution containing at least one salt whose cationic component is selected from the group consisting of sodium, potassium, magnesium, calcium, barium, zinc, manganese and iron thereby obtaining a ruthenium or rhodium supported carrier which is impregnated with said salts of steps (1) and (3) and separating the resultant catalyst from said second aqueous solution.

4,055,513

PEROVSKITE CATALYSTS AND PROCESS FOR THEIR PREPARATION

Kenneth S. Wheelock, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 13, 1976, Ser. No. 676,511

Int. Cl.² B01J 21/04, 23/02, 23/10, 23/78

U.S. Cl. 252-462

22 Claims

1. In a supported perovskite catalyst for hydrocarbon conversion and hydrocarbon treating processes which comprises a perovskite comprising at least one transition metal, the improvement which comprises: a support comprising a metal oxide and a spinel on the surface of said metal oxide, said spinel being selected from the group consisting of normal spinel and inverse spinel, said normal spinel having an empirical formula MY₂O₄ wherein M and Y in said normal spinel formula are cations of different metals and wherein one of said cations of said normal spinel formula is the metal of said metal oxide, said inverse spinel having an empirical formula Y(XY)₂O₄ wherein Y and X in said inverse spinel formula are cations of different metals, and wherein one of said cations of said inverse spinel formula is the metal of said metal oxide, said supported catalyst having a surface area of at least 65 m²/g.

4,055,514

CATALYST FOR PREPARATION OF 4-CYANTHIAZOLE

Glenn R. Elion, Avenel, and Arthur E. Klink, Lebanon, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 15, 1976, Ser. No. 666,714

Int. Cl.² B01J 23/88

U.S. Cl. 252-470

2 Claims

1. An ammoxidation catalyst composition prepared by the process of treating cobalt molybdate with a solution of potassium hydroxide, drying and firing for about 4 hours at 450° C, wherein the molybdenum cobalt molar ratio is from 1.20:1.00 to 1.05:1.00 and potassium cobalt molar ratio from 0.001:1.0 to 0.1:1.0.

4,055,515

DEVELOPER FOR PRINTING PLATES

John Nicholas Kirch, Blue Ash, Ohio, assignor to Borden, Inc., Columbus, Ohio

Filed Dec. 31, 1975, Ser. No. 645,704

Int. Cl.² C11D 7/50; G03C 5/24; C11D 7/32

U.S. Cl. 252-542

9 Claims

1. Developer composition for developing an exposed photosensitive coating on a substrate to remove therefrom non-image areas comprising, on weight basis, 50 to 85% water; 10 to 25% relatively non-volatile solvent selected from C₁ to C₆ alkyl alcohols, Cellosolve, Cellosolve acetate, butyl Cellosolve,

solve, methyl Cellosolve, and mixtures thereof; 0.1 to 5% of a detergent selected from the group consisting of nonionic, anionic and cationic detergents of the mild variety; and 5 to 15% of a pyrrolidone lubricant.

4,055,516

POLY(CYANODIFLUOROAMINO ETHERS), THEIR PREPARATION AND UTILIZATION

Leon Hunter, Walnut Creek, and Walter L. Petty, Moraga, both of Calif., assignors to Shell Oil Company, Houston, Tex.

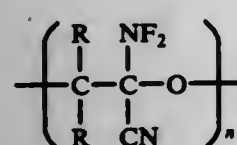
Filed Mar. 24, 1971, Ser. No. 127,805

Int. Cl.² C08G 65/32

U.S. Cl. 260—2 A

13 Claims

1. A polymer containing high energy groups and improved thermal stability which comprises a polyether having repeating units of



wherein each R is a lower alkyl radical or hydrogen and n is an integer between 10 and 60.

2. A cured polymer having high energy groups and improved thermal stability which is suitable as a solid propellant binder which comprises the reaction product of the polymer of claim 1 with an organic polyisocyanate.

4,055,517

PROCESS FOR PRODUCING WATER-SOLUBLE ORGANIC MACROMOLECULES, AND THE WATER-SOLUBLE ORGANIC MACROMOLECULES OBTAINED

Wolfgang Daimler, Graz, Austria, assignor to Vianova Kunstharz A.G., Vienna, Austria

Filed Aug. 26, 1975, Ser. No. 607,910

Claims priority, application Austria, Aug. 27, 1974, 6924/74

Int. Cl.² C08G 59/14

U.S. Cl. 260—2 EP

10 Claims

1. Process for producing water-soluble organic macromolecules comprising reaction at a temperature of from about 0° to 150° C. a water-insoluble reaction product selected from the group consisting of

- a polyepoxide and a secondary amine;
- a polymer containing ester groups and a low volatile N-tertiary substituted alkanol amine; the reaction product carrying at least one mole of tertiary substituted basic nitrogen atoms in 1,000 g of macromolecular substance and having a molecular weight from about 400 to 20,000, with a substance which will split off oxygen and continuing the reaction until the macromolecular substance is water soluble.

4,055,518

VINYL CHLORIDE RESIN COMPOSITION

Haruaki Kakitani, and Satoru Sugino, both of Yokkaichi, Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Oct. 28, 1975, Ser. No. 626,461

Claims priority, application Japan, Oct. 28, 1974, 49-124088

Int. Cl.² C08J 9/00

U.S. Cl. 260—2.5 AM

14 Claims

1. A crosslinkable vinyl chloride resin composition comprising: a vinyl chloride copolymer containing from 90 to 99.5 wt. % of vinyl chloride and from 10 to 0.5 wt. % of a hydroxyl group containing comonomer, from 1 to 10 parts by weight of a polyisocyanate compound per 100 weight parts of said vinyl chloride copolymer, and a stabilizer composed principally of salt of a metal of Group IIa in the Periodic Table.

4,055,519 SIMULTANEOUSLY FOAMED RESIN AND MAGNESIUM OXYCHLORIDE CEMENT

Henry Clark Thompson, Saratoga, Calif., assignor to Henry Clark Thompson, Saratoga, Calif.

Continuation-in-part of Ser. No. 397,833, Sept. 17, 1973, Pat. No. 3,951,885, which is a continuation-in-part of Ser. No. 194,557, Nov. 1, 1971, Pat. No. 3,778,304, which is a continuation-in-part of Ser. No. 811,616, March 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 589,808, Oct. 27, 1966, abandoned. This application Apr. 19, 1976, Ser. No. 678,168

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.² C08G 18/14; C08K 3/22; C08J 9/00

U.S. Cl. 260—2.5 AK

8 Claims

1. In a method of preparing a fireproof material, the steps of mixing

- between 1 and 9 parts by weight on a dry basis of
 - aqueous magnesium chloride having a specific gravity between 21.5 and 22.5° Baume,
 - between 5 and 6.5 pounds magnesium oxide per gallon of aqueous magnesium chloride, and
 - a surfactant with
 - one part of the ingredients for synthetic resin foam and reacting the ingredients simultaneously to form a co-foamed product wherein the foam forming ingredient of the resin component is relied upon to produce all of the bubbles in the cofoam.
2. A method as in claim 1 wherein the synthetic resin is polyurethane.

4,055,520

POLYPHOSPHAZENE BLENDS

Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

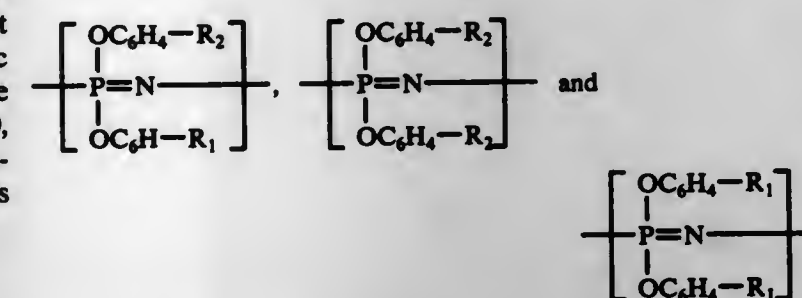
Filed July 14, 1976, Ser. No. 705,116

Int. Cl.² C08J 9/00

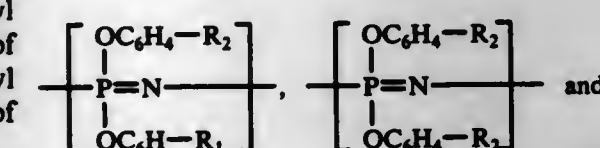
U.S. Cl. 260—2.5 R

29 Claims

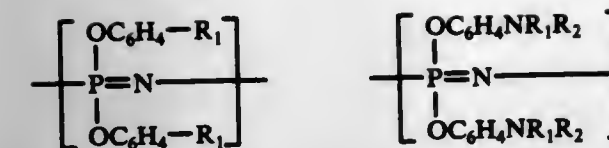
1. The process of foaming a composition comprising a blend of at least one relatively elastomeric polyphosphazene copolymer having a Young's Storage Modulus in the range of 1×10^6 to 5×10^8 dynes/cm² and having randomly repeating units represented by the formulas



wherein R₁ and R₂ are the same or different and are hydrogen, a C₁-C₁₀ linear or branched alkyl radical, or a C₁-C₄ linear or branched alkoxy, with the proviso that when R₂ is alkoxy, R₁ and R₂ are different; with at least one relatively stiff or rigid polyphosphazene homopolymer or copolymer having a Young's Storage Modulus in the range of 5×10^8 to 6×10^{10} dynes/cm² and having randomly repeating units represented by the formulas



-continued



wherein R₁ and R₂ are the same or different and are hydrogen, a C₁-C₁₀ linear or branched alkyl radical, or a C₁-C₄ linear or branched alkoxy, said relatively elastomeric copolymer: relatively stiff or rigid homopolymer or copolymer in a ratio of from about 1:3 to about 3:1, wherein said blend is mixed with a chemical blowing agent and the mixture heated to a temperature sufficient to decompose said blowing agent.

wherein R₁ and R₂ are the same or different and are C₁ to C₁₀ linear or branched alkyl, the radical —NR₁R₂ substituted on the meta or para position of the phenoxy radical and n is from 20 to 2000.

4,055,524

SYNTHESIS OF PEPTIDES

Robert L. Colescott, Bourbonnais; Emil Kaiser, Chicago; Charles D. Bossinger, Olympia Fields, and Paul I. Cook, Kankakee, all of Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

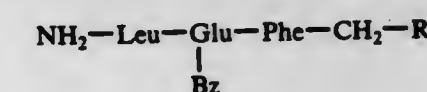
Continuation-in-part of Ser. No. 441,770, Feb. 12, 1974, Pat. No. 3,915,949. This application Aug. 11, 1975, Ser. No. 603,771

Int. Cl.² C08L 89/00; C07C 103/52

U.S. Cl. 260—8

13 Claims

1. A resin peptide having the structure:



in which

Bz is benzyl, p-methoxybenzyl, p-chlorobenzyl, p-nitrobenzyl or benzylhydriyl and
R is divinylbenzene crosslinked polystyrene resin.

4,055,525

NOVEL POLYAMIDE ADHESIVES AND METHOD OF PREPARATION

Thomas T. Cheng, Lawrenceville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

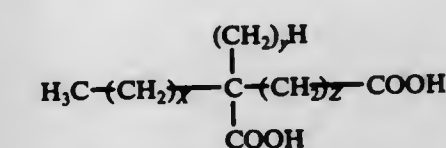
Filed June 23, 1976, Ser. No. 698,867

Int. Cl.² C08G 69/26

U.S. Cl. 260—18 N

31 Claims

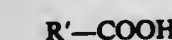
1. The polyamide obtained on condensation of substantially equivalent proportions of hexamethylene diamine and a mixture of acids, said mixture comprising aliphatic dicarboxylic acids of the formula:



wherein X and Z are integers of from 0 to 15, inclusive, y is an integer of from 0 to 1 and the sum of X + y + Z is 15; aliphatic dicarboxylic acids of the formula:



wherein R represents alkylene of 4 to 8 carbon atoms, inclusive and monocarboxylic acids of the formula:



wherein R' is selected from the group consisting of alkyl having 1 to 21 carbon atoms, inclusive, phenyl and hydroxy-substituted phenyl; the ratio of the moles of the acid of formula (I) to the moles of acid of formula (II) in said mixture being in the range of from 1-2:1 and the ratio of the sum of the moles of acids of formulae (I) and (II) to the moles of formula (III) being from 1:0.0-0.08; said condensation being carried out in the presence of a catalytic proportion of a catalyst selected from the group consisting of phosphoric acid, magnesium oxide and

4,055,521

CONSTANT BOILING TERNARY COMPOSITIONS AND THE PROCESS FOR USING SUCH COMPOSITIONS IN THE PREPARATION OF POLYURETHANE FOAM

Bernard Taub, and Robert Leopold Ostrozynski, both of Williamsville, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 8, 1975, Ser. No. 620,664

Int. Cl.² C08J 9/14; C09K 3/00

U.S. Cl. 260—2.5 AF

7 Claims

1. A composition of matter comprising from about 94.6 to about 74.0 weight percent trichlorofluoromethane, from about 2.6 to about 13 weight percent isopentane and from about 2.8 to about 13 weight percent methylene chloride.

5. The process for preparing polyurethane foam which comprises reacting and foaming a mixture of ingredients which will react to form a polyurethane foam in the presence of a blowing agent comprising the composition of claim 1.

4,055,522

PROCESS FOR PRODUCING AN ISOCYANATE-BASED POLYMER HAVING REDUCED SMOKE GENERATION

Kaneyoshi Ashida, Chofu; Masaaki Ohtani, Kawasaki; Takashi Yokoyama, Yakuohji, and Shoichi Ohkubo, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Sept. 19, 1975, Ser. No. 614,933

Claims priority, application Japan, Sept. 26, 1974, 49-110724

Int. Cl.² C08G 18/14

U.S. Cl. 260—2.5 AW

11 Claims

1. A process for producing an isocyanate-based polymer having reduced smoke generation which comprises reacting, in the presence of a trimerization catalyst, a polymethylene polyphenylene polyisocyanate produced by the phosgenation of a precondensate of aniline and formaldehyde, the improvement which comprises the addition to the reaction system in an amount of from 3 to 20% by weight based on the amount of said polyisocyanate present, of an aromatic aldehyde having an aldehyde group and no other functional group capable of reacting with anisocyanate group.

4,055,523

POLY(DIALKYLAMINOARYLOXYPHOSPHAZENE) POLYMERS AND FOAMS

Ronald L. Dieck; Alan B. Magnusson, and Edwin J. Quinn, all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 16, 1976, Ser. No. 714,526

Int. Cl.² C08G 79/02

U.S. Cl. 260—2.5 R

19 Claims

1. Poly(dialkylaminoaryloxyphosphazenes) having the formula:

calcium oxide and in the presence of an excess of an aqueous solvent.

4,055,526

PLANAR HEATING ELEMENT AND PRODUCTION THEREOF

Shin Kiyokawa; Shokichi Sakaguchi, and Toru Takeuchi, all of 139, Kamihikona, Misato, Saitama, Japan

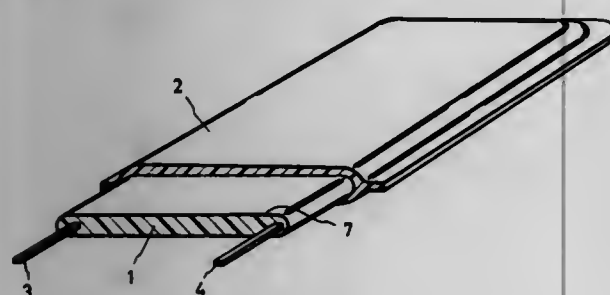
Filed Mar. 26, 1975, Ser. No. 562,046

Claims priority, application Japan, Mar. 29, 1974, 49-35373; Mar. 29, 1974, 49-35374

Int. Cl.² H05B 3/18

U.S. Cl. 264-22

8 Claims



1. A method for producing a planar heating element which comprises uniformly melt-admixing an insulating thermoplastic resin with an electrically conductive powder wherein said electrically conductive powder is present in an amount less than 40% by weight of the thermoplastic resin, extruding the mixture to form said planar heating element and immediately cooling the extruded heating element rapidly at a temperature of less than 20° C. whereby the conductive powder is in a higher concentration near the surface of the element.

4,055,527

METHOD AND RESINOUS VEHICLES FOR ELECTRODEPOSITION

Edward L. Jozwiak, Jr., Gibsonia, and Surya K. Das, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 28, 1975, Ser. No. 599,747

Int. Cl.² C08L 91/00; C25D 13/06

U.S. Cl. 260-23.7 A

10 Claims

1. A process for preparing a resinous vehicle suitable for electrodeposition which comprises:

- A. addition polymerizing a diene, in the presence of an oil-soluble free radical polymerization catalyst, in aqueous medium with
- B. an at least 25 percent neutralized reaction product of:
 1. not more than about 45 percent by weight of an unsaturated dicarboxylic acid or its anhydride with
 2. at least about 55 percent by weight of a drying oil which has an iodine value of about 90 and above.

4,055,528

PHENOL-FORMALDEHYDE RESIN FOR FOUNDRY APPLICATIONS

Young D. Kim, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 23, 1976, Ser. No. 660,326

Int. Cl.² C08L 61/10

U.S. Cl. 260-29.3

5 Claims

1. A no-bake foundry sand composition comprising:
 - a. a foundry aggregate;
 - b. between about 1 and about 5 parts by weight per 100 parts of aggregate of a phenolaldehyde resin made by:
 1. heating phenol and an aldehyde in a mole ratio of aldehyde to phenol of between about 1.05 to 1 and about 1.5 to 1 in the presence of an alkaline catalyst until the free aldehyde content is less than one percent;

2. neutralizing the reaction product to a pH of about 5.5 to about 6.5 by adding an acid; and
3. dehydrating the resultant product to a viscosity of between about 1.5 and about 2.0 stokes and a water content of between about 10 and about 12 percent by weight, and
- c. between about 10 and about 60 parts by weight per 100 parts of resin of a curing catalyst.

4,055,529

ADHESIVE JOINT DRESSING COMPOSITIONS CONTAINING AN ALKALI THICKENABLE POLYMER

David R. Burley, Cranbury, N.J., assignor to Tile Council of America, Inc., Princeton, N.J.

Filed Apr. 29, 1975, Ser. No. 572,660

Int. Cl.² C08L 33/02

U.S. Cl. 260-29.6 RW

30 Claims

1. a dressing composition capable of selectively adhering to substrate surfaces and forming on adherable substrate surfaces a non-porous, strain resistant, washable layer when cured, said composition comprising

- i. a high molecular weight polymer in the form of an emulsion which is alkali-thickenable whereby it is capable of substantially increasing the viscosity of the composition as the pH of the composition is increased above neutral pH;
- ii. a high molecular weight polymer in the form of an emulsion which is not alkali-thickenable;
- iii. an alkaline agent wherein the cation or cations of said agent are mono-valent, said alkaline agent present in sufficient amounts to cause the alkali-thickenable polymer to increase the viscosity of the composition; and
- iv. water;

wherein both of said polymers are room temperature curable and form water resistant films when cured and wherein the dispersion of at least one of said polymers becomes destabilized in the presence of polyvalent cations whereby its emulsion phase is broken and the droplets of the polymer no longer remain suspended in the liquid phase and wherein the total weight of polymer solids is in the range of 5-60% by weight of the total composition, the volatile components comprising at least 20% by weight of the total composition and the composition having a thixotropic rheology with a viscosity greater than about 50,000 cps at 70° F.

4,055,530

AQUEOUS DISPERSION OF ADDITION POLYMER OF AN ALPHA-BETA-ETHYLENICALLY UNSATURATED MONOMER AND SUSPENDED POLYPROPYLENE PARTICLES

Wassily Poppe, Lombard, and Ivor R. Fielding, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 27, 1975, Ser. No. 553,891

Int. Cl.² C08L 33/10

U.S. Cl. 260-29.6 RW

7 Claims

1. An aqueous coating composition comprising a dispersion of a resinous addition polymer comprising from about 0.5 to 50% by weight of an alpha, beta-ethylenically unsaturated carboxylic acid and from 25 to 99.5% by weight of at least one monomer selected from the group consisting of ethylene and soft alkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid and suspended particles of a resinous polymer of propylene containing at least 75% by weight propylene wherein said resinous polymer of propylene has a melting point of about 150° to 175° C. and an average particle size of 500 microns diameter or less.

4,055,531

PVC PLASTICIZED WITH TETRACARBOXYLATES

Joe B. Lavigne, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 537,051, Dec. 27, 1974, Pat. No. 4,012,438, which is a continuation-in-part of Ser. No. 163,534, July 9, 1971, abandoned, which is a continuation-in-part of Ser. No. 835,735, June 23, 1969, abandoned, Ser. No. 835,736, June 23, 1969, abandoned, and Ser. No. 835,763, June 23, 1969, abandoned.

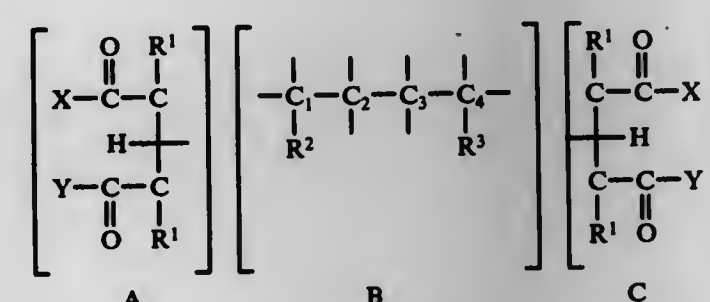
This application Oct. 4, 1976, Ser. No. 729,323

Int. Cl.² C08K 5/11

U.S. Cl. 260-31.8 B

4 Claims

1. Polyvinyl chloride plastic compositions containing in amounts sufficient to impart plasticizing properties esters of the formula



wherein A and C are monovalent succinic acid groups having attachment to B at either of the two carbon atoms of A or C having unsatisfied valences and a hydrogen atom attached to the other unsatisfied carbon atom; and wherein B is a connecting alkane or cycloalkane group of 8 to 30 carbon atoms having 2 of the above-described monovalent groups A and C, which may be the same or different, attached at carbon atoms 1 and 2 or at carbon atoms 1 and 3; and optionally having carbon atom 1 and carbon atom 4 connected by a 1-8 carbon methylene bridge; the remainder of the unsatisfied carbon valences of said bivalent hydrocarbon group being attached to hydrogen atoms; and wherein R¹ is H and R² and R³ are H or the same or different alkyl groups; X and Y are the same or different groups having the structure: —OR, in which R is an alkyl group having from 1 to 8 carbon atoms.

4,055,532

STABILIZED ACETONITRILE SOLVENT CONTAINING POLYACRYLONITRILE COMPOSITIONS AND METHOD OF FORMING SAME

Darrell R. Thompson, Somerville, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 367,088, June 4, 1973, Pat. No. 3,917,553, which is a continuation of Ser. No. 136,620, April 22, 1971, abandoned. This application Aug. 12, 1975, Ser. No. 603,977

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.² C08L 33/20

U.S. Cl. 260-32.4

5 Claims

1. A method of forming stabilized film or fiber forming polyacrylonitrile compositions which comprises the steps of adding to a solvent which consists essentially of acetonitrile from about 0.01 to about 3 weight percent based on the weight of said polyacrylonitrile, of a sulfur-containing stabilizer selected from the group consisting dodecanethiol, mercaptosuccinic acid, benzenethiol, thiodiglycol, dibhenyl thiodipropionate, distearyl thiodipropionate, and diethoxyethyl thiodipropionate; adding polyacrylonitrile which contains at least 85 percent acrylonitrile and up to about 15 weight percent of at least one other ethylenically unsaturated material copolymerized therewith; and heating and mixing the resultant mixture under superatmospheric pressure to a temperature above about 80 degrees centigrade and below the degradation temperature of said polyacrylonitrile to produce a solution.

4,055,533

POTTERY-LIKE COATING COMPOSITION

Laurence A. Malone, 2111 Jefferson Davis Highway, Arlington, Va. 22202

Continuation-in-part of Ser. No. 672,068, March 30, 1976, abandoned. This application Apr. 5, 1977, Ser. No. 784,845

Int. Cl.² C08L 63/02

U.S. Cl. 260-37 EP

3 Claims

1. A composition capable of hardening into a hard, pottery-like material and comprising a mixture of a first component which comprises:

- 22.0-36.1% by weight of an epoxy resin having a viscosity of 100-160 poise and an epoxide equivalent of 185-192;
 - 2.1-4.0% by weight of a semi-solid epoxy resin having an epoxide equivalent of 230-280;
 - 0.3-1.4% by weight of hexachlorobutadiene;
 - 0.5-1.0% by weight of zinc oxide;
 - 0.6-1.6% by weight of white lead;
 - 32.1-52.1% by weight of calcium carbonate;
 - 0.9-2.0% by weight of titanium dioxide;
 - 0.5-0.9% by weight of barium sulphate;
 - 0.3-0.5% by weight of mineral oil; and
 - 0.2-0.5% by weight of acetic acid; and
- a second component which comprises:
- 15.0-23.3% by weight of a polyamide resin having an equivalent weight of 225 grams per amine hydrogen;
 - 23.0-61.2% by weight of calcium carbonate;
 - 1.5-3.0% by weight of epichlorohydrin;
 - 0.5-3.5% by weight of bisphenol-A;
 - 1.5-3.5% by weight of diacetamide;
 - 1.5-2.0% by weight of aminophenol; and
 - 0.4-3.5% by weight of amido-aldehyde.

4,055,534

UPGRADED AROMATIC POLYESTER MATERIAL IN POWDER FORM

Arthur H. Gerber, University Hts., Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

Filed Nov. 14, 1975, Ser. No. 631,996

Int. Cl.² C08G 18/08, 18/82; C08K 5/52; C08G 18/42

U.S. Cl. 260-45.7 PH

16 Claims

1. A process for preparing a polyester in powder form by upgrading the molecular-weight of an aromatic polyester or a mixture of aromatic polyesters with an initial molecular weight of about 10,000 to a product possessing a relative viscosity of at least 1.8 as measured in m-cresol at 31° C. which comprises: reacting said polyester with at least one reagent selected from the group consisting of (1) diisocyanates represented by the formula R(NCO)₂ and at least one difunctional compound in which the functionality is selected from the group consisting of —OH, —NH, —COOH and mixtures thereof; and (2) the reaction products of said diisocyanate and said difunctional compound alone or with at least one other difunctional compound; effecting said reaction in a polar aprotic solvent at temperatures of 100°-180° C., the relative proportions of the reactants being such that the total number of equivalents of isocyanate groups is substantially equal to the total number of equivalents of —OH, —NH, and/or —COOH reactive sites present in the polyester and difunctional compounds, the difunctional compound being present in the amount of 1 to 50 percent by weight based on the weight of said polyester, and R represents a divalent number selected from the group consisting of alkylene, cycloalkylene, alkenylene, cycloalkenylene, arylalkylene, arylene, biarylene, and all the R groups are not required to be the same and thereafter removing said solvent.

4,055,535

PROCESS FOR PRODUCING STABILIZED OLEFIN TERPOLYMERS AND STABILIZED OLEFIN TERPOLYMERS PRODUCED ACCORDING TO SAID PROCESS

Sergio Arrighetti; Sebastiano Cesca; Giuseppe Ghetti, and Eugenio Vajna, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Milan, Italy
Division of Ser. No. 275,936, July 28, 1972, Pat. No. 3,892,712.
This application Apr. 11, 1975, Ser. No. 567,299

Claims priority, application Italy, July 31, 1971, 27014/71
Int. Cl.² C08L 9/00

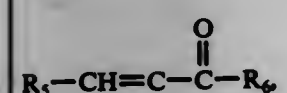
U.S. Cl. 260—45.7 R

10 Claims

1. A process for preparing an olefin terpolymer which is stabilized against oxidative aging, which comprises reacting in a hydrocarbon solvent and at a temperature between 0° and 150° C.

a. a terpolymer of ethylene, another alpha olefin, and a polyene selected from the group consisting of dehydro-1,5-dicyclopentadiene and 2-(2',4'-dimethyl-penta 1',3'-dienyl)-norborn-5-ene, having in addition to a double bond for participating in the terpolymer formation, conjugated double bonds in the cyclopentadienyl substituent, with

b. a dienophilic agent of the general formula:



wherein R₃ can be hydrogen or alkyl, aryl, cycloalkyl or arylalkyl radicals having up to 8 carbon atoms and R₆ can be alkyl, alkenyl, cycloalkyl, aryl, or arylalkyl radical having up to 8 carbon atoms.

4,055,536

4,4'-BIPIPERIDYLIDENE DERIVATIVES AND THEIR USE AS STABILIZERS

Nobuo Soma; Takao Yoshioka; Tomoyuki Kurumada, and Syoji Morimura, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed July 30, 1976, Ser. No. 710,313

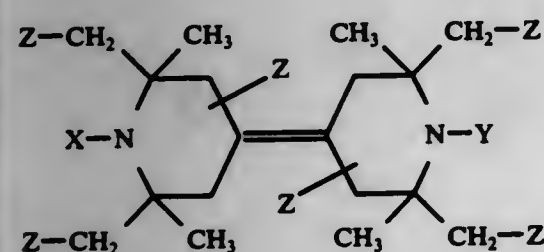
Claims priority, application United Kingdom, Aug. 8, 1975, 33228/75

Int. Cl.² C07D 401/04; C08J 3/20

U.S. Cl. 260—45.8 N

13 Claims

1. A 4,4'-bipiperidylidene compound having the formula (I):



wherein

each of the symbols Z represents a hydrogen atom, or an alkyl group having from 1 to 3 carbon atoms; and X and Y are the same or different and each represents a hydrogen atom, an oxyl group, a hydroxy group, an alkyl group having from 1 to 18 carbon atoms, an alkenyl group having from 3 to 6 carbon atoms, an alkoxyalkyl group having from 1 to 3 carbon atoms in its alkyl moiety and from 1 to 18 carbon atoms in its alkoxy moiety, a cyanoalkyl group having 2 or 3 carbon atoms, an alkanoyl group having from 1 to 12 carbon atoms,

an alkenoyl group having 3 or 4 carbon atoms, an 2,3-epoxypropyl group, an unsubstituted aralkyl group having 7 or 8 carbon atoms, an aralkyl group having 7 or 8 carbon atoms and having in its aryl moiety up to 3 substituents selected from the group consisting of chlorine atoms, C₁₋₄ alkyl groups and C₁₋₈ alkoxy groups, a group of the formula —CH₂CH(R¹)OR²

wherein

R¹ represents a hydrogen atom, a methyl group, or a phenyl group, and

R² represents a hydrogen atom, or an acyl group having the formula —COR³

wherein

R³ represents an alkyl group having from 1 to 17 carbon atoms, an alkenyl group having from 2 to 4 carbon atoms, an unsubstituted phenyl group, a phenyl group having up to 3 substituents selected from the group consisting of

chlorine atoms, C₁₋₄ alkyl groups, C₁₋₈ alkoxy groups and hydroxy groups,

an unsubstituted aralkyl group having 7 or 8 carbon atoms, an aralkyl group having 7 or 8 carbon atoms and having in its aryl moiety up to 3 substituents selected from the group consisting of

chlorine atoms, C₁₋₄ alkyl groups, C₁₋₈ alkoxy groups, and hydroxy groups, a styryl group, or a cyclohexyl group, a group of the formula —CH₂COOR³

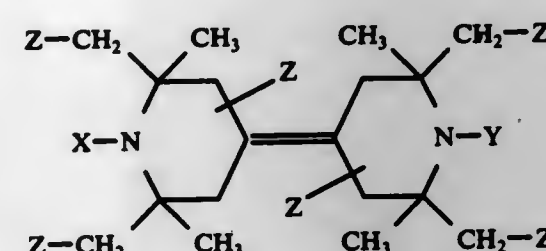
wherein

R³ represents an alkyl group having from 1 to 18 carbon atoms, an alkenyl group having from 3 to 6 carbon atoms, a phenyl group, an aralkyl group having 7 or 8 carbon atoms, or a cyclohexyl group, or a group of the formula —COOR⁴

wherein

R⁴ represents an alkyl group having from 1 to 8 carbon atoms, a benzyl group, a phenyl group, or a cyclohexyl group and an acid addition salt thereof.

7. An organic polymer composition stabilized against photo- and thermal deterioration by the incorporation of a stabilizing amount of a 4,4'-bipiperidylidene derivative having the formula (I)



wherein

each of the symbols Z represents a hydrogen atom, or an alkyl group having from 1 to 3 carbon atoms, and X and Y are the same or different and each represents a hydrogen atom, an oxyl group, a hydroxy group,

an alkyl group having from 1 to 18 carbon atoms, an alkenyl group having from 3 to 6 carbon atoms, an alkoxyalkyl group having from 1 to 3 carbon atoms in its alkyl moiety and from 1 to 18 carbon atoms in its alkoxy moiety;

a cyanoalkyl group having 2 or 3 carbon atoms, an alkanoyl group having from 1 to 23 carbon atoms, an alkenoyl group having 3 or 4 carbon atoms, an 2,3-epoxypropyl group, an unsubstituted aralkyl group having 7 or 8 carbon atoms,

an aralkyl group having 7 or 8 carbon atoms and having in its aryl moiety up to 3 substituents selected from the group consisting of chlorine atoms, C₁₋₄ alkyl groups and C₁₋₈ alkoxy groups,

a group of the formula —CH₂CH(R¹)OR²

wherein

R¹ represents a hydrogen atom, a methyl group, or a phenyl group, and

R² represents a hydrogen atom, or an acyl group having the formula —COR³

wherein

R³ represents an alkyl group having from 1 to 17 carbon atoms, an alkenyl group having from 2 to 4 carbon atoms, an unsubstituted phenyl group, a phenyl group having up to 3 substituents selected from the group consisting of chlorine atoms, C₁₋₄ alkyl groups, C₁₋₈ alkoxy groups and hydroxy groups, an unsubstituted aralkyl group having 7 or 8 carbon atoms,

an aralkyl group having 7 or 8 carbon atoms and having in its aryl moiety up to 3 substituents selected from the group consisting of chlorine atoms, C₁₋₄ alkyl groups, C₁₋₈ alkoxy groups and hydroxy groups, a styryl group, or a cyclohexyl group,

a group of the formula —CH₂COOR³

wherein

R³ represents an alkyl group having from 1 to 18 carbon atoms, an alkenyl group having from 3 to 6 carbon atoms, a phenyl group, an aralkyl group having 7 or 8 carbon atoms, and a cyclohexyl group, or a group of the formula —COOR⁴

wherein

R⁴ represents an alkyl group having from 1 to 8 carbon atoms, a benzyl group, a phenyl group, or a cyclohexyl group, and an acid addition salt thereof.

4,055,537

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

William Joseph Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 4, 1977, Ser. No. 774,556

Int. Cl.² C08K 5/34

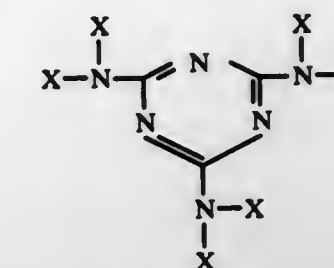
U.S. Cl. 260—45.75 D

18 Claims

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with a smoke retardant amount of

A. at least one melamine molybdate or substituted melamine

molybdate, the melamine or substituted melamine having the formula



wherein X is hydrogen or an alkyl, alicyclic, aralkyl, alkaryl, aryl or heterocyclic group containing from 1 to 10 atoms of C, O, S and/or N, and with two X's on each of one or more nitrogen atoms optionally being joined together to form a heterocyclic ring; and

B. at least one compound selected from the group consisting of Bi₂O₃, CdO, MnCO₃, SnO₂, Ta₂O₅, TiO₂, H₂WO₄, ZnO, Zn₂SiO₄, zinc borate, and hydrates thereof.

4,055,538

SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

William Joseph Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 4, 1977, Ser. No. 774,554

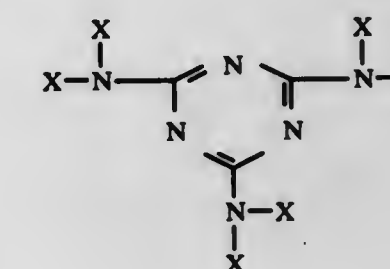
Int. Cl.² C08K 5/34

U.S. Cl. 260—45.75 P

12 Claims

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with a smoke retardant amount of

A. at least one melamine molybdate or substituted melamine molybdate, the melamine or substituted melamine having the formula



wherein X is hydrogen or an alkyl, alicyclic, aralkyl, alkaryl, aryl or heterocyclic group containing from 1 to 10 atoms of C, O, S and/or N, and with two X's on each of one or more nitrogen atoms optionally being joined together to form a heterocyclic ring; and

B. at least one compound selected from the group consisting of iron oxide, FeSO₄, Fe₂(SO₄)₃, iron (III) acetylacetonate, and hydrates thereof.

4,055,539

ALKYLIDENE-BISPHENOLS CONTAINING SULPHUR, AND THEIR USE AS STABILIZERS

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 610,498, Sept. 4, 1975, abandoned. This application May 27, 1976, Ser. No. 690,470

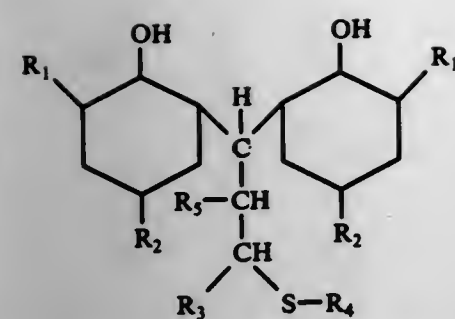
Claims priority, application Switzerland, Sept. 16, 1974, 12573/74

Int. Cl.² C08K 5/05, 5/13; C07C 149/36

U.S. Cl. 260—45.95 C

9 Claims

1. A compound of the general formula I



wherein R_1 is an alkyl group which has 1 to 18 carbon atoms and which is not branched in the α -position, R_2 denotes a linear or branched alkyl group having 1 to 8 carbon atoms, or a hydrogen atom, R_3 denotes an alkyl group having 1 to 6 carbon atoms and R_4 denotes a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, and R_4 denotes a linear or branched alkyl group having 1 to 20 carbon atoms wherein the carbon chain can be interrupted by sulphur atoms.

4,055,540

5-HYDROXYDIPHENYL SULFOXIDE COMPOSITIONS
Dwight William Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

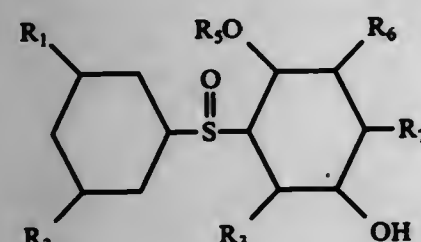
Filed Nov. 2, 1976, Ser. No. 737,954

Int. Cl.² C08K 5/41

U.S. Cl. 260—45.95 C

8 Claims

1. A polyolefin containing a stabilizing amount of a 5-hydroxydiphenyl sulfoxide of the formula



wherein R_1 is hydrogen, R_2 is a lower alkyl or halogen as defined, wherein R_3 is hydrogen or a lower alkyl, R_4 is lower alkyl from 1 to 6 carbon atoms, R_5 is hydrogen or lower alkyl and R_7 is hydrogen or lower alkyl from 1 to 6 carbon atoms.

4,055,541

REACTION PRODUCTS OF NON-CYCLOALIPHATIC EPOXY RESINS AND AMINE-TERMINATED LIQUID POLYMERS AND PROCESS FOR PREPARATION THEREOF

Changku Keith Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

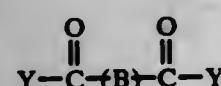
Continuation-in-part of Ser. No. 586,723, June 13, 1975, abandoned. This application July 14, 1975, Ser. No. 595,445

Int. Cl.² C08L 63/02

U.S. Cl. 260—47 EN

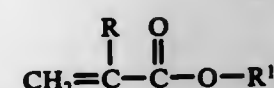
22 Claims

1. A composition comprising
A. 100 parts by weight of a non-cycloaliphatic epoxy resin containing at least an average of about 1.7 oxirane groups per molecule, said resin having an epoxy equivalent weight from about 70 to about 6000, and
B. from about 1 to about 1,000 parts by weight of an amine-terminated liquid polymer containing an average from about 1.7 to about 3 amine groups per molecule, said groups being primary, secondary or a mixture thereof, and said polymer having the formula



wherein Y is a univalent radical obtained by removing hydrogen from an amine group of an aliphatic, alicyclic, heterocyclic or aromatic amine containing from 2 to 20 carbon atoms and

(I) least two amine groups, at least two of said amine groups being primary, secondary or a mixture thereof, and B is a polymeric backbone consisting of carbon-carbon linkages and containing polymerized units of at least one vinylidene monomer having at least one terminal $\text{CH}_2=\text{C}$ group, said monomer being selected from the group consisting of (a) monoolefins containing 2 to 14 carbon atoms, (b) dienes containing 4 to 10 carbon atoms, (c) vinyl and allyl esters of carboxylic acids containing 2 to 8 carbon atoms, (d) vinyl and allyl ethers of alkyl radicals containing 1 to 8 carbon atoms, and (e) acrylic acids and acrylates having the formula



said R being hydrogen or an alkyl radical containing 1 to 3 carbon atoms and said R' being hydrogen, an alkyl radical containing 1 to 18 carbon atoms, or an alkoxyalkyl, alkylthioalkyl or cyanoalkyl radical containing 2 to 12 carbon atoms.

4,055,542

ANAEROBICALLY CURABLE SEALING COMPOSITION CONTAINING (A) ACRYLATE DERIVATIVE OF BISPHENOL A AND (B) HYDROXYACRYLATE

Tsutomu Saito, Hachioji, Japan, assignor to Three Bond Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1976, Ser. No. 660,435

Claims priority, application Japan, Feb. 24, 1975, 50-22663

The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.

Int. Cl.² C08F 3/62, 3/64

U.S. Cl. 260—47 UA

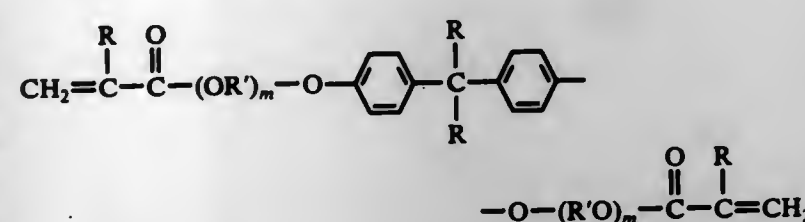
8 Claims

1. An anaerobically curable sealing composition comprising a polymerisable monomer and an organic peroxide, characterized in that said monomer is a mixture of the following monomers (A) and (B), the ratio of the amounts of which are:

Monomer (A): 95 to 50 parts by weight,

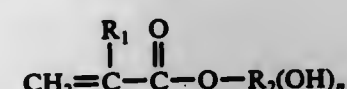
Monomer (B): 50 to 5 parts by weight.

monomer (A) having the general formula of

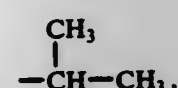


wherein, R represents hydrogen or alkyl radical having from 1 to 4 carbon atoms, R' represents alkylene radical having from 2 to 4 carbon atoms and m represents an integer of from 2 to 8,

monomer (B) having the general formula of



in which, R_1 indicates hydrogen or alkyl radical having from 1 to 4 carbon atoms, R_2 indicates $-\text{CH}_2-\text{CH}_3$, $-\text{CH}_2-\text{CH}_2-\text{CH}_3$ or



and n indicates an integer of from 1 to 3.

4,055,543

CHAIN-EXTENDING SCHIFF BASE TERMINATED POLYIMIDES AND METHOD OF PREPARATION
Gaetano Francis D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

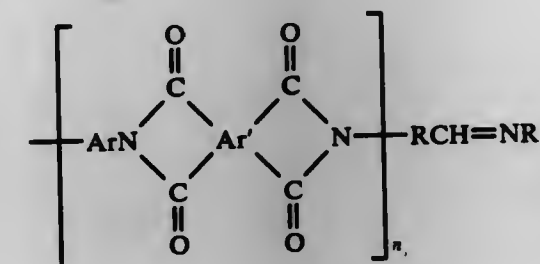
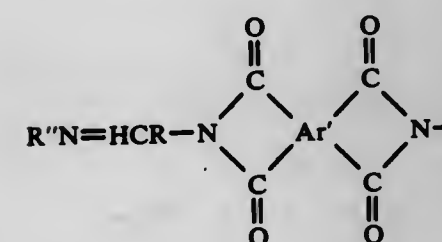
Continuation-in-part of Ser. No. 363,800, May 25, 1973, Pat. No. 3,998,786, and a continuation-in-part of Ser. No. 363,801, May 25, 1973, Pat. No. 3,897,395. This application May 27, 1975, Ser. No. 581,095

Int. Cl.² C08G 73/10, 73/12

U.S. Cl. 260—47 CP

14 Claims

1. A polymeric chain-extending process comprising: heating a polyimide, at a temperature in the range of about 150°–450° C, of the formula:



wherein

Ar' is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar' radical,

Ar is a divalent aromatic organic radical,

R is a hydrocarbon radical of 1 to 12 carbon atoms, and

R'' is a hydrocarbon radical of 1 to 12 carbon atoms, and

n is a positive integer of at least one.

4,055,544

PROCESS FOR MAKING POLYCARBONATES USING AMMONIA OR AMMONIA COMPOUNDS AS THE CATALYSTS

Joseph McClendon Baggett, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 12, 1976, Ser. No. 704,202

Int. Cl.² C08G 63/62

U.S. Cl. 260—47 XA

6 Claims

1. A process for making thermoplastic aromatic polycarbonates which comprises reacting under interfacial polycarbonate-forming conditions

1. a carbonyl halide,

2. a dihydric phenol or mixtures of dihydric phenols, and

3. a catalytic amount of ammonia or an ammonium compound which liberates ammonia under the conditions of the reaction.

4,055,545

SMOKE-SUPPRESSANT ADDITIVES FOR POLYPHOSPHAZENES

Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 712,149, Aug. 6, 1976, Pat. No. 4,026,838.

This application Dec. 20, 1976, Ser. No. 752,569

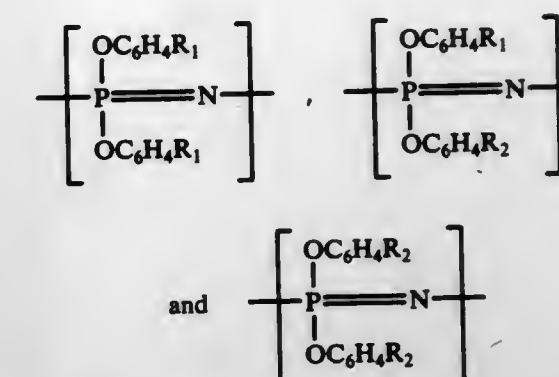
Int. Cl.² C08G 79/04

U.S. Cl. 260—47 P

13 Claims

1. A poly(aryloxphosphazene) smoke suppressed composition comprising

a. an aryloxphosphazene homopolymer or copolymer of the formula



wherein R_1 and R_2 are the same or different and are hydrogen, a C_1 - C_{10} linear or branched alkyl radical or a C_1 - C_4 linear or branched alkoxy radical, said R_1 and R_2 substituted in any sterically permissible position on the phenoxy group; and

b. a normally solid carboxylic acid.

4,055,546

NOVEL THERMOSETTING RESINS AND PROCESS FOR PREPARING THE SAME

Tzong Jeng Chu, and Susumu Konii, both of Shimodate, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 302,207, Oct. 30, 1972, Pat. No. 3,950,309. This application Jan. 5, 1976, Ser. No. 646,671

Claims priority, application Japan, Oct. 29, 1971, 46-85520; Oct. 29, 1971, 46-85521

Int. Cl.² C08G 8/28, 10/04

U.S. Cl. 260—51 R

14 Claims

1. A thermosetting resin, the thermoset resin obtained therefrom having such a thermal resistance that the temperature at which the thermoset resin is caused to show a weight loss of 6% by heating at a temperature elevation rate of 10° C. per minute is at least 400° C., which comprises a reaction product of a novolak which is obtained by the reaction of a phenol and an aldehyde in the presence of an acid catalyst or a novolak type aryl-modified phenolic resin which is obtained by the reaction of a phenol and an aromatic hydrocarbon-aldehyde condensation initial-stage reaction product with a member selected from the group consisting of a silicic acid ester of the formula $\text{Si}(\text{OR})_4$, wherein R represents alkyl or aryl and a mixture of a silicic acid ester of the formula as defined above and a titanate acid ester of the formula $\text{Ti}(\text{OR})_4$, wherein R has the same meaning as defined above, said reaction product having such structure that the silicon is or silicon and titanium are bonded directly to oxygens of the phenolic hydroxyl groups while 20–70 mole %, based on the amount of phenol present in the starting system to be reacted with said member, of the phenolic hydroxyl groups, in terms of the amount of phenol, are left in the free form.

4,055,547

REMOVING ODOROUS FORMALDEHYDE FROM STABILIZED SHAPED POLYOXYMETHYLENES

Helmuth Doerfel, 152 Bergstrasse, 6900 Heidelberg 1; Franz Schmidt, 3 Trommstrasse, 6800 Mannheim 1; Wilhelm Schuetz, 5 Frankstrasse, 6720 Speyer; Claus Cordes, 13 Halbergstrasse, 6719 Weisenheim, and Wolfgang Schenk, 1 Carl-Goerdeler-Strasse, 6830 Schwetzingen, all of Germany

Filed June 20, 1975, Ser. No. 588,819

Claims priority, application Germany, July 29, 1974, 2436384

Int. Cl.² C08G 2/28

U.S. Cl. 260—67 FP

5 Claims

1. In a method for removing odorous monomeric formaldehyde from stabilized polyoxymethylenes wherein a polyoxymethylene copolymer is prepared by copolymerizing formaldehyde or trioxane with comonomers selected from 1,3-dioxo-

lane, ethyleneoxide, 1,3-dioxepane or polydioxolane, said copolymer is subjected to stabilization by incorporating antioxidants and thermostabilizers in extruders and the copolymers are converted to granules or particulate shaped articles containing from 50 to 1000 ppm of monomeric formaldehyde, the improvement comprising: causing an inert gas to flow over the stabilized and shaped solid polyoxymethylene at a temperature of from about 110° to 140° C, but more than 25° C below the melting point of the polymer until the volatile formaldehyde content of the copolymer is lowered to less than 60 ppm.

4,055,548

STORAGE-STABLE LIQUID POLYISOCYANATE COMPOSITION

Peter S. Carleton, Branford; James H. Ewen, Jr., New Haven, and Harold E. Reymore, Jr., Wallingford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 17, 1976, Ser. No. 724,401
Int. Cl.² C08G 18/76, 18/14; B29D 27/00

U.S. Cl. 260—77.5 AT

6 Claims

1. A liquid isocyanate prepolymer composition which has a viscosity determined in centipoises at 25° C of from about 130 to about 2800 and which can be subjected to many freeze-thaw cycles with little or no solids formation comprising the product obtained by bringing together and reacting (i) a polymethylene polyphenylisocyanate containing from about 65 to about 85 percent by weight of methylenebis(phenylisocyanate) the remainder of said polymethylene polyphenylisocyanates having a functionality greater than 2 and (ii) from about 0.0185 to about 0.15 equivalent, per equivalent of said polyphenylisocyanate, of a polyoxyethyleneglycol having an average molecular weight from about 200 to about 600.

4,055,549

THERMOPLASTICALLY PROCESSABLE POLYURETHANES BASED ON TOLYLENE DIISOCYANATE

Rene Roberts, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 5, 1976, Ser. No. 683,638
Int. Cl.² C08G 18/42, 18/82, 18/10

U.S. Cl. 260—77.5 AN

16 Claims

1. A method for producing a thermoplastically processable polyurethane, which comprises simultaneously reacting
a. a polycaprolactone diol having a molecular weight of from 1,000 to 4,000;
b. a low molecular weight diol chain extender;
c. tolylene diisocyanate; and
d. water,
the mole ratio of a:b:c:d employed in the reaction being 1:3-6:8-14:2-7 and the ratio of c:d employed in the reaction being from 2:1 to 4:1.

4,055,550

CONTINUOUS PROCESS FOR THE PRODUCTION OF PARTIALLY BLOCKED ISOCYANATES

K. A. Pai Panandiker, Maple Grove, Minn., and David E. Tweet, Carpentersville, Ill., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed Dec. 8, 1976, Ser. No. 748,496
Int. Cl.² C08G 18/02

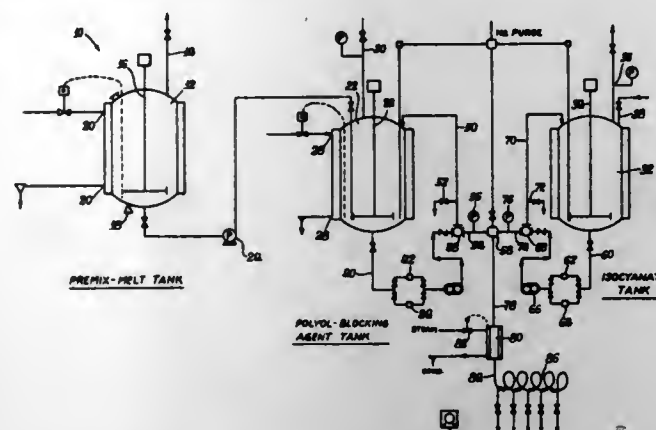
U.S. Cl. 260—77.5 AA

11 Claims

1. A method for manufacturing partially blocked isocyanate curing agents which are the reaction product of a polyfunctional isocyanate and a blocking agent for the isocyanate which is capable of splitting from the curing agent at elevated temperature to regenerate isocyanate functionality, comprising the steps of

separately and continuously metering a polyisocyanate and a blocking agent for said polyisocyanate into a reaction zone in predetermined stoichiometric isocyanate excess to

provide a reaction mixture in the reaction zone at reaction temperature, continuously withdrawing the reaction mixture from said reaction zone to provide a partially blocked isocyanate



curing agent reaction product after maintaining said reaction mixture in the reaction zone for a time sufficient to reduce the free isocyanate content of the reaction product to at least a predetermined level indicating substantial completion of the reaction.

4,055,551

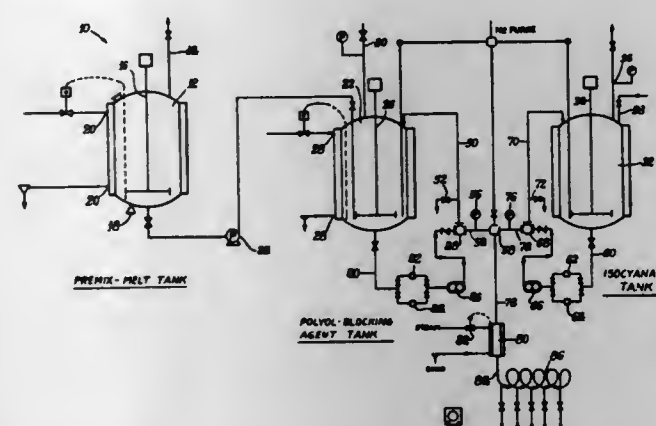
CONTINUOUS PROCESS FOR THE PRODUCTION OF BLOCKED ISOCYANATES

K. A. Pai Panandiker, Maple Grove, Minn., and David E. Tweet, Carpentersville, Ill., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed Dec. 8, 1976, Ser. No. 748,497
Int. Cl.² C08G 18/02

U.S. Cl. 260—77.5 AA

11 Claims



1. A method for manufacturing blocked isocyanate curing agents which are the reaction product of a polyfunctional isocyanate and a blocking agent for the isocyanate which is capable of splitting from the curing agent at elevated temperature to regenerate isocyanate functionality, comprising the steps of

separately and continuously metering a polyisocyanate and a blocking agent for said polyisocyanate into a reaction zone in stoichiometric proportion to provide a reaction mixture in the reaction zone at reaction temperature, said stoichiometric proportion being based on the deficient or excess isocyanate functionality of said reaction mixture, and

continuously withdrawing the reaction mixture from said reaction zone to provide a blocked isocyanate curing agent reaction product after maintaining said reaction mixture in the reaction zone for a time sufficient to reduce the free isocyanate functionality of the reaction product to at least a predetermined level indicating substantial completion of the blocking reaction.

4,055,552

HOT-MELT ADHESIVES BASED ON ANIONIC TERPOLYMERS OF LACTAMS

Zbyněk Bukáč, Jan Šebenda, both of Prague, and Richard Suchý, Liberec, all of Czechoslovakia, assignors to Československá akademie věd, Prague, Czechoslovakia

Filed May 26, 1976, Ser. No. 689,964

Claims priority, application Czechoslovakia, June 10, 1975, 4055/75

Int. Cl.² C08G 69/14

3 Claims

U.S. Cl. 260—78 L

1. Hot-melt adhesive from an anionic terpolyamide of 10-90 mol% 8-octanolactam and 90-10 mol% of at least two different anionically polymerizable lactams having 6 or more carbon atoms in the lactam ring, one of said latter lactams being of a lower molecular weight than the other, the latter lower molecular weight lactam being present in an amount of 10-60 mol% and the latter higher molecular weight lactam being present in an amount of 20-50 mol%.

4,055,553

(GLY- γ -ALA)-SOMATOSTATIN

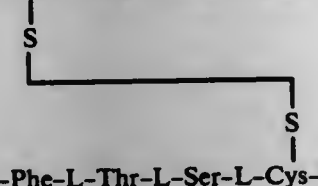
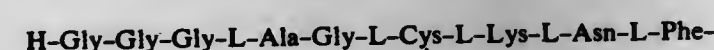
Sie-Yearl Chai, Royersford, and John P. Yardley, King of Prussia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,254
Int. Cl.² C07C 103/52; A61K 37/00

U.S. Cl. 260—112.5 S

3 Claims

1. A compound selected from the group consisting of



in which R is dimethylamino, alkylamino of 1 to 5 carbon atoms or phenethylamino, the corresponding linear heptadecapeptide, to protamine zinc, protamine aluminum and non-toxic acid addition salts thereof.

4,055,554

GEL STRENGTH ENHANCER FOR GELATIN COMPOSITIONS INCLUDING AN OXIDIZED POLYSACCHARIDE

Gerald J. Helmstetter, Bridgewater, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Sept. 10, 1976, Ser. No. 721,954
Int. Cl.² C09H 7/00

U.S. Cl. 260—117

12 Claims

1. A method of hardening gelatin which comprises the step of adding to the gelatin a polysaccharide which has been oxidized to an extent that 0.5 to 100% of the original anhydroglucose units have been converted to dialdehyde units and subsequently subjected to chemical modification under aqueous alkaline conditions with a mono-reactive reagent to a degree of substitution of at least 0.005 wherein the chemical modification is one which results in a polysaccharide derivative selected from the group consisting of succinate, acetate, alkenyl succinate, diethylaminoethyl ether, phthalate, sulfonate, carboxymethylated and chlorinated derivatives.

4,055,555

SOLUBILIZATION OF CASEIN

Ernest Badertscher, Orbe; Michel Chavéron, Vevey, and Valentin Wenner, La Tour-de-Peilz, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

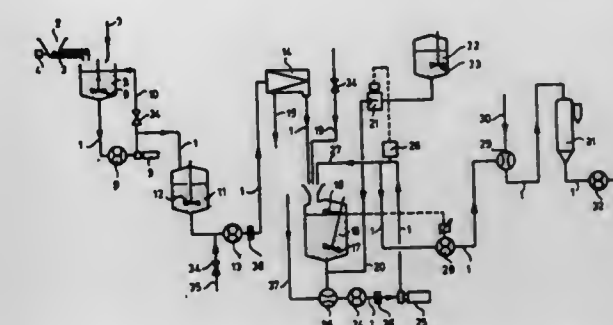
Filed Mar. 4, 1976, Ser. No. 663,715

Claims priority, application Switzerland, Mar. 20, 1975, 3555/75

Int. Cl.² A23J 3/00

10 Claims

U.S. Cl. 260—119



1. A process for solubilizing a suspension of a casein selected from the group consisting of casein precipitated from milk by addition of calcium salts to said milk or rennet casein, which comprises suspending said casein in powder form in an aqueous medium, the casein suspension containing at most 270 g of casein per liter of aqueous medium, and leaving the casein suspension to age for at least 10 minutes, after which a calcium-complexing solubilizing agent is progressively added to the suspension until a homogeneous solution is obtained.

4,055,556

MONOAZO AND DISAZO COMPOUNDS HAVING OPTIONALLY FURTHER SUBSTITUTED 2-ACYL-, CARBOXY- OR CYANO-BENZOTHIENYL DIAZO COMPONENT RADICALS

Max Aeberli, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sept. 3, 1974, Ser. No. 502,445

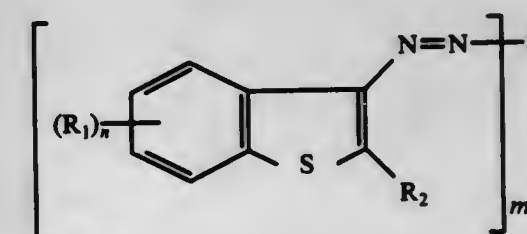
Claims priority, application Switzerland, Sept. 6, 1973, 12814/73

Int. Cl.² C09B 29/20, 29/32, 29/36, 33/14

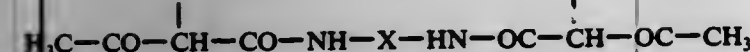
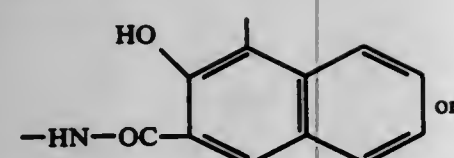
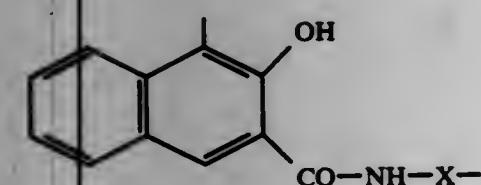
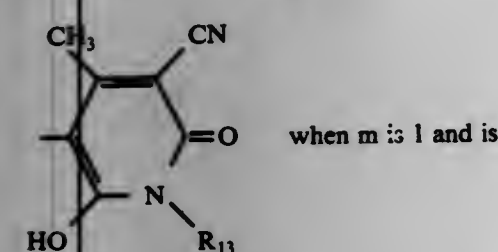
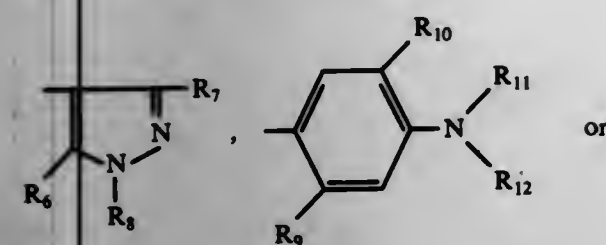
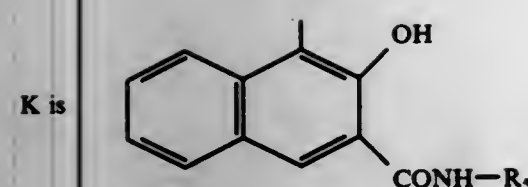
U.S. Cl. 260—152

53 Claims

1. A compound of the formula



wherein each R₁ is independently halo, C₁₋₈alkyl, substituted C₁₋₈alkyl, C₃₋₈cycloalkyl, substituted C₃₋₈cycloalkyl, C₁₋₈alkoxy, substituted C₁₋₈alkoxy, C₃₋₈cycloalkoxy, substituted C₃₋₈cycloalkoxy, trifluoromethyl or nitro, R₂ is carboxy, carbamoyl, (C₁₋₈alkyl)carbamoyl, (substituted C₁₋₈alkyl)carbamoyl, (C₃₋₈cycloalkyl)carbamoyl, (substituted C₃₋₈cycloalkyl)carbamoyl, di-(C₁₋₈alkyl)carbamoyl, di-(substituted C₁₋₈alkyl)carbamoyl, N-C₁₋₈alkyl-N-(substituted C₁₋₈alkyl)carbamoyl, phenylcarbamoyl, substituted phenylcarbamoyl, (C₁₋₈alkoxy)carbonyl, (substituted C₁₋₈alkoxy)carbonyl, (C₃₋₈cycloalkoxy)carbonyl, (substituted C₃₋₈cycloalkoxy)carbonyl, phenoxycarbonyl, substituted phenoxycarbonyl or cyano,



when m is 2,

wherein R₅ is phenyl; phenyl substituted by 1-3 substituents each of which is independently chloro, bromo, methyl, methoxy or trifluoromethyl or benzimidazolonyl-5,

R₆ is hydroxy or amino,

R₇ is hydrogen, methyl, phenyl, methoxycarbonyl or ethoxycarbonyl,

R₈ is hydrogen, methyl, ethyl, phenyl or phenyl substituted by 1-3 substituents each of which is independently chloro, bromo, cyano, nitro, methyl, methoxy or ethoxy,

R₉ is hydrogen; methyl; formamido; (C₁₋₄alkyl)carbonylamino; (C₁₋₄alkyl)carbonylamino monosubstituted by chloro, bromo, phenyl, C₁₋₄alkoxy or phenoxy; (C₁₋₄alkoxy)carbonylamino; (C₁₋₄alkoxy)carbonylamino monosubstituted by chloro, bromo, phenyl, C₁₋₄alkoxy or phenoxy; C₁₋₄alkylsulfonylamino or C₁₋₄alkylsulfonylamino monosubstituted by chloro, bromo, phenyl, C₁₋₄alkoxy or phenoxy,

R₁₀ is hydrogen, methoxy or ethoxy,

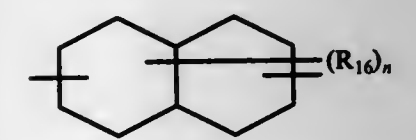
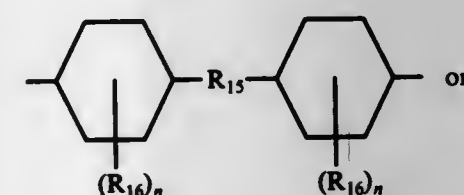
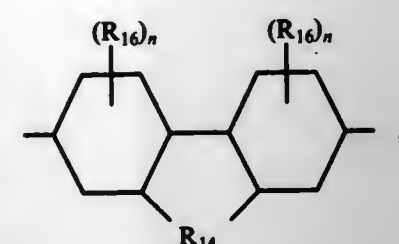
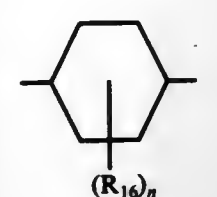
R₁₁ is C₁₋₄alkyl or C₁₋₄alkyl or C₁₋₄alkyl monosubstituted by chloro, bromo, cyano, hydroxy, methoxy, ethoxy, phenyl, phenoxy, (C₁₋₄alkyl)carbonylamino, (C₁₋₄alkyl)carbonyloxy, (C₁₋₄alkoxy)carbonyl or (C₁₋₄alkoxy)carbonyloxy,

R₁₂ is hydrogen, C₁₋₄alkyl or C₁₋₄alkyl monosubstituted by chloro, bromo, cyano, hydroxy, methoxy, ethoxy, phenyl, phenoxy, (C₁₋₄alkyl)carbonylamino, (C₁₋₄alkyl)carbonyloxy, (C₁₋₄alkoxy)carbonyl or (C₁₋₄alkoxy)carbonyloxy,

R₁₃ is hydrogen, phenyl, amino, C₁₋₄alkylamino, di-(C₁₋

4alkyl)amino, C₁₋₄alkyl or C₁₋₄alkyl monosubstituted by chloro, bromo, cyano, hydroxy, methoxy, ethoxy, phenyl, phenoxy, (C₁₋₄alkyl)carbonylamino, (C₁₋₄alkyl)carbonyloxy, (C₁₋₄alkoxy)carbonyl or (C₁₋₄alkoxy)carbonyloxy, and

X is a direct bond,



wherein R₁₄ is two hydrogen, —SO₂—, —NH—, —O— or —S—,

R₁₅ is —O—, —S—, —CH₂—, —NH—, —CO— or —SO₂—,

each R₁₆ is independently chloro, bromo, nitro, cyano, trifluoromethyl, methyl, methoxy, ethoxy, methoxycarbonyl or ethoxycarbonyl, and

n is 0, 1 or 2,

m is 1 or 2, and

n is 0, 1 or 2,

wherein each substituted C₁₋₄alkyl and substituted C₁₋₄alkoxy group and moiety independently has 1 or 2 substituents each of which is independently halo, cyano, hydroxy, C₁₋₄alkoxy, phenyl, phenoxy, acyl, acyloxy or acylamino,

each substituted C₃₋₈cycloalkyl and substituted C₃₋₈cycloalkoxy group and moiety independently has 1 or 2 substituents each of which is independently C₁₋₄alkyl, halo, cyano, hydroxy, C₁₋₄alkoxy, phenyl, phenoxy, acyl, acyloxy or acylamino,

each substituted phenyl and substituted phenoxy moiety independently has 1 or 2 substituents each of which is independently nitro, C₁₋₄alkyl, halo, cyano, hydroxy, C₁₋₄alkoxy, phenyl, phenoxy, acyl, acyloxy or acylamino, each acyl and acyl moiety of acyloxy and acylamino is independently R—Y— or R'—Z—,

wherein R is C₁₋₄alkyl; C₁₋₄alkyl substituted by 1 or 2 substituents each of which is independently halo, cyano, hydroxy, C₁₋₄alkoxy, phenyl or phenoxy; phenyl or phenyl substituted by 1 or 2 substituents each of which is independently nitro, C₁₋₄alkyl, halo, cyano, hydroxy, C₁₋₄alkoxy, phenyl or phenoxy,

Y is —O—CO—, —SO₂— or —OSO₂—,

Z is —CO—, —NR'—CO— or —NR'—SO₂—, and

R' is hydrogen; C₁₋₄alkyl; C₁₋₄alkyl substituted by 1 or 2 substituents each of which is independently halo, cyano, hydroxy, C₁₋₄alkoxy, phenyl or phenoxy; phenyl or phenyl substituted by 1 or 2 substituents each of which is independently nitro, C₁₋₄alkyl, halo, cyano, hydroxy, C₁₋₄alkoxy, phenyl or phenoxy, and

each halo is independently fluoro; chloro or bromo.

4,055,557 SULFONAMIDOBENZENE-AZO-AMINOPYRAZOLE DYESTUFFS

Manfred Wiesel, and Richard Sommer, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

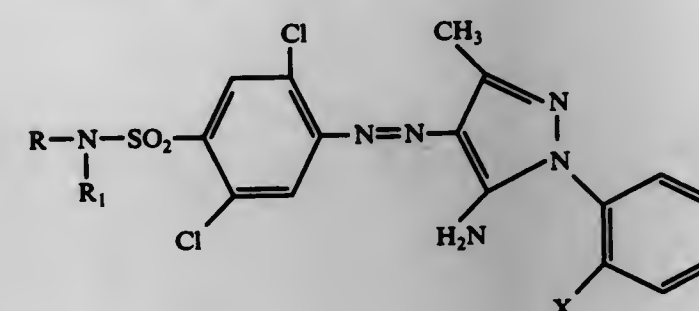
Filed Aug. 10, 1973, Ser. No. 387,315

Claims priority, application Germany, Aug. 12, 1972, 2239814

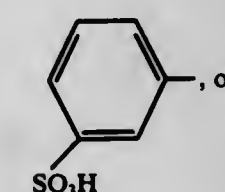
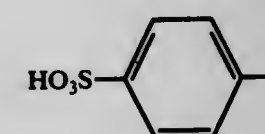
Int. Cl.² C09B 29/38

U.S. Cl. 260—162

1. Dyestuff of the formula



wherein
R is



HO₃S—C₂H₄—;
R₁ is H or CH₃; and
X is H or Cl.

4,055,558 TETRAKISAZO DYESTUFFS

Hermann Goebel, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

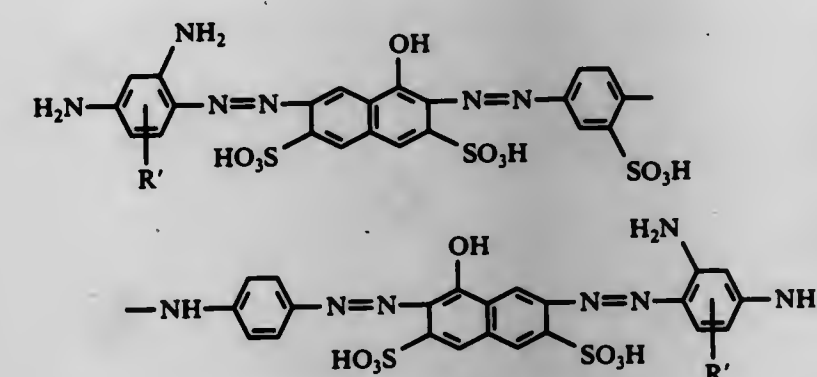
Filed Aug. 14, 1972, Ser. No. 280,230

Claims priority, application Germany, Aug. 14, 1971, 2140866

Int. Cl.² C09B 35/36

U.S. Cl. 260—166

1. Tetrakisazo dyestuff which in the acid form corresponds to the formula



wherein R' = H, CH₃, or NO₂.

4,055,559 DISAZO PIGMENT CONTAINING AT LEAST 2 CHLORINE ATOMS AND PROCESS FOR THEIR MANUFACTURE

Georg Cseh, Arlesheim, and Willy Mueller, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

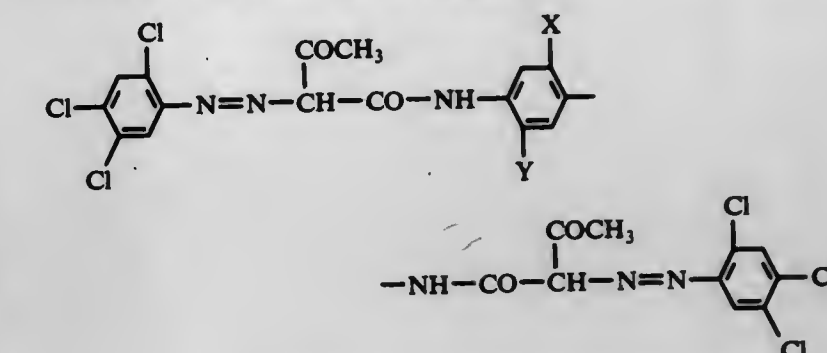
Continuation-in-part of Ser. No. 481,284, June 20, 1974, abandoned, which is a continuation of Ser. No. 287,327, Sept. 8, 1972, abandoned. This application Oct. 8, 1975, Ser. No. 620,689

Claims priority, application Switzerland, Sept. 10, 1971, 13313/71

Int. Cl.² C09B 33/14

U.S. Cl. 260—176

1. A disazo pigment of the formula



wherein X and Y are hydrogen, chlorine or methyl and one of X and Y may be methoxy.

4,055,560 SULFOPHENYL-AZO-PHENYL-AZO-(4-HYDROXYALK- OXYPHENYL) COMPOUNDS

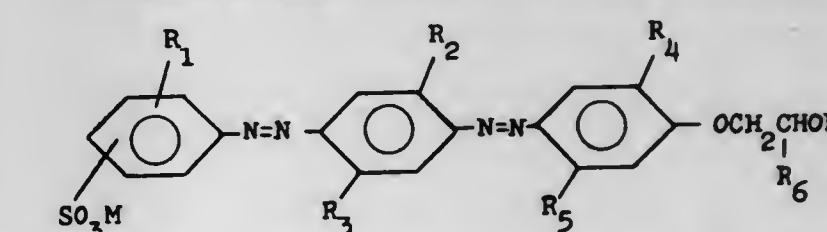
Steven Arnold Dombchik, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 260,798, June 8, 1972, abandoned. This application Aug. 8, 1974, Ser. No. 495,803

Int. Cl.² C09B 43/00

U.S. Cl. 260—186

1. Yellow to orange, disazo acid dye having the formula



wherein SO₃M is meta or para to the azo group, R₁ is selected from H, CH₃, OCH₃ and Cl, R₂ and R₃ are independently selected from H, CH₃ and OCH₃, R₄ and R₅ are independently selected from H, Cl and CH₃, but only one can be Cl, R₆ is C₂H₅ and M is selected from H, alkali metal, ammonium, Cl, alkylammonium and Cl₂ alkanolammonium cations.

7. The dye of claim 1 wherein R₁ is ortho to the azo group and SO₃M is para to the azo group.

4,055,561 α-ALKYLBENZYL LACTAMIMIDES

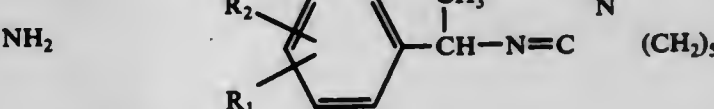
J. Martin Grisar, George P. Claxton, and Robert D. MacKenzie, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Apr. 25, 1973, Ser. No. 354,443

Int. Cl.² C07D 223/12; A61K 31/55; C07D 207/22, 211/72

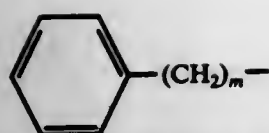
U.S. Cl. 260—239 B

1. An α-methylbenzyl lactamimide having the formula



wherein

R₁ is phenyl, phenoxy, the group



wherein m is an integer of from 1 to 4, phenylalkoxy having from 2 to 4 aliphatic carbon atoms and phenoxyalkoxy having from 2 to 4 aliphatic carbon atoms;

R_1 is selected from the group consisting of hydrogen or when taken together and adjacent to the group R_1 is the cyclic radical $-(CH_2)_3-$, $-CH_2CH_2C(CH_3)_2-$, $-(CH_2)_4-$ and $-C(CH_3)_2CH_2CH_2C(CH_3)_2-$; and the pharmaceutically acceptable acid addition salts thereof.

4,055,562

PROCESS FOR PREPARING PREGN-20-YNE COMPOUNDS AND NOVEL PRODUCT PRODUCED THEREBY

Robert George Christiansen, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 619,579, Oct. 6, 1975, abandoned. This application May 28, 1976, Ser. No. 691,196

Int. Cl.² C07J 71/00

U.S. Cl. 260—239.55 R

11 Claims

1. A process for preparing a 17 α -(2-R-ethynyl)-17 β -hydroxysteroido[2,3-d]isoxazole which comprises reacting a 17-oxosteroido[2,3-d]isoxazole devoid of substituents, other than the 17-oxo group, reactive with organometallic compounds, with (2-R-ethynyl)magnesium halide or (2-R-ethynyl)lithium wherein R is hydrogen, methyl or trifluoromethyl.

4,055,563

CYANO INTERMEDIATES FOR PROSTAGLANDINS

David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 566,356, April 9, 1975, Pat. No. 3,974,146.

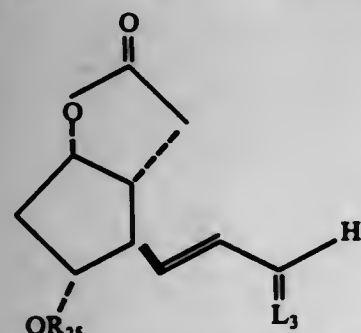
This application June 11, 1976, Ser. No. 695,147

Int. Cl.² C07C 177/00; C07D 307/77

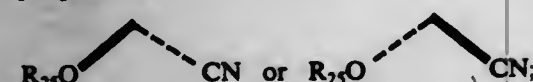
U.S. Cl. 542—413

5 Claims

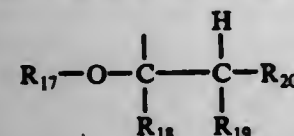
1. An optically active compound of the formula



or a mixture of that compound and the enantiomer thereof, wherein L_3 represents



and wherein R_{25} is hydrogen, 1-ethoxyethyl, tetrahydropyranyl, tetrahydrofuranyl, or a group of the formula



wherein R_{17} is alkyl of one to 17 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{18} and R_{19} are the same or different, being hydrogen, alkyl of one to 4 carbon atoms, inclusive, phenyl or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or, when R_{18} and R_{19} are taken together, $-(CH_2)_a-$ or $-(CH_2)_b-O-(CH_2)_c-$ wherein a is 3, 4, or 5, b is one, 2, 3, and c is one, 2, or 3 with the proviso that b plus c is 2, 3, or 4, and

wherein R_{20} is hydrogen or phenyl; with the further proviso that both R_{25} 's are the same.

4,055,564

NOVEL PROSTAGLANDIN INTERMEDIATES AND PROCESS FOR THE PRODUCTION THEREOF

Francisco S. Alvarez, Sunnyvale, and Albert R. Van Horn, Menlo Park, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 541,188, Jan. 15, 1975, Pat. No. 3,998,852, which is a division of Ser. No. 351,312, April 16, 1973, Pat. No. 3,886,185. This application Aug. 23, 1976, Ser. No. 716,727

Int. Cl.² C07D 7/02; C07C 61/06

U.S. Cl. 542—413

9 Claims

1. A compound selected from the group consisting of (dl)-2 α -(2-acetoxyethyl)-3 β -(3S-tetrahydropyranyloxy-trans-1-octenyl)-4 α -tetrahydropyranyloxy-1-oxocyclopentane.

(dl)-2 α -(2-acetoxyethyl)-3 β -(3S-tetrahydropyranyloxy-trans-1-octenyl)-4 α -tetrahydropyranyloxy-1 α -hydroxycyclopentane,

(dl)-2 α -(2-acetoxyethyl)-3 β -(3S-tetrahydropyranyloxy-trans-1-octenyl)-4 α -tetrahydropyranyloxy-1 α -(2-methoxyprop-2-oxo)cyclopentane,

(dl)-2 α -(2-acetoxyethyl)-3 β -(3S-tetrahydropyranyloxy-trans-1-octenyl)-4 α -tetrahydropyranyloxy-1 α -dimethyl-tert-butylsilyloxycyclopentane,

2 α -(2-acetoxyethyl)-3 β -(3S-tetrahydropyranyloxy-trans-1-octenyl)-4 α -tetrahydropyranyloxy-1-oxocyclopentane,

2 α -(2-acetoxyethyl)-3 β -(3S-tetrahydropyranyloxy-trans-1-octenyl)-4 α -tetrahydropyranyloxy-1 α -hydroxycyclopentane,

2 α -(2-acetoxyethyl)-3 β -(3S-tetrahydropyranyloxy-trans-1-octenyl)-4 α -tetrahydropyranyloxy-1 α -(2-methoxyprop-2-oxo)cyclopentane, and

2 α -(2-acetoxyethyl)-3 β -(3S-tetrahydropyranyloxy-trans-1-octenyl)-4 α -tetrahydropyranyloxy-1 α -dimethyl-tert-butylsilyloxycyclopentane.

4,055,565

OPTICAL BRIGHTENING AGENTS OF NAPHTHALIMIDE DERIVATIVES

Seiji Hotta, Hirakata, and Takashi Akamatsu, Ashiya, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 100,816, Dec. 22, 1970, Pat. No. 3,798,224.

This application Aug. 3, 1973, Ser. No. 385,578

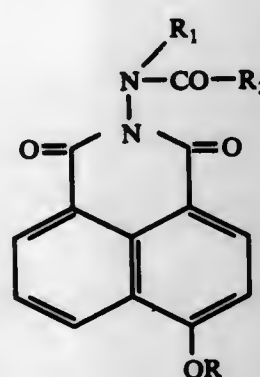
Claims priority, application Japan, Dec. 30, 1969, 45-1862; Dec. 30, 1969, 45-1863; Dec. 30, 1969, 45-1864; Dec. 30, 1969, 45-1865; Dec. 30, 1969, 45-1866; May 8, 1970, 45-39536; May 23, 1970, 45-44291; July 15, 1970, 45-62427; Sept. 18, 1970, 45-82103; Sept. 18, 1970, 45-82104; Nov. 6, 1970, 45-98113; Nov. 12, 1970, 45-100011; Nov. 12, 1970, 45-100012; Nov. 12, 1970, 45-100013

Int. Cl.² C07D 217/24

U.S. Cl. 260—281 N

11 Claims

1. A naphthalimide compound of the formula



wherein

R is C_1 - C_6 alkyl, benzyl, C_1 - C_6 alkoxy- C_1 - C_6 alkyl, or phenyl;

R_1 is hydrogen, C_1 - C_6 alkyl, hydroxy- C_1 - C_6 alkyl or C_1 - C_6 alkoxy C_1 - C_6 alkyl and

R_2 is C_1 - C_6 alkyl, halo- C_1 - C_6 alkyl, phenyl, or C_1 - C_6 -alkyl- or halogen-substituted-phenyl.

4,055,566

5-SUBSTITUTED-6H[1]-BENZOPYRANO[3,2-C][1,8]NAPHTHYRIDINE-6,7-(6H)-DIONES

Goetz E. Hardtmann, Morristown, and Gary M. Coppola, Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 673,743, April 5, 1976, Pat. No. 4,017,499.

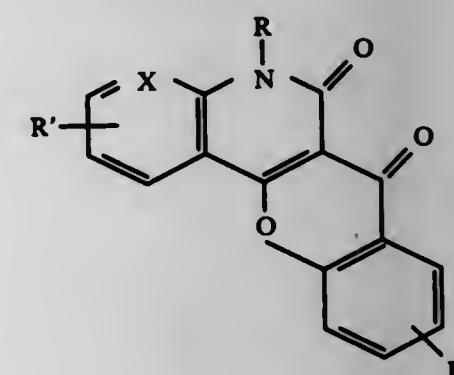
This application Dec. 17, 1976, Ser. No. 751,797

Int. Cl.² C07D 491/22; A61K 31/44

U.S. Cl. 260—295 A

11 Claims

1. A compound of the formula:



wherein

R is alkyl of 1 to 5 carbon atoms, alkenyl of 3 to 5 carbon atoms, alkynyl of 3 to 5 carbons, benzyl optionally mono- or disubstituted independently by fluoro, chloro or alkyl of 1 to 4 carbon atoms or cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl is of 1 to 3 carbon atoms, provided that the unsaturation on any alkenyl or alkynyl is other than on the alpha carbon atom, X is N,

R' is hydrogen, alkyl of 1 to 4 carbon atoms, fluoro, chloro, bromo or alkoxy of 1 to 4 carbon atoms when X is CH and hydrogen or alkyl of 1 to 4 carbon atoms when X is N, and R'' is hydrogen or alkyl of 1 to 4 carbon atoms.

4,055,567

PREPARATION OF O,O'-DIHYDROXYAZOBENZENES FROM O-NITROPHENOLS

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 402,338, Oct. 1, 1973, abandoned. This

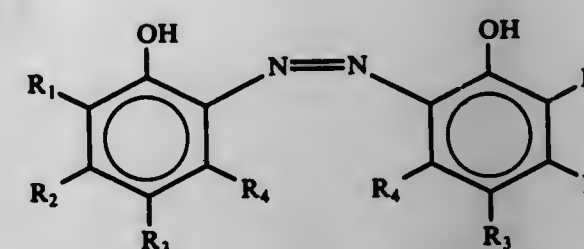
application Mar. 8, 1976, Ser. No. 664,845

Int. Cl.² C09B 27/00, 43/00

U.S. Cl. 260—206

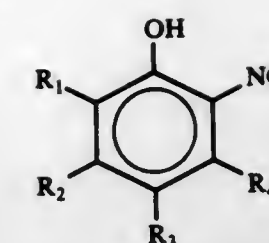
18 Claims

1. A process for the preparation of an o,o'-dihydroxyazobenzene having the following formula



wherein the R's are individually selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, alkaryl, aralkyl, alkoxy, aryloxy, tert-amino, and alkylthio, said R's containing up to about 12 carbon atoms, which comprises

1. forming an acetal of an o-nitrophenol of the formula:



II.

wherein the R's are as earlier stated,

2. reacting said acetal with a reducing agent under such conditions that said acetal is converted to the corresponding diacetal azobenzene, and

3. then employing acid hydrolysis upon said diacetal azobenzene to regenerate the hydroxyl groups and yield the corresponding o,o'-dihydroxyazobenzene.

4,055,568

DYES OF THE COUMARIN SERIES

Manfred Patsch, and Christos Vamvakaris, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed June 7, 1976, Ser. No. 693,187

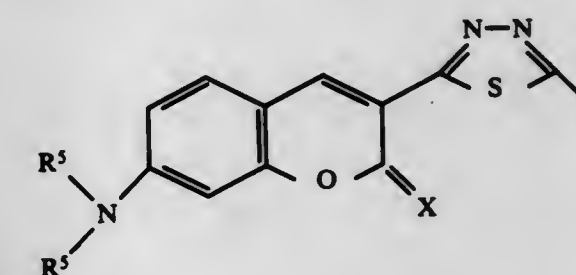
Claims priority, application Germany, July 2, 1975, 2529434; Nov. 27, 1975, 2553294

Int. Cl.² C07D 419/00

U.S. Cl. 260—302 H

2 Claims

1. A compound of the formula



wherein:

R is phenyl, phenyl substituted by chloro, methyl, methoxy or cyano; C_1 to C_6 alkylmercapto; benzylmercapto; tolylmercapto; chlorobenzylmercapto, hydroxyethylmercapto; β -di- C_1 to C_4 alkylaminoethylmercapto; or γ -di- C_1 to C_4 alkylaminopropylmercapto; R^1 is alkyl of one to four carbon atoms; and X is oxygen or imino.

4,055,569

1-BENZOTHAZOLYL-5-ACYLOXYIMIDAZOLIDINONES

Chin Ching Wu, Libertyville, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

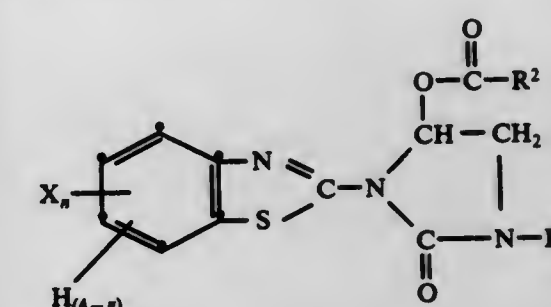
Filed May 20, 1976, Ser. No. 688,447

Int. Cl.² C07D 417/02

U.S. Cl. 260—305

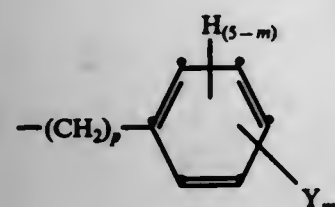
9 Claims

I. 1. A compound of the formula



wherein X is selected from the group consisting of lower alkyl, chlorine, bromine, fluorine, lower chloroalkyl, lower bromoalkyl,

kyl, trifluoromethyl, and lower alkoxy; n is an integer from 0 to 2; R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl; and R^2 is selected from the group consisting of alkyl, of up to 18 carbon atoms, lower alkenyl, lower haloalkyl, propargyl, lower alkoxyalkyl, cycloalkyl of from 3 to 7 carbon atoms and



wherein p is an integer from 0 to 2; Y is selected from the group consisting of lower alkyl, lower alkenyl, chlorine, bromine, fluorine lower haloalkyl, lower alkoxy, lower alkylthio, nitro and cyano; and m is an integer from 0 to 3.

4,055,570

IMIDAZOLIDINE-4,5-DIONE DICARBOXYLIC ACIDS AND DERIVATIVES

Hans Herzog, Badenweiler; Lothar Buxbaum; Thomas Kainmüller, both of Lindenfels, Odenwald, all of Germany, and Jürgen Habermeyer, Pfaffingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

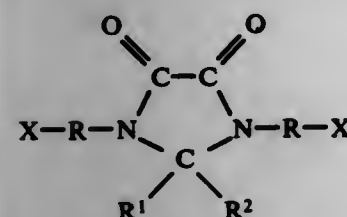
Filed Apr. 14, 1976, Ser. No. 676,850

Claims priority, application Switzerland, Apr. 23, 1975, 5204/75; Feb. 12, 1976, 1708/76

Int. Cl.² C07D 233/72

U.S. Cl. 548-301

1. A dicarboxylic acid or derivative which contains an imidazolidine-4, 5-dione ring, of the formula I



wherein

X represents nitrile, carboxyl, chlorocarbonyl, phenoxy carbonyl or alkoxy carbonyl of 1 to 10 carbon atoms in the alkoxy moiety,

R represents alkylene of 1 or 2 carbon atoms in the chain, said alkylene substituted with alkyl groups of 1 to 6 carbon atoms, cyclohexylene, phenylene or benzylene the methyl group of which is attached to the nitrogen atom, each of R^1 and R^2 independently represents hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 8 ring members, phenyl, or together R^1 and R^2 represent tetramethylene, pentamethylene, hexamethylene or heptamethylene, with the proviso that, if R represents phenylene, R^1 is a hydrogen atom and R^2 is alkyl of 1 to 18 carbon atoms or cycloalkyl of 5 to 8 ring members.

4,055,571

O-[1-ALKYL-5-SUBSTITUTED-MERCAPTO-TRIAZOL(3-YL)-PHOSPHORIC(PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Hellmut Hoffmann, Wuppertal; Ingeborg Hamann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 30, 1975, Ser. No. 573,203

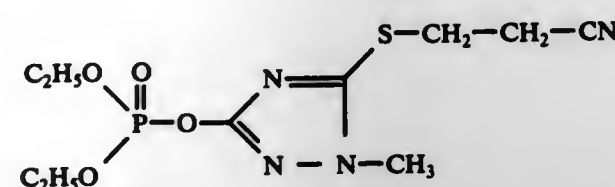
Claims priority, application Germany, May 16, 1974, 2423765

Int. Cl.² C07D 249/12

U.S. Cl. 260-308 R

1. The compound O,O-diethyl-O-[1-methyl-5-(2'-cyano-

thyl)-mercapto-triazol(3-yl)]-phosphoric acid ester of the formula



4,055,572

PROCESS FOR THE PRODUCTION OF 3-HYDROXY-1,2,4-TRIAZOLE DERIVATIVES

Dag Dawes, Vøyenenga, Norway, Rudolph C. Thummel, Courgenay, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 20, 1976, Ser. No. 707,148

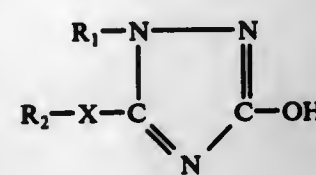
Claims priority, application Switzerland, Aug. 6, 1975, 10241/75; June 25, 1976, 8152/76

Int. Cl.² C07D 249/12

U.S. Cl. 260-308 R

6 Claims

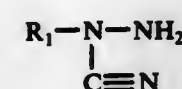
1. Process for the production of 3-hydroxy-1,2,4-triazole derivatives of formula I



wherein

R_1 and R_2 each represent a straight-chain or branched-chain alkyl group having 1 to 6 carbon atoms, or a cycloalkyl group having 3 to 6 carbon atoms, and

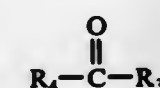
X represents oxygen or sulphur, which process comprises reacting a 1-alkyl-1-cyanohydrazine of formula II



wherein R_1 has the meaning given under formula I, in an inert solvent in the presence of a base at a temperature of 0° - 250° C. with a compound of formula III



wherein R_2 and X have the meanings given under formula I; and subsequently cyclizing the reaction product at a temperature of 20° - 100° C. in the presence of a base by reaction with a compound of formula IV



wherein R_3 and R_4 independently of one another represent chlorine or an alkoxy group having 1 to 4 carbon atoms.

4,055,573

ELECTROCHEMICAL REDUCTION OF IMIDAZOLECARBOXYLIC ESTERS

Wilford Lee Mendelson, Philadelphia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Filed May 6, 1976, Ser. No. 683,863

Int. Cl.² C07D 233/64; C25B 3/09

U.S. Cl. 548-335

10 Claims

7. The method of preparing 4-(2-aminoethylthiomethyl)-5-

methylimidazole comprising electrochemical reduction in a divided cell of a lower alkyl 5-methyl-4-imidazolecarboxylate in 25% sulfuric acid with a mercury or lead cathode at about 40°-75° C. in a concentration chosen from within the range of from 1 M. up to the upper limit of solubility to give a mixture of 5-methyl-4-hydroxymethylimidazole and 5-methyl-4-lower-alkyloxymethylimidazole then reacting said mixture with cysteamine.

4,055,574

6,11-DIHYDRODIBENZO-[B.E.]-THIEPIN-11-ONE-3-THIOACETATES

Jack Ackrell, Palo Alto, Calif., and Joseph M. Muchowski, Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

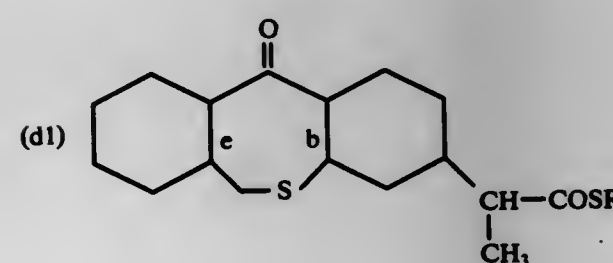
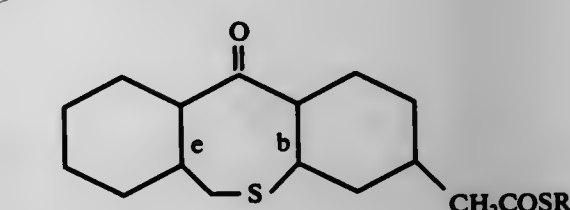
Filed July 1, 1976, Ser. No. 701,779

Int. Cl.² C07D 337/12

U.S. Cl. 260-327 B

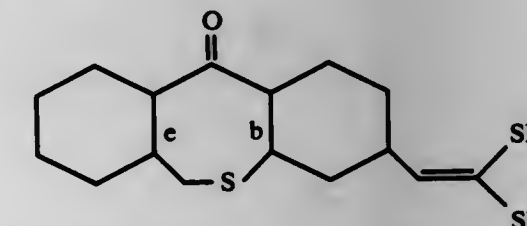
18 Claims

1. A compound selected from the group of those represented by the formulas



or the individual (d) isomers of the compounds of Formula (B), wherein R is a lower alkyl group of one to six carbon atoms, phenyl, monosubstituted phenyl, benzyl or monosubstituted benzyl, said substitution in the phenyl and benzyl groups consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chloro, bromo or fluoro, at the o-, m- or p-positions of the aromatic ring.

17. A compound of the formula



wherein R is a lower alkyl group of one to six carbon atoms, phenyl, monosubstituted phenyl, benzyl, or monosubstituted benzyl, said substitution in the phenyl and benzyl groups consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chloro, bromo or fluoro, at the o-, m- or p-positions of the aromatic ring.

4,055,575

SYNTHESIS OF DEHYDROPHYTOL AND VITAMIN E

Ralph E. Close, Jacksonville, Fla., and William Orosnik, Plainfield, N.J., assignors to SCM Corporation, New York, N.Y.

Filed Mar. 20, 1975, Ser. No. 560,550

Int. Cl.² C07D 311/72

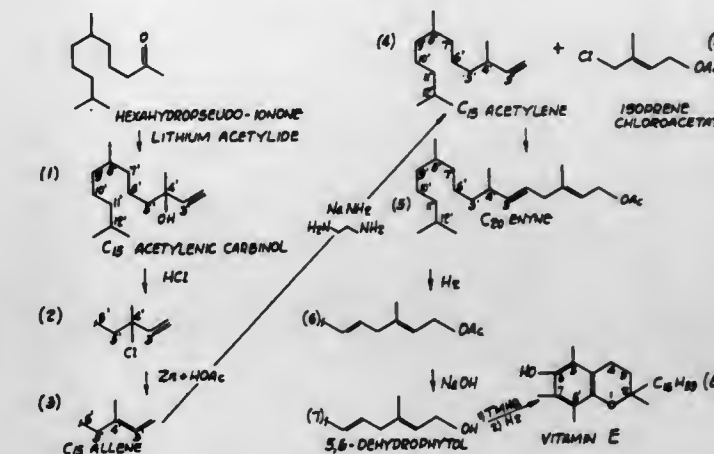
U.S. Cl. 260-345.5

7 Claims

1. A process for the synthesis of dehydro-Vitamin E comprising the steps of

a. reacting hexahydropseudo-ionone with a metal acetylide to form 3,7,11-trimethyl-3-hydroxy-1-dodecyne;

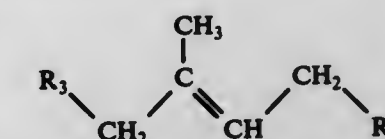
b. reacting the product of step a) with a reagent capable of replacing the hydroxyl group with a halogen to produce 3,7,11-trimethyl-3-halo-1-dodecyne;



c. reducing the product of step b) to form the corresponding allene, said allene being 3,7,11-trimethyldodeca-1,2-diene;

d. isomerizing the allene of step c) to 3,7,11-trimethyldodeca-1-yne in the presence of a strong base;

e. coupling the acetylene of paragraph d) with a reactant having the general formula



wherein R_3 is a halogen and R_1 is an hydroxyl or carboxylic acid ester group;

f. hydrogenating and saponifying the coupling product to dehydrophytol; and

g. coupling the product of step (f) with trimethylhydroquinone.

4,055,576

PROCESS FOR THE PREPARATION OF TERPENE-MALEIC ANHYDRIDES CONTAINING LESS THAN 15% DI-ADDUCT

Robert William Schluenz, and Curry Beach Davis, both of Panama City, Fla., assignors to Arizona Chemical Company, Wayne, N.J.

Filed Apr. 19, 1976, Ser. No. 678,083

Int. Cl.² C07D 307/89

U.S. Cl. 260-346.6

7 Claims

1. A process for preparing maleic anhydride adducts from non-conjugated monocyclic terpenes which comprises: reacting at temperatures between 175° C. and 200° C. substantially equimolar amounts of (a) a non-conjugated monocyclic terpene or mixed non-conjugated monocyclic terpenes and (b) maleic acid anhydride in the presence of from 0.05% to 0.15% iodine, based on the weight of the terpene, and recovering a mixture of not less than 85% mono-adduct and not more than 15% di-adduct of terpene maleic adduct in good yield, color and purity.

4,055,577

PROCESS FOR THERMAL TREATMENT OF CRUDE PHTHALIC ACID

Helmut Saffran, Dansweiler, and Lothar Sterck, Hurth, both of Germany, assignors to Davy Powergas GmbH, Cologne, Germany

Filed Nov. 11, 1974, Ser. No. 522,913

Int. Cl.² C07D 307/89

U.S. Cl. 260-346.7

17 Claims

1. A process for the thermal treatment of crude liquid phthalic anhydride to enhance purification of said liquid which

comprises passing said liquid through a portion of a thermal treating path, passing said liquid from said portion through another portion of said path, one of said portions being positioned substantially completely around said other portion and in adjacent, indirect heat exchange relationship therewith, and heating said liquid as it passes through said path to a temperature of about 190° to 285° C.

4,055,578

CERTAIN FURAN-3-THIOLS, CERTAIN DIHYDRO DERIVATIVES THEREOF AND 2,5-DIMETHYLTETRAHYDROFURAN-3-THIOL

William John Evers, Red Bank, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 295,859, Oct. 10, 1972, which is a continuation of Ser. No. 864,227, Oct. 6, 1969, abandoned, which is a continuation-in-part of Ser. No. 796,923, Feb. 5, 1969, Pat. No. 3,666,495. This application Aug. 18, 1975, Ser. No. 605,393. The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.

Int. Cl.² C07D 307/64, 307/38

U.S. Cl. 260—347.2

1. A furanthiol having the formula



wherein R₂ is alkyl containing 2 to 5 carbon atoms, each of R₃ and R₇ is hydrogen or alkyl containing 1 to 5 carbon atoms and the dashed line represents a single or double carbon-to-carbon bond.

4,055,579

PROCESS FOR THE PRODUCTION OF ETHYLENE OXIDE

Giuseppe Cocuzza, Catania; Italo Montoro, Como, and Benedetto Calcagno, Milan, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Nov. 29, 1973, Ser. No. 420,343

Claims priority, application Italy, Nov. 30, 1972, 32274/72

Int. Cl.² C07D 301/10

U.S. Cl. 260—348.34

16 Claims

1. Process for the production of ethylene oxide by catalytic oxidation of a gas stream containing ethylene and oxygen in the presence of a silver-based catalyst, characterized in that: a first reaction zone containing the silver-based catalyst is supplied with a gas stream containing about 5 to 25% by volume of ethylene, about 2 to 10% by volume of oxygen and about 0.1 to 20 ppm of a moderator for the reaction, the zone being kept at a temperature of about 220° to 350° C and at a pressure from atmospheric pressure to about 30 kg/cm² and the contact times being from about 1 to 6 seconds wherein the conversion in the first zone is limited so that the content of ethylene oxide in the outgoing gas stream does not exceed about 1.5% by volume;

the gas stream from the first zone, containing at least about 0.9% by volume of ethylene oxide, is cooled to about 220° to 270° C and (is added with) oxygen or a gas containing molecular oxygen and the moderator for the reaction are added thereto in such amounts that the concentrations of the aforementioned substances are restored to approximately their respective levels present before entering the first zone and therefore are respectively from about 2 to 10% by volume and from about 0.1 to 20 ppm; the resulting gas stream is supplied to a second reaction zone containing the silver-based catalyst and the contact times in the second zone are from about 1 to 6 seconds, the pressure is from atmospheric pressure to about 30 kg/cm² and the temperature is from about 200° to 300° C, the

reaction temperature of the second zone being at least 5° C less than the temperature of the first zone; and ethylene oxide leaving the second reaction zone is recovered and the residual gases are recycled to the first zone after removing the carbon dioxide which they contain.

4,055,580

DERIVATIVES OF

AMINOMETHYLCYCLOHEXANECARBOXYLIC ACID

Aldo Bertelli, Milan, Italy, assignor to Rorer Italiana S.p.A., Milan, Italy

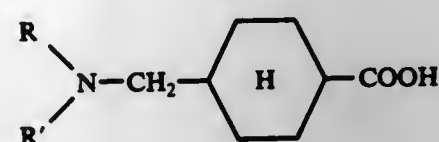
Filed Aug. 22, 1975, Ser. No. 607,041

Int. Cl.² C11C 3/00; C07F 3/00; C07C 61/01, 101/00

U.S. Cl. 260—404.5

10 Claims

1. A compound selected from the compounds of general formula:



in which:

R is in a group C_nH_{2n+m}—CO—;

n is an integer from 4 to 20,

m is selected from +1, -1, -3 and -5, and

R is selected from hydrogen and the alkyl groups having 1 to 6 carbon atoms,

and the inorganic and organic therapeutically acceptable salts thereof.

2. A compound according to claim 1, wherein said salt is selected from the sodium, potassium, magnesium, calcium, aluminium, arginine, ornithine and lysine salts.

4,055,581

HEAT AND LIGHT STABILIZERS FOR HALOGEN CONTAINING POLYMERIC RESINS

George C. Hopkins, Clarence, N.Y., and D. Bruce Merrifield, Houston, Tex., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

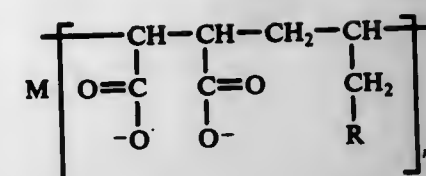
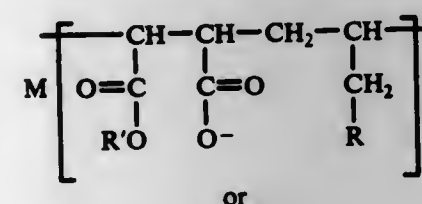
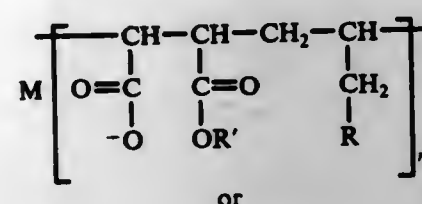
Continuation-in-part of Ser. No. 430,115, Jan. 2, 1974, Pat. No. 3,933,740. This application Nov. 14, 1975, Ser. No. 631,967

Int. Cl.² C07F 3/06

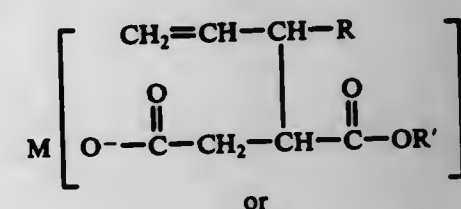
U.S. Cl. 260—429.9

9 Claims

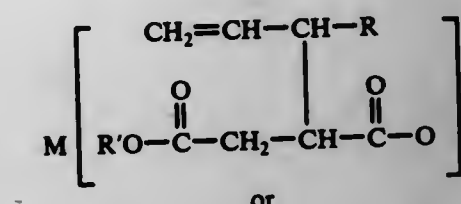
1. As stabilizer for halogen-containing polymers, a metal salt selected from the group consisting of metal salts of the polymeric and monomeric reaction products of an alpha olefin and maleic anhydride, said polymeric metal salt having recurring units of the formula:



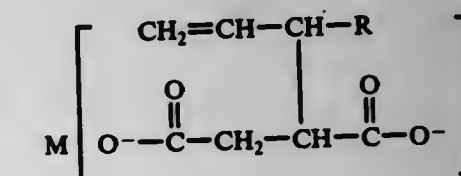
and said metal monomeric salt being represented by the formula:



or



or



or mixtures thereof wherein M represents a di- or tetravalent metal selected from the group consisting of calcium, zinc, cadmium, barium and tin; n is 1 or 2 in formulas (C) and (F) and 2 or 4 in formulas (A), (B), (D), and (E); R is selected from the group consisting of hydrogen, aryl, alkyl, aralkyl, alkaryl and substituted derivatives thereof having 1 to 17 carbon atoms which can be halogenated, and R' is selected from the group consisting of alkali metal cations, ammonium cation, lower alkyl-substituted ammonium cations, hydrogen atom, aryl groups, alkyl groups, aralkyl groups, alkaryl groups and substituted derivatives of said groups having 1 to 17 carbon atoms which can be halogenated.

4,055,582

SYNTHESIS OF NICKEL AND PALLADIUM ORGANOPHOSPHORUS COMPLEXES

Darryl R. Fahey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 10, 1976, Ser. No. 684,986

Int. Cl.² C07F 15/04, 15/00

U.S. Cl. 260—439 R

26 Claims

1. A process comprising reacting at least one compound of the formula RMX(PR₃)₂ with at least one compound of the formula APR₂ in the presence of a diluent under reaction conditions sufficient to produce at least one composition which can be represented by the formula M(PQ₃)_n, wherein M is palladium or nickel; X is a halogen; A is an alkali metal; each R is individually selected from the group consisting of suitable aliphatic hydrocarbyl radicals, halosubstituted aliphatic hydrocarbyl radicals, aromatic hydrocarbyl radicals wherein at least one carbon adjacent the radical carbon has a hydrogen substituent, halosubstituted aromatic hydrocarbyl radicals wherein at least one carbon adjacent the radical carbon has a hydrogen substituent, hydrocarbyloxy radicals, and halosubstituted hydrocarbyloxy radicals, each Q is individually selected from any R contained in the reactants; each PR₃ may be the same or different; each PQ₃ may be the same or different; the molar ratio of each different PQ₃ to M can be any rational number such that the sum of the molar ratios of the different PQ₃'s

(C) equals n; and n equals 3 when M is palladium or 4 when M is nickel.

26. A composition of matter having the average formula of Pd(PEt₃)_{1.9}(PPh₃)_{1.1} wherein PEt₃ is triethylphosphine and PPh₃ is triphenylphosphine.

4,055,583

METHOD FOR THE PRODUCTION OF CARBONACEOUS ARTICLES, PARTICULARLY STRANDS

Georg Kölling, Essen, and Ingo Romey, Drevenack, both of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Division of Ser. No. 570,458, April 22, 1975, Pat. No. 3,997,654.

This application June 15, 1976, Ser. No. 696,296

Claims priority, application Germany, Apr. 24, 1974, 2419659

Int. Cl.² D01F 9/12

U.S. Cl. 423—447.4

8 Claims

1. A method for producing carbonaceous articles in the form of fibers or strands comprising

- heating pitch having a Kramer-Sarnow softening point between about 70° and 190° C to a temperature about 40° to 100° C above its softening point so that part of the pitch is molten;
- filtering the thus-obtained molten mass so as to remove substantially all solid particles and to increase the homogeneity of the molten mass;
- then cooling the remaining mass and grinding it to small particles followed by contacting the particles with an aliphatic solvent adapted to dissolve a portion of the said particles;
- removing at least the major part of the solvent;
- passing the remaining aliphatic solvent-insoluble portion of the mass under application of heat and pressure through a forming head so as to shape it to fibers, strands or threads;
- sprinkling the fibers or strands with finely ground activated carbon which has been impregnated with a liquid oxidizing agent;
- then heating the thus-treated fiber strands or fibers to about 350° C to improve their melt-resistance, and
- finally carbonizing the strands or fibers at a temperature of about 1000° C.

4,055,584

PROCESS FOR THE PRODUCTION OF BETA-CHLOROETHYLTRICHLOROSILANE

Hermann Kny, Fullinsdorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 10, 1976, Ser. No. 722,858

Int. Cl.² C07F 7/08, 7/12

U.S. Cl. 260—448.2 E

4 Claims

1. In a process for the production of β-chloroethyltrichlorosilane by reacting hydrogen chloride with vinyl trichlorosilane in the presence of aluminium chloride at elevated pressure at temperature between 0° and 90° C, the improvement which comprises using the aluminium chloride which remains in the reaction vessel after separating off the β-chloroethyltrichlorosilane by distillation, and which still contains β-chloroethyltrichlorosilane, directly in the next reaction, provided that β-chloroethyltrichlorosilane is distilled off after each reaction in such an amount that the residue constitutes a still stirrable broth.

4,055,585

PREPARATION OF LIQUID TDI FOR COMPOSITIONS
Masahiro Okamoto; Makoto Nemoto, both of Kanagawa; Yu-
shiro Katsuka, Ehime, and Yoshiharu Tokugawa, Hyogo, all of
Japan, assignors to Sumitomo Chemical Company, Limited,
Osaka and Nittetsu Chemical Industrial Co., Ltd., Tokyo,
both of Japan

Division of Ser. No. 470,098, May 15, 1974, Pat. No. 4,000,099.
This application Apr. 26, 1976, Ser. No. 680,391
Int. Cl.² C07C 118/02, 119/048

U.S. Cl. 260—453 SP

3 Claims

1. A process for forming a liquid of a solid toluene diisocyanate tar by-product in the preparation of toluene diisocyanate, which comprises

1. heating the toluene diisocyanate tar having a softening point of about 200° C or higher, at a temperature above the softening point of said toluene diisocyanate tar, or
- 1-2. withdrawing the toluene diisocyanate tar having a softening point of about 200° C or higher, in a molten condition from the toluene diisocyanate producing apparatus, and then the molten toluene diisocyanate tar at a temperature above the softening point of said toluene diisocyanate tar in a substantially anhydrous condition with an aromatic solvent selected from the group consisting of creosote oil, anthracene oil, pitch oil, methyl naphthalene oil, crystal-free naphthalene oil, absorbing oil, washing oil, and hydrogenated cracked gasoline having a boiling point of above 200° C, to form a solution of said toluene diisocyanate tar,
2. pulverizing the above-defined toluene diisocyanate tar at a temperature below the softening point thereof to a stirrable size, and
- 2-1. mixing the pulverized toluene diisocyanate tar at a temperature below the softening point thereof in a substantially anhydrous condition with the above-defined aromatic solvent to form a dispersion of said toluene diisocyanate tar, and then maintaining the temperature of the dispersion at a temperature above the softening point thereof for at least 5 minutes to form a solution of said toluene diisocyanate tar, or
- 2-2. mixing the pulverized toluene diisocyanate tar at a temperature above the softening point thereof in a substantially anhydrous condition with the above defined aromatic solvent to form a solution of the toluene diisocyanate tar, or
3. pulverizing the above-defined toluene diisocyanate tar at a temperature below the softening point thereof in a substantially anhydrous condition in the above-defined aromatic solvent to form a dispersion of said toluene diisocyanate tar.

4,055,586

PROCESS FOR THE MANUFACTURE OF BIS-(2-CYANOETHYL)-AMINE

Hans Feichtinger, Dinslaken; Wolfgang Payer, Wesel; Boy Cornils, Dinslaken, and Jürgen Weber, Oberhausen, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Filed Oct. 20, 1976, Ser. No. 733,999

Claims priority, application Germany, Oct. 27, 1975, 2547977
Int. Cl.² C07C 120/00, 121/43

U.S. Cl. 260—465.5 R

5 Claims

1. A process for the manufacture of bis-(2-cyanoethyl)-amine which comprises reacting gaseous ammonia with acrylonitrile having a 5–15% by weight water content in a bubble column reactor.

4,055,587

AMMOXIDATION OF ALKYL SUBSTITUTED ORGANIC COMPOUNDS USING A SOLUTION OF AMMONIUM CARBONATE AS THE AMMONIA SOURCE
Richard V. Norton, Wilmington, Del., assignor to Suntech, Inc., St. Davids, Pa.

Filed Aug. 16, 1976, Ser. No. 714,730

Int. Cl.² C07C 120/14

U.S. Cl. 260—465 C

9 Claims

1. In the process of converting an alkyl-substituted hydrocarbon of the benzene or naphthalene series to a nitrile by ammoxidation where the hydrocarbon reactant, oxygen and ammonia are reacted over an ammoxidation catalyst under ammoxidation conditions to obtain the nitrile, the improvement of supplying the total amount of ammonia reactant to the reactor as an aqueous solution of ammonia and carbon dioxide.

4,055,588

TETRA-(LOWER-ALKYL)-3-(3-NITROPHENYL)-1,5-PENTANEDIONE-1,2,4,5-TETRACARBOXYLATES

Philip M. Carabateas, and Gordon L. Williams, both of Scho-dack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.
Division of Ser. No. 659,695, Feb. 20, 1976, which is a division of Ser. No. 588,380, June 19, 1975, Pat. No. 3,970,662. This application Aug. 18, 1976, Ser. No. 715,329

Int. Cl.² C07C 79/46

U.S. Cl. 560—23

2 Claims

1. Tetra-(lower-alkyl) 3-(3-nitrophenyl)-1,5-pentanedione-1,2,4,5-tetracarboxylate.

4,055,589

20-ALKOXY-16-ALKYL PROSTADIENOIC ACID DERIVATIVES

Noriyoshi Inukai; Masuo Murakami, both of Tokyo; Hidenori Iwamoto, Ageo; Isao Yanagisawa; Toshinari Tamura, both of Tokyo; Yoshio Ishii, Omiya; Kenichi Tomioka, Kitamoto, all of Japan, and Tetsuya Shiozaki, deceased, late of Misato, Japan (by Hiroko Shiozaki, legal representative), assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan
Filed Dec. 15, 1975, Ser. No. 640,497

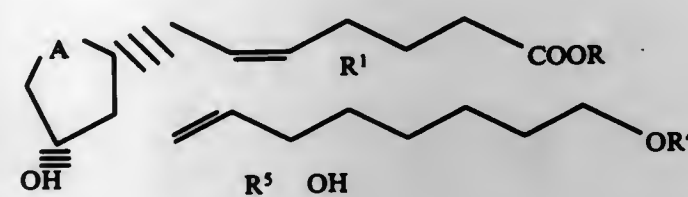
Claims priority, application Japan, Dec. 20, 1974, 49-145617; Nov. 4, 1975, 50-132295

Int. Cl.² C07C 177/00

U.S. Cl. 560—121

4 Claims

1. A 20-alkoxy-16-alkylprostadienoic acid derivative shown by the formula



wherein A represents



R and R⁵, which may be the same or different, each represents a hydrogen atom or a lower alkyl group, and R¹ and R⁴, which may be the same or different, each represents a lower alkyl group and the pharmacologically acceptable nontoxic salts thereof.

4,055,590

METHOD OF MAKING CARBOXYLIC ACID ESTERS
Wilhelm Gruber, Darmstadt, and Guenter Schroeder, Ober-Ramstadt, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed June 22, 1976, Ser. No. 698,676

Claims priority, application Germany, June 26, 1975, 2528524
Int. Cl.² C07C 69/66

U.S. Cl. 560—179

5 Claims

1. In a method for making a carboxylic acid ester by the reaction of the corresponding carboxylic acid amide with a primary alcohol in the presence of a catalyst at elevated temperature, the improvement wherein said catalyst is an at least partially dissolved metal carboxylate or a compound forming a metal carboxylate by reaction in situ with a carboxylic acid, the anion of which metal carboxylate is the anion of said carboxylic acid.

4,055,591

PHOSPHONOMETHYL COMPOUNDS

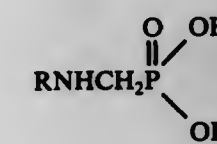
Daniel J. Scharf, Cheektowaga, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.
Division of Ser. No. 431,195, Jan. 7, 1974, Pat. No. 3,939,226.
This application Jan. 2, 1976, Ser. No. 646,218

Int. Cl.² C07F 9/38; C07C 143/86

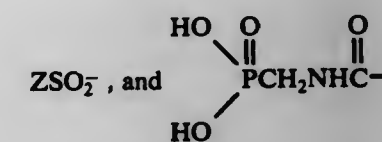
U.S. Cl. 260—502.5

4 Claims

1. A compound of the formula



wherein R is selected from the group consisting of



wherein Z is selected from the group consisting of OH, alkyl, aryl, alkoxy, and aryloxy.

4,055,592

N-(SULFO-LOWER ALKYL) AMIDES OF (3-TRIFLUOROMETHYLPHENOXY) (4-CHLOROPHENYL)ACETIC ACID

William A. Bolhofer, Frederick, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

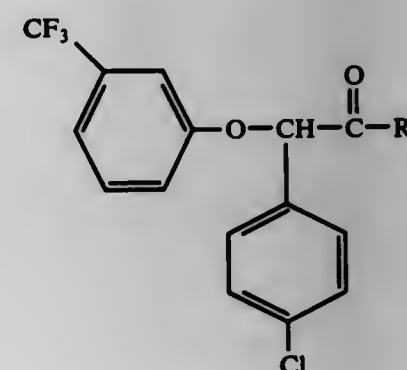
Continuation of Ser. No. 501,717, Aug. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 309,569, Nov. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 232,966, March 8, 1972, Pat. No. 3,787,423. This application Feb. 13, 1976, Ser. No. 657,813

Int. Cl.² A61K 31/185; C07C 143/52

U.S. Cl. 260—507 R

3 Claims

1. A compound of the formula:



wherein R¹ is sulfo-lower alkyl amino or the non-toxic, pharmacologically acceptable alkali metal salts.

4,055,593

ALKYL DIETHERS OF PROSTAGLANDINS

Ned M. Weinshenker, Sunnyvale, Calif., and Niels H. Andersen, Seattle, Wash., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 117,166, Feb. 19, 1971, abandoned.
This application Apr. 23, 1975, Ser. No. 570,621

Int. Cl.² C07C 177/00

U.S. Cl. 260—514 D

2 Claims

1. A 11α,15(S)-bis(lower dialkyl' lower alkoxy' methoxy)-9-oxo-5-cis,13-trans-prostadienoic acid wherein the lower alkyl group is from 1 to 8 carbon atoms and the lower alkoxy is from 1 to 8 carbon atoms.

4,055,594

INTERMEDIATES USEFUL FOR THE PRODUCTION OF NORPACHOULENOL

Paul José Teisseire, Grasse, France, assignor to Societe Anonyme Roure Bertrand Dupont, Paris, France
Filed July 9, 1975, Ser. No. 594,335

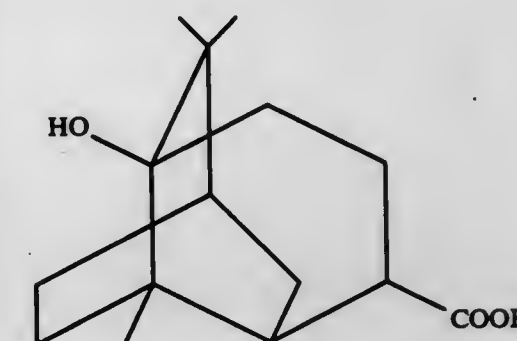
Claims priority, application Switzerland, Apr. 9, 1975, 10676/75

Int. Cl.² C07C 61/32

U.S. Cl. 260—514 G

1 Claim

1. A compound of the formula



4,055,595

SUBSTITUTED

ARYLOXY-3,3,3-TRIFLUORO-2-PROPIONIC ACIDS, ESTERS AND SALTS THEREOF

David Bryan Haydock; Thomas Patrick Cunningham Mulholland, and Jeffrey Meyrick Thorp, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 10, 1975, Ser. No. 630,685

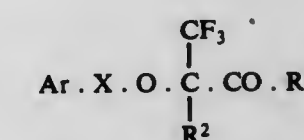
Claims priority, application United Kingdom, Dec. 6, 1974, 52829/74

Int. Cl.² C07C 65/14, 65/02, 69/76

U.S. Cl. 260—520 B

8 Claims

1. A fluorinated compound of the formula:-



wherein Ar is a phenyl or naphthyl radical which, may optionally bear as substituent a halogen atom, an alkyl radical of 1–4 carbon atoms or an alkoxy radical of 1–4 carbon atoms, or a phenyl or phenoxy radical which may itself bear as substituent a halogen atom, an alkyl radical or 1–4 carbon atoms or an alkoxy radical of 1–4 carbon atoms; X is —CH₂—; R¹ is a hydroxy radical or an alkoxy radical of 1–6 carbon atoms; and R² is a hydrogen atom, a methyl radical or a trifluoromethyl

radical; or, for a compound wherein R¹ is a hydroxy radical, a pharmaceutically acceptable base addition salt thereof.

4,055,596

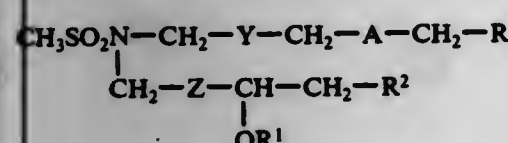
11,12-SECO-PROSTAGLANDINS

Edward J. Cragoe, Jr., Lansdale, and James H. Jones, Blue Bell, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J. Division of Ser. No. 505,445, Sept. 13, 1974, Pat. No. 3,991,106. This application July 14, 1976, Ser. No. 704,859 Int. Cl.² C07C 143/822

U.S. Cl. 260—534 M

7 Claims

1. The compound of the formula



wherein

R is selected from the group consisting of carboxy and a carboxy salt, said carboxy salt being formed from a pharmaceutically acceptable cation, and alkoxycarbonyl of the formula —COOAlk wherein Alk is alkyl having 1–10 carbon atoms; p1 R¹ is hydrogen or lower alkanoyl;

A is selected from the group consisting of methylene or oxygen;

Y is selected from the group consisting of ethylene, vinylene, or ethynylene;

Z is selected from the group consisting of ethylene, vinylene, or ethynylene;

R² is —O—R³ or —S—R³ wherein R³ is lower alkyl or fluorinated lower alkyl.

4,055,597

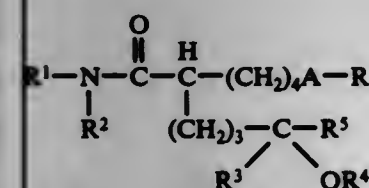
10-AZA-11,12-SECO-PROSTAGLANDINS

Edward J. Cragoe, Jr., and John B. Bicking, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J. Continuation-in-part of Ser. No. 326,934, Jan., 1973, abandoned. This application June 2, 1975, Ser. No. 583,075 Int. Cl.² C07C 101/00

U.S. Cl. 260—534 M

14 Claims

1. The compound having the following formula:



wherein

R is carboxy or a carboxy salt having the formula —COO—Me⁺ wherein Me is a pharmaceutically-acceptable cation derived from a metal or an amine;

A is ethylene, trimethylene, α-methylethylene, β-methylethylene, α,α-dimethylethylene, or β,β-dimethylethylene;

R¹ is hydrogen or methyl;

R² is hydrogen or alkyl or 1–3 carbon atoms;

R³ is hydrogen or methyl;

R⁴ is hydrogen; and

R⁵ is loweralkyl of 3–7 carbon atoms, 4-pentenyl, or 5,5,5-trifluoropentyl; except that when R³ is methyl, R⁵ is limited to propyl, butyl, pentyl, 4-methylpentyl, 4,4-dimethylpentyl, hexyl, heptyl, and 5,5,5-trifluoropentyl.

4,055,598
PROCESS FOR PREPARATION OF UREA
AUTOCONDENSATION PRODUCT

John M. Lee, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich. Continuation-in-part of Ser. No. 242,220, April 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 865,211, Oct. 9, 1969, abandoned. This application Apr. 14, 1975, Ser. No. 568,095

Int. Cl.² C07C 127/24

U.S. Cl. 260—553 B

5 Claims

1. A process in which urea is pyrolytically converted to biuret, said process consisting of dispersing, with agitation in an inert hydrocarbon carrier, a seed material consisting of a urea pyrolyzate product essentially containing less than about 15 weight percent urea, about 60 to about 85 weight percent of biuret, and minor amounts of other urea condensation products, adding to the so-dispersed seed material, with agitation, a feedstock material consisting of a urea pyrolyzate product essentially containing about 35 weight percent or more of urea, a biuret content of up to about 55 weight percent, and minor amounts of other urea condensation products, wherein the feedstock material is added in an amount that the total urea content of the combined seed and feedstock does not exceed 20 weight percent, the ratio of the combined seed and feedstock to hydrocarbon carrier being in the range of about 5:95 to about 60:40 by weight,

heating, with agitation, the mixture of seed and feedstock dispersed in said carrier at a temperature in the range of about 100° C to about 150° C for a period of time of from about 10 minutes to about 8 hours to cause pyrolysis of the urea,

and recovering from said carrier a urea pyrolyzate product containing less than about 15 weight percent urea, 60 to about 85 weight percent biuret, and minor amounts of other urea condensation products, wherein the said inert hydrocarbon carrier is substantially a non-solvent for, and is substantially inert to, ammonia, urea and autocondensation pyrolysis products of urea, said carrier comprising at least one of those compounds selected from the group consisting of saturated branched-chain and straight-chain hydrocarbons of the alkane series having from 8 to 12 carbon atoms.

4,055,599

N-(ALKYLHYDROBENZYL)-ALKYLTHIO- AND MERCAPTO-ACETAMIDES

Helmuth Huber-Emden; Karl Eschle, both of Basel, and Arthur Maeder, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 69,886, Sept. 4, 1970, Pat. No. 3,927,091, which is a continuation-in-part of Ser. No. 737,832, June 18, 1968, abandoned. This application Sept. 8, 1975, Ser. No. 611,043

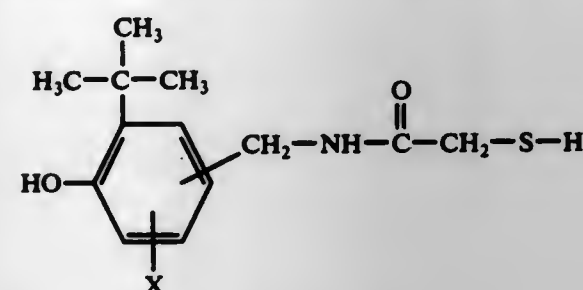
Claims priority, application Switzerland, June 23, 1967, 8947/67

Int. Cl.² C07C 103/38

U.S. Cl. 260—562 S

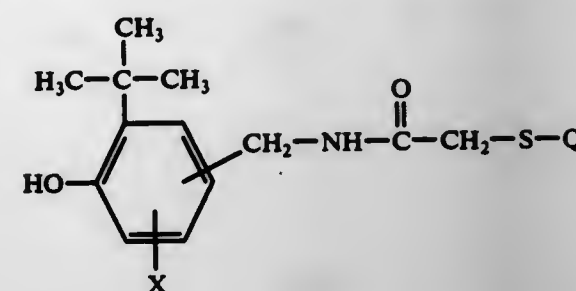
6 Claims

1. A carboxylic acid amide of the formula



in which X is methyl or tertiary butyl.

3. A carboxylic acid amide of the formula



in which X is methyl or tertiary butyl and Q is alkyl containing 1 to 20 carbon atoms.

4,055,600

CYCLOHEXANE OXIDATION PROCESS

Philip Edward Langley, and Robert Tulip, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 6, 1975, Ser. No. 629,554

Claims priority, application United Kingdom, Nov. 21, 1974, 50443/74

Int. Cl.² C07C 27/12, 29/00, 45/02, 179/02

U.S. Cl. 260—586 P

8 Claims

1. In a process for the oxidation of cyclohexane wherein the liquid cyclohexane and a gas containing molecular oxygen are continuously fed to a reactor operating at elevated temperature under pressure and wherein the liquid cyclohexane in absence of catalyst is converted to the extent of less than 5% to an oxidation product consisting essentially of cyclohexylhydroperoxide, cyclohexanol and cyclohexanone, and a liquid mixture of cyclohexane and the said oxidation product is continuously removed from the reactor, the improvement consisting essentially of conducting the oxidation in a two compartment reactor, the two compartments contacting each other to allow heat transfer between them, and releasing the entire reaction mixture in the first compartment in which the degree of conversion of cyclohexane is from 2 to 4% directly from the first compartment at a pressure in the range 8 to 50 bar absolute and a temperature in the range 150° to 200° C to the second compartment operating at a lower pressure in the range 2 to 5 bar absolute and a lower temperature in the range 115° to 140° C, whereby part of the cyclohexane is vaporized, and a liquid mixture of cyclohexane and oxidation product containing from 5 to 15% of oxidation product is continuously removed from the reactor.

4,055,601

PROCESS FOR THE OXIDATION OF PRIMARY ALLYLIC ALCOHOLS

William J. Ehmann, Orange Park, Fla., assignor to SCM Corporation, New York, N.Y.

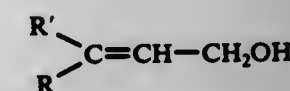
Continuation-in-part of Ser. No. 437,188, Jan. 28, 1974, abandoned. This application May 30, 1975, Ser. No. 582,114

Int. Cl.² C07C 45/16

U.S. Cl. 260—593 R

13 Claims

1. In an Oppenauer oxidation for converting a 3-substituted or 3,3-disubstituted allyl alcohol having the following configuration



wherein R is an aliphatic or aromatic group and R' is hydrogen, an aliphatic or an aromatic group, into the corresponding olefin aldehyde, in the presence of an Oppenauer oxidation catalyst and hydrogen acceptor under mild temperature Oppenauer oxidation conditions, the improvement which comprises carrying out said oxidation in the presence of furfural as said hydrogen acceptor in a molar ratio of furfural to allyl alcohol of about 10:1–1:10 and forming a reaction product

mixture containing the aldehyde corresponding to the allyl alcohol and as a by-product, furfuryl alcohol, said catalyst being employed in a catalytic amount.

3. The oxidation process of claim 1 wherein said allyl alcohol is disubstituted with aliphatic groups.

4,055,602

2-DECARBOXY-2-HYDROXY-METHYL-5-OXA-17-PHENYL-18,19,20-TRINOR-PGF-ANALOGS

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

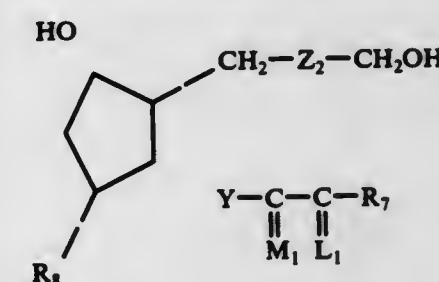
Filed Jan. 8, 1976, Ser. No. 647,357

Int. Cl.² C07C 43/20

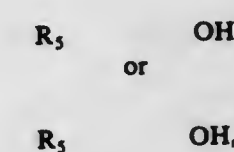
U.S. Cl. 250—613 D

39 Claims

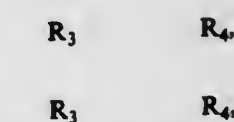
1. A prostaglandin analog of the formula



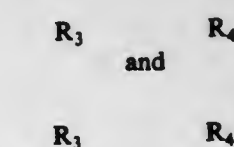
wherein R₁ is hydrogen or hydroxy; wherein Y is trans—CH=CH—; wherein M₁ is



wherein R₃ is hydrogen or methyl; wherein L₁ is

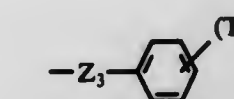


or a mixture of



wherein R₃ and R₄ are hydrogen, methyl or fluoro, being the same or different, with the proviso that one of R₃ and R₄ is methyl only when the other is hydrogen or methyl;

wherein Z₂ is —CH₂—O—(CH₂)_g—CH₂—; where g is one, 2, or 3; and wherein R₇ is



wherein Z₃ is methylene, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,055,603

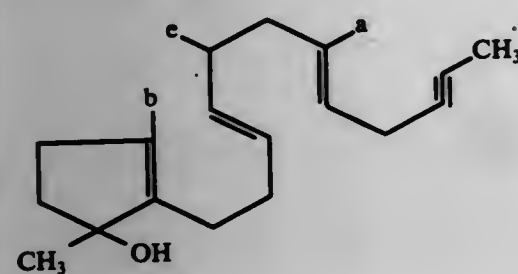
ALKYNYL TERMINATING GROUPS IN BIOGENETIC-LIKE CYCLIZATIONS TO STEROIDS
William S. Johnson, Portola Valley, Calif., and Michael B. Gravestock, Bramhall, England, assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 375,617, July 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 162,672, July 17, 1971, abandoned. This application Aug. 4, 1975, Ser. No. 601,742

Claims priority, application Canada, July 10, 1972, 146715
Int. Cl.² C07C 35/06

U.S. Cl. 260—617 R

1. A compound of the formula:



wherein:

a and b are hydrogen or lower alkyl of from 1 to 3 carbon atoms; and
c is hydrogen or lower alkyl of from 1 to 2 carbon atoms.

4,055,604

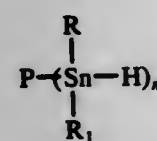
PROCESS FOR THE REDUCTION OF ALDEHYDES AND KETONES TO THE CORRESPONDING CARBINOLS
Ned M. Weinshenker, Palo Alto, Calif., assignor to Dynapol, Palo Alto, Calif.

Division of Ser. No. 467,951, May 8, 1974, Pat. No. 3,975,334.
This application Jan. 28, 1976, Ser. No. 653,051
Int. Cl.² C07C 29/14, 29/00

U.S. Cl. 260—618 H

2 Claims

1. A process of reducing a carbonyl compound selected from among aldehydes and ketones to the corresponding carbinol which comprises contacting, in liquid phase, said compound with a porous, solid, insoluble polymeric organotin hydride compound of the formula



where P represents an organic polymer; R and R₁ each represent hydrogen, a lower alkyl group having from 1 to 5 carbon atoms, an aryl group having from 6 to 10 carbon atoms, or an alkyl or alkaryl group having from 7 to 10 carbon atoms; and n is a positive value greater than 1 at a temperature and for a period of time necessary to reduce said carbonyl compound to a reduction reaction product; the amount of said solid polymeric organotin hydride compound used being at least equivalent, in equivalents, to the amount of reduction to be effected; hydrolysing the reduction reaction product to the carbinol by contact with dilute acid and recovering the carbinol.

4,055,605

PHENOL ALKYLATION

Charles L. Jarreau, Sr., Natchez, Miss., assignor to Calumet Petrochemicals, Inc., Natchez, Miss.

Filed Jan. 2, 1973, Ser. No. 320,265

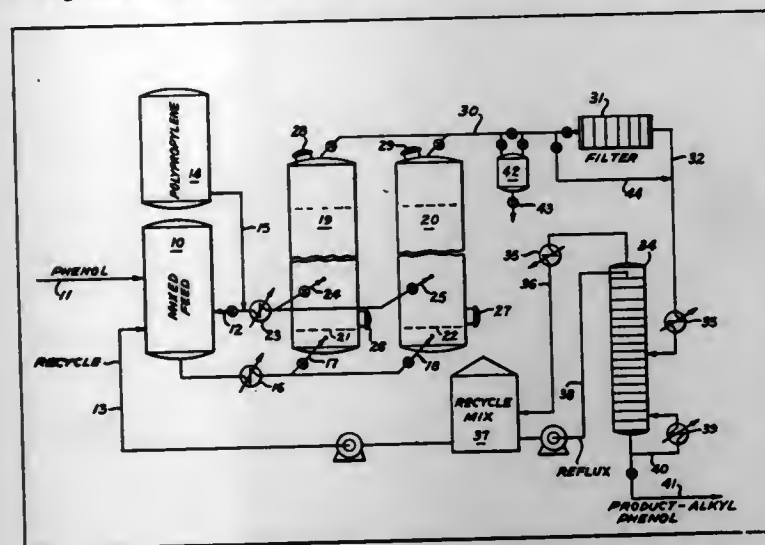
Int. Cl.² C07C 39/06

U.S. Cl. 260—624 R

2 Claims

1. In the process of preparing monoalkylphenols wherein an olefin hydrocarbon having from 8 to 18 carbon atoms is reacted with a phenol selected from the group consisting of

phenol, cresol, and xylene in the presence of a catalyst consisting essentially of an acid activated clay, the improvement comprising passing a stream of the liquid mixture of phenol and olefin through a stationary bed of activated clay catalyst in granular form in a vertically elongated reaction zone at a rate corresponding to a space velocity of 0.2 to 0.5 volumes per volume of catalyst per hour and a temperature of 250° to 350° F., a portion of the olefin charged to said reaction zone being



introduced thereinto at an intermediate point therein, thereby increasing further the average mol ratio of phenol to olefin in said catalyst bed, said catalyst having an acid value of about 12-15, and acidity of about 3-3.4 pH, and a particle size of about 15 to 40 mesh, maintaining an excess of phenol in said catalyst bed corresponding to a mol ratio of about 1.5 to 3.5, distilling unreacted phenol from the stream leaving the catalyst and recycling said recovered phenol to said reaction zone.

4,055,606

NOVEL COPOLYESTER-POLYEPOXIDE COMPOSITIONS

Dusan C. Prevorsek, Morristown, and Shaul M. Aharoni, Morris Plains, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed June 21, 1976, Ser. No. 698,247

Int. Cl.² C08L 63/00

U.S. Cl. 260—835

19 Claims

1. A copolyester-polyepoxide composition characterized by possessing a single discernible glass transition temperature before curing as measured by differential scanning calorimetry comprising:

- A. a copolyester having a number average molecular weight in the range from about 6,000 to about 50,000; and
- B. a polyepoxide mixture comprising high, intermediate and low molecular weight components wherein
 - a. about 25 to 75 weight percent of said mixture is said high molecular weight component having a weight average molecular weight in the range of above 25,000 to about 120,000 and an epoxide equivalent in the range from above 10,000 to about 60,000;
 - b. about 15 to 65 weight percent of said mixture is said intermediate molecular weight component having a weight average molecular weight in the range of above 3,000 to 25,000 and an epoxide equivalent in the range from above 1,600 to 10,000;
 - c. about 5 to 35 weight percent of said mixture is said low molecular weight component having a weight average molecular weight in the range of about 150 to 3,000 and an epoxide equivalent in the range from about 50 to 1,600, said polyepoxide mixture being present in an amount of at least 50% but not more than about 200% by weight based on said copolyester; and
- C. an epoxy curing agent present in the amount from 0 to about 1.1 equivalents per epoxy equivalent.

4,055,607

ACRYLIC COATING COMPOSITIONS

Thomas R. Sullivan, Natrona Heights; Roger M. Christenson, Gibsonia; Surya K. Das, Pittsburgh, and Rostyslaw Dowbenko, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 296,741, Oct. 11, 1972, abandoned. This application Aug. 7, 1975, Ser. No. 602,857

Int. Cl.² C08L 61/28, 51/08; C08K 5/01

U.S. Cl. 260—851

8 Claims

1. A thermosetting polymer composition comprising:

- a. at least one polymer which is the copolymerization product of ethylenically unsaturated monomers, said ethylenically unsaturated monomers comprising
 1. from about 4 to about 30 percent by weight hydroxy-containing ethylenically unsaturated monomer, and
 2. from about 0.5 to about 15 percent by weight ethylenically unsaturated carboxylic acid;
- b. an active solvent in which said polymer is dissolved to form a polymer solution;
- c. at least 0.5 percent by weight microgel particles based on the weight of polymer solids in said composition, said microgel particles
 1. being the addition copolymerization product of ethylenically unsaturated monomers and a dispersion stabilizer, said ethylenically unsaturated monomers comprising:
 - a. hydroxy-containing ethylenically unsaturated monomer, and
 - b. hydroxy-free ethylenically unsaturated monomers,
 2. being substantially crosslinked,
 3. being substantially insoluble in said active solvent,
 4. being substantially insoluble in tetrahydrofuran,
 5. having substantially the same refractive index as that of said dissolved polymer, and
 6. being of size in the range of from about 1 to about 40 microns; and
- d. an aminoplast resin in an amount in the range of from about 5 to about 50 percent by weight of said composition wherein
- e. said dispersion stabilizer in said microgel particles is a branched copolymer containing two polymeric segments of which one segment is solvated by an aliphatic hydrocarbon dispersing liquid and said second segment is
 1. an anchor polymer of different polarity to said first segment,
 2. relatively non-soluble by said dispersing liquid, and
 3. contains pendant groups which have been addition copolymerized with said ethylenically unsaturated monomers of said microgel particles.

4,055,609

CARBURETOR AND FUEL SUPPLY SYSTEM

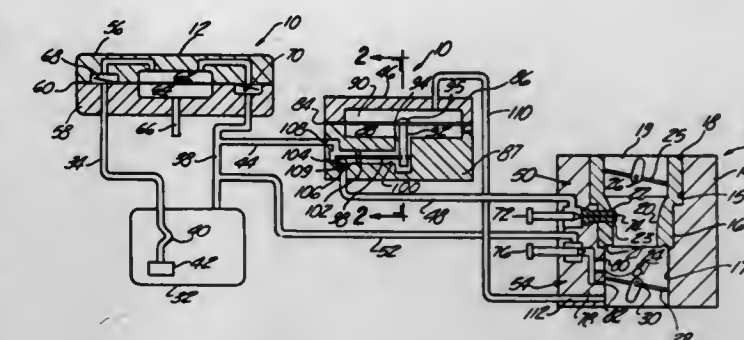
Harold E. Phelps, Bellville, Mich., assignor to Harold Phelps, Inc., Plymouth, Mich.

Continuation-in-part of Ser. No. 534,274, Dec. 19, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 642,015

Int. Cl.² F02M 17/04

U.S. Cl. 261—36 A

13 Claims



1. A fuel supply system for operating an engine in various positions, including an inverted position, comprising: a housing, a mixing passage in said housing for supplying a mixture of fuel and air to the engine, a throttle valve in said passage for controlling the supply of air and fuel mixture to the engine, a pump having an inlet and an outlet, said inlet being connected to a source of fuel for receiving fuel therefrom, a return conduit connected to said outlet and to said source for returning fuel from said pump to said source, means operatively associated with said inlet for restricting fuel flow to said outlet to maintain fuel pressure at said outlet less than the pressure upstream from said inlet, a main metering system communicating with said return conduit and said mixing passage to deliver fuel for operating the engine in a high speed range, an idle metering system communicating with said return conduit to supply fuel to the mixing passage downstream from the throttle valve for operating the engine in the idle speed range, and valve means in said main metering system responsive when said pump is not operating to close said main metering system, a valve in said idle metering system movable between open and closed positions, and control means responsive to pressure upstream from said inlet to open and responsive to the absence of pressure to close said valve.

4,055,610

PREVENTING WALL LEAKAGE IN CONTACT TOWERS
Max Leva, One Hodgson Ave., Pittsburgh, Pa. 15205, and Joseph L. Leva, 1485 McFarland Road, Pittsburgh, Pa. 15216

Filed June 24, 1975, Ser. No. 589,875

Int. Cl.² B01D 3/18, 47/12

U.S. Cl. 261—114 R

12 Claims

1. A gas-liquid contact tower comprising an outer tower shell, a plurality of superimposed generally horizontal contact plates within said tower, said plates being grouped into at least one subassembly thereof, means for removably supporting said plate subassembly within said tower shell, and a baffle arrangement mounted within said tower shell and adjacently overlying said plate subassembly, said baffle arrangement including a cylindrical section closely but spacedly and removably fitted within adjacent inner wall surfaces of said tower shell and a frustroconical section for directing fluid from said cylindrical baffle section onto a contact plate immediately underlying said baffle arrangement, said baffle arrangement being thereby shaped to minimize or substantially preclude splashing of said shell walls, said cylindrical section having sufficient height to

4,055,608

DYEABLE POLYPROPYLENE CONTAINING BISULFATE

Wassily W. Poppe, Lombard, and Mark D. Inskeep, Downers Grove, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed July 6, 1976, Ser. No. 702,438

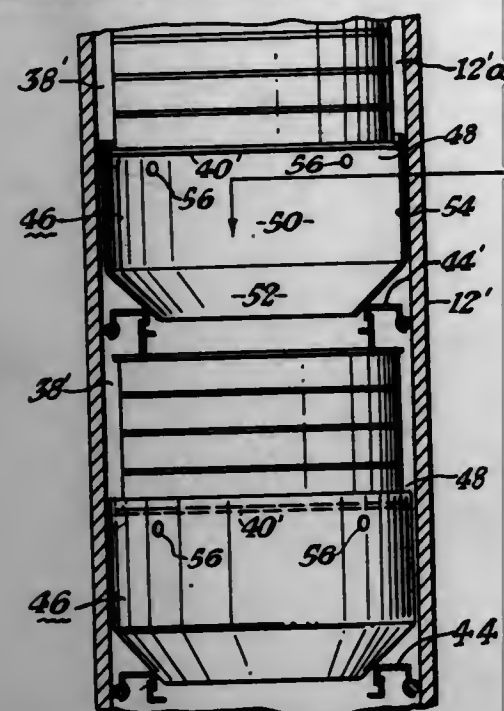
Int. Cl.² C08L 77/00

U.S. Cl. 260—857 L

27 Claims

1. A resinous composition comprising from about 40 to 99.4 parts by weight resinous polymer of propylene, from about 0.1 to 10 parts by weight alkali metal bisulfate and from 0.5 to 50 parts by weight thermoplastic amino polymer.

afford that flow resistance which would substantially preclude longitudinal direction if the web deviates from said predetermined path; and heating a major portion of the tensioned web



said shell inner wall surfaces and outer surfaces of said cylindrical baffle section.

4,055,611

SHORT GLASS FIBERS COVERED WITH POLYMERIC MATERIALS

Uwe Hucks, Duisburg, and Hugo Vernaleken, Krefeld-Bockum, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 25, 1975, Ser. No. 561,827

Claims priority, application Germany, Mar. 27, 1974, 2414804

Int. Cl.² B29C 3/00; B22D 13/04, 23/08, 19/00

U.S. Cl. 264—6

11 Claims

11. A process for the production of spheres of high molecular weight organic thermoplastic resins filled with fibers selected from the group consisting of mineral fibers, carbon fibers and other inorganic fibers exclusive of glass fibers having an average diameter of between 1 and 15 mm and containing from 1 to 30% by weight of high molecular weight thermoplastics comprising:

- mixing said fibers having an average length of between 0.1 and 10 mm in a 1 to 30% strength by weight solution of high molecular weight thermoplastics having a viscosity of less than 1000 cP;
- rotating the mixture of said fibers and high molecular weight thermoplastics solution in an apparatus which rotates about an axis which passes through said apparatus to form spheres of high molecular weight thermoplastics filled with said fibers; and
- subsequently drying the spheres of high molecular weight thermoplastics filled with said fibers to free said spheres from solvent.

4,055,612

TREATING OF TRAVELLING WEBS

Peter Zimmer, Untere Sparchen 54, A 6330 Kufstein (Tirol), Austria

Continuation of Ser. No. 332,275, Feb. 14, 1973, abandoned.

This application Dec. 12, 1974, Ser. No. 532,250

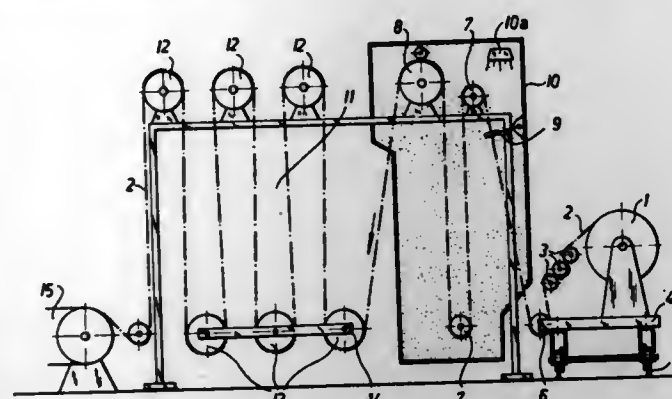
Claims priority, application Austria, Feb. 15, 1972, 1206/72

Int. Cl.² B65H 25/26

U.S. Cl. 264—40.7

12 Claims

12. A method for forwarding a relatively inelastic textile web from a web supply toward a printing station at which the longitudinal edges of the web are required to travel along a predetermined path, comprising the steps of moving the web in longitudinal direction under tension from the supply means along said predetermined path towards said printing station; moving the supply means in a direction transverse to said



to enhance its stretchability to avoid fold formation during movement of the web in said transverse direction.

4,055,613

PRODUCTION OF THREE-DIMENSIONAL DESIGNS

Ales M. Kapral, Menasha, Wis., assignor to Akrosil Corporation, Menasha, Wis.

Filed Oct. 23, 1974, Ser. No. 517,175

Int. Cl.² B29D 27/04; B29C 1/02, 1/04

U.S. Cl. 264—46.4

13 Claims



1. Method of producing a foamed resin sheet having a three-dimensional pattern or design thereon which comprises applying a heat-foamable plastic material in the form of a two-dimensional pattern on a flexible sheet or web, then heating said heat-foamable plastic material to cause said heat-foamable plastic material to unite with said sheet or web and to expand forming a three-dimensional pattern on said sheet or web and thus form a master mold form, applying a release coating to the three-dimensional surface of said flexible sheet or web, depositing a layer of a foamable resin plastisol upon the surface of said three-dimensional pattern, heating said layer to gel, fuse and foam said layer to form a foamed resin object, and removing said master mold form from said foamed resin object to expose the three-dimensional pattern thereon.

7. Method of producing a resin sheet having a three-dimensional pattern or design thereon which comprises applying a heat-foamable plastic material in the form of a two-dimensional pattern on a flexible sheet or web, then heating said heat-foamable plastic material to cause said heat-foamable plastic material to unite with said sheet or web and to expand forming a three-dimensional pattern on said sheet or web and thus form a master mold form, applying a release coating to the three-dimensional surface of said sheet or web, depositing a layer of fluid non-foaming resin upon the surface of said three-dimensional pattern, curing said layer while said layer is in contact with said three-dimensional surface to form a solid resin article and removing said sheet or web from said fused resin article to expose the three-dimensional pattern thereon.

4,055,614

METHOD OF FIRING FORMED CERAMIC BODY

Akira Morikawa, and Yoshinori Narita, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 488,679, July 15, 1974, abandoned.

This application Jan. 29, 1976, Ser. No. 653,527

Claims priority, application Japan, July 24, 1973, 48-83470

Int. Cl.² C04B 33/32

U.S. Cl. 264—59

6 Claims

1. A method of firing a formed raw ceramic body containing not less than 15% by weight of resinous organic components as a plasticizer and bonding agent and 100 parts by weight of inorganic components, comprising the steps of covering such a formed raw ceramic body with a metal foil capable of being oxidized at a high temperature, and firing said metal foil-covered raw ceramic body in an ordinary oxidizing atmosphere to sinter said body, said metal foil being gradually oxidized at a temperature greater than 250° C said foil suppressing oxidation of said organic components thereby preventing cracking of the ceramic body without lowering the firing temperature.

4,055,615

METHOD OF MANUFACTURING ELECTRIC RESISTORS

Yasuo Ikeda, 500, Toyoshina, Minamiazumi, Nagano, Japan

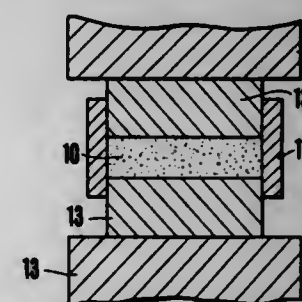
Filed Sept. 17, 1974, Ser. No. 506,791

Claims priority, application Japan, Sept. 21, 1973, 48-107179

Int. Cl.² G04B 35/00

U.S. Cl. 264—105

11 Claims



1. A method of manufacturing a thin, flat, flexible electrical resistor heating element for use in electric blankets, said method comprising the steps of:

- mixing tetrafluoropolyethylene powder and a mixture of carbon powder and metal powder to form an admixture, said mixture of carbon and metal powders not exceeding 30% by volume of said tetrafluoropolyethylene powder in said admixture;
- charging said powder admixture in a metal mold;
- compressing said powder admixture in said mold for a sufficient time interval to eliminate air voids and bond said powder admixture into a compressed body;
- removing said compressed body from said mold;
- sintering said compressed body to form a sintered body; and
- cutting said sintered body into at least one flat, flexible electrical resistor.

4,055,616

METHOD FOR SEPARATING SECTIONS OF A COVERING ON A CABLE

Ralph H. Keen, Arvada, and Gary G. Seaman, Broomfield, both of Colo., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,249

Int. Cl.² B23P 19/02

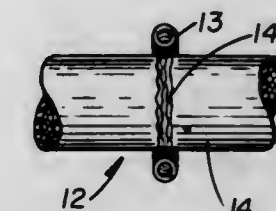
U.S. Cl. 264—139

5 Claims

1. A method of desheathing a round cable formed of a thermoplastic cable jacket enclosing a plurality of conductors having thermoplastic insulation thereon, which comprises: surrounding an annular section of the thermoplastic cable

jacket adjacent a leading end portion of the cable with an annular heat source;

heat-softening the material of the annular cable jacket section about the entire circumference thereof without contacting the jacket and without softening the thermoplastic insulation on the conductors, the width of the heat-softened section being sufficiently narrow that it will not elongate any significant amount when the jacket is separated along a line defined by the heat-softened circumferential section upon the application of longitudinal tension to the jacket, whereby the separated heat-softened material of the section will reharden to form a relatively smooth edge along the line of separation when application of heat thereto is terminated;



applying tension to the cable jacket on opposite sides of the heat-softened annular section to separate the jacket along the heat-softened section and to expose the insulated conductors;

terminating the application of heat upon separation of said jacket and within a time sufficient to preclude damage to the exposed insulation on the cable conductors and to reharden the heat-softened material of the remaining jacket on the cable to form a smooth edge along the line of separation of the jacket; and removing the leading end portion of the jacket from the cable.

4,055,617

PROCESS FOR PREPARING GRANULAR POTASSIUM SORBATE

Yasuyoshi Taga, and Masaharu Wakasone, both of Ogaki, Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 21, 1976, Ser. No. 678,983

Claims priority, application Japan, Apr. 26, 1975, 50-50909

Int. Cl.² C07C 57/10

U.S. Cl. 264—141

2 Claims

1. A process for preparing granular potassium sorbate, which comprises the steps of

- adding water to powdery potassium sorbate in an amount of 2 to 8% by weight based on the weight of the potassium sorbate,
- kneading the resulting mixture at a temperature of 10° to 45° C. for 10 minutes to 4 hours to give a uniformly wetted powder,
- supplying the wetted powder to a hopper of a screw type extruding machine equipped with a perforated cylinder die at a vicinity of an end of a screw, and extruding it under an extruding pressure at said die of 10 to 50 kg./cm², and an extruding rate at said die of 1 to 4 g./cm².sec. to give a vermicelli-like extrudate, and
- drying the extrudate to give granules having a volatile material content of not more than 0.1% by weight.

4,055,618

PROCESS FOR PREPARING GRANULAR SORBIC ACID
Shigemi Fujita, Gifu, and Masaru Goto, Hirakata, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 15, 1976, Ser. No. 723,484

Claims priority, application Japan, Sept. 23, 1975, 50-115026; Nov. 21, 1975, 50-140406

Int. Cl.² C07C 57/10

U.S. Cl. 264—141

2 Claims

1. A process for preparing granular sorbic acid, which comprises the steps of

- adding at least one member selected from the group consisting of water and lower alkyl alcohols having 1 to 3 carbon atoms to powdery sorbic acid having a particle size of 30 to 150 μ , said water being employed in an amount of 8 to 35% by weight based on the total weight and said lower alkyl alcohol being employed in an amount of 5 to 25% by weight based on the total weight,
- kneading the resulting mixture at a temperature of 10° to 45° C. for 10 minutes to 4 hours to give a uniformly wetted powder,
- supplying the wetted powder to a hopper of a screw type extruding machine equipped with a perforated-cylinder die in the vicinity of an end of a screw, and extruding it under an extruding pressure at a die of 10 to 50 kg./cm.², and an extruding rate at a die of 1 to 4 g./cm.²sec. to give a vermicelli-like extrudate, and
- drying the extrudate to give granules having a volatile material content of not more than 0.1% by weight.

4,055,619

TIRE MANUFACTURE

Anthony Gerald Goodfellow, Maghull, near Liverpool, England, assignor to Dunlop Limited, London, England

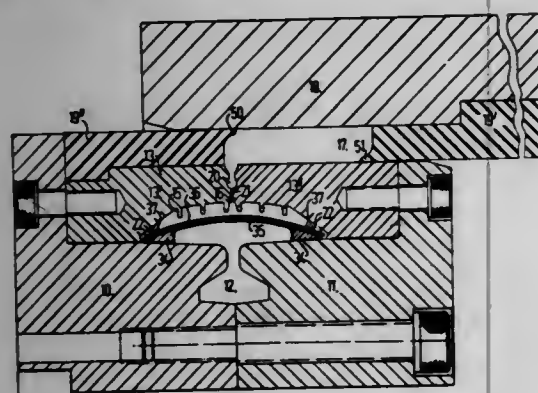
Filed May 28, 1975, Ser. No. 581,587

Claims priority, application United Kingdom, May 28, 1974, 23564/74

Int. Cl.² B29D 3/02; B29H 3/12

U.S. Cl. 264—258

2 Claims



1. A method of molding the tread portion of a pneumatic tire which minimizes the displacement of axially extending cords in a breaker structure incorporated therein, the method comprising

- locating on the radially inner surface of an annular mold cavity for the tread portion an annular breaker structure having a single layer, or a radially outermost layer, consisting of parallel cords extending axially of the cavity and introducing uncured rubber into the cavity substantially uniformly in terms of volume and pressure around the circumference of the cavity through an annular gate in the radially outer surface of the cavity, said gate lying in a plane substantially perpendicular to the axis of the cavity whereby the incoming flow of uncured rubber into the cavity divides and flows toward the opposite axial ends of the cavity substantially without any flow in the circumferential direction so that it does not tend to displace the cords as the cavity is filled.

4,055,620

FLEXIBLE MOLD AND PROCESS

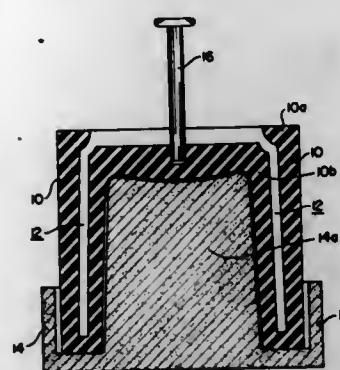
Jack R. Conrad, 3071 Club House Circle, Costa Mesa, Calif. 92626

Filed Sept. 7, 1976, Ser. No. 721,038

Int. Cl.² B29C 5/00; 7/00; B29D 23/00

U.S. Cl. 264—313

2 Claims



1. In a method of making a substantially cylindrical article having an open end and a closed end, said closed end having an aperture therein, the steps comprising: supporting an expansible mold having radially spaced inner and outer walls defining an annular cavity therebetween, said annular cavity being closed at one end and open at another end thereof, said mold also having an upper mold surface extending between end portions of said inner wall; inserting an elongated member through the open end of said cavity and into the upper mold surface; filling said cavity with a hardenable casting material; permitting said casting material to harden to form the substantially cylindrical article having an open end and a closed end; removing said elongated member to form an aperture in the closed end; and introducing pressurized fluid into the mold through said aperture and causing said outer wall to move radially outwardly releasing said article and removing said article from said mold through said open end of said cavity.

4,055,621

PROCESS FOR OBTAINING TITANIUM TETRACHLORIDE, CHLORINE AND IRON OXIDE FROM ILMENITE

Shigenori Okudaira, Chigasaki; Mitsuo Takahashi, Tokyo; Takefumi Irie, Chigasaki; Eiji Itoh, Urawa, and Koh Kashiwagi, Hiratsuka, all of Japan, assignors to Nihon Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 3, 1975, Ser. No. 583,382

Claims priority, application Japan, June 7, 1974, 46-64133

Int. Cl.² C01B 7/00; C01G 23/02, 49/06, 49/08

U.S. Cl. 423—79

29 Claims

17. A process for obtaining chlorine and iron oxide from iron chloride comprising the steps of: adding iron oxide to iron chloride preliminarily prepared by chlorinating iron-containing titanium ore, said iron oxide being added in an amount of more than 10 percent by weight based on the weight of the resulting mixture, charging the mixture of iron oxide and iron chloride is solid phase into a fluidizing roasting furnace, blowing oxygen-containing gas into the fluidizing roasting furnace from its bottom to form a fluidized bed of said mixture and to effect the oxidizing roasting in the fluidizing roasting furnace at a temperature of 600 to 1000 C, removing the chlorine from the fluidizing roasting furnace adjacent the top thereof, extracting the overflow from said fluidized bed in the fluidizing roasting furnace, charging the extracted overflow into a secondary roasting furnace for additional oxidizing roasting and for purging chlorine gas present in interstices between the overflow particles, and

removing iron oxide from the secondary roasting furnace.

4,055,622

PROCESS FOR THE PRODUCTION OF ZEOLITIC ALKALI METAL ALUMINOSILICATES

Peter Christophleimk, Dusseldorf; Wolfgang Friedemann, Neuss; Ernst Vaeth, and Karl-Heinz Worms, both of Dusseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, both of Germany

Filed July 16, 1976, Ser. No. 705,791

Claims priority, application Germany, July 26, 1975, 2533614

Int. Cl.² C01B 33/28

U.S. Cl. 423—118

8 Claims

1. A process for the production of zeolitic alkali metal aluminosilicates from alkali metal aluminate solutions containing alkali metal sulfate impurities consisting essentially of the steps of

- a. mixing an aqueous alkali metal silicate solution with an aqueous alkali metal aluminate solution
1. containing an alkali metal sulfate having a molar ratio of Al_2O_3 to sulfate of 1:0.35 to 1.25 under agitation at a precipitation temperature of from 0° C to 110° C,
2. in such amounts that the resulting mixture has a molar ratio of alkali oxide : Al_2O_3 : SiO_2 of 1.5 to 6.0:1.0:1 to 5.0, wherein
3. the alkali metal oxide is present in a stoichiometric excess with respect to SiO_2 ,
4. the excess of alkali metal oxide over unity as well as the alkali metal oxide concentration is decreased when the sulfate content is increased, and
5. the alkali metal oxide : Al_2O_3 : SiO_2 solids content of the resultant aqueous mixture is maintained between 10% to 40% by weight,
- b. subjecting the aqueous precipitate to a homogenization by application of shearing forces,
- c. converting the amorphous homogenized slurry to a crystalline state by maintaining the slurry at a crystallization temperature of between about 40° C and 120° C,
- d. determining the calcium binding power of the crystalline aluminosilicate formed, and
- e. (6) discontinuing the conversion step (c) by cooling and separating the crystalline aluminosilicate when substantially the optimum calcium binding power is attained.

4,055,623

METHOD OF REMOVING NITROGEN OXIDES FROM A GAS AS A SALT OF IMIDODISULFONIC ACID

Shigeru Saitoh; Tetsuya Watanabe; Koji Konno, and Tadashi Nakamura, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 651,422, Jan. 22, 1976, Ser. No. 542,778, Jan. 21, 1975, Pat. No. 3,992,508, and Ser. No. 542,777, Jan. 21, 1975, Pat. No. 3,991,161, said Ser. No. 651,422, is a division of Ser. No. 517,370, Oct. 23, 1974. This application July 7, 1976, Ser. No. 703,200

Claims priority, application Japan, Jan. 21, 1974, 49-9158; May 10, 1974, 49-51934; Dec. 4, 1974, 49-138967; Dec. 4, 1974, 49-138969

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.² C01B 21/00

U.S. Cl. 423—235

9 Claims

1. A method for removing nitrogen oxides from a gas mixture, in the form of a solid salt of imidodisulfonic acid comprising:

- contacting the gas mixture with an aqueous scrubbing solution containing at least 0.02% by weight of at least one ferrous salt and at least 0.2% by weight of at least an alkali salt of sulfurous acid to absorb the nitrogen oxides,

thereby forming an alkali salt of imidodisulfonic acid in solution; cooling the solution containing the alkali salt of imidodisulfonic acid to solidify said alkali salt of imidodisulfonic acid; and separating the solidified salt of imidodisulfonic acid from solution.

4,055,624

PROCESS FOR REMOVING NITROGEN OXIDES FROM GASEOUS MIXTURES

Hiroyuki Yoshida, and Katumi Saga, both of Koriyama, Japan, assignors to Hodogaya Chemical Co., Ltd.

Continuation of Ser. No. 510,800, Sept. 30, 1974, abandoned.

This application Sept. 20, 1976, Ser. No. 724,974

Claims priority, application Japan, Oct. 3, 1973, 48-110437

Int. Cl.² C01B 21/00

U.S. Cl. 423—235

7 Claims

1. A process for removing nitrogen oxides from a waste gas containing the nitrogen oxides and sulfur dioxide which comprises the step of contacting said waste gas, first, at a temperature from room temperature to 80° C with an aqueous acid solution consisting essentially of at least one chlorate selected from the group consisting of sodium chlorate, potassium chlorate, ammonium chlorate, calcium chlorate and barium chlorate and 1 to 80% by weight of an inorganic acid, selected from the group consisting of nitric acid, sulfuric acid and hydrochloric acid and then, with a liquid selected from the group consisting of an aqueous solution or dispersion of a basic compound and an aqueous alkaline solution or dispersion of at least one compound selected from the group consisting of alkali metal sulfides, alkali metal sulfites and hydrogen peroxide.

4,055,625

METHOD OF TREATMENT OF A MIXTURE OF AIR AND AT LEAST PARTIALLY RADIOACTIVE RARE GASES

Pierre Faugeras, Versailles; Pierre Lecoq, La Queue-en-Brie; Pierre Miquel, Chatillon; Hubert Rouyer, Antony, and Guy Simonet, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 3, 1975, Ser. No. 592,949

Claims priority, application France, July 31, 1974, 74.26520; Apr. 17, 1975, 75.11965

Int. Cl.² C01B 23/00

U.S. Cl. 423—262

5 Claims

1. A method for treating radioactive effluent gases obtained from reprocessing of irradiated nuclear fuels containing xenon, and krypton which is radioactive in air by treating a mixture thereof also containing oxygen, nitrogen oxides, gaseous carbon dioxide, water vapor, argon and hydrocarbons comprising

- removing nitrogen oxides, gaseous carbon dioxide, water vapor and hydrocarbons contained in said effluent gas mixture therefrom, thereafter
- liquifying the oxygen in said effluent gas mixture and distilling off gaseous nitrogen oxides a portion of the oxygen, and argon contained therein in a cryogenic distillation column thereby forming a concentrated liquified mixture in the lower portion thereof, said concentrated liquified mixture also containing ozone formed from oxygen in the radioactive medium, withdrawing a fraction of said ozone-containing liquified mixture from said distillation column and dissociating said ozone in said liquified mixture and then returning said liquified mixture to said distillation column, and removing a liquified mixture of oxygen containing xenon and krypton from the lower portion of said distillation column, then
- adding hydrogen to said oxygen containing xenon and krypton and catalytically combining said oxygen with said hydrogen to form water and removing said water, to form an admixture of xenon and krypton, and

- iv. cryogenically distilling said admixture of xenon and krypton to distill the krypton as a gas from liquid xenon and recovering said xenon.

4,055,626

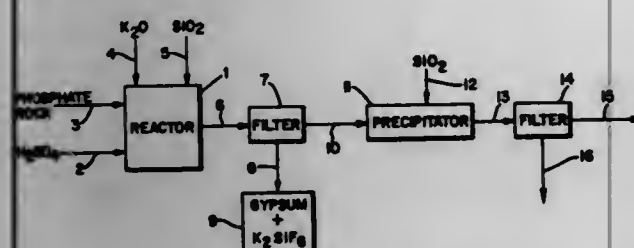
METHOD OF PRODUCING FLUORIDE-FREE PHOSPHORIC ACID

Erhart Karl Drechsel, Houston, Tex., and John B. Sardisco, Shreveport, La., assignors to Pennzoil Company, Shreveport, La.

Filed June 15, 1976, Ser. No. 696,290
Int. Cl.² C01B 25/16

U.S. Cl. 423—320

7 Claims



1. A method for the preparation of phosphoric acid by the steps which comprise:

- reacting a fluorine-containing phosphate rock with sufficient sulfuric acid to acidulate said rock in an acidulation reactor, said reaction being conducted in the presence of:
 - potassium ion provided by addition of a member selected from the group consisting of KH_2PO_4 , KHSO_4 , K_2SO_4 , KOH and mixtures thereof in sufficient amounts to combine with the fluorine liberated from the phosphate rock during acidulation and in a sufficient excess amount that the phosphoric acid recovered from the reaction will contain about 0.5 to 1.0 weight percent potassium ion as K_2O ; and
 - in the presence of a sufficient amount of silicon dioxide to combine with the fluorine liberated during acidulation of the rock and a sufficient excess amount of the silicon dioxide to provide about 0.003 to 0.015 parts of silicon dioxide per part of P_2O_5 in the phosphoric acid recovered;
- forming a resulting slurry of gypsum solids in phosphoric acid and removing the slurry from the acidulation reactor; and
- separating the gypsum solids from the phosphoric acid and recovering gypsum solids containing precipitated potassium silicofluoride and a phosphoric acid solution substantially free of fluorine.

4,055,627

PROCESS FOR TREATING GASES IN THE AMMONIA SYNTHESIS

Mario Guadalupi, Via Tiziano, 18, Milan, Italy

Filed Nov. 13, 1970, Ser. No. 89,343

Claims priority, application Italy, Nov. 15, 1969, 24469/69; May 29, 1970, 25266/70; Aug. 27, 1970, 29055/70

Int. Cl. C01b 2/30

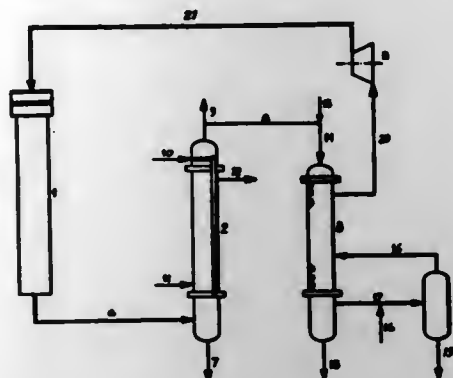
U.S. Cl. 423—359

13 Claims

1. A process for treating the effluent gases from an ammonia synthesis reactor and for recycling such gases with fresh gases to such reactor comprising the following steps:
- absorbing ammonia contained in the effluent gases discharged from the synthesis reactor in the liquid film of a film absorber and obtaining a strong ammonia solution;
 - blending the effluent gases discharged from said liquid film absorber with fresh gases for feed to said reactor into a heat exchanger and condensing the water contained in the blended effluent and fresh gases;
 - removing the condensed water from said heat exchange as a weak ammonia solution;

injecting liquid ammonia into gases discharged from said heat exchanger;

feeding said discharged gases with said liquid ammonia injected therein into a separator and separating from said feed in said separator cooled dry gases and a strong solution of ammonia;



feeding said cooled dry gases from said separator into said heat exchanger to cool and condense the water in the blended effluent and fresh gases being fed into said heat exchanger; and

feeding said blended effluent and fresh gases, after the water contained therein has been condensed, from said heat exchanger to said ammonia synthesis reactor.

4,055,628

METHOD FOR PREPARING GRAPHITE CONTAINING CARBON

John James McCarroll, Camberley; John Trevor Kent Clark, Weybridge, and Stephen Robert Tennison, New Haw, all of England, assignors to The British Petroleum Company Limited, London, England

Continuation-in-part of Ser. No. 606,420, Aug. 21, 1975, abandoned. This application Sept. 22, 1976, Ser. No. 725,586
Claims priority, application United Kingdom, Sept. 2, 1974, 38182/74; Sept. 2, 1974, 38183/74

Int. Cl.² C01B 31/02, 31/04; B01J 21/18

U.S. Cl. 423—448

8 Claims

1. A method for the preparation of a graphite-containing carbon having (1) a basal plane surface area of at least 100 m^2/g ; (2) a ratio of BET surface area to basal plane surface area of not more than 5:1; and (3) a ratio of basal plane surface area to edge surface area of at least 5:1, which method comprises treating a high surface area carbon having a BET surface area of at least 500 m^2/g to the steps of (1) an initial heat treatment in an inert atmosphere at a temperature between 900° C and 3300° C; (2) oxidation stage by heating in an oxidizing atmosphere at a temperature between 300° and 1200° C; and (3) a further heat treatment in an inert atmosphere at a temperature between 1000° C and 3000° C.

4,055,629

PROCESS FOR THE REMOVAL OF SELENIUM COMPOUNDS FROM URETHANE SOLUTIONS

Rudolph Rosenthal, Broomall, and Edward T. Shawl, Wallingford, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 13, 1976, Ser. No. 750,109

Int. Cl.² C01B 19/00; C01G 3/02

U.S. Cl. 423—509

12 Claims

1. A process for the recovery of selenium from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises the steps of:
- contacting the selenium-containing urethane solution at a temperature in the range of from about ambient to about

150° C. with copper (I) chloride at a weight ratio of copper to contained selenium of about 1:10, from about 5 to about 50 parts by weight based on urethane solution treated of an alkyl, aryl or aralkyl amine or alkyl, aryl or substituted aryl nitrile complexing solvent, and oxygen or an oxygen-containing gas at a pressure of from about 0.1 to about 5 atmospheres to form an insoluble copper-selenium compound or complex precipitate in solution;

separating the insoluble precipitated compound or complex from the solution;

treating said insoluble copper-selenium compound or complex with air or oxygen at a temperature of from about 300° C. to 650° C. to convert the selenium to selenium dioxide and the copper to copper oxide to separate selenium and copper; and

recovering said copper oxide and selenium dioxide.

4,055,630

PROCESS FOR THE RECOVERY OF SELENIUM FROM URETHANES CONTAINING SELENIUM OR COMPOUNDS THEREOF

John J. McCoy, Media, and John G. Zajacek, Devon, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 603,998, Aug. 12, 1975. This application Nov. 10, 1976, Ser. No. 740,684
Int. Cl.² C01B 19/00

U.S. Cl. 423—509

6 Claims

1. A process for the recovery of selenium or compounds thereof from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises treating said urethane solution with a mixture of metals and metal oxides at a temperature in the range of from about 25° to 250° C. to retain and remove said selenium or compound thereof from said urethane solution, said metals and metal oxides being selected from metals and oxides of Group IB, IIB, VIB and VIIIB metals of the Periodic Table of Elements, recovering the treated urethane solution, and subjecting the mixture of metal and metal oxide with retained selenium or compounds thereof to treatment with air or oxygen at a temperature of from 250° to 800° C. and pressures of up to 50 atmospheres to convert the selenium to selenium dioxide, and recovering said selenium dioxide from said mixture of metal and metal oxide for reuse in said selenium catalyzed reaction.

4,055,631

PRODUCTION OF IRON SULFATE MONOHYDRATE

Patrick J. McGauley, Port Washington, N.Y., and Abraham A. Dor, Lakewood, Ohio, assignors to The Hanna Mining Company, Cleveland, Ohio

Continuation of Ser. No. 410,217, Oct. 26, 1973, abandoned, which is a division of Ser. No. 113,553, April 13, 1971, Pat. No. 3,860,696. This application Dec. 15, 1975, Ser. No. 640,939

Int. Cl.² C01G 49/14

U.S. Cl. 423—558

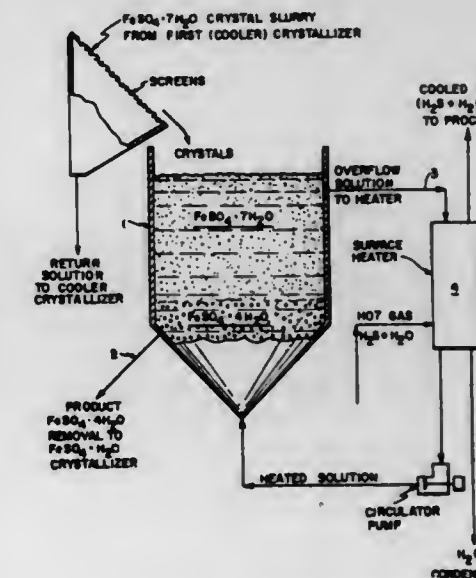
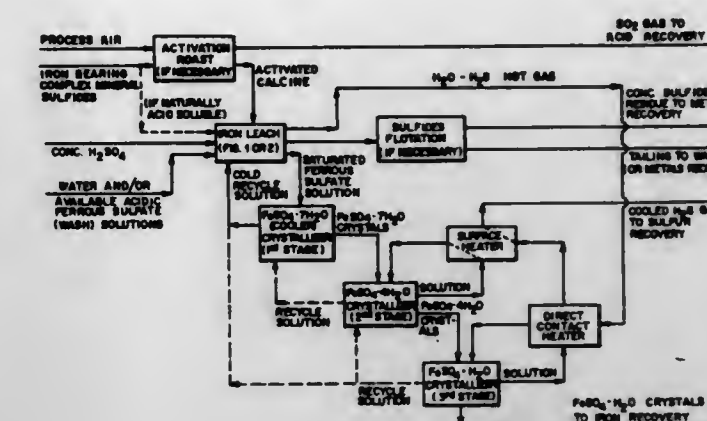
6 Claims

1. The process for producing high purity crystals of ferrous sulfate monohydrate from a purified solution that is essentially saturated with ferrous sulfate at temperatures of 50° to 80° C. which comprises the steps of:
- cooling the solution to a temperature below about 50° C. to precipitate crystals of ferrous sulfate heptahydrate,
 - separating the crystals of ferrous sulfate heptahydrate from the solution at a temperature below about 50° C.,
 - pulping the crystals of ferrous sulfate heptahydrate in a hot purified aqueous solution that is essentially saturated with ferrous sulfate to produce a high density slurry of crystals,
 - heating the slurry of crystals to a temperature of from

about 56.5° to about 64.8° C. to dehydrate a fraction of the crystals from $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ to $\text{FeSO}_4 \cdot 4\text{H}_2\text{O}$,

e. separating the crystals of $\text{FeSO}_4 \cdot 4\text{H}_2\text{O}$ from the slurry,

f. pulping the crystals of $\text{FeSO}_4 \cdot 4\text{H}_2\text{O}$ in a hot purified aqueous solution that is essentially saturated with ferrous sulfate to produce a second high density slurry of crystals,



- heating the second slurry with hot gases to a temperature above 65° C. to evaporate the water and to produce dry solids that are essentially pure crystals of ferrous sulfate monohydrate, and
- collecting the crystals of ferrous sulfate monohydrate as product of the process.

4,055,632

CONTROLLABLE GAS GENERATOR

Robert T. Hoffman, and Roger W. Buecher, both of Kailua, Hawaii, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1976, Ser. No. 753,026

Int. Cl.² C01B 1/05; B01J 7/02

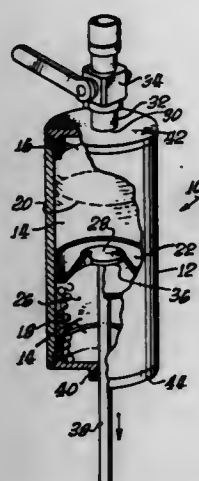
U.S. Cl. 423—657

6 Claims

1. A gas generator comprising:
- an elongated container having a top and a bottom; first and second liquids and pellets, the pellets being non-reactive with and floatable in the first liquid and reactive with and nonfloatable in the second liquid;
 - the first and second liquids being disposed in the container, and the first liquid being denser than the second liquid so that the first and second liquids form an interface;
 - a partition mounted in the container below the level of said interface for dividing the container into top and bottom compartments;
 - the pellets being disposed in the bottom compartment with the first liquid;
 - valve means mounted in the partition for dispensing the pellets,
 - whereby upon opening the valve means pellets will exit therethrough and ascend in the first liquid to said interface

where the pellets will react with the second fluid to generate the gas.

A method of generating gas comprising the steps of: providing liquid freon and water and sodium borohydride pellets, the pellets being nonreactive with and floatable in the freon and reactive with and nonfloatable in the water;



containing the liquid freon and water together so that the liquids interface with the freon below the water; disposing the pellets in the liquid freon below said interface; and dispensing the pellets from the liquid freon so that the dispensed pellets will float upwardly to said interface and react with the water to generate gas.

4,055,633

IMMUNOASSAY FOR THYMPOIETIN

Gideon Goldstein, Riverdale, N.Y., assignor to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed July 28, 1976, Ser. No. 709,565

Int. Cl.² A61K 43/00; G01N 33/16; G21H 5/02

U.S. Cl. 424—1 18 Claims

11. A method for the assay of thymopoietin in a sample, which method comprises mixing said sample with a known amount of labeled thymopoietin and an antibody which will selectively complex with said thymopoietin, separating the resulting antibody-antigen complex from the supernatant, measuring the degree of binding of the said labeled thymopoietin in said complex and determining the amount of thymopoietin present in said sample by comparing said degree of binding to a standard curve obtained by mixing known amounts of thymopoietin with fixed amounts of said labeled thymopoietin and said antibody and determining the degree of binding for each known amount of thymopoietin.

4,055,634

ANTIPERSPIRANTS

Wolf Brenner, Fullinsdorf; Gustav Erlemann, Basel, and Horst Pauling, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

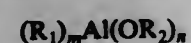
Filed Feb. 11, 1975, Ser. No. 549,241

Claims priority, application Switzerland, Feb. 22, 1974, 1538/74; Dec. 3, 1974, 16014/74

Int. Cl.² A61K 7/38; C07F 5/06

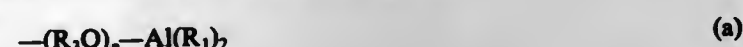
U.S. Cl. 424—47 14 Claims

1. An antiperspirant/deodorant composition which contains (a) a compatible cosmetically acceptable aerosol propellant and (b) as the active ingredient 1% to 30% by weight of one or a mixture of compounds represented by the formula



wherein m and n each are 1 or 2 and the sum of m and n is 3; R_1 is alkyl containing from 2 to 30 carbon atoms; R_2 is substituted and unsubstituted radicals selected from the group consisting of alkyl containing from 1 to 20 carbon atoms, cycloalkyl containing 5 or 6 carbon atoms, alkenyl containing

from 1 to 20 carbon atoms, cycloalkenyl containing 5 to 6 carbon atoms, aryl having 1 or 2 aromatic nuclei, alkanoyl containing from 20 to 30 carbon atoms, alkenoyl containing from 2 to 30 carbon atoms and aroyl having 1 to 2 aromatic nuclei; wherein the substituents on R_2 when R_2 is selected from the group consisting of alkyl, alkenyl, alkanoyl and alkenoyl and mixtures thereof are one or more of cycloalkyl containing 5 or 6 carbon atoms, cycloalkenyl containing 5 or 6 carbon atoms, atoms substituted cycloalkenyl containing 5 or 6 carbon atoms, aryl containing 1 or 2 aromatic nuclei, alkoxy containing 1 to 20 carbon atoms, cycloalkoxy containing 5 or 6 carbon atoms, cycloalkenyloxy containing 5 or 6 carbon atoms, aryloxy containing 1 or 2 aromatic nuclei, alkyl containing 1 to 20 carbon atoms and mixture thereof, substituted aryl containing 1 or 2 aromatic nuclei, cycloalkenyloxy containing 5 or 6 carbon atoms or aryloxy containing 1 or 2 aromatic nuclei; and wherein the substituents on R_2 when R_2 is the said cycloalkyl, cycloalkenyl, aryl and aroyl groups are one or more of alkyl containing 1 to 20 carbon atoms, alkoxy containing 1 to 20 carbon atoms or aryl containing 1 or 2 aromatic nuclei; and when R_2 is phenyl, two adjacent alkyl and alkoxy substituents and mixture thereof on the phenyl can be joined to form a 5- or 6-membered saturated ring; when m is 2 and n is 1, R_2 can be



wherein R_1 has the significance above and each R_1 can be the same or different, R_3 is a straight chain alkylene of 2 to 4 carbons and p is 0, 1 or 2; when m is 1 and n is 2, R_2 has the significance above and each R_2 can be the same or different or when one R_2 is alkyl the other R_2 can be



wherein R_1 has the significance above and R_4 is alkyl containing 1 to 20 carbon atoms.

4,055,635

FIBRINOLYTIC COMPOSITIONS

Joseph Green, London, and Michael Anthony Cawthorne, Hordsham, both of England, assignors to Beecham Group Limited, England

Filed July 2, 1974, Ser. No. 485,302

Claims priority, application United Kingdom, July 5, 1973, 32071/73

Int. Cl.² A61K 31/74, 37/48

U.S. Cl. 424—78 9 Claims

1. A fibrinolytic pharmaceutical composition in unit dosage form suitable for administration by injection to humans which comprises an amount of a water soluble complex of a proteolytic enzyme sufficient to achieve the desired degree of fibrinolysis on administration to a human and linked covalently to a water-soluble polymeric substance having a molecular weight of from 10,000 to 500,000, said enzyme and said polymeric substance being present in the ratio of 1:2 to 1:50 said composition being substantially free of unreacted enzyme.

4,055,636

N²-ALKOXYNAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

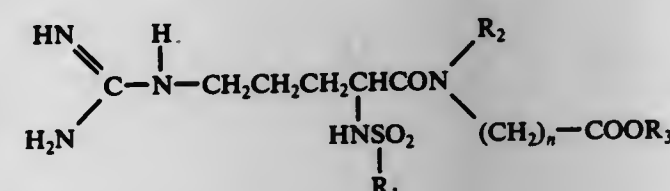
Shosuke Okamoto, Kobe; Ryoji Kikumoto; Kazuo Ohkubo, both of Tokyo; Tohru Tezuka, Yokohama; Shinji Tonomura, Tokyo; Yoshikuni Tamao, Yokohama, and Akiko Hijikata, Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo and Shosuke Okamoto, Kobe, both of Japan

Continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Dec. 9, 1975, Ser. No. 638,985

Int. Cl.² A61K 37/00; C07C 103/52

U.S. Cl. 424—177 10 Claims

1. N²-alkoxynaphthalenesulfonyl-L-argininamides having the formula:



and the pharmaceutically acceptable salts thereof, wherein R_1 is a naphthyl substituted with at least one C_1 - C_3 alkoxy; R_2 is C_2 - C_{10} alkyl or C_2 - C_{10} alkoxyalkyl; R_3 is hydrogen or C_1 - C_{10} alkyl; and n is an integer of 1, 2 or 3.

4,055,637

MEDICINAL PREPARATION FOR HEALING WOUNDS AND TREATING DERMATITIS USING 1-(CHLOROMETHYL)SILATRANE

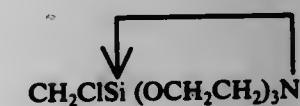
Mikhail Grigorovich Voronkov, ulitsa Lermontova, 315, kv.32; Ada Timofeevna Platonova, ulitsa Lermontova, 313, kv.31; Ijudmila Andreevna Mansurova, ulitsa Lermontova, 333, kv.153; Igor Georgievich Kuznetsov, ulitsa Lermontova, 325, kv.36, all of Irkutsk; Gunar Izidorovich Zelchan, ulitsa Moskovskaya, 256/4, kv.11, Riga, and Valery Mikhailovich Dyakov, ulitsa Lermontova, 263, kv.23, Irkutsk, all of U.S.S.R.

Filed Aug. 15, 1975, Ser. No. 605,202

Int. Cl.² A61K 31/695

U.S. Cl. 424—184 2 Claims

1. A method for healing wounds in patients which comprises topically administering to a patient in need of such treatment a wound-healing effective amount of a medicinal composition containing from 1 to 5% by weight of 1-(chloromethyl)silatrane of the formula



in a pharmaceutical carrier selected from the group consisting of lanolin-petroleum jelly and vegetable oil.

4,055,638

NOVEL COMPOUNDS, COMPOSITIONS CONTAINING SUCH COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND METHODS OF TREATMENT

Bertil Högborg; Hans Fex; Torsten Perklev; Sten Veige, all of Helsingborg, and Bo Fredholm, Nyhamnsåge, all of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

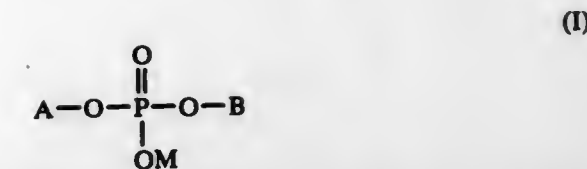
Division of Ser. No. 280,211, Aug. 14, 1972, Pat. No. 3,989,825. This application July 23, 1976, Ser. No. 708,187

Claims priority, application United Kingdom, Aug. 17, 1971, 38578/71; Jan. 31, 1972, 4510/72

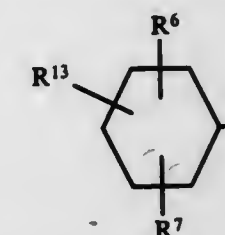
Int. Cl.² C07F 9/09; A01N 9/36

U.S. Cl. 424—219 20 Claims

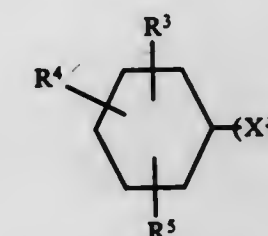
1. A novel secondary phosphoric acid ester compound having the general formula



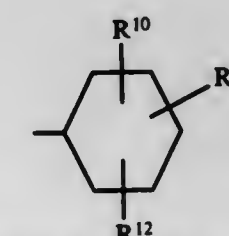
wherein M is selected from the group consisting of hydrogen and a pharmaceutically acceptable inorganic and organic cation, and wherein A and B, independent of each other, are



wherein one and only one of the substituents R^6 , R^7 , and R^{13} always represents a group R, located in any of the ortho, meta and para positions relative to the phosphoric acid ester group, the group R having the formula



wherein q is selected from the group consisting of zero and one, and wherein X is selected from the group consisting of: straight saturated hydrocarbon chains having at most 4 carbon atoms; and straight hydrocarbon chains having 2 to 4 carbon atoms and containing one double bond; wherein X above may be substituted by at most two substituents selected from the group consisting of: lower alkyl; cyclopentyl; cyclohexyl; phenyl; phenyl substituted in m- or p- position by one substituent selected from the group consisting of lower alkyl, —F, —Cl, and —Br; benzyl; and benzyl substituted in m- or p- position by one substituent selected from the group consisting of lower alkyl, —F, —Cl, and —Br, with the proviso that not more than one substituent selected from the group consisting of: cyclopentyl; cyclohexyl; phenyl; substituted phenyl; benzyl; and substituted benzyl is present in X; wherein B in the general formula (I) above also may be selected from the group consisting of: 1- and 2- naphthyl, both naphthyls being at most di-substituted; and



wherein the substituents in B, when B is naphthyl, are selected from the group consisting of lower alkyl, —F, —Cl, and —Br; wherein R^3 , R^4 , R^5 , R^6 , R^7 , R^{10} , R^{11} , R^{12} , and R^{13} above are selected from the group consisting of: hydrogen; lower alkyl; —F; —Cl; and —Br; with the proviso that when $B = A$, resulting in symmetric secondary phosphoric acid esters, and q is zero, at least two of R^3 , R^4 , R^5 , R^6 , R^7 , and R^{13} are substituents other than hydrogen.

2. A method of treating a living animal body suffering from the actions of an excessive formation and release of endogenous prostaglandin or exposure to exogenous prostaglandin comprising administration of a therapeutically effective amount of a compound of claim 1 to said animal body.

4,055,643

FURO(3,4-c)-AS-TRIAZINES AND CORRESPONDING 4-OXIDES AS SLEEP INDUCERS AND MINOR TRANQUILIZERS

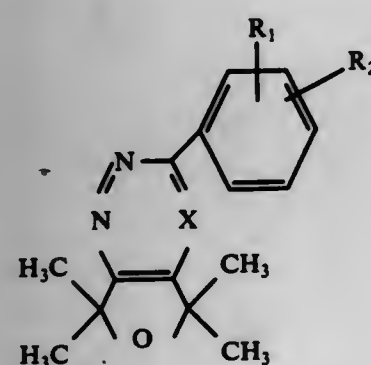
Gregory B. Bennett, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 586,349, June 12, 1975, Pat. No. 3,963,713, which is a continuation-in-part of Ser. No. 541,721, Jan. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 496,578, Aug. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 465,759, May 1, 1974, abandoned. This application Mar. 10, 1976, Ser. No. 665,775 Int. Cl.² A61K 31/53

U.S. Cl. 424-249

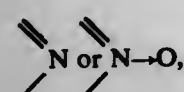
3 Claims

1. A method of inducing sleep in animals which comprises administering to an animal in need of such treatment a sleep-inducing effective amount of a compound of the formula



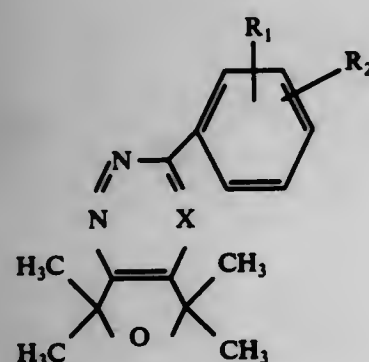
wherein

R₁ and R₂ each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, straight chain lower alkoxy, amino, nitro or trifluoromethyl, and X represents



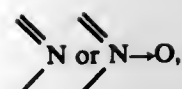
provided that

- when one of R₁ and R₂ represents nitro, the other is other than nitro or trifluoromethyl;
 - when R₁ and R₂ represent trifluoromethyl, they are on other than adjacent carbon atoms, and
 - when R₁ and R₂ represent t-butyl, they are on other than adjacent carbon atoms, and
 - when one of R₁ and R₂ is trifluoromethyl and the other is t-butyl, they are on other than adjacent carbon atoms.
2. A pharmaceutical composition for use in treating tension or inducing sleep comprising a therapeutically effective amount of a compound of the formula



wherein

R₁ and R₂ each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, straight chain lower alkoxy, amino, nitro or trifluoromethyl, and X represents



provided that

- when one of R₁ and R₂ represents nitro, the other is other than nitro or trifluoromethyl;
- when R₁ and R₂ represent trifluoromethyl, they are on other than adjacent carbon atoms, and
- when R₁ and R₂ represent t-butyl, they are on other than adjacent carbon atoms, and
- when one of R₁ and R₂ is trifluoromethyl and the other is t-butyl, they are on other than adjacent carbon atoms, in association with a pharmaceutically acceptable diluent or carrier therefor.

4,055,644

HYDROXYALKYL**SUBSTITUTED-4,5-DIHYDROPYRIDAZIN(2H)-3-ONES**

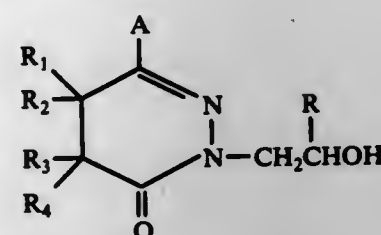
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 409,653, Oct. 25, 1973, Pat. No. 3,931,176, which is a continuation-in-part of Ser. No. 366,670, June 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 182,159, Sept. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 166,565, July 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 88,976, Nov. 20, 1970, abandoned. This application Sept. 18, 1975, Ser. No. 614,539 Int. Cl.² C07D 237/04; A61K 31/50

U.S. Cl. 260-250 AH

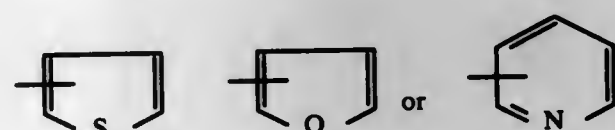
4 Claims

1. A compound of the formula



where

R is lower alkyl having 1 or 4 carbon atoms, R₁, R₂, R₃ and R₄ each independently represent hydrogen or lower alkyl having 1 to 4 carbon atoms, and represents



4,055,645

NOVEL ANTI-HYPERTENSIVE COMPOSITIONS
Alexander Scriabine, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 13, 1976, Ser. No. 657,825

Int. Cl.² A61K 31/50, 31/15

U.S. Cl. 424-250

5 Claims

1. A pharmaceutical composition for treating hypertension comprising effective amounts of
- hydralazine or a pharmaceutically acceptable salt thereof and
 - racemic mixture or L-isomer of a hydrazino phenyl propionic acid decarboxylase inhibitor,
- wherein the weight ratio of (a):(b) is 1:1 to about 1:1000.

4,055,646

1-(5-NITROTHIAZOLYL-2)-3-(PIPERAZINOMETHYL)-IMIDAZOLIDINONES-2 AND CORRESPONDING IMINO AND THIONES

Gerd Ascher, and Hellmuth Reinshagen, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

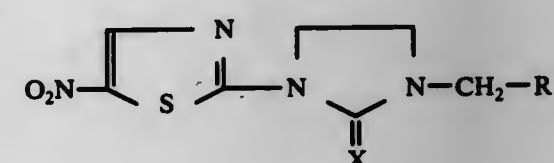
Filed Feb. 6, 1976, Ser. No. 655,729

Claims priority, application Switzerland, Feb. 13, 1975, 1773/75

Int. Cl.² C07D 417/14; A61K 31/495

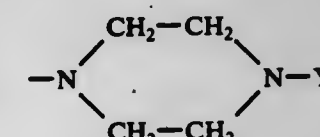
U.S. Cl. 424-250

1. A compound of formula I,



in which

X is oxygen, sulphur or imino, and R₁ is



wherein y is alkyl of 1 to 4 carbon atoms or monohydroxy alkyl of 1 to 4 carbon atoms, or chemotherapeutically acceptable acid addition salts thereof.

6. A chemotherapeutic composition consisting essentially of a compound of claim 1 in association with a chemotherapeutically acceptable diluent or carrier.

7. A method of treating schistosomiasis, trichomiasis or coccidiosis or of inhibiting bacterial growth, consisting essentially of administering to a subject in need of such treatment an effective amount of a compound of claim 1.

4,055,647

CONDENSED PYRROLE MERCAPTO COMPOUNDS HAVING HYPOTENSIVE AND DECONGESTANT PROPERTIES

Vishva Prakash Arya, and Kuppuswamy Nagarajan, both of Bombay, India, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 478,197, June 11, 1974, Pat. No. 3,954,757. This application Dec. 19, 1975, Ser. No. 642,503

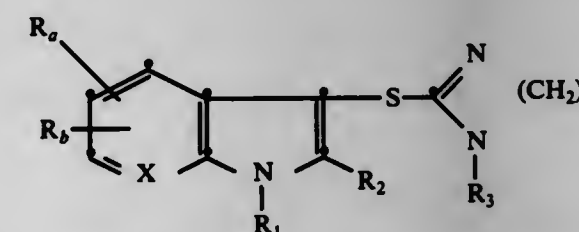
Claims priority, application Switzerland, June 14, 1973, 8609/73

Int. Cl.² A61K 31/505

U.S. Cl. 424-251

3 Claims

1. A pharmaceutical composition having vasoconstrictor and blood pressure lowering properties comprising a therapeutically effective amount of a compound of formula Ia



wherein X is nitrogen or the group CH, and each of R₁ and R₂ is hydrogen, lower alkyl, halogen or a lower alkoxy group, each of R₃ and R₄ independently is hydrogen or a lower alkyl group, R₅ is hydrogen, lower alkyl, a free carboxy group of a methoxy- or ethoxycarbonyl group and n is an integer denot-

ing 2-4, or its tautomers or acid addition salts together with a pharmaceutically acceptable carrier.

4,055,648

PAPAVERINE THIENYL-CARBOXYLATES AND MEDICAMENTS CONTAINING THEM

Edgar Sache, Bures-sur-Yvette, France, assignor to Choay S.A., Paris, France

Filed Jan. 15, 1975, Ser. No. 541,279

Claims priority, application France, Jan. 16, 1974, 74.01460 Int. Cl.² A61K 31/485; C07D 217/20

U.S. Cl. 424-260

18 Claims

1. The papaverine compounds selected from the group consisting of: papaverine thienyl-2-carboxylate and papaverine thienyl-3-carboxylate.

4,055,649

4-ALKYL-2,6-DI-(SECONDARY OR TERTIARY ALKYL)AMINO-3-FORMYLPYRIDINES PHARMACEUTICAL COMPOSITIONS THEREOF AND THEIR USE IN THE TREATMENT OF OBESITY AND DIABETES

William R. Simpson, Mendham, and Robert J. Strohschein, Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

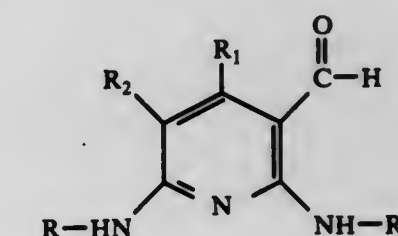
Filed Feb. 5, 1976, Ser. No. 655,428

Int. Cl.² A61K 31/44; C07D 213/74

U.S. Cl. 424-263

18 Claims

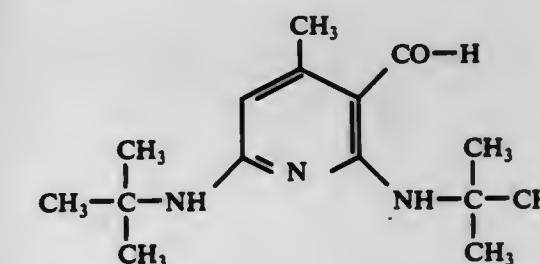
1. A compound of the formula



wherein

R is secondary alkyl of 3 to 7 carbon atoms or tertiary alkyl of 4 to 7 carbon atoms, R' is secondary alkyl of 3 to 7 carbon atoms or tertiary alkyl of 4 to 7 carbon atoms, R₁ is primary or secondary alkyl of 1 to 5 carbon atoms, and R₂ is hydrogen, chloro or bromo, or a pharmaceutically acceptable acid addition salt thereof.

7. A pharmaceutical composition comprising an effective amount of a compound according to claim 1, or a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier, said amount being an amount effective for the treatment of obesity or diabetes.

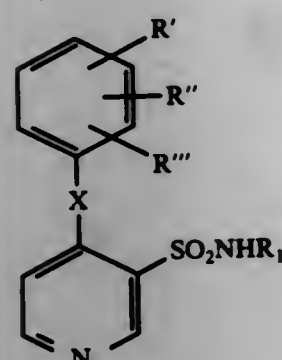


4,055,650
CERTAIN 4-PHENOXY(OR
PHENYLTHIO)-3-N-ACYLATED-SULFONAMIDO-PYRI-
DINES

Jacques E. Delarge, Dolembreux; Charles L. Lapiere, Tongeren, and Andre H. Georges, Ottignies, all of Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium
Continuation-in-part of Ser. No. 568,759, April 16, 1975, Pat. No. 4,018,929. This application June 9, 1976, Ser. No. 694,421
Claims priority, application United Kingdom, Apr. 17, 1974, 16836/74

Int. Cl.² C07D 213/71; A61K 31/44
U.S. Cl. 424-263

1. A compound of the following structure:



in which X represents an oxy or thio group; R₁ represents a group of the formula:



wherein R₃ represents a C₁-C₄-alkyl, cyclohexyl, unsubstituted phenyl or substituted phenyl group, or R₁ represents a group of the formula:



wherein R₄ represents a C₁-C₄-alkyl group or an unsubstituted or substituted phenyl group; R', R'' and R''' represent each hydrogen or a substituent selected from the group comprising the halogen atoms, the trifluoromethyl group and the C₁-C₄-alkyl groups, as well as the pyridine N-oxide of the compounds of Formula I and the pharmaceutically acceptable base and acid addition salts of said compounds.

5. Pharmaceutical compositions containing a hypo-uricemic or hypo-lipemic effective amount of at least one compound according to claim 1 as active ingredient, together with a pharmaceutical carrier or vehicle.

4,055,651
N²-ALKOXYNAPHTHALENESULFONYL-L-ARGININA-
MIDES AND THE PHARMACEUTICALLY ACCEPTABLE
SALTS THEREOF

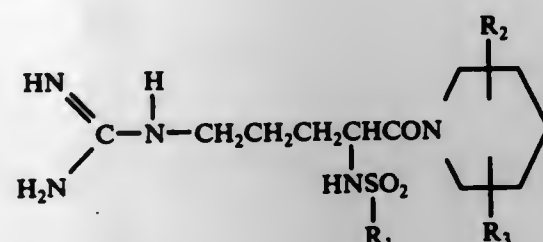
Shosuke Okamoto, Kobe; Ryoji Kikumoto; Kazuo Ohkubo, both of Tokyo; Tohru Tezuka, Yokohama; Shinji Tonomura, Tokyo; Yoshikuni Tamao, Yokohama, and Akiko Hijikata, Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Ltd. and Shosuke Okamoto, both of Japan
Continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 28, 1976, Ser. No. 653,217

6 Claims
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-23268; Feb. 26, 1975, 50-23635; Mar. 5, 1975, 50-26768; Mar. 11, 1975, 50-29357; Mar. 11, 1975, 50-29358

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

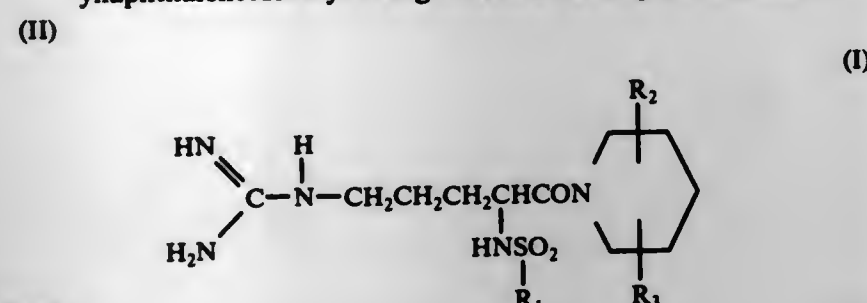
Int. Cl.² A61K 31/445; C07D 211/60

(I) U.S. Cl. 424-267 12 Claims
1. An N²-alkoxynaphthalenesulfonyl-L-argininamide having the formula:



and the pharmaceutically acceptable salts thereof, wherein R₁ is naphthyl substituted with at least one C₁-C₅ alkoxy; R₂ is hydrogen or C₁-C₁₀ alkyl; R₃ is -COOR₄ wherein R₄ is selected from the group consisting of hydrogen, C₁-C₁₀ alkyl, C₆-C₁₀ aryl and C₇-C₁₂ aralkyl; R₂ can be substituted at the 2, 3, 4, 5 or 6 — position; and R₃ is substituted at the 2 or 3 — position.

12. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a patient a pharmaceutically effective amount of an N²-alkoxynaphthalenesulfonyl-L-argininamide having the formula:



or the pharmaceutically acceptable salts thereof, wherein R₁ is naphthyl substituted with at least one C₁-C₅ alkoxy; R₂ is hydrogen or C₁-C₁₀ alkyl; R₃ is -COOR₄ wherein R₄ is selected from the group consisting of hydrogen, C₁-C₁₀ alkyl, C₆-C₁₀ aryl and C₇-C₁₂ aralkyl; R₂ can be substituted at the 2, 3, 4, 5 or 6 — position; and R₃ is substituted at the 2 or 3 position.

4,055,652
1-[β(R-THIO)PHENETHYL]IMIDAZOLES AND
DERIVATIVES THEREOF

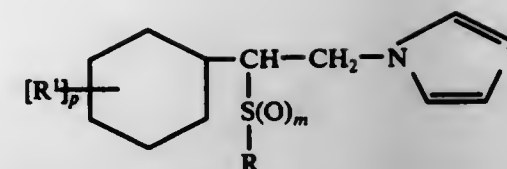
Keith A. M. Walker, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 593,620, July 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 508,384, Sept. 23, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,453

Int. Cl.² C07D 233/60; A61K 31/415

U.S. Cl. 424-273 R 46 Claims
1. A compound of the formula:

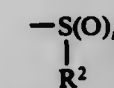
R¹ is hydrogen, halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro, cyano, thiocyno or the group



and the antimicrobial acid addition salts thereof, wherein:

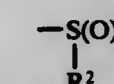
R is alkyl, alkenyl, aralkenyl, substituted aralkenyl, alkynyl, cycloalkyl, cycloalkyl alkyl, aralkyl, substituted aralkyl, aryl or substituted aryl, said substituted aralkenyl and substituted aralkyl containing at least one substituent on the aryl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro and cyano and said substituted aryl containing at least one substituent selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro, amino alkanoylamino and cyano;

R¹ is hydrogen, halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro, cyano, thiocyno or the group



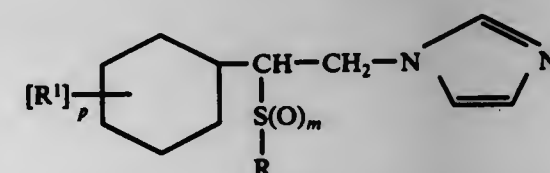
in which R² is alkyl, cycloalkyl, aralkyl, substituted aralkyl, aryl or substituted aryl, and substituted aralkyl and said substituted aryl containing at least one substituent on the aryl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro and cyano;

and wherein with reference to the above, alkyl has 1 to 20 carbon atoms, cycloalkyl has 5 to 8 carbon atoms, cycloalkyl has 6 to 11 carbon atoms, alkenyl and alkynyl have 2 to 12 carbon atoms, aryl has 6 to 10 carbon atoms, aralkyl has 7 to 14 carbon atoms, aralkenyl has 8 to 14 carbon atoms, lower alkyl and lower alkoxy have 1 to 6 carbon atoms and alkanoylamino has 2 to 12 carbon atoms; m, n and p are independently selected from the integers zero, 1 and 2; provided that the value of m cannot be greater than the value of n except when R¹ is the group



and R² is aryl or substituted aryl.

44. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing, or subject to attack by fungi, bacteria or protozoa, an effective amount of a compound of the formula



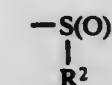
or an antimicrobial acid addition salt thereof or a composition containing same as an active ingredient, wherein:

R is alkyl, alkenyl, aralkenyl, substituted aralkenyl, alkynyl, cycloalkyl, cycloalkyl alkyl, aralkyl, substituted aralkyl, aryl or substituted aryl, said substituted aralkenyl and substituted aralkyl containing at least one substituent on the aryl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro and cyano and said substituted aryl containing at least one substituent selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro, amino alkanoylamino and cyano;

in which R² is alkyl, cycloalkyl, aralkyl, substituted aralkyl, aryl or substituted aryl, said substituted aralkyl and said substituted aryl containing at least one substituent on the aryl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro and cyano;

and wherein with reference to the above, alkyl has 1 to 20 carbon atoms, cycloalkyl has 5 to 8 carbon atoms, cycloalkyl alkyl has 6 to 11 carbon atoms, alkenyl and alkynyl have 2 to 12 carbon atoms, aralkyl has 7 to 14 carbon atoms, aralkenyl has 8 to 14 carbon atoms, lower alkyl and alkoxy have 1 to 6 carbon atoms and alkanoylamino has 2 to 12 carbon atoms;

m, n and p are independently selected from the integers zero, 1 and 2; provided that the value of m cannot be greater than the value of n except when R¹ is the group



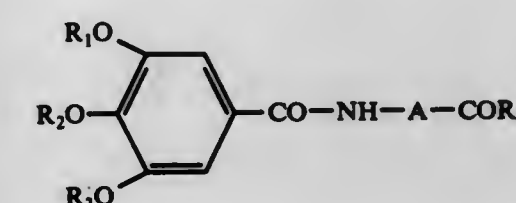
and R² is aryl or substituted aryl.

4,055,653
SULFUR CONTAINING TRIALKOXYBENZOYLAMINO
CARBOXYLIC ACIDS

Heribert Offermanns, Grossauheim, and Klaus Posselt, Wachberg-Villiprot, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation-in-part of Ser. No. 468,087, May 8, 1974, Pat. No. 3,981,910. This application May 18, 1976, Ser. No. 687,504
Claims priority, application Austria, May 15, 1973, 4232/73
Int. Cl.² A61K 31/24, 31/38, 31/195

U.S. Cl. 424-275 46 Claims
1. A pharmaceutical composition having antiischemic activity comprising (1) an effective amount of a compound of the formula;



wherein:

A is alkylidene having 2 to 5 carbon atoms and which is substituted by alkyl thio having 1 to 4 carbon atoms, carboxymethyl thio group, carboxyethyl thio, alkylsulfonyl having 1 to 4 carbon atoms, or mercapto, or the substituent on A together with -COR₄ forms a 4 to 7 membered thiolactone ring, or A is substituted by an acylmercapto wherein the acyl is benzoyl, benzoyl substituted with one, two or three alkoxy groups with 1 to 6 carbon atoms, alkanoyl of one to six carbon atoms, alkenoyl of 3 to 6 carbon atoms, at least two of R₁, R₂ and R₃ are alkyl of 1 to 5 carbon atoms and the other R₁, R₂ and R₃ is alkyl of 1 to 5 carbon atoms, hydrogen or the acyl of alkanoyl acid of 2 to 4 carbon atoms and R₄ is hydroxy or alkoxy with 1 to 5 carbon atoms and their pharmaceutically acceptable salts and (2) a pharmaceutically acceptable adjuvant.

4,055,654

6,8-DI-T-BUTYL-4-OXO-4H-1-BENZOPYRAN-2-CARBOXYLIC ACID AND DERIVATIVE FOR THE PREVENTION OF ASTHMATIC SYMPTOMS

Hugh Cairns, Albert Chambers, and Thomas Brian Lee, all of Loughborough, England, assignors to Fisons Limited, England Division of Ser. No. 382,642, July 26, 1973, Pat. No. 3,952,104, which is a division of Ser. No. 172,214, Aug. 16, 1971, Pat. No. 3,786,071. This application Jan. 2, 1976, Ser. No. 646,025 Claims priority, application United Kingdom, Aug. 25, 1970, 40777/70; Sept. 15, 1970, 43984/70; Dec. 11, 1970, 58860/70; June 3, 1971, 18807/71

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.² A61K 31/35

U.S. Cl. 424—283

4 Claims

1. A composition useful for the prevention of asthmatic symptoms comprising an amount useful for the prevention of asthmatic symptoms of 6,8-di-t-butyl-4-oxo-4H-1-benzopyran-2-carboxylic acid or a pharmaceutically acceptable salt, lower alkyl ester, ester with a di-lower alkylamine substituted lower alcohol, bis ester with a di-(hydroxy lower alkyl) ether or unsubstituted amide thereof, as active ingredient, in combination with a pharmaceutically acceptable carrier.

4,055,655

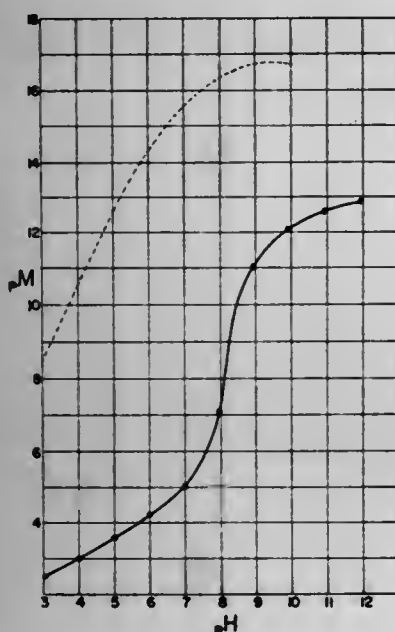
COMPLEXES OF HEAVY METAL IONS AND POLYFUNCTIONAL ORGANIC LIGANDS USED AS ANTIMICROBIAL AGENTS

Gerald L. Maurer, Fairfield, and Sudhir K. Shringarpurey, Cincinnati, both of Ohio, assignors to National Research Laboratories, Cincinnati, Ohio

Filed July 21, 1975, Ser. No. 597,756
Int. Cl.² A01N 9/00

U.S. Cl. 424—294

14 Claims



1. A method of controlling microbes in a medium conducive to microbial growth which comprises contacting said microbes or said medium with an effective antimicrobial amount of a metal complex of a heavy metal ion and a polyfunctional organic ligand in a ratio of 1:1 of the metal ion to the ligand, said ligand selected from the group consisting of an organic acid and a substituted organic acid, said complex having an aqueous proton induced dissociation property represented by a sigmoidally-shaped curve on a cartesian coordinate plot of the negative log of the metal ion concentration versus the negative log of the hydrogen ion concentration, said dissociation property causing the controlled release of metal ions at a pH compatible with the viability of microbes in said medium.

4,055,656

METHOD OF CONTROLLING PEA APHIDS

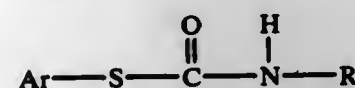
Jay Kent Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 30, 1976, Ser. No. 701,382
Int. Cl.² A01N 9/12; C07C 155/00

U.S. Cl. 424—300

4 Claims

1. A method of effectively controlling insects of the genus Acrythosiphum, which comprises bringing the insects into contact with an effective amount to effectively control said insect of a composition represented by the general formula:



wherein:

Ar is an aryl selected from the group consisting of: 4-chlorophenyl, 4-nitrophenyl, 2-chlorophenyl, 4-bromophenyl, 4-fluorophenyl, 3,4-dichlorophenyl, 3,4-dibromophenyl, 3,4-xylyl, 3-alkylphenyl in which the alkyl has from one to four carbon atoms, 4-alkylphenyl in which the alkyl has from one to four carbon atoms, 3-alkoxyphenyl in which the alkoxy has from one to four carbon atoms, 4-alkoxyphenyl in which the alkoxy has from one to four carbon atoms, 3-alkylthiophenyl in which the alkylthio has from one to four carbon atoms, and 4-alkylthiophenyl in which the alkylthio has from one to four carbon atoms; and

R is a cycloalkyl selected from the group consisting of cyclopropyl, 2-methylcyclopropyl, cyclobutyl, cyclopentyl, 2-methylcyclopentyl and cyclohexyl.

4,055,657

METHODS FOR CONTROLLING FUNGI

Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

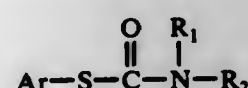
Filed July 6, 1976, Ser. No. 702,563
Int. Cl.² A01N 9/12; C07C 155/00

U.S. Cl. 424—300

13 Claims

1. A method of controlling the deleterious effects of a fungus selected from the group consisting of Phytophthora and Pythium ultimum which comprises:

contacting the fungus with an effective amount of a compound to control the deleterious effects of said fungus, said compound having a general formula:



wherein:

Ar is selected from the group consisting of 4-nitrophenyl, 4-bromophenyl, 4-fluorophenyl, 3,4-dichlorophenyl, 3,4-dibromophenyl, and 2-chlorophenyl;

R₁ is selected from the group consisting of hydrogen, an alkyl of from one to four carbon atoms; and

R₂ is selected from the group consisting of an alkyl of one to four carbon atoms.

4,055,658

CYANOMETHYLPHENETHANOLAMINES

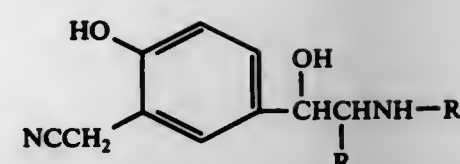
William E. Kreighbaum, William L. Matier, and Herbert R. Roth, all of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed May 17, 1976, Ser. No. 687,435
Int. Cl.² A61K 31/275; C07C 121/80

U.S. Cl. 424—304

10 Claims

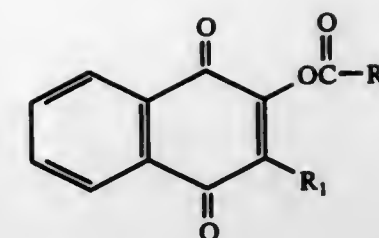
1. A compound selected from the group of phenethanolamines of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein

R is hydrogen, methyl or ethyl;

R₁ is hydrogen or a radical selected from the group consisting of straight or branched chain lower alkyl of 1 to 6 carbon atoms inclusive, straight or branched chain lower alkyl of 1 to 6 carbon atoms substituted by phenyl, phenoxy, substituted phenyl or substituted phenoxy wherein said phenyl or phenoxy substituent is hydroxy, methoxy, or halogen.



wherein

R₁ is alkyl of 8-14 carbon atoms which are branched, cyclic, or straight chain and

R₂ is alkyl of 1-6 carbon atoms either branched or straight chain, —CH₂OCH₃ or —CH₂OCH₂CH₃.

4,055,662

ANTIMICROBIAL COMPOSITION CONTAINING 10-UNDECENOIC ACID ISOPROPYLIC ESTER

Rudolf Kürner, P.O. Box 1763, 638 Bad Homburg vor der Höhe, Germany

Filed Oct. 3, 1975, Ser. No. 619,507

Claims priority, application Germany, Oct. 5, 1974, 2447627
Int. Cl.² A01N 9/24

U.S. Cl. 424—312

3 Claims

1. A method for the treatment of a fungal disease of the skin which comprises topical administration to the afflicted skin of a host of an amount of 10-undecenoic acid isopropyl ester which is therapeutically effective for the treatment thereof.

4,055,663

HALOGENATED ACYLAMINO ACIDS AS FUNGICIDES

Sol J. Barer, Plainsboro; Peter C. Valenti, East Windsor, and Michael Marchwinski, N. Brunswick, all of N.J., assignors to National Patent Development Corporation, New York, N.Y.

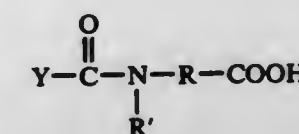
Filed June 27, 1974, Ser. No. 483,579

Int. Cl.² A01N 9/20

U.S. Cl. 424—319

13 Claims

1. A method of destroying fungi comprising applying to the fungi a fungicidally effective amount of a compound of the formula



wherein Y is chlorinated alkyl of 1 to 6 carbon atoms, R is C_nH_{2n} or R₂C_nH_{2n-1}, n is an integer from 1 to 11, R₂ is phenyl-alkyl of up to 10 carbon atoms or carboxyalkyl of up to 5 carbon atoms, R₁ is hydrogen, alkyl, haloalkyl of 1 to 4 carbon atoms, phenyl or alkylphenyl of up to 10 carbon atoms, or a salt thereof.

4,055,664

PHARMACEUTICAL PREPARATIONS CONTAINING 4-(4-BIPHENYLYL) BUTYLAMINES AND TREATMENT OF THE ANIMAL ORGANISM THEREWITH

Martin O. Skibbe, Kankakee, Ill., assignor to Armour Pharmaceutical Company, Phoenix, Ariz.

Division of Ser. No. 548,717, Feb. 10, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 726,081

Int. Cl.² A61K 31/135

U.S. Cl. 424—330

15 Claims

8. The method of treating an inflammatory condition of a host, including man, comprising administering to said host daily from about 1 mg. to about 2,000 mg. of a compound having the structure

4,055,659

RETINOIC ACID DERIVATIVES

Robert J. Gander, Whitehouse, and John A. Gurney, East Brunswick, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 3, 1975, Ser. No. 628,185

Int. Cl.² A61K 31/215; C09F 5/00

U.S. Cl. 424—305

9 Claims

1. All trans-retinoyloxyacetamide.
2. A pharmaceutical composition for the treatment of acne by topical application which comprises an effective acne-treatment amount of all-trans-retinoyloxyacetamide admixed with a pharmaceutically-acceptable vehicle.

4,055,660

TREATMENT FOR WARTS

Dwight W. Meierhenry, 738 E. Sahara Ave., Las Vegas, Nev. 89104

Continuation-in-part of Ser. No. 483,681, June 26, 1974, abandoned. This application July 12, 1976, Ser. No. 704,285

Int. Cl.² A61K 31/245

U.S. Cl. 424—310

4 Claims

1. A method of treating warts causing their remission which consists of injecting directly into the wart, under pressure, until at least part of the wart structure is physically destroyed and bleeding occurs, from about 0.5 to about 5 cc's of an aqueous solution comprising from about 0.1% to about 10% by weight of procaine, and allowing the treated wart to remain in place without surgical treatment for at least two weeks.

4,055,661

MITICIDAL AND APHICIDAL METHOD UTILIZING 2-HIGHER ALKYL-3-HYDROXY-1,4-NAPHTHOQUINONE CARBOXYLIC ACID ESTERS

Russell Frank Bellina, and Dennis Lynn Fost, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

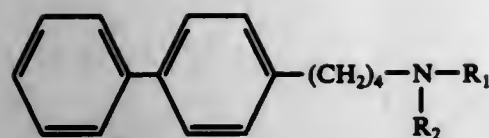
Continuation-in-part of Ser. No. 531,483, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 494,294, Aug. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,692, May 10, 1974, abandoned. This application Sept. 15, 1975, Ser. No. 613,553

Int. Cl.² A01N 9/24

U.S. Cl. 424—311

14 Claims

1. A method for protecting plants from mites or aphids comprising applying to the plant locus to be protected a miticidally or aphicidally effective amount of a compound of the formula:



wherein: R_1 is selected from the group consisting of hydrogen and a lower alkyl having from one to four carbon atoms; and R_2 is selected from the group consisting of hydrogen, and a lower alkyl having from one to four carbon atoms.

4,055,665

TREATING ARRHYTHMIA WITH PHENYLTHIOARALKYLAMINES

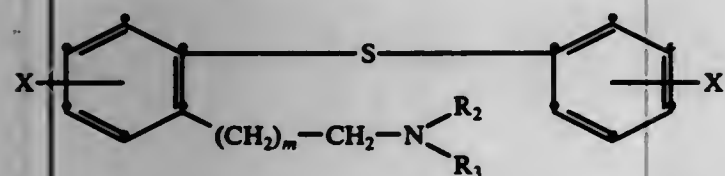
Marcia Elizabeth Christy, Perkasi, Pa., assignor to Merck & Co., Inc., Rahway, N.J.
Division of Ser. No. 526,984, Nov. 25, 1974, Pat. No. 4,018,830, which is a continuation-in-part of Ser. No. 860,076, Sept. 22, 1969, abandoned. This application Apr. 12, 1976, Ser. No. 675,651

Int. Cl.² A61K 31/135, 31/54, 31/535, 31/495

U.S. Cl. 424-330

3 Claims

1. Method of treating animals suffering from arrhythmia which comprises orally or parenterally administering an antiarrhythmic amount of compound having the formula



wherein

R_1 and R_2 are independently selected from the group consisting of hydrogen, C_1-C_6 alkyl, benzyl, phenethyl, C_2-C_6 alkenyl and C_2-C_6 alkynyl;

X and X' are selected from the group consisting of hydrogen, halogen, C_1-C_6 alkyl, C_1-C_3 alkoxy, and trifluoromethyl; and

m is an integer selected from the group consisting of 0 to 4 inclusive and non-toxic, pharmacologically acceptable salts thereof.

4,055,666

ANIMAL FEED YEAST SUPPLEMENT FROM DRIED WHEY YEAST BRAN PROCESS

George A. Jeffreys, Jean L. Price, and James F. Tobey, all of Salem, Va., assignors to George A. Jeffreys & Co., Inc., Salem, Va.

Filed May 24, 1976, Ser. No. 689,158

Int. Cl.² A12K 1/08

U.S. Cl. 426-31

6 Claims

1. A process for producing an animal feed supplement by growing a yeast that utilizes lactose, which comprises the steps of

- preparing a solid substrate mixture composed of bran husks supplemented with essential nutrients, and 10 to 21% dried whey typically containing 65 to 75% lactose;
- moistening said mixture to bring the water-substrate ratio within the range of 50/100 to 70/100, thereby providing a semi-solid substrate;
- pasteurizing the moistened mixture and then cooling it to at least 100° F;
- inoculating the cooled mixture with a lactose utilizing yeast selected from a group consisting of *Kluveromyces fragilis*, *Kluveromyces lactis*, *Torulopsis cremoris* and *Torulopsis spherica*;
- said lactose utilizing yeast being mixed with a lactic culture selected from a group consisting of *Lactobacillus acidophilus*, *Lactobacillus bulgaricus*, *Lactobacillus ther-*

mophilus, *Streptococcus cremoris*, and *Streptococcus lactis*, and
f. incubating the inoculated mixture at humidities and temperatures conducive to the growth of the yeast for 12 to 24 hours.

4,055,667

ANIMAL FEEDS

John H. Linton; William J. Esdale, both of Beaconsfield, and John Viscount Cross, Saskatoon, all of Canada, assignors to Ogilvie Mills Ltd., Montreal, Canada

Filed Dec. 3, 1975, Ser. No. 637,129

Int. Cl.² C12C 11/18

U.S. Cl. 426-62

17 Claims

1. A liquid animal feed supplement comprising a colloidal mixture having a pH below 5, and a solids content of from 30 to 50% by weight suspended in a colloidal suspension of spent brewers' yeast in an aqueous alcoholic medium and an effective amount of at least one water dispersible water-binding agent, said spent brewers' yeast having a majority of said suspended solids, said supplement being pumpable, having a viscosity of from 250 to 7000 cps at 23° C. and a flow rate of less than 5 minutes and more than 11 seconds at 20° C., and said supplement being further characterized by being gravitationally stable.

4,055,668

INFUSION PACKAGE

Georg Kopp, Neuhausen am Rheinfall, Switzerland, assignor to S I G Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

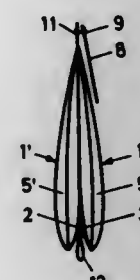
Filed Mar. 18, 1976, Ser. No. 668,077

Claims priority, application Switzerland, Mar. 25, 1975, 3814/75

Int. Cl.² B65B 29/04

U.S. Cl. 426-79

4 Claims



1. An infusion package including a first and a second bag joined to one another along a common first seam and being arranged in a face-to-face relationship by folding the bags onto one another along a fold line extending in the first seam and dividing the first seam into face-to-face arranged longitudinal halves; each bag having a free edge opposite the first seam; a second seam extending along the free edge of the first bag; a third seam extending along the free edge of the second bag; the second and the third seam being in a face-to-face relationship and being secured to one another; and a holder string positioned between the two bags; the holder string having a first end attached to one of the bags and a second end attached to a tag; the improvement comprising means defining a first and a second opening in said first and said second seam, respectively; said first end of said holder string being affixed to said third seam; said holder string extending between said first and second bags looplessly to said first opening from its attachment to said third seam; said holder string being slidably threaded twice through said first opening to form a string loop oriented externally of said bags; said holder string further extending between said first and second bags looplessly to said second opening from said first opening; said holder string being slidably threaded, adjacent its said second end, through said second opening; said tag being arranged externally of said bags

4,055,671

HERMETICALLY SEALED PACKAGE

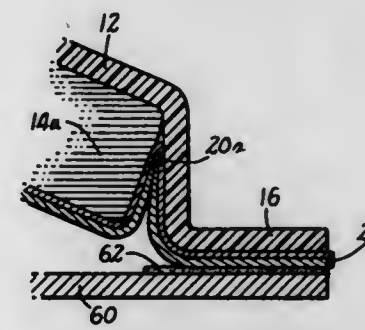
Reid A. Mahaffy, Montclair; Joel A. Hamilton, Englewood, and Wesley W. Pinney, Upper Montclair, all of N.J., assignors to Mahaffy & Harder Engineering Company, Totowa, N.J.
Continuation of Ser. No. 295,134, Oct. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 64,035, July 22, 1970, Pat. No. 3,709,702, which is a continuation of Ser. No. 484,284, Sept. 1, 1965, abandoned. This application July 21, 1975, Ser. No. 597,883

The portion of the term of this patent subsequent to Jan. 9, 1990, has been disclaimed.

Int. Cl.² B65D 5/64, 85/72

U.S. Cl. 426-123

1 Claim



4,055,669

FOOD BAR AND PROCESS OF PREPARING SAME

Ray G. Kelly, Kirkwood; Kenneth R. Pruitt, Sr., Arnold, and Alvin L. Kershman, Bridgeton, all of Mo., assignors to Sunmark, Inc., St. Louis, Mo.

Continuation of Ser. No. 367,115, June 4, 1973, abandoned. This application June 16, 1975, Ser. No. 586,970

(under 37 CFR 1.47)

Int. Cl.² A23L 1/34

U.S. Cl. 426-93

23 Claims

1. A food bar comprising particles of cereal bound together with an edible solid particulate adhesive food composition comprising a particulate protein source in a proportion sufficient that said composition contains at least about 15% by weight protein, between about 33% and about 85% by weight of edible fat, said fat being substantially solid at room temperature but becoming a smooth fluid at mouth temperature, and up to about 52% by weight of a carbohydrate selected from the group consisting of monosaccharides and disaccharides, the individual particles of said protein source and carbohydrate being substantially coated with said fat so as to mask flavors arising from said protein.

4,055,670

PACKAGE FOR STORING AND TRANSPORTING TORTILLAS OR TACOS

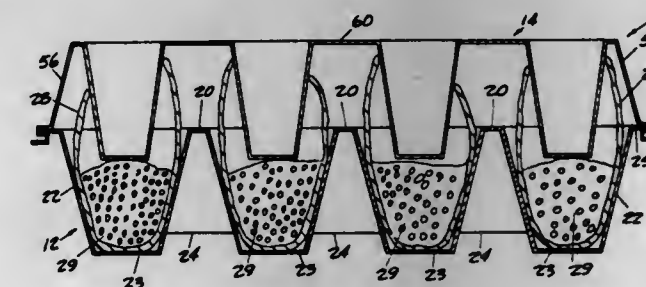
Edward Bruce Belmont, Winston-Salem, N.C., assignor to RJR Foods, Inc., Winston-Salem, N.C.

Filed Sept. 30, 1976, Ser. No. 728,092

Int. Cl.² B65B 23/00

U.S. Cl. 426-119

14 Claims



1. A package of U-shaped tortilla shells comprising:

- a tray means containing said tortilla shells with the fold zone of said shell within the tray, said shell opening upwardly;
- a lid means covering said tray means for enclosing said tortilla shells; and
- spacer means for insertion into the open end of each of said shells, whereby the sides of the shells are prevented from collapsing and the opening is maintained, said tortilla shells being out of contact with each other.

1. A hermetically sealed and evacuated package assembly comprising a cup-shaped container holding a perishable food product and having side walls with a continuous planar peripheral flange around its opening, said container member being made of semi-rigid gas-impermeable plastic material adapted to provide mechanical protection for the contained food product, the upper surfaces of said product being below the flange of the container member at least in the region adjacent the container side walls when said semi-rigid container is positioned with said opening facing upwards:

a stiff planar protective member secured to said container member in position parallel to and covering said opening a short distance from the adjacent surfaces of said product, said protective member defining a gas-permeable bottom element for the package when the semi-rigid container serves as the protective top element in the normal upright position of the completed package assembly, said bottom element acting as a base providing physical support and protection for the remaining food product after the package assembly has been opened for removal of a portion of the food product and then has been reclosed; and

a sheet of flexible stretchable gas-impermeable material disposed over said opening, between said container member and said protective member, to serve as a closure member for the package, said sheet being sealed to the flange of said container member around the periphery of said opening to cooperate with said container member in hermetically sealing said package from outside atmosphere, said sheet material being substantially thinner than said semi-rigid material and incapable of providing substantial mechanical protection for the contained product, said sheet material being sufficiently flexible that it is of nonform-retaining characteristic, said flexible material immediately adjacent said flanges comprising preformed portions shaped by stretching prior to package evacuation to extend into said container along the side walls thereof, said preformed portions being held by atmospheric pressure in tight and intimate form-fitting engagement with said product and said side walls, the portions of said flexible material which are held against said product being spaced from said protective member, the stretching of said flexible material being carried to a permanent-set dimension sufficient to avoid distortion of said semi-rigid container due to the force of atmospheric pressure on said flexible material;

said flexible sheet having a part thereof which extends out

beyond the peripheral edge of said container member flange to provide for manipulation of said extending part to permit said closure member to be at least partially disengaged from said container member to gain access to the enclosed food product; and means providing for reclosure of said protective member and said container member with said protective member means secured to said container member to hold a remaining part of the product.

4,055,672

CONTROLLED ATMOSPHERE PACKAGE

Arthur Hirsch, Elizabeth; Francis X. Spiegel, Cedar Grove, both of N.J., and John M. Ramsbottom, Glenn Ellyn, Ill., assignors to Standard Packaging Corporation, New York, N.Y.
Continuation of Ser. No. 242,430, April 10, 1972, abandoned.
This application Mar. 31, 1976, Ser. No. 672,455

Int. Cl.² B65D 81/20

U.S. Cl. 426—127

6 Claims



1. A package for controlling the atmospheric condition of a package product comprising a meat product, a semi-rigid performed tray for holding said meat product, said tray being formed from a material which is oxygen impermeable and a composite lid, said composite lid being heat-sealed to said preformed tray around the periphery thereof to define a sealed package containing said meat product, a substantially non-oxygen containing atmosphere surrounding said meat product, said composite lid comprising an inner layer, an intermediate adhesive layer and an outer layer, said inner layer being formed from an oxygen impermeable material, said outer layer being formed from an oxygen impermeable material, said outer layer being secured to said inner layer by said adhesive layer to provide a hermetically sealed oxygen impermeable package, said outer layer and said adhesive layer being removable from said inner layer without destruction of said seal between said tray and said lid so as to allow oxygen to flow through said inner layer.

4,055,673

METHOD OF MOISTENING WHOLE GRAINS

Roman Mueller, Niederuzwil, Switzerland, and Josef Kalapos, Mommheim, Germany, assignors to Gebrüder Buehler AG, Uzwil, Switzerland

Division of Ser. No. 547,357, Feb. 5, 1975, abandoned. This application Jan. 14, 1976, Ser. No. 649,100

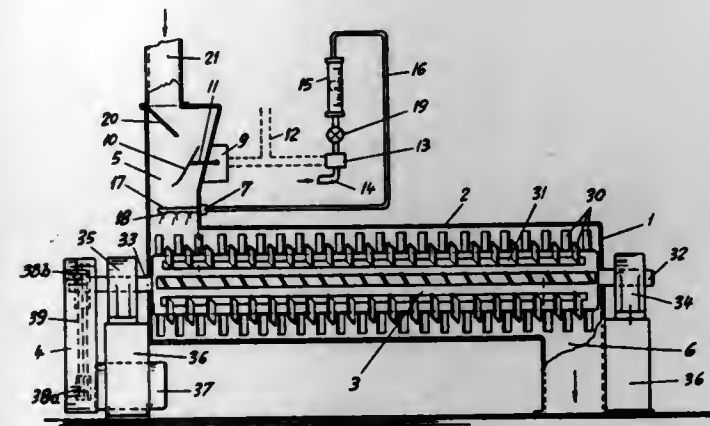
Claims priority, application Switzerland, Feb. 8, 1974, 1757/74; Oct. 2, 1974, 13240/74; Nov. 22, 1974, 15610/74
Int. Cl.² A23L 1/212; A23P 1/00

U.S. Cl. 426—231

13 Claims

1. A method of uniformly moistening whole grain kernels to a predetermined uniform moisture content in preparation for milling, comprising the steps of:
a. admitting whole grain kernels through an inlet at one end of a closed, circular vessel having an inner circumferential wall;
b. admitting metered quantities of water into contact with said grain kernels in the region of said vessel inlet;
c. accelerating the admitted grain kernels circumferentially within the vessel and creating a whirling tubular veil of generally freely moving grain kernels in the vicinity of the inner circumferential wall of the vessel that moves sub-

stantially continuously lengthwise of the vessel, through the use of a rotor that extends axially within the vessel, the rotor having a plurality of individual blades projecting transversely of the rotor axis and having free outer ends, said blades being spaced over substantially the entire length of the rotor and generally uniformly spaced around its circumference, the blades numbering at least twenty blades for every square meter of surface area of said inner circumferential wall, and the rotor being made to rotate at



a speed requisite for imparting to the outer ends of the blades a circumferential velocity of between substantially six meters per second and thirty meters per second, whereby said whole grain kernels are impacted within the whirling tubular veil by the rotating blades and caused to frictionally engage each other, thereby effecting uniform moistening of the grain kernels;
d. and removing and uniformly moistened whole grain kernels through an outlet at the other end of the vessel.

4,055,674

METHOD FOR THE REMOVAL OF AFLATOXIN FROM CEREALS, OIL SEEDS AND FEEDSTUFFS

Nobumitsu Yano; Itaru Fukinbara, both of Tokyo; Koji Yoshida, and Tokiyoshi Korenaga, both of Sakaimachi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 14, 1976, Ser. No. 696,148

Claims priority, application Japan, June 17, 1975, 50-72722
Int. Cl.² A23L 3/00

U.S. Cl. 426—430

9 Claims

1. A method for the removal of Aflatoxin from cereals, oil seeds and feedstuffs contaminated therewith which comprises subjecting said cereals, oil seeds and feedstuffs to at least one extraction with liquid dimethyl ether and water at temperatures not higher than those at which any proteins in said materials are thermally denatured, said water being employed in an amount of 2 to 8% by weight with respect to the liquid dimethyl ether.

4,055,675

PREPARATION OF PUFFED FRUIT

Karel Popper, Danville; William G. Schultz, El Cerrito; Wayne M. Camirand, Albany; Earl Hautala, Martinez; George H. Robertson, Berkeley; Ladell Crawford, Richmond, and Bernard J. Finkle, Berkeley, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 13, 1976, Ser. No. 750,324

Int. Cl.² A23L 1/212

U.S. Cl. 426—470

1 Claim

1. A process for preparing a food product from bite-size pieces of fruit, which consists of the steps of
a. partially dehydrating the fruit to a moisture content of about 10-50%,
b. contacting the dehydrated fruit solely with liquid carbon

dioxide at ambient temperature for about from 0.5-6 hours, said liquid carbon dioxide being maintained under a pressure of about 900-1000 psig,
c. rapidly releasing the pressure to puff the fruit, and then
d. heating the puffed fruit at about 70°-90° C for 1-24 hours to form a crisp outer layer on the surface of the puffed fruit.

4,055,676

REPLACEMENT OF SUGAR IN A SUGAR-CONTAINING FOOD AND PROCESS

Peter H. Foulkes, Fox River Grove, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 579,224, May 20, 1975, abandoned. This application Apr. 1, 1976, Ser. No. 672,659

Int. Cl.² A23B 4/12, 4/14

U.S. Cl. 426—532

5 Claims

1. In a semi-moist pet food comprising:
a. about 3 percent to about 65 percent by weight of the pet food of a protein source wherein the protein source is at least one selected from the group consisting of at least one meat, at least one meat by-product, and at least one vegetable protein source;
b. about 0.1 percent to 35 percent by weight of the pet food of sugar;
c. about 0.5 percent to about 3.0 percent of at least one edible acid;
d. about 0.01 percent to about 0.35 percent by weight of the pet food of at least one antimycotic;
the improvement wherein the semi-moist pet food further comprises:
1. about 7 percent to about 14 percent by weight of the pet food of corn syrup, wherein the corn has a dextrose equivalent of about 10 to about 60; and
2. about 5 percent to about 9 percent by weight of the pet food of propylene glycol
the combination of corn syrup and propylene glycol serving as a replacement for 55 to 100 percent of the sugar.

4,055,677

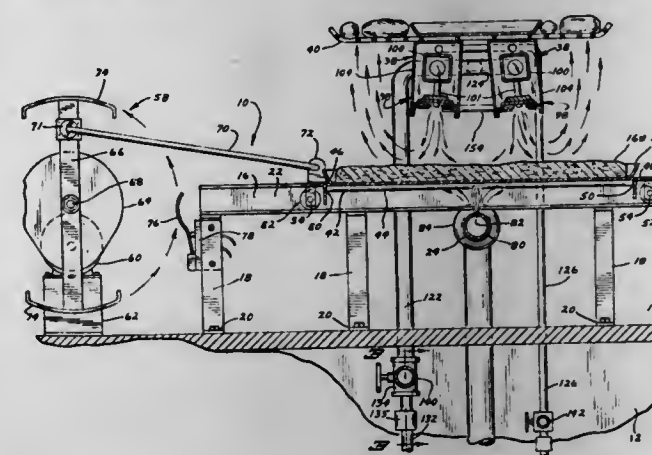
METHOD OF BROILING

Lyall B. White, 1408 Jacobson Circle, Sun City Center, Fla. 33570

Continuation-in-part of Ser. No. 522,596, Nov. 11, 1974, Pat. No. 3,943,910. This application Jan. 7, 1976, Ser. No. 647,043
Int. Cl.² A23L 1/01

U.S. Cl. 426—438

3 Claims



1. A method of cooking a portion of food including the steps of:
a. positioning the food on a platter;
b. positioning the platter with the portion of food thereon over a lower heat source of sufficient intensity to cause said food portion to fry on the heat transmitted from the lower source through the platter;
c. simultaneously subjecting the food portion to heat from above from an upper heat source of sufficient intensity to cause the food portion to be broiled by the heat from the upper heat source;
d. reciprocating at least the upper heat source and the food

portion horizontally back and forth with respect to each other; and
e. maintaining the food and platter relationship relative to said lower and upper heat sources during reciprocation until cooking of the food to a desired degree is achieved.

4,055,678

SWEETENER DERIVATIVES

Guy A. Crosby, and Grant E. DuBois, both of Palo Alto, Calif., assignors to Dynapol, Palo Alto, Calif.

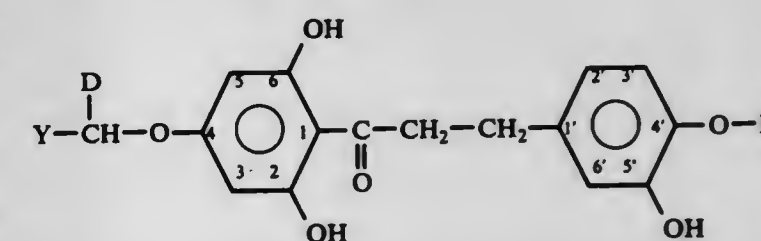
Division of Ser. No. 477,730, June 10, 1974, Pat. No. 3,976,687. This application Jan. 12, 1976, Ser. No. 648,423

Int. Cl.² A23L 1/236

U.S. Cl. 426—548

9 Claims

1. A compound of the formula



wherein Y is a sulfonic acid or a pharmacologically acceptable salt thereof, D is a linear polyether of the formula $CH_3-(O-CH_2-CH_2)_n-$ wherein n has a value of from 1 to 30 inclusive; and R is a lower alkyl of from 1 to 4 carbon atoms inclusive.

8. A sweetened edible composition comprising an edible composition having in intimate admixture therewith from 0.0001% to about 0.05% by weight of a compound of claim 1.

4,055,679

PLASTIC FAT PRODUCT

Hans Robert Kattenberg, and Charles Cornelis Verburg, both of Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 2, 1976, Ser. No. 663,015

Claims priority, application United Kingdom, Mar. 4, 1975, 8937/75

Int. Cl.² A23D 3/00

U.S. Cl. 426—607

6 Claims

1. Fat product containing 50-75% of palm-based fats selected from the group consisting of hydrogenated and unhydrogenated palm oil and solid and liquid fat fractions thereof, 20-90% of said palm-based fats being co-randomised with the balance of fats containing at least 80% of fatty acids with a chain length of 18 carbon atoms or more to provide at least 50% of co-randomised triglycerides in said fat product, the balance of the palm-based fats being non-randomised, said fat product containing 15-25% of 1,3-disaturated, -2-mono-unsaturated triglycerides, the weight ratio between 1,3-disaturated, -2-mono-unsaturated and 1,2-disaturated, -3-mono-unsaturated triglycerides being within the range of 1.8 to 1.5, the saturated acid residues of forementioned triglycerides having 8-24 carbon atoms.

4,055,680

PELLETIZING COTTON LINT

Gene L. Duke, P.O. Box 988, Brownfield, Tex. 79316

Filed Aug. 2, 1972, Ser. No. 277,400

Int. Cl.² A23K 1/02

U.S. Cl. 426—635

7 Claims

1. A lint pellet, the lint of which is ammonia-neutralized lint of dry-acid-delinted cottonseed.

4,055,681

METHOD OF MAKING A DRY-TYPE PET FOOD

Alexander Balaz, Barrington; David P. Bone, Palatine, and Edward L. Shaanon, Barrington, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,759

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.² A23J 3/00; A23K 1/14

U.S. Cl. 426—656

37 Claims

1. A method for the production of a dry pet food product containing less than 15 percent by weight moisture having a soft elastic, substantially fibrous meat-like texture and appearance comprising the steps of:

- A. blending a dough containing fat, at least one proteinaceous adhesive selected from the group consisting of an alkali modified oil seed vegetable protein, alkali modified wheat gluten, albumen, collagen, sodium caseinate, calcium caseinate, potassium caseinate, magnesium caseinate and ammonium caseinate, a plasticizing agent with sufficient water to produce a product having less than 1 percent moisture and an additional amount of water sufficient for processing; wherein said proteinaceous adhesive is present in an amount of from about 4 to about 60 percent by weight; and said plasticizing agent is present in an amount of from about 2 to about 40 percent by weight;
- B. cooking said dough at a temperature between 200° and 300°F;
- C. stretching the cooked mixture to form a fibrous-like mixture; and
- D. immediately cooling the stretched mixture to prevent the fibers from watering.

4,055,682

CATHETER AND THE METHOD OF MAKING

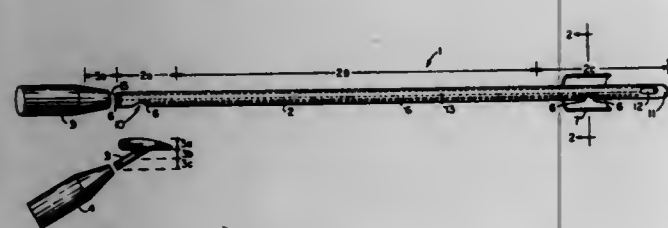
Edward Wilson Merrill, Cambridge, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Continuation-in-part of Ser. No. 200,560, Nov. 19, 1971, Pat. No. 3,773,871, Ser. No. 205,156, Dec. 6, 1971, Pat. No. 3,802,458, and Ser. No. 417,053, Nov. 19, 1973, abandoned. This application Mar. 25, 1976, Ser. No. 670,422

Int. Cl.² B05D 3/06

U.S. Cl. 427—2

2 Claims



1. The process for rendering superficially hydrophilic a catheter formed from a silicone composition by forming on the surface thereof a hydrophilic polymeric layer so thin that the stiffness of the catheter after treatment when dry is not substantially greater than that of an uncoated catheter of the same composition and degree of crosslinking, which method comprises contacting the surface of the catheter uniformly with a liquid containing free-radical polymerizable precursor to said hydrophilic polymer layer, said precursor comprising N-vinylpyrrolidone (NVP), NVP and water or NVP, a hydroxalkyl acrylate and water, exposing said surface while in contact with said precursor to high rate dosage of high energy ionizing radiation sufficient to form a hydrophilic surface on said catheter, and controlling the intensity and duration of radiation and the concentration of the precursor to prevent excessive migration of precursor into the silicone polymer composition, thereby causing said precursor to graft to said surface and thereby producing a thin smooth hydrophilic layer uniformly over the entire surface.

4,055,683

METHOD OF BALANCING ROTORS

Anatoly Alexandrovich Gusarov, Universitetsky prospekt, 5, kv. 470, and Lev Nizolaevich Shatalov, ulitsa Utennyaya, 3, kv. 107, both of Moscow, U.S.S.R.

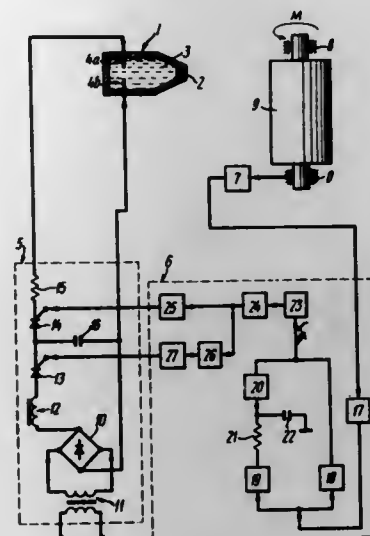
Division of Ser. No. 474,106, May 28, 1974, Pat. No. 3,996,883.

This application Sept. 23, 1976, Ser. No. 725,992

Int. Cl.² B05B 12/04

U.S. Cl. 427—8

2 Claims



1. A method of balancing rotors, comprising a procedure including the steps of: finding a "light" point on the surface of the rotor being balanced while being rotatably supported in front of a nozzle measuring the parameters of vibration of the rotor while rotating; transmitting a signal to nozzle energizing means in response to said vibration parameter measurement during rotor vibration; discharging predefined successive amounts of a quickly solidifying balancing compound in the liquid state from the nozzle to said "light" point; employing a force of a controllable electro-hydraulic impact for governing the mass of the compound applied to said rotor; and repeating the procedure until balance of the rotor is attained.

4,055,684

COATED CARRIER PARTICLES FOR USE IN ELECTROPHOTOGRAPHIC PROCESS

Evan Serge Baltazzi, Northfield, and Pabitra Datta, Lyndhurst, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Division of Ser. No. 528,712, Dec. 2, 1974. This application May 3, 1976, Ser. No. 682,310

Int. Cl.² G03G 13/09, 9/10, 9/14

U.S. Cl. 427—18

10 Claims

1. A process for developing a visual image from a latent electrostatic image which comprises applying to the surface upon which is formed the latent electrostatic image a developer mix comprising a finely divided electroscopic powder and discrete solid carrier particles selected from the group consisting of glass beads, ceramic beads, grains of sand and metallic particles, coated with a dispersion in a low surface energy thermoplastic polymeric binder of dried, finely ground particles in the micron to submicron range of a polymer consisting essentially of a backbone of a highly crosslinked copolymer of styrene and divinylbenzene having ion exchanging groups chemically bonded thereto; said coating being about from 1 micron to 3 microns in thickness.

4,055,685

PROCESS FOR THE IMPROVEMENT OF THE ADHESION OF PHOTOGRAPHIC LAYERS TO A FILM WEB BY MEANS OF A CORONA TREATMENT

Gunther Bayer, Leverkusen; Hans Georg Fitzky, Odenthal-Hahnenberg; Herbert Hoyer, Leverkusen; Gunter Lutgens, Langenfeld, and Wolfgang Muller-Bardorff, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 26, 1976, Ser. No. 680,100

Claims priority, application Germany, Apr. 30, 1975, 2519233

Int. Cl.² G03C 1/78, 1/96

U.S. Cl. 96—87 R

5 Claims

1. A process for the corona treatment of a web of polyethylene coated photographic paper in which the web is subjected to alternating current corona discharge in two consecutive stages, the frequency of the corona discharge in the first stage being from 5 to 100 kHz and the frequency in the second stage being from 500 to 2000 kHz.

4,055,686

METHOD OF FORMING METAL HYDRIDE FILMS

Robert Steinberg, Berea; Donald L. Alger, Cleveland, and Dale W. Cooper, Rocky River, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 20, 1976, Ser. No. 659,882

Int. Cl.² G21G 4/02, 3/04

U.S. Cl. 427—124

14 Claims

1. A process for coating a substrate with a continuous, stoichiometric, metal hydride film comprising the steps of selecting a substrate compatible with a hydride forming metal to be coated thereon, chemically cleaning said substrate, disposing said substrate in a vacuum chamber capable of being evacuated to a pressure of about 10^{-10} Torr, said substrate being enclosed by a shroud, a sublimator of the hydride forming metal also being disposed within said shroud with a shutter positioned between said substrate and said sublimator, sputter etching said substrate, evacuating said chamber to a pressure of from about 10^{-8} to 10^{-10} Torr, vapor depositing said hydride forming metal on the interior of said shroud with said shutter closed to form a gettering layer of said hydride forming metal on the interior of said shroud, opening said shutter to cause a film of said hydride forming metal to vapor deposit on said substrate, directing a hydrogen isotopic gas into said chamber to achieve a pressure such that the gas is diffused through said hydride forming metal film at a rate substantially and continuously greater than the rate at which it is absorbed at the surface of said film thereby converting said film to a metal hydride.

4,055,687

BATTERY TERMINAL POST CLEANER

Maurice R. Blue, 60960 Crown Court, South Bend, Ind. 46614

Filed Jan. 26, 1976, Ser. No. 652,501

Int. Cl.² B23P 7/00

U.S. Cl. 427—142

1 Claim

1. A method of treating a corroded terminal post of an electrical storage battery wherein a coating layer of corrosion products and oily residues adheres to said post, which comprises spraying onto said coating layer of said terminal post an aerosol of a mixture consisting essentially of a liquefied halogenated hydrocarbon propellant and non-volatile mineral oil, said aerosol being sprayed from an aerosol pressure package under an internal pressure of a vapor phase of said propellant, said aerosol spray being deposited as a coating film on said coating layer and said propellant foams and evaporates while

in contact with said layer and thereby removes the oily residues from said coating layer and transforms said corrosion products to a powder whereby said post becomes clean and said mineral oil remains as a corrosion-resistant coating on said post.

4,055,688

METHOD AND APPARATUS FOR APPLYING SYNTHETIC RESIN POWDER IN A GRATE-SHAPED COATING TO WEB MATERIAL

Hans-Peter Caratsch, Itenhardstrasse 16, 5620 Bremgarten, Switzerland

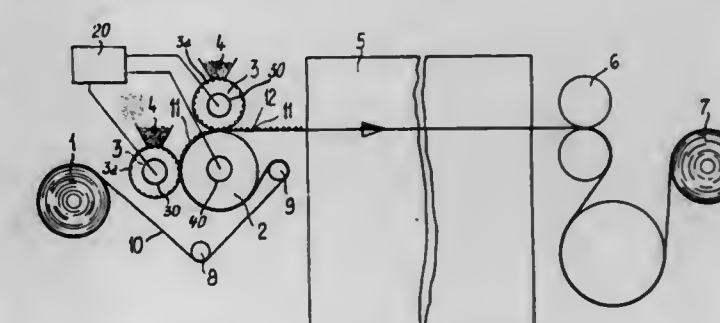
Filed May 13, 1976, Ser. No. 686,141

Claims priority, application Switzerland, Mar. 31, 1976, 4000/76; Mar. 31, 1976, 4001/76

Int. Cl.² B05D 5/00, 1/00, 7/00

U.S. Cl. 427—195

2 Claims



1. A method for applying synthetic resin powder in the form of a substantially grate-shaped coating to web material, comprising the steps of: heating a web of material, applying a lower layer of the synthetic resin powder in the form of piles by means of a relief-like structured printing roll to the material web, applying an upper layer in the form of piles in coincidence to and upon the lower layer by means of a relief-like structured printing roll, bringing the powder of both layers during transfer thereof in the rolls to its sintering temperature, heating the web material prior to forming the lower layer approximately to the plasticizing temperature of the powder for this layer, and placing the powder piles of the upper layer upon the powder piles of the lower layer immediately after transferring the powder piles of the lower layer to the web material.

4,055,689

PROCESS FOR FLAMEPROOFING ORGANIC FIBER MATERIAL

Hermann Nachbur, Dornach, and Arthur Maeder, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 483,493, June 27, 1974, Pat. No. 3,946,092.

This application Jan. 12, 1976, Ser. No. 648,541

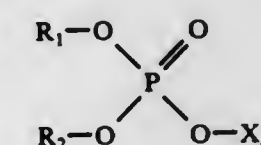
Claims priority, application Switzerland, July 3, 1973, 9671/73

Int. Cl.² C09K 3/28; C09D 5/18

U.S. Cl. 427—379

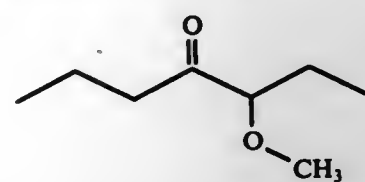
15 Claims

1. A process for flameproofing organic fiber material, which comprises applying to said material a preparation which contains a phosphate of the formula



wherein each of R₁ and R₂ is bromoalkyl with 2 to 6 carbon atoms and X₁ is unsubstituted phenyl, phenyl which is substituted in ortho- or para-position by phenyl, monoalkylphenyl or dialkylphenyl with 1 to 9 carbon atoms in each alkyl moiety; drying the material and subjecting it to a heat treatment at 175° to 220° C. for about 10 to 200 seconds.

from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of a compound having the structure:



4,055,692 GAS PUMP COUNTER DISPLAY AND METHOD OF FORMATION THEREOF

Bernard S. Zions, 11 Rye Ridge Parkway, West Hartford, Conn. 06117, and Victor Zions, 6 Jonathan Law Court, Waterford, Conn. 06385

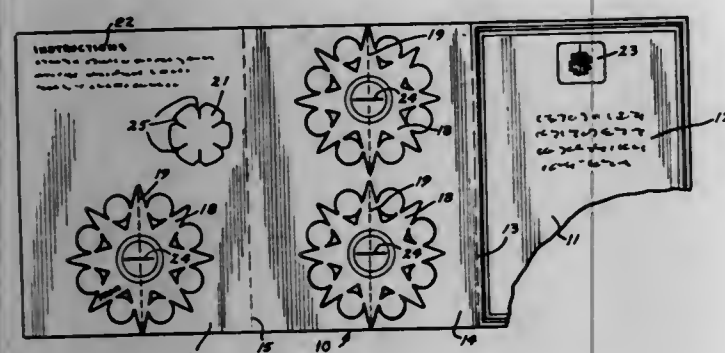
Filed June 4, 1976, Ser. No. 692,998

Int. Cl.² B32B 3/14

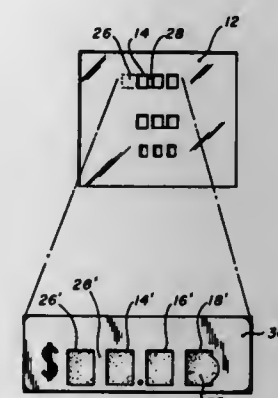
U.S. Cl. 428—78

6 Claims

2 Claims



1. An ornament which may be assembled from a greeting card comprising a flat disc-like mounting member a plurality of flat panels of generally identical peripheral edge shape, a separate transversely extending bisecting score line in the center portions of each of said panels, each of said panels being folded along the score line to form a pair of panel portions joined at an apex and forming a V, slit means in said panel portions extending across the folded edge and terminating short of the peripheral edges of the respective panel and of size to receive said mounting member whereby said mounting member retains said panel portions in a generally V shape with the panel portions extending generally radially from the center of said disc-like mounting member and wherein said mounting member has a plurality of notches and teeth defined in its peripheral edge spaced annularly around said member, said panel portions of each folded panel fitting into an associated notch and being held thereby in a desired radial position.



1. A modified display plate for liquid dispensing apparatus, the display plate having:
an array of aligned windows formed in the body of the display plate;
an enlarged window in said array; and
a mask mounted on said display plate, said mask having a plurality of windows therein each aligned with each of said display plate windows other than said enlarged window and two windows aligned with the enlarged window of the display plate.

4,055,693 LEATHERLIKE FABRICS

Frank Peter Civardi, Wayne, N.J., assignor to Inmont Corporation, New York, N.Y.

Continuation of Ser. No. 542,993, Jan. 22, 1975, Pat. No. 3,988,488. This application Aug. 4, 1976, Ser. No. 711,589

The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.

Int. Cl.² D06C 11/00

U.S. Cl. 428—91

8 Claims



1. A leather substitute comprising a fabric of interlaced

4,055,691
USES OF α -OXY(OXO) SULFIDES AND ETHERS IN FOODSTUFFS AND FLAVORS FOR FOODSTUFFS
William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Division of Ser. No. 730,537, Oct. 7, 1976. This application Feb. 4, 1977, Ser. No. 765,775
Int. Cl.² A23L 1/226, 1/235

U.S. Cl. 426—534

2 Claims

1. A process for augmenting or enhancing the taste or aroma of a foodstuff comprising the step of adding to said foodstuff

multifiber yarns having extending from one face thereof a nap of fibers teased from said yarns, said nap having fibers thereof bonded together by bonding agent, said nap, with bonding agent, having a thickness of about 0.3 mm to about 1 mm and comprising spaced flexible clumps of nap fibers bonded together by said bonding agent, said clumps containing more than five nap fibers per clump, the void volume in said nap, with bonding agent, being at least about 70%, said spaced clumps being movable to project more or less from the surrounding nap, said clumps giving said nap a rough appearance like split suede leather, said fabric having on the upper face thereof opposite said nap a cellular elastomeric polymer layer having a continuous substantially nonporous skin at its upper surface.

4,055,694

STARCH LATEX COMPOSITION

Robert B. Hadgraft, East Ridge, and John J. Martin, Hixson, both of Tenn., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 461,471, April 16, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,999

The portion of the term of this patent subsequent to Dec. 18, 1990, has been disclaimed.

Int. Cl.² B32B 3/02; C08L 3/02; D04H 11/00; D05C 17/02

U.S. Cl. 428—95

9 Claims

1. A latex composition comprising an elastomeric polymer latex and up to about 66 parts by weight of an extender per 100 parts of said polymer latex consisting essentially of a mixture of granular starch and borax, the weight ratio of granular starch to borax being from about 1.5:1 to about 12:1.

4,055,695

FOAMED POLYOLEFINE FILMS

Anthony Graham Marshall Last, Welwyn Garden City, and John Albert Rixon, Shefford, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 105,622, Jan. 11, 1971, abandoned. This application Apr. 17, 1975, Ser. No. 568,835

Claims priority, application United Kingdom, Jan. 30, 1970, 4647/70

Int. Cl.² B32B 3/10, 5/18

U.S. Cl. 428—195

8 Claims

1. A wall or ceiling covering comprising a printed open celled foamed film of foamed polyolefine derived from a blend containing between 60% and 90% by weight of low density polythene and between 40% and 10% by weight of a crystalline polyolefine, said foamed film having a bulk density between 0.1 and 0.4 grams/cc and an open cell structure in the range of 40 to 90% open cells, the surface of said film having been subjected to surface treatment on at least one surface to improve the ink bonding properties of that surface, said film being characterized by higher abrasion resistance and higher dry ink abrasion resistance than corresponding surface treated film made from 100% by weight low density polythene.

4,055,696

POROUS POLYPROPYLENE HOLLOW FILAMENTS AND METHOD MAKING THE SAME

Kensuke Kamada; Shunsuke Minami, and Kanji Yoshida, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed June 23, 1976, Ser. No. 698,929

Claims priority, application Japan, July 9, 1975, 50-84718

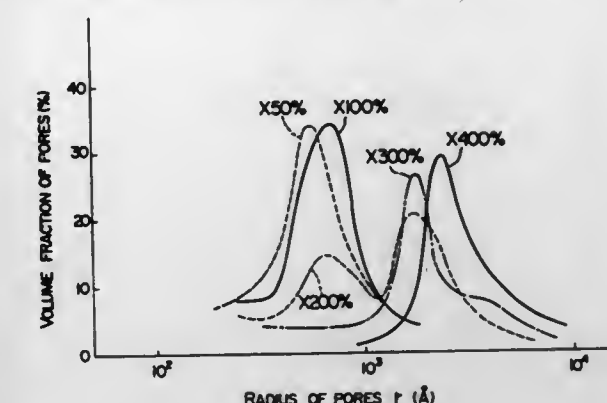
Int. Cl.² D02G 3/00; D01D 5/12

U.S. Cl. 428—398

2 Claims

1. Porous polypropylene hollow filaments consisting essentially of polypropylene, wherein:
the thickness of the surrounding wall portion is less than 60 μ ;
many fine interconnecting holes are present in said surrounding wall portion;

the distribution curve of the radius of said fine holes has at least one maximum point within the range of 200–1200 Å; said porous polypropylene filaments being more permeable to nitrogen gas than to oxygen gas and;



wherein said porous polypropylene hollow filaments have been prepared by stretching hollow polypropylene filaments from 30 to 200%.

4,055,697

WOVEN MATERIAL WITH FILLING THREADS AT ANGLES OTHER THAN RIGHT ANGLES

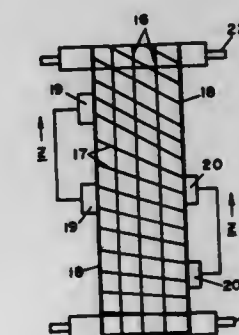
Donald W. Schmanski, Carson City, Nev., assignor to Fiberite Corporation, Winona, Minn.

Filed May 19, 1975, Ser. No. 578,372

Int. Cl.² B32B 5/12

U.S. Cl. 428—113

16 Claims



1. An anisotropic material comprising, a plurality of lengthwise spaced threads, a plurality of filling threads interwoven with said lengthwise threads so as to place some areas of said filling threads on opposite sides of said lengthwise threads, a number of said filling threads being interwoven with said lengthwise threads along pre-oriented axes and at predetermined angles other than a right angle with respect to said lengthwise threads to impart physical characteristics to said material at angles other than at right angles thereto, said interwoven filling threads and said lengthwise threads interlocking one another to provide rail-shear strength and reduce lateral movement and delamination effects between said lengthwise and filling threads.

4,055,698

POLYOLEFIN WEB HAVING REMOISTENABLE ADHESIVE BONDED THERETO

Floyd T. Beery, Prairie Village, Kans., assignor to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed June 25, 1976, Ser. No. 699,702

Int. Cl.² B32B 7/10, 7/12; D04H 13/00

U.S. Cl. 428—262

14 Claims

1. A remoistenable polyolefin web, comprising:
a substrate formed of a polyolefin material;
a primer layer applied to at least one face of said substrate, said primer layer comprising the dried residue of a coating composition applied in liquid form and consisting essen-

ially of a chlorinated polyolefin and a copolymerized olefinic vinyl acetate; and
a remoistenable adhesive layer applied over said primer layer and principally comprising a polyvinyl alcohol, said primer layer having the properties of bonding to said substrate and to said remoistenable adhesive layer.

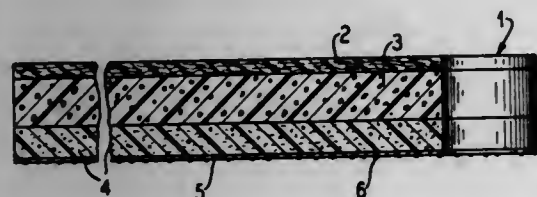
4,055,699

COLD INSULATING INSOLE

Du Yung Hsiung, Park Forest, Ill., assignor to Scholl, Inc., Chicago, Ill.

Filed Dec. 2, 1976, Ser. No. 746,891
Int. Cl.² B32B 3/26

U.S. Cl. 428—311



1. A laminated multi-layer insole for disposition in an article of footwear to insulate the foot from the cold developed in the sole of the footwear from walking or standing on a cold surface which comprises four superimposed layers comprising from top to bottom, a thin soft fabric layer laminated to the top of an open cell foam layer, a dense cross-linked polyolefin layer laminated to the bottom of said foam layer, and an aluminum coated moisture barrier layer of polymeric material laminated to the bottom of said cross-linked polyolefin layer, and said polymeric material layer having the aluminum coating on the exposed bottom face of the insole to engage the footwear.

4,055,700

THIN COMPOSITE WIRE SAW WITH SURFACE CUTTING CRYSTALS

Axel Georg Ronnquist, Sollentuna; Erik Tommie Lindahl, Solna, and Nicolay Stefanov Stollov, Tyreso, all of Sweden, assignors to Lumalamp AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 502,836, Sept. 3, 1974, abandoned. This application June 2, 1975, Ser. No. 582,681
Int. Cl.² B27B 33/16

U.S. Cl. 428—366

12 Claims

1. A composite metal saw wire comprising (i) a high tensile strength metal or alloy wire core which is at least one metal selected from the group comprising tungsten, molybdenum, tantalum, osmium, rhenium, and alloys thereof having a thickness between 10 and 500 μ m, and (ii) an integral crystalline surface layer having a thickness between about 1.5 and 10 μ m, said surface layer consisting essentially of hard cutting crystals selected from the group consisting of boron, and the borides, nitrides, and carbides of the transition metals and silicon with cutting edges projecting irregularly from the surface thereof.

4,055,701

AZIDO-SILANE COMPOSITIONS

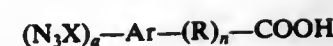
James Glenn Marsden, Amawalk, and Peter Joseph Orenski, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 483,367, June 26, 1974, Pat. No. 4,002,651. This application Oct. 18, 1976, Ser. No. 733,418
Int. Cl.² C07C 117/00, 121/86; B32B 9/00, 25/20

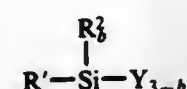
U.S. Cl. 428—391

10 Claims

1. An article of manufacture comprising a material selected from the group consisting of siliceous materials, metals, metal oxides and organic polymers coated with a solubilized azido-containing silane composition of matter produced by a process which comprises reacting in the presence of a solvent (a) an azido-containing compound selected from the group consisting of carboxylic acids of the formula



and the ammonium salts of said acids, wherein X is a radical selected from the group consisting of sulfonyl and formyl radicals, a is an integer of from 1 to 2, Ar is an aryl or hydroxy-substituted aryl radical, R is an alkylene radical and n has a value of 0 or 1; and (b) an amino-containing silane having the formula



7 Claims

wherein R^2 is a monovalent hydrocarbon radical, b has a value of from 0 to 2, Y is a hydrolyzable group selected from the class consisting of alkoxy and aryloxy radicals, and R' is an organic radical directly bonded to the silicon atom of said silane through a carbon to silicon bond, said organic radical further containing at least one nitrogen atom, said solvent being present in an amount sufficient to solubilize the azido-containing silane product of (a) and (b).

4,055,702

ADDITIVE-CONTAINING FIBERS

Roger T. Guthrie, Westfield; Justin L. Hirshman, East Brunswick; Stanley Littman, Sharon; Edwin L. Sukman, Upper Montclair, and Philip H. Ravenscroft, Rowayton, all of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Division of Ser. No. 521,843, Nov. 7, 1974, Pat. No. 4,001,367, which is a continuation-in-part of Ser. No. 456,130, March 29, 1974, abandoned. This application Dec. 2, 1975, Ser. No. 637,024
Int. Cl.² B29C 17/02; D02G 3/00

U.S. Cl. 428—398

10 Claims



1. A melt spun, cold drawn fiber of a synthetic organic polymer selected from the group consisting of polyesters, polyamides, polypropylene and high density polyethylene, said fiber containing from 0.1 to 25%, based on the weight of said fiber, of an additive which at least partially occupies a network of interconnecting microvoids extending along the entire length and throughout the cross section of said fiber, said additive being selected from the group consisting of dye receptors, flame retardants, anti-static agents, stabilizers, mildewicides and antioxidants.

4,055,703

ION EXCHANGE STRENGTHENED GLASS CONTAINING P_2O_5

Dale W. Rinehart, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 605,108, Aug. 15, 1975, Pat. No. 4,015,045, which is a continuation-in-part of Ser. No. 432,006, Jan. 9, 1974, abandoned. This application July 19, 1976, Ser. No. 706,660

Int. Cl.² B32B 17/00; C03C 21/00

U.S. Cl. 428—410

16 Claims

1. A glass essentially transparent to visible light and capable of being strengthened by ion exchange with potassium ions, comprising by weight on the oxide basis:

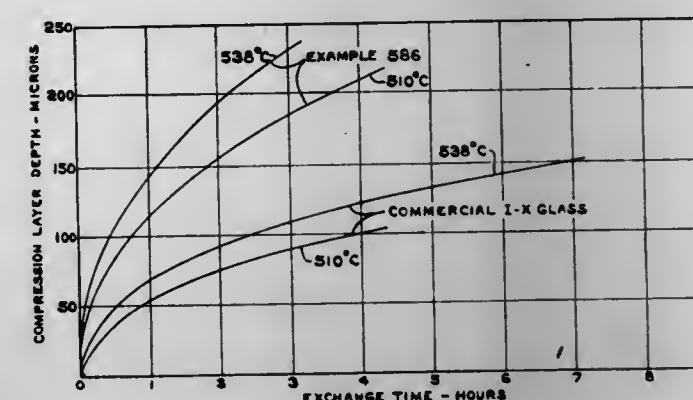
34 to 61 percent SiO_2

12 to 20 percent Na_2O
2 to 9 percent K_2O
17 to 23 percent ($Na_2O + K_2O$)
2 to 15 percent Al_2O_3
0 to 10 percent ZrO_2
9 to 23 percent ($Al_2O_3 + ZrO_2$)
2 to 20 percent P_2O_5
0 to 8 percent ZnO
0 to 6 percent MgO
0 to 5 percent TiO_2
2 to 9 percent ($ZnO + MgO + TiO_2$)
0 to 0.1 percent Li_2O

wherein said constituents comprise at least 90 percent by weight of the glass and are proportioned relative to one another so as to provide the glass with a viscosity of 100 poises at a temperature less than 2800° F. (1538° C.)

4. A chemically strengthened transparent glass article exhibiting a surface compressive stress after being subjected to surface abrasion composed of an interior portion which is in tension and a surface compressive layer, said interior portion comprised of by weight on the oxide basis:

34 to 61 percent SiO_2
12 to 20 percent Na_2O
2 to 9 percent K_2O
17 to 23 percent ($Na_2O + K_2O$)
2 to 15 percent Al_2O_3
0 to 10 percent ZrO_2
9 to 23 percent ($Al_2O_3 + ZrO_2$)
2 to 20 percent P_2O_5



0 to 8 percent ZnO
0 to 6 percent MgO
0 to 5 percent TiO_2
2 to 9 percent ($ZnO + MgO + TiO_2$)
0 to 0.1 percent Li_2O

said constituents comprising at least 90 percent by weight of the interior portion and proportioned relative to one another so as to provide a glass having a viscosity of 100 poises at a temperature less than 2800° F. (1538° C.), said surface compressive layer having a higher content of K_2O and a lower content of Na_2O than the interior portion.

10. A method of strengthening a transparent glass article comprising the steps of:

a. contacting a source of potassium ions with the surface of a glass article comprising by weight on the oxide basis:

34 to 61 percent SiO_2
12 to 20 percent Na_2O
2 to 9 percent K_2O
17 to 23 percent ($Na_2O + K_2O$)
2 to 15 percent Al_2O_3
0 to 10 percent ZrO_2
9 to 23 percent ($Al_2O_3 + ZrO_2$)
2 to 20 percent P_2O_5
0 to 8 percent ZnO
0 to 6 percent MgO
0 to 5 percent TiO_2
2 to 9 percent ($ZnO + MgO + TiO_2$)
0 to 0.1 percent Li_2O

said constituents comprising at least 90 percent by weight of

the glass article and proportioned relative to one another so as to provide a glass having a viscosity of 100 poises at a temperature less than 2800° F. (1538° C.);

b. heating said source of potassium ions while in contact with the glass to a temperature at which potassium ions from said source replace sodium ions in the glass, but essentially below the strain point of the glass, thereby creating a zone of compression at the surface of the glass which extends at least 5 microns into the glass; and
c. removing the glass from contact with the potassium ion source.

4,055,704

TYPING CORRECTION PAPER

John Fahimian, and Clive H. Hare, both of 72 Second St., Cambridge, Mass. 02141

Filed Aug. 1, 1975, Ser. No. 601,323

Int. Cl.² B32B 9/06, 5/30, 9/04

U.S. Cl. 428—411

11 Claims

1. A correction sheet material for masking characters on a substrate, which material consisting essentially of:

a. a carrier sheet; and
b. a thin dry coating layer on the carrier sheet, the coating layer adapted, on the application of sufficient pressure, to be transferred from the carrier sheet onto the characters on the substrate, the coating layer comprising a pigment in an amount to provide sufficient opacity to cover the characters to be masked, and a high molecular weight organic ammonium salt as a binding and adhesive agent for the pigment, the salt insoluble in water and in oils used in typewriter ink and carbon paper, the salt present in the coating layer in both continuous film and precipitated salt form, whereby, on the application of pressure, a strong opaque film of pigment and precipitated salt particles is transferred to mask the character on the substrate.

4,055,705

THERMAL BARRIER COATING SYSTEM

Stephan Stecura, Parma, and Curt H. Leibert, Middleburg Heights, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 14, 1976, Ser. No. 686,449

Int. Cl.² B32B 15/04

U.S. Cl. 428—633

8 Claims

1. A coated article of manufacture having a thermal barrier coating system comprising
a substrate selected from the group consisting of nickel-base alloys and cobalt-base alloys,
a bond coating consisting essentially of NiCrAlY covering said substrate, and
a thermal barrier coating consisting essentially of zirconia stabilized with another oxide.

4,055,706

PROCESSES FOR PROTECTING REFRACTORY METALLIC COMPONENTS AGAINST CORROSION
Philippe M. Galmiche, Clamart, and Pierre J. Lepetit, Saint-Vrain, both of France, assignors to Office National d'Etudes et de Recherches Aérospatiales (O.N.E.R.A.), Chatillon-sous-Bagneux, France

Filed July 10, 1975, Ser. No. 594,802

Int. Cl.² B23P 3/00

U.S. Cl. 428—652

12 Claims

1. In a process of forming a coating selected from nickel and cobalt-based coatings on a surface of a component comprising a metallic refractory material comprising at least 50% by weight of metal selected from the group consisting of iron, cobalt and nickel, the improvement comprising, forming chemically at least one layer comprising an alloy of boron with a member selected from the group consisting of nickel, cobalt

and nickel/cobalt on the component, said layer being deposited by immersing the surface of the component in an aqueous bath containing at least one boron salt and at least one salt selected from nickel salts and cobalt salts, after which the boron is eliminated from the layer by heating the coated component in a halogenated and hydrogenated atmosphere at a temperature between 800° and 1250° C, the elimination of the boron being accompanied by diffusion of at least one of cobalt and nickel into the metallic refractory material.

4,055,707

SELECTIVE COATING FOR SOLAR PANELS

Glen E. McDonald, Strongsville, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 22, 1975, Ser. No. 643,041

Int. Cl.² F24J 3/02; B32B 15/18, 15/20; B05D 3/12

U.S. Cl. 428-652

8 Claims

1. In apparatus for collecting solar energy of the type having a composite heating panel for absorbing said solar energy and converting the same to heat, the improvement comprising a metallic substrate forming a high conductivity base for said panel, said substrate having at least one surface exposed to said solar energy,
- a layer of dull nickel on said one surface to lower the emissivity of said surface, and
- a coating of black chrome on said layer of dull nickel, said coating having a thickness between about 0.5 micron and about 2.5 microns and being highly absorptive in the visible range.
2. A method of making a composite heating panel for a solar collector comprising the steps of depositing a layer of dull nickel to a thickness of about 0.0005 inch on a surface of a high thermal conductivity substrate to lower the emissivity thereof, and coating said layer of dull nickel with black chrome to a thickness between about 0.5 micron and about 2.5 microns to raise the absorptivity of said surface in the visible range.

4,055,708

DEVICE FOR DETECTING THE OVERDISCHARGE OF AN ACCUMULATOR AS WELL AS THE SURFACE LEVEL OF THE LIQUID CONTAINED IN THE ACCUMULATOR

Mitsuo Yamamoto, Kakegawa, Japan, assignor to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

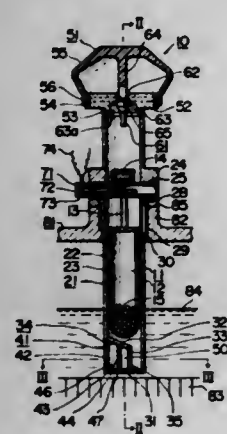
Filed May 21, 1976, Ser. No. 688,688

Claims priority, application Japan, May 27, 1975, 50-63612; Jan. 16, 1976, 51-4373

Int. Cl.² H01M 10/48

U.S. Cl. 429-10

12 Claims



1. A device for detecting the overdischarge of the accumulator as well as the surface level of electrolyte contained in the accumulator comprising a floating member provided with a permanent magnet or a magnetic material, a case housing the floating member and having a hole through which the electrolyte in the accumulator passes, a means for sucking the electro-

lyte through the hole into the case and being attached to the case, a magnetically sensing switch arranged to be operated responding to movement of the permanent magnet or the magnetic material, and a valve means provided between the case and the electrolyte sucking means.

4,055,709

REJUVENATION OF NICKEL-CADMIUM BATTERY CELLS

Robert C. Medford, Newport News, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1976, Ser. No. 712,105

Int. Cl.² H01M 10/44

U.S. Cl. 429-49

6 Claims

1. A method of rejuvenating nickel-cadmium battery cells of limited voltage capacity comprising the steps of: charging the cells at approximately 2.5 amps until equilibrium is reached; draining the electrolyte from the cells; flushing the cells internally with demineralized-distilled water, which is free of carbon dioxide, in an ultrasonic bath; preparing fresh electrolyte by dissolving approximately 33% by weight of reagent grade potassium hydroxide in boiled-distilled water; and adding said fresh electrolyte to said cells.

4,055,710

ELECTROCHEMICAL CELLS HAVING SOLID ELECTROLYTE OF TUBULAR FORM

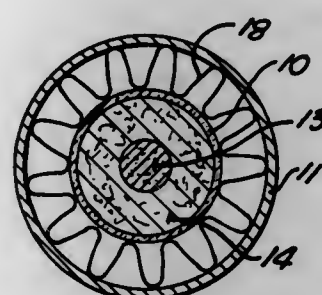
Geoffrey John May, Frodsham, and Michael McNamee, Wallasey, both of England, assignors to Chloride Silent Power Limited, London, England

Filed Oct. 1, 1976, Ser. No. 728,679

Int. Cl.² H01M 10/39

U.S. Cl. 429-104

27 Claims



1. An electrochemical cell having a tube of solid electrolyte material separating a liquid alkali metal from a cathodic reactant, wherein constraining means are provided around the electrolyte tube, the constraining means having a coefficient of thermal expansion such as to provide an increasing inward pressure on the electrolyte tube as the temperature rises.

4,055,711

LEAD-ACID STORAGE BATTERY

Shinichi Ikari, Kumagaya, Japan, assignor to Masao Kubota, Tokyo, Japan

Continuation-in-part of Ser. No. 618,260, Sept. 30, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,780

Claims priority, application Japan, Oct. 3, 1974, 49-113320

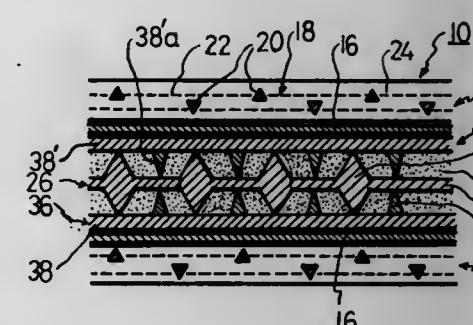
Int. Cl.² H01M 2/16

U.S. Cl. 429-143

7 Claims

1. A lead-acid storage battery comprising positive plates and pasted negative plates, which are alternately arranged so that one of said positive and negative plates is disposed between the other of said plates, and insulating separators each being disposed between the adjacent positive and negative plates, char-

acterized by that each of said positive plates comprises a substrate having at least spaced longitudinal members of electrically conductive material with first and second outer surfaces of said spaced longitudinal members being substantially in first and second planes; pasted active material filled in said substrate substantially to the level of said first and second plane, respectively; and an active material holder including porous insulating sheets mounted on both sides of said active material, said insulating sheets each having an inner surface lying substantially in said first and second planes, respectively, and substan-



tially engaging said outer surfaces of said spaced longitudinal members, a plurality of longitudinal partitions of insulating material secured to said inner surfaces of said porous insulating sheets and interleaved with said longitudinal members, said plurality of longitudinal partitions extending inwardly from said inner surfaces and being embedded in said active material so as to effectively subdivide the active material into smaller active material portions, and whereby the said partitions and porous insulating sheets are effective in holding more securely the active material on the substrate during charge and discharge of the battery.

4,055,712

METHOD OF PREPARING CAPPED POLYMERS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Kewanee Industries, Bryn Mawr, Pa.

Division of Ser. No. 623,402, Oct. 17, 1975, which is a continuation-in-part of Ser. No. 518,596, Oct. 29, 1974, Pat. No. 3,931,319. This application Sept. 27, 1976, Ser. No. 726,580

Int. Cl.² C08G 61/00; C08F 110/00

U.S. Cl. 526-11.1

7 Claims

1. A method of making a capped polymer which comprises condensing a difunctional tertiary amine with a greater than molar equivalent amount of a 1,4-dihalo-2-butene, and then, after extracting the unreacted dihalo compound, reacting the condensation product with a monofunctional heterocyclic tertiary amine to form a linear polymer having a quaternary ammonium moiety at each end.

4,055,713

IODINE MOLECULAR WEIGHT REGULATORS IN SUSPENSION POLYMERIZATION SYSTEMS

George A. Moczygemba; W. Delmar Johnson, and Earl Clark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 510,040, Sept. 27, 1974, Pat. No. 3,983,187, which is a continuation of Ser. No. 303,330, Nov. 3, 1972, abandoned. This application May 13, 1976, Ser. No. 686,200

Int. Cl.² C08F 12/06, 18/04, 20/12, 20/42

U.S. Cl. 526-207

16 Claims

1. In an aqueous suspension polymerization system, wherein at least one polymerizable monomer polymerizable under aqueous suspension polymerization conditions is polymerized under aqueous suspension polymerization conditions, including water, suspending agent, and in the presence of a molecular weight modifier, optionally with a free radical initiator, wherein said polymerizable monomer comprises a monovinyl-substituted aromatic compound, α,β -unsaturated nitrile, ester of acrylic acid, ester of alkacrylic acid, or vinyl ester, the

improvement which comprises the step of employing elemental iodine as said molecular weight modifier.

4,055,714

AZO FREE RADICAL INITIATORS CONTAINING ULTRAVIOLET LIGHT STABILIZING GROUPS

Chester S. Sheppard, Kenmore, and Ronald E. MacLeay, Williamsburg, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 435,622, Jan. 22, 1974, abandoned, which is a division of Ser. No. 98,893, Dec. 16, 1970, abandoned. This application Apr. 27, 1976, Ser. No. 680,545

Int. Cl.² C08F 4/04, 4/34, 12/08

U.S. Cl. 526-208

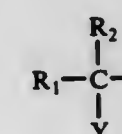
4 Claims

1. In the process of preparing a polymer containing an ultraviolet light stabilizer chemically bound to said polymer comprising polymerizing an ethylenically unsaturated monomer capable of being polymerized by free radicals in the presence of a free radical initiator the improvement comprising polymerizing said monomer in the presence of a free radical initiator containing ultraviolet light stabilizing groups and having the formula:

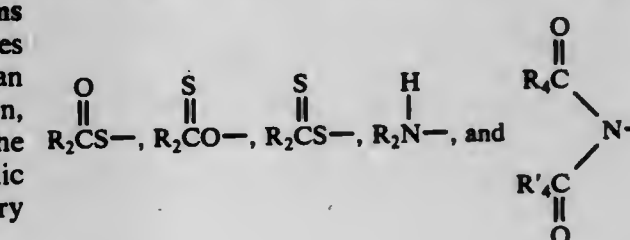
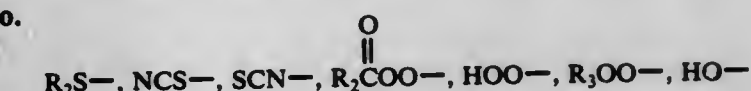
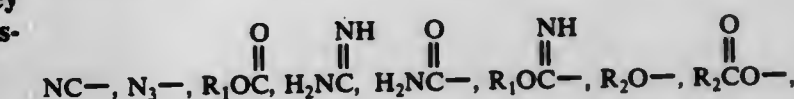


wherein

R' is selected from the group consisting of alkyl of 1-20 carbons, cycloalkyl of 3-10 carbons, aralkyl of 7-20 carbons and



wherein: Y is selected from the group consisting of



wherein

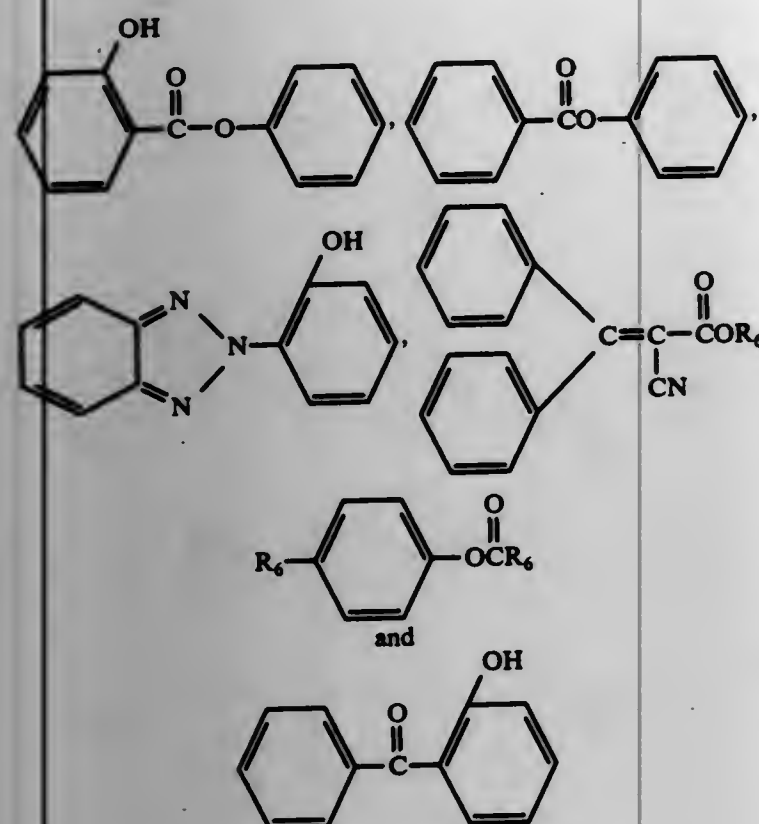
R₁ and R₂ are selected from the group consisting of alkyl of 1-20 carbons, cycloalkyl of 3-6 carbons, and alkylene of 2-30 carbons when R₁ and R₂ are joined together; and wherein one but not both of R₁ and R₂ may in addition be phenyl, tolyl, xylyl, benzyl, or phenethyl;

R₃ is t-alkyl of 4-8 carbons, t-cycloalkyl of 4-8 carbons or t-aralkyl of 9-15 carbons;

R₄ and R'₄ are alkyl of 1-6 carbons, cycloalkyl of 3-6 carbons or aryl of 6-12 carbons, when R₄ and R'₄ are joined together, and alkylene of 1-6 carbons or arylene of 6-12 carbons when R₄ and R'₄ are joined together;

R is any of the foregoing radicals of R', and in addition, may be selected from the group consisting of aryl of 6-14 carbons, acyl of 2-20 carbons, aroyl of 7-20 carbons, carbamoyl, alkylcarbamoyl of 2-7 carbons, cycloalkylcarbamoyl of 4-11 carbons, -CO₂Na, -CO₂K, alkoxycarbonyl of 2-7 carbons, cycloalkoxycarbonyl of 4-11 carbons, and aryloxy carbonyl of 7-13 carbons, with the proviso that when R is carbamoyl, R' can be, in addition,

alkoxycarbonyl of 2-7 carbons, cycloalkoxycarbonyl of 4-11 carbons, or aryloxycarbonyl of 4-11 carbons and at least one of R and R' contains an ultraviolet light stabilizing radical of a compound selected from the group consisting of



where R₆ is alkyl of 1-6 carbons.

4,055,715

METHOD OF PRODUCING

1-N-[L-(-)-α-HYDROXY-γ-AMINO BUTYRYL]XK-62-2
Shuji Tomioka, Machida; Yasuki Mori, Kawasaki; Takashi Nara, Tokyo, all of Japan, and Kunikatsu Shirahata, Columbus, Ohio, assignors to Abbott Laboratories, North Chicago, Ill.

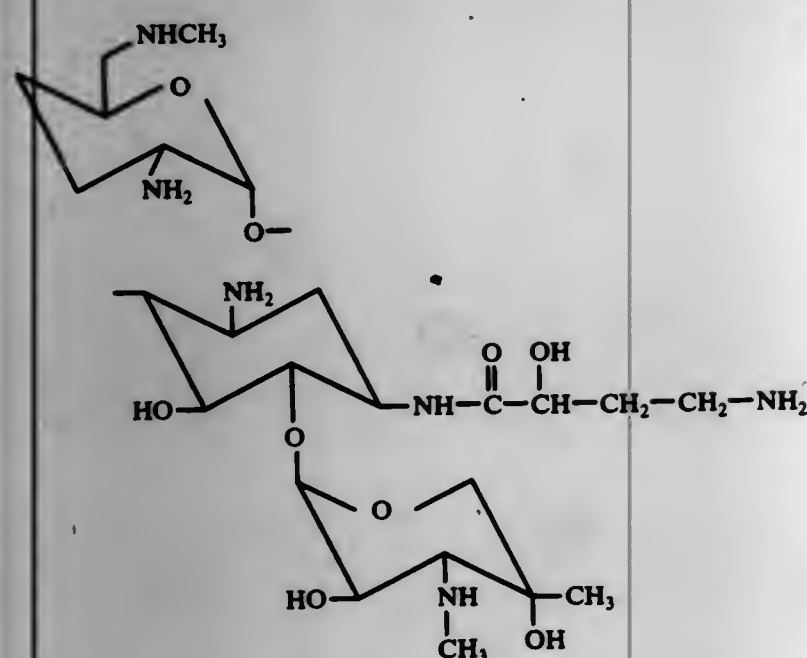
Filed Jan. 22, 1975, Ser. No. 542,950

Claims priority, application Japan, Jan. 24, 1974, 49-9733
Int. Cl.² C07H 15/22

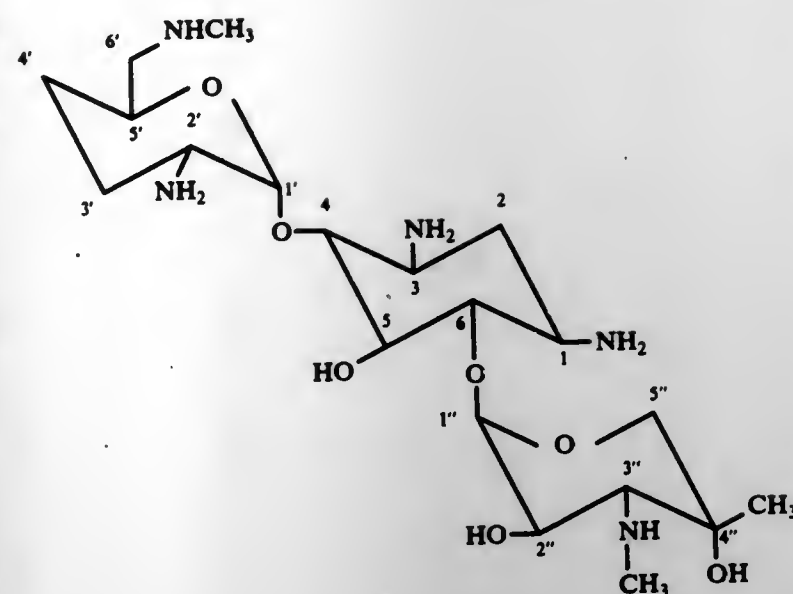
U.S. Cl. 536-17

6 Claims

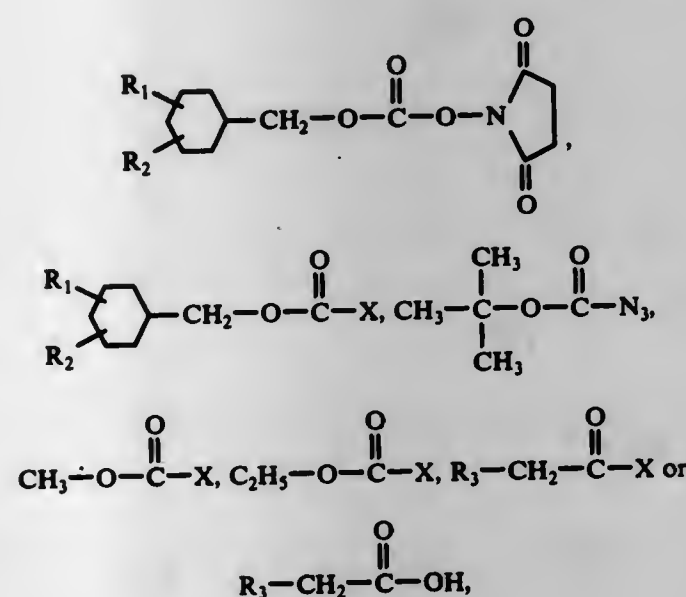
1. A process for producing a compound of the formula:



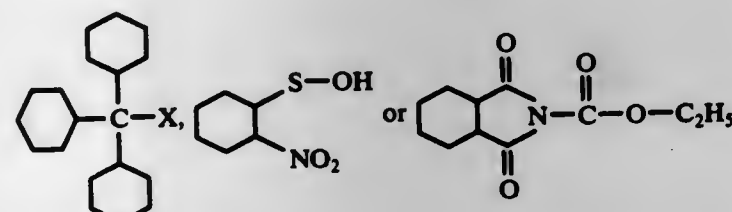
which comprises reacting a compound of the formula:



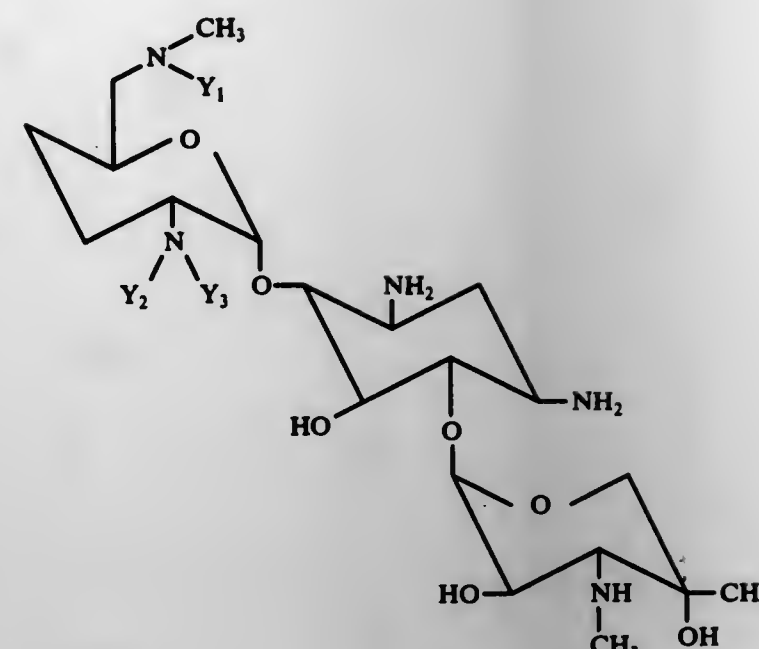
with an acylating agent selected from the group consisting of:



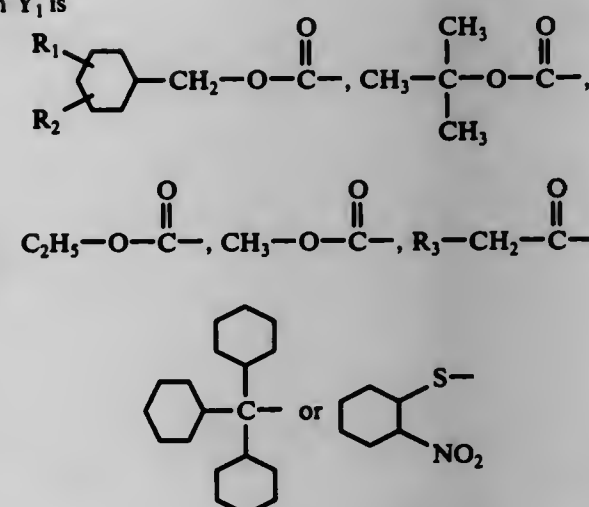
wherein R₁ and R₂ may be the same or different and are H, OH, NO₂, Cl, Br, I, alkyl groups having 1 to 5 carbon atoms or alkoxy groups having 1 to 5 carbon atoms, respectively, R₃ is H, F, Cl, Br, I or an alkyl group having 1 to 5 carbon atoms and X is Cl, Br or I; or an amino protecting reagent selected from the group consisting of:



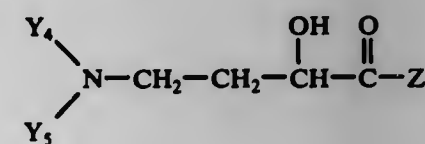
wherein X has the same significance as defined above to introduce an eliminable protecting group to the amino group bound to the carbon atoms at the 2' and 6' positions to prepare a first intermediate compound represented by the formula



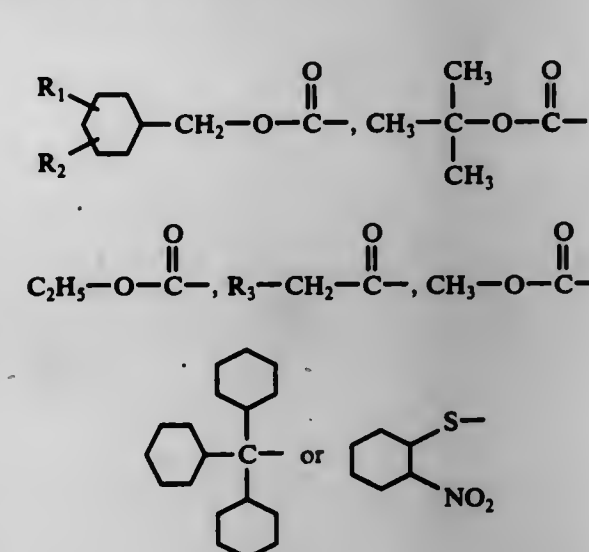
wherein Y₁ is



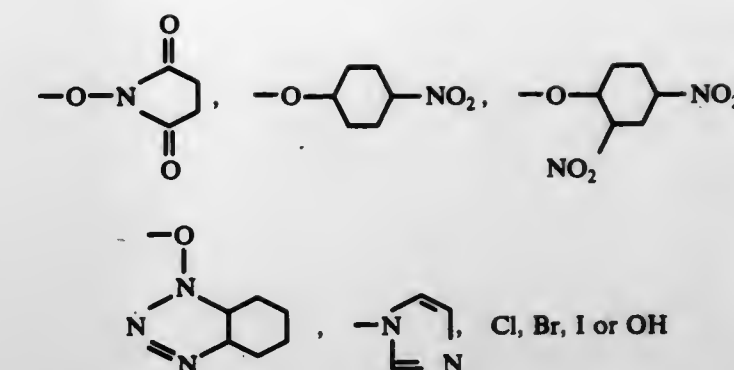
wherein R₁, R₂ and R₃ have the same significance as defined above, Y₂ has the same significance as Y₁ and Y₃ is hydrogen, or Y₂ and Y₃ form a phthaloyl group; acylating said first intermediate compound with an acylating agent derived from α-hydroxy-γ-aminobutyric acid represented by the formula:



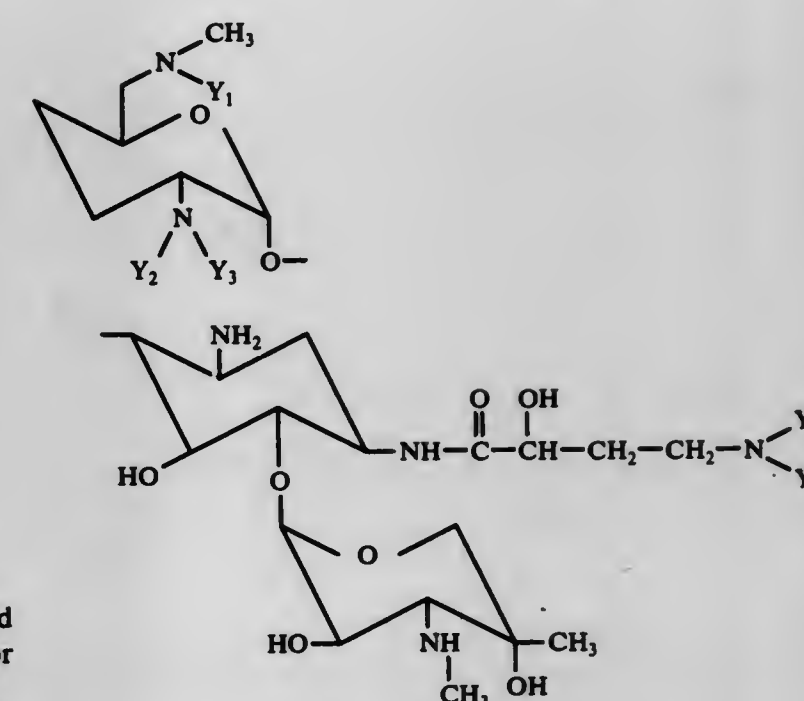
wherein Y₄ is H and Y₅ is



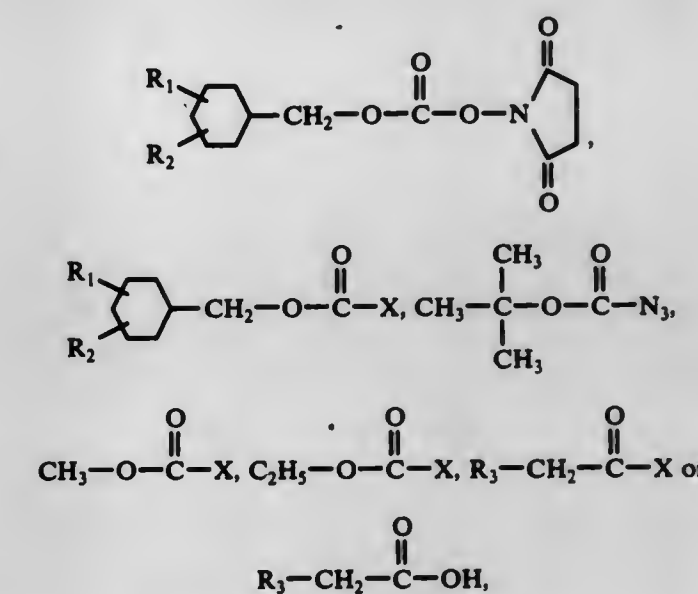
wherein R₁, R₂ and R₃ have the same significance as defined above or Y₄ and Y₅ form a phthaloyl group; and Z is



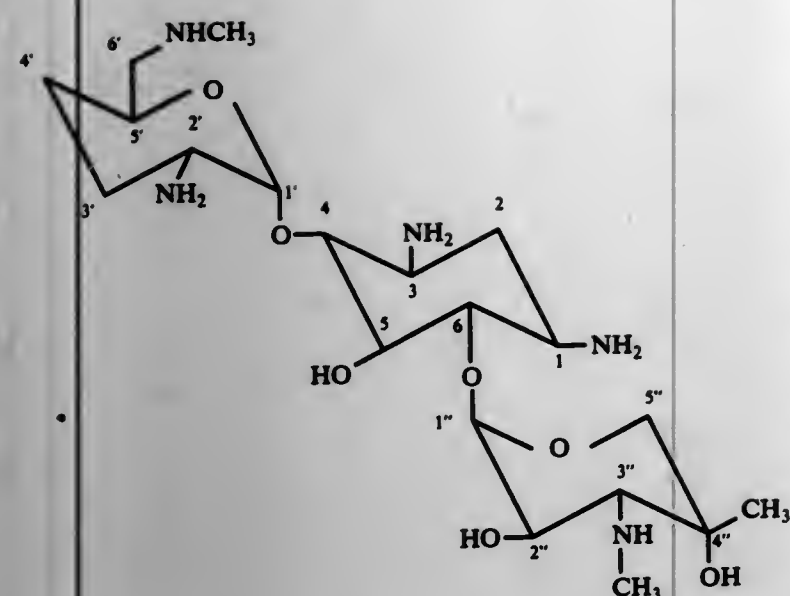
to prepare a second intermediate compound represented by the formula:



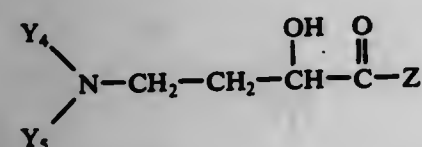
wherein Y₁, Y₂, Y₃, Y₄ and Y₅ have the same significance as defined above; and thereafter eliminating said protecting groups wherein said reaction to prepare said first intermediate compound is carried out at a temperature from -50° to 50° C for from 1/4 to 24 hours and wherein from 1.0 to 4.5 moles of said acylating agent having the formula



or said amino protecting reagent is employed per mole of



and wherein said first intermediate compound is acylated to prepare said second intermediate compound at a temperature from -50° to 50° C for from $\frac{1}{2}$ to 24 hours employing 0.5 to 1.5 moles of said acylating agent having the formula

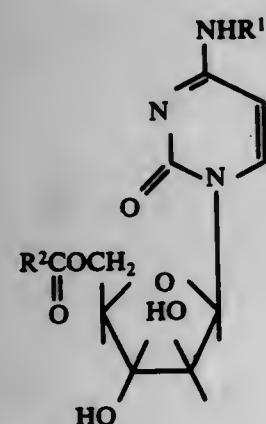


per mole of said first intermediate compound.

4,055,716
N⁴-ACYL-1-ARABINOFURANOSYLCYTOSINE-5'-ESTERS
Torao Ishida, Takashi Shirai, and Minoru Akiyama, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 8, 1976, Ser. No. 675,050
Claims priority, application Japan, Apr. 8, 1975, 50-41815;
Apr. 8, 1975, 50-41816

Int. Cl.² C07H 19/06
U.S. Cl. 536—23
1. A nucleoside derivative represented by the formula:

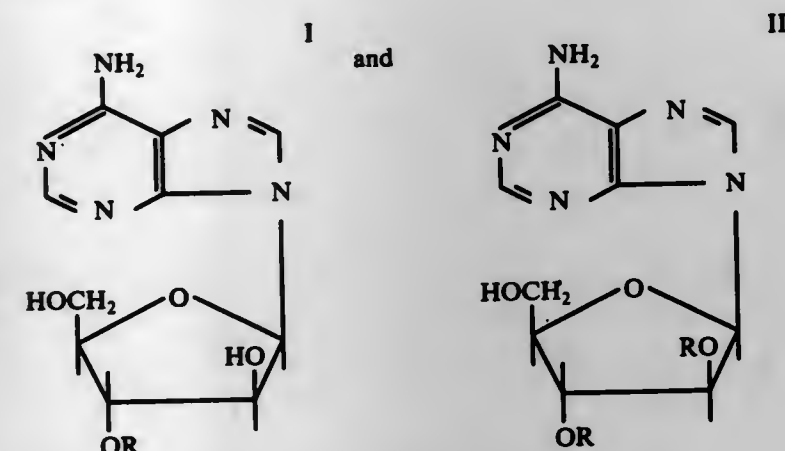


wherein R¹ represents an acyl group having 3 to 28 carbon atoms and R² represents an XCH₂-, XCH₂CH₂— or CH₃CHX— group, wherein X represents chloro, bromo, a (CH₃)₂N-group or a (C₂H₅)₂N-group.

4,055,717
9-(3-O-ACYL-β-D-ARABINOFURANOSYL)ADENINE COMPOUNDS,
9-(2,3-DI-O-ACYL-β-D-ARABINOFURANOSYL)-ADENINE COMPOUNDS, AND METHOD FOR THEIR PRODUCTION

David Clarkston Baker, and Theodore Herbert Haskell, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed May 17, 1976, Ser. No. 687,273
Int. Cl.² C07H 19/18; A61K 31/52
U.S. Cl. 536—26
1. 9-(β-D-Arabinofuranosyl)adenine compounds having the formulas

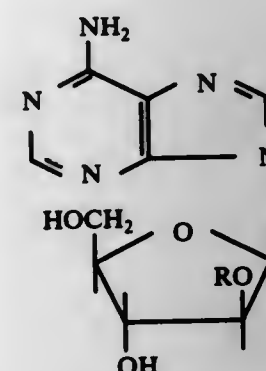


where R is an alkanoyl group having from 2 to 4 carbon atoms.

4,055,718
9-(2-O-ACYL-β-D-ARABINOFURANOSYL)-ADENINE COMPOUNDS AND METHOD FOR THEIR PRODUCTION

David Clarkston Baker, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed May 17, 1976, Ser. No. 687,271
Int. Cl.² A61K 31/52; C07H 19/18
U.S. Cl. 536—26
1. A 9-(2-O-acyl-β-D-arabinofuranosyl)adenine compound having the formula



where R is a C₂₋₄ straight chain or C₃₋₄ branched chain alkanoyl group.

4,055,719
PROCESS FOR PRODUCING TRICHLOROISOCYANURIC ACID FROM SELECTED SYMMETRICAL TRIAZINES

John A. Wojtowicz, Chesire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed June 25, 1976, Ser. No. 699,825
Int. Cl.² C07D 251/28

U.S. Cl. 544—190
1. A process for producing trichloroisocyanuric acid by the reaction of a solid symmetrical triazine compound selected from the group consisting of ammeline, chlorosubstituted

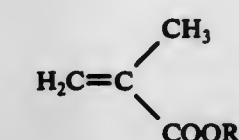
ammeline, ammeline, chlorosubstituted ammeline, and mixtures thereof with a gaseous mixture of dichlorine monoxide and a diluent gas, said gaseous mixture being comprised of from about 1 percent to about 30 percent by volume of said dichlorine monoxide, and recovering said trichloroisocyanuric acid produced thereby.

4,055,721
METHOD OF PRODUCING UNSATURATED CARBONYL COMPOUNDS

Noboru Kawata, Kosaku Honna, and Hirozo Sugahara, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company, Ltd., Tokyo, Japan

Filed July 6, 1976, Ser. No. 702,987
Claims priority, application Japan, July 10, 1975, 50-84010
Int. Cl.² C07C 69/54

U.S. Cl. 560—207
1. A method of producing an unsaturated carbonyl compound of the formula



4,055,720
DIAMINOTRIHALOPROPYL TRIAZINES; AND THEIR METHYLOL DERIVATIVES

Leon H. Chance, New Orleans, and Judy D. Timpa, Metairie, both of La., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,771
Int. Cl.² C07D 251/48
U.S. Cl. 544—205
1. 2,4-Diamino-6(3,3,3-tribromo-1-propyl)-1,3,5-triazine.

wherein R' is hydrogen or lower alkyl, which comprises reacting methyl acetylene, carbon monoxide and a compound of the formula R'OH wherein R' is hydrogen or lower alkyl in the presence of a catalyst consisting essentially of a palladium (II) compound and a compound of the formula R''X wherein R'' is hydrogen, lower alkyl or aryl and X is iodine or bromine, and in the presence of an ester of a saturated aliphatic acid or a saturated aliphatic ketone, the amount of said R'OH compound being substantially equal to the amount of methyl acetylene and the amount of said ester or ketone being from about 2 to about 10 times the amount of said R'OH compound.

ELECTRICAL

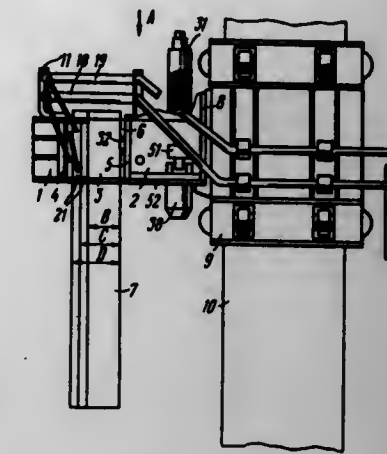
4,055,722

ELECTRODE HOLDER

Jury Sergeevich Lukyanov, ulitsa Bljukhera, 35, kv. 51; Lev Seliverstovich Kazantsev, ulitsa Rimskogo-Korsakova, 11, kv. 69; Andrei Grigorievich Pomeschikov, ulitsa Rimskogo-Korsakova, 10, kv. 2, and Gennady Fedorovich Skvortsov, prospekt Karla Marksa, 25, kv. 26, all of Novosibirsk, U.S.S.R.
Filed Mar. 11, 1976, Ser. No. 665,933
Int. Cl.² H05B 7/102, 7/103

U.S. Cl. 13—16

3 Claims



1. An electrode holder for holding electrodes of different types and sizes comprising: a casing for the electrode holder; a cantilever head having recesses and said head is connected to said casing; at least one electrode adapted to be installed in said recesses of said cantilever head; electroconducting contact plates with current-feeding pipes secured on one of the walls of said cantilever head; said contact plates are provided with replaceable inserts made from electroconducting material, the thickness thereof depending on the thickness of said electrode to be installed; and each of said replaceable inserts having a cooling cavity communicating through said pipes for the delivery and discharge of a cooling fluid, with a corresponding cooling cavity of said contact plate and said current-feeding pipe.

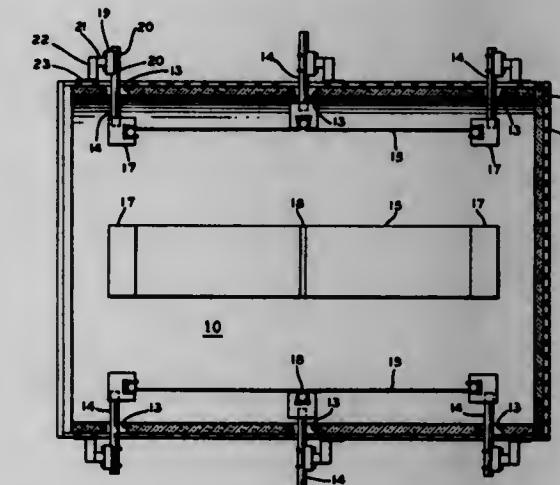
4,055,723

HEATER SUPPORT ELEMENT FOR ELECTRIC FURNACE

Wallace Snow Vanderford, Kintnersville, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.
Filed July 19, 1976, Ser. No. 706,654
Int. Cl.² H05B 3/34

U.S. Cl. 13—25

8 Claims



1. In an electric furnace having an electric heater formed of a flexible material, an improved electrical connecting and supporting element for said heater comprising
a bar of electrically conductive material having in a face thereof a longitudinal slot parallel with the longitudinal axis of said bar with the width of its entrance of lesser dimension than the width of the inner portion of said slot

to receive within said slot a loop of said flexible electric heater, and
a mandrel having a cross-sectional dimension greater than said width of said entrance and less than said width of said inner portion of said slot inserted within said loop within said slot whereby said flexible material is mechanically secured to said bar of electrically conductive material and provides an electrical connection between said bar and said heater.

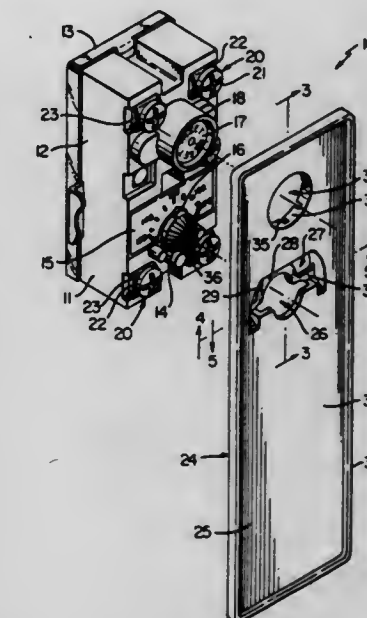
4,055,724

PROTECTIVE SHIELD FOR A CONTROL DEVICE

Siegfried E. Manecke, and James L. Shaw, both of Indiana, Pa., assignors to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 499,327, Aug. 21, 1974, Pat. No. 3,914,661.
This application Aug. 4, 1975, Ser. No. 601,514
Int. Cl.² H05K 5/03

U.S. Cl. 174—66

7 Claims



2. A substantially flat protective shield for a control device having a housing provided with a selector knob and dial arrangement adjacent said knob as well as electrical terminal means adjacent said knob and dial arrangement, said protective shield being adapted to be secured to said control device to cover said terminal means, said shield having two separate opening means therethrough, one of said opening means being adapted to expose said dial arrangement and the other of said opening means being adapted to have said selector knob projecting therethrough, said shield having a web portion thereof separating said two opening means from each other, said web portion having a part thereof offset relative to said shield by another part thereof, said offset part of said web portion being disposed spaced from and parallel to said shield while being adapted to engage against said housing to space said shield therefrom.

4,055,725

CIRCUIT BOARD ASSEMBLY

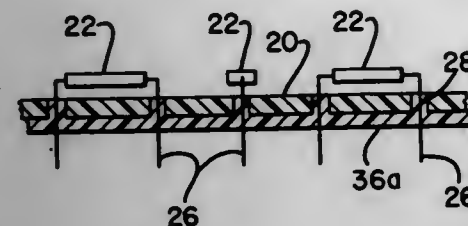
Kenneth G. Boynton, Milford, N.H., assignor to Hollis Engineering, Inc., Nashua, N.H.
Division of Ser. No. 469,536, May 13, 1974, Pat. No. 3,973,322.
This application Feb. 2, 1976, Ser. No. 654,367
Int. Cl.² B23K 31/02; H05K 3/20

U.S. Cl. 174—68.5

19 Claims

1. A method of treating electrical and electronic components assembled in a perforated circuit board in preparation for mass joining with solder said electrical and electronic components by their leads to said board, and wherein said component leads extend through at least some of the perforations in said board, said method comprising the steps in sequence of:
a. applying a meltable cement to said board and said component leads so as to (1) at least partially cover at least some

of said perforations and (2) intimately contact (a) wall areas of said circuit board defining said perforations and (b) said leads extending through said perforations, said cement (i) being applied as a liquid, said cement in solid form (ii) being compatible with said solder, and, (iii) having a melting point below that of said solder, and



- b. hardening said liquid to form said solid, solder-compatible meltable cement, coupling said leads and said board.
4. A method according to claim 1 further including the step of intermixing a compatible flux active agent with said cement and applying the intermix resulting to said board and component leads.

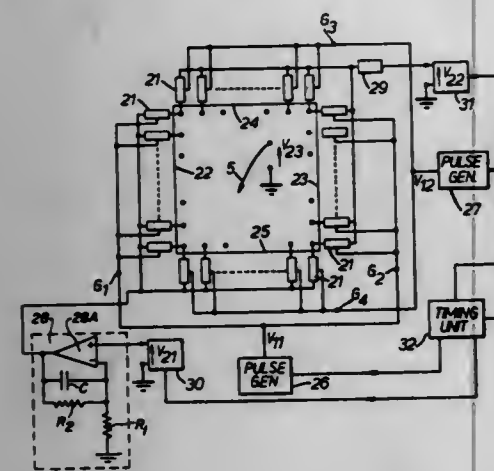
4,055,726

ELECTRICAL POSITION RESOLVING BY ZERO-CROSSING DELAY

John A. Turner, 13 Station Road, Earls Coln, Colchester, Essex, and Gordon J. Ritchie, 44 Wivenhoe Road, Alresford, Colchester, Essex, both of England

Filed June 24, 1976, Ser. No. 699,381
Int. Cl.² G08C 21/00

U.S. Cl. 178—18



1. An electrical position resolver arrangement, comprising means defining a resistive surface, at least two electrode means in electrical contact with the surface at points extending respectively along spaced-apart lines, a movable probe for making electrical connections with the surface at a point between the said lines, first and second sources respectively providing first and second voltages having substantially similar voltage/time waveforms which are separated by a predetermined time delay and each of which has at least a portion which is unmodulated and substantially linear, connection means for respectively connecting the first and second voltages to said two electrode means, and output means responsive to the voltage produced on the probe by the first and second voltages for determining the time delay between the time when the said portion of one of the first and second voltages crosses a datum value and the time when the probe voltage crosses the corresponding datum value, so as to sense the position of the probe relative to the two electrode means to which the first and second voltages are applied.

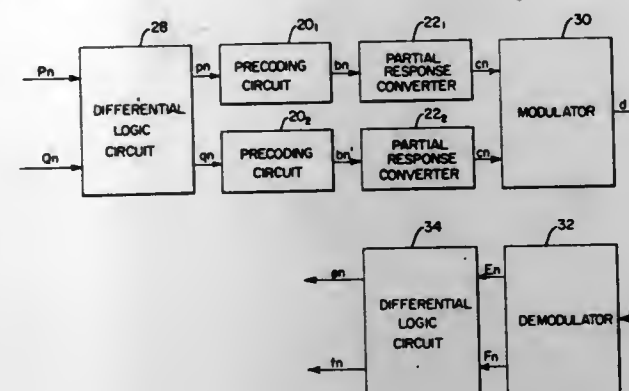
4,055,727 PARTIAL RESPONSE, QUADRATURE AMPLITUDE MODULATION SYSTEM

Tadayoshi Katoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 20, 1976, Ser. No. 716,098
Claims priority, application Japan, Aug. 20, 1975, 50-100759
Int. Cl.² H04L 15/00

U.S. Cl. 178—68

6 Claims



1. In a partial response modulation system having a receiver portion including a means for regenerating a carrier which is subject to phase ambiguity, and comprising in the transmitter portion thereof two pre-coding circuits for respectively pre-coding two parallel input signals and producing corresponding pre-coded output signals, two partial response converters for performing partial response conversion of the respective outputs of the said two pre-coding circuits and a modulator for amplitude modulating quadrature-related carriers of a common frequency with said two partial response converter outputs and producing a quadrature amplitude modulated output, the improvement comprising:

processing means, including a differential logic circuit and means for receiving said two parallel input signals and detecting when the combination code of said two parallel input signals is such as not to be influenced by the 90° phase ambiguity of the regenerated carrier during demodulation in a receiving means, thereupon to apply said two parallel input signals directly to said respective two pre-coding circuits, and for detecting when the combination of said two parallel input signals codes is such as will be influenced by the 90° phase ambiguity of the said regenerated carrier during demodulation, thereupon to apply said two parallel input signals to said differential logic processing means prior to processing of said two parallel input signals by said respective two pre-coding circuits.

4,055,728

FINE DIVISION TELEPHONE MULTIPLEXED SWITCHING NETWORK

Robert Lyon-Caen, and Pham Ngu Tung, both of Paris, France, assignors to Thomson-CSF, Paris, France

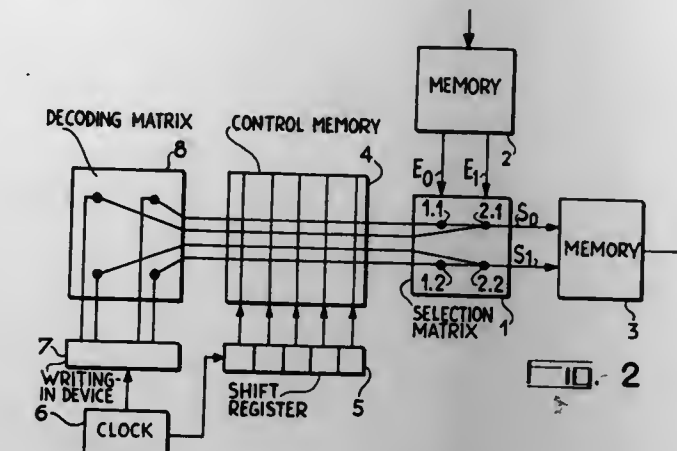
Filed Mar. 19, 1976, Ser. No. 668,687
Claims priority, application France, Mar. 21, 1975, 75.08944
Int. Cl.² H04Q 11/04

U.S. Cl. 179—15 AT

5 Claims

1. A telephone switching system comprising n inputs capable of simultaneously receiving first frames of telephonic signals and n outputs capable of simultaneously delivering second frames of the same kind as said first, and connection means capable of connecting at will each of the n inputs to each said n outputs respectively, a connection matrix of n^2 connection points for connecting always one input to one output and one only, each of said connection points being a two-state bistable element, said element being blocked in one of said states and conducting in the other, and having a control input for triggering them from one state to the other, a connection memory comprising p columns of n^2 two-state bistable elements, each having an output, said control inputs being connected to said $p \times n^2$ outputs, a shift register addressing said p columns suc-

sively and cyclically, a control memory of n^2 control elements having respective outputs, enabling the states of the p elements



of a column to be triggered from one state to the other at any instant.

4,055,729

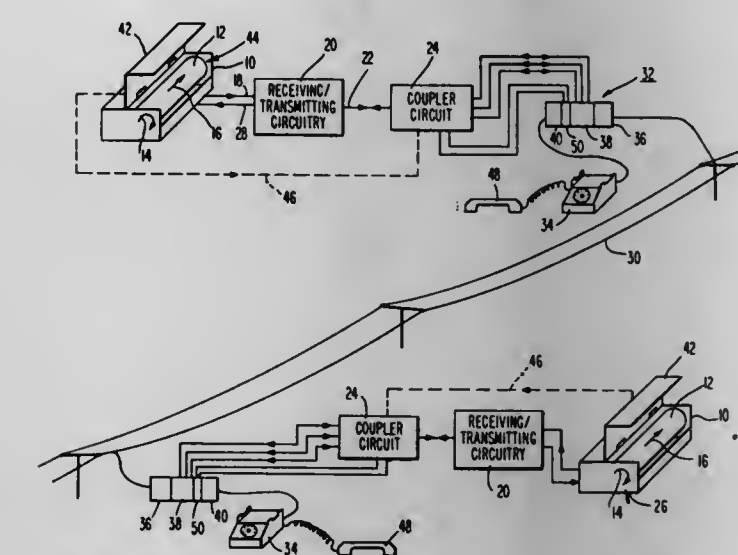
APPARATUS FOR THE DIRECT CONNECTION OF ANCILLARY EQUIPMENT TO A TELEPHONE NETWORK

John M. Vandling, Pleasantville, N.Y., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed May 24, 1976, Ser. No. 689,263
Int. Cl.² H04M 1/00, 9/00

U.S. Cl. 179—2 C

45 Claims



20. Apparatus for direct coupling a telephone set and ancillary equipment to a telephone network comprising: first circuit means providing a first communication current path through said telephone set and said network; second circuit means providing a second communication current path through said ancillary equipment and said network; third circuit means providing a third control current path through said telephone set and said network simultaneously with said second communication current path; control means for selectively completing said first current flow path or said second current flow path; and sensor means for sensing the magnitude of current flow in said third current flow path; said control means being responsive to said sensor means so as to selectively complete said first current flow path and break said second current flow path in response to sensing said open circuit in said third current flow path.

963 O.G.—52

4,055,730

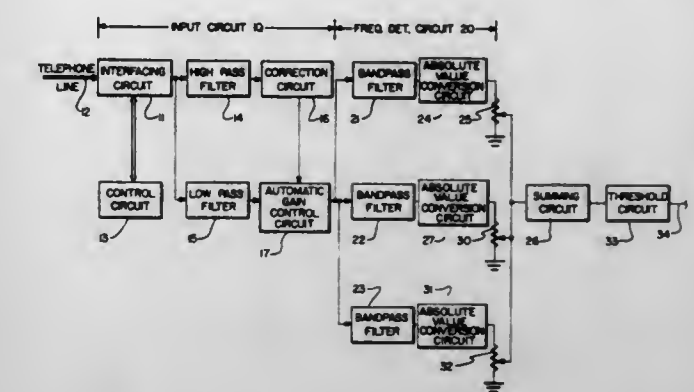
CIRCUIT FOR DETECTING DIAL PULSES

Gary N. Stapleford, Londonderry, and Joel E. Sandahl, Derry, both of N.H., assignors to Comex Systems, Inc., Hudson, N.H.

Filed May 29, 1975, Ser. No. 581,731
Int. Cl.² H04M 1/50

U.S. Cl. 179—84 VF

25 Claims



1. A circuit for correlating an incoming sequence of pulses and a known pulse pattern, said correlation circuit comprising: receiving means for transmitting a sequence of probable pattern pulses in response to the incoming sequence of pulses, each probable pattern pulse corresponding to the incoming pulses, pattern means for providing, in a timed sequence, a plurality of control signals which correspond to the known pulse pattern, said receiving means enabling said pattern means to transmit the control signals in response to each probable pattern pulse, means responsive to a first probable pattern pulse in the sequence for synchronizing the operation of said pattern means and the probable pattern pulses, and correlation means responsive to said control signals transmitted by said pattern means upon receipt of successive probable pattern pulses from said receiving means for indicating whether the incoming pulse sequence correlates to the known pulse pattern.

4,055,731

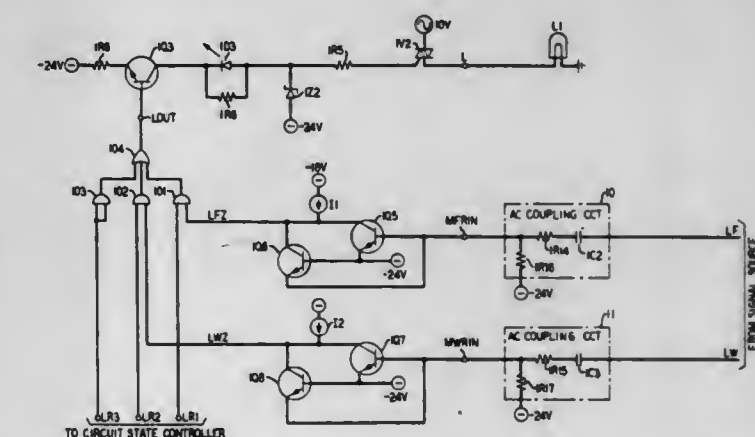
KEY TELEPHONE LAMP CONTROL CIRCUIT

Ronald Joseph Angner, Freehold, and James Volney Lacy, Red Bank, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1976, Ser. No. 708,846
Int. Cl.² H04M 1/72

U.S. Cl. 179—99

2 Claims



2. A line circuit for use in a key telephone system where a plurality of different ac lamp signals, each having a different duty cycle indicative of a particular circuit state, are provided to a connected telephone station, said line circuit having supplied thereto a source of ac signals having a continuous duty cycle and a first phase, and a source of ac signals having a first duty cycle and said first phase,

the improvement comprising means, including a solid state ac switch, having a power input terminal connected to said continuous duty cycle ac signals, and having a power output terminal for providing said ac lamp signals to said connected telephone station, and having a gate terminal for controlling the passage of said ac signals through said ac switch, means for generating from said first duty cycle ac signals a first control signal consisting of a series of discrete pulses, each pulse being coincident with a zero crossing of said continuous duty cycle ac signal, said control signal having said first duty cycle, said generating means including means for shifting the phase of received first ac voltage signals, means for applying said first control signal to said gate lead of said ac switch whereby said ac switch is enabled to supply said continuous duty ac signals to said connected telephone station, said signals being provided through said ac switch at said first duty cycle, means for generating from said second duty cycle ac signals a second control signal consisting of a series of discrete pulses, each pulse being coincident with a zero crossing of said continuous duty cycle ac signal, said control signal having said second duty cycle, means for applying said second control signal to said gate lead of said ac switch whereby said ac switch is enabled to supply said continuous duty ac signals to said connected telephone station said signals being provided through said ac switch at said second duty cycle, and means for selectively enabling said first and said second control signal applying means.

4,055,732

INBOARD TYPE MAGNETIC SYSTEM FOR ELECTRO-DYNAMIC TRANSDUCER

Hiroshi Yoshimura, Minoo; Sadao Yukimoto, Neyagawa; Takashi Matsumoto, Hirakata; Isago Konno, Neyagawa; Nobuyuki Kato; Tadao Ohtani, both of Katano, and Takao Kubo, Kawachinagano, all of Japan, assignors to Matsushita Electric Industrial Company Limited, Osaka, Japan

Filed Dec. 2, 1975, Ser. No. 636,960

Claims priority, application Japan, Dec. 2, 1974, 49-139322
Int. Cl.² H04R 9/02; B21C 23/00; C22C 22/00

U.S. Cl. 179-117

2 Claims



1. An inboard type magnetic system for an electrodynamic transducer having an anisotropic permanent magnet with magnetic characteristics that the direction of the preferred magnetization is between the ends thereof and the degree of anisotropization in the outer circumferential part thereof is larger than that in the inner part, a yoke which is mounted on one end of said permanent magnet to form a magnetic circuit therewith, a center pole which is mounted on the other end of said permanent magnet and a voice coil which is arranged in a space provided between said yoke and said center pole, wherein said permanent magnet is comprised of an alloy composition of 68.0 to 73.0% by weight of manganese, carbon in an amount of from (one-tenth the amount of Mn-6.6) weight % to (one-third the amount of Mn-22.2) weight %, and the remainder aluminum, and said magnet being of a magnetic material which has been subjected to warm extrusion at a temperature in the range of 620° - 750° C through a conical die which has extrusion ratio of 2.5 to 12 and semiangle of 5° to 15° for giving it anisotropic magnetic characteristics with the direction of the preferred magnetization in the direction of the warm extrusion and for making the degree of anisotropization in the outer

circumferential part of said permanent magnet larger than that in the inner part, whereby the magnetic system can be made thin.

4,055,733

LINE LEVEL SIGNAL MEASURING DEVICE

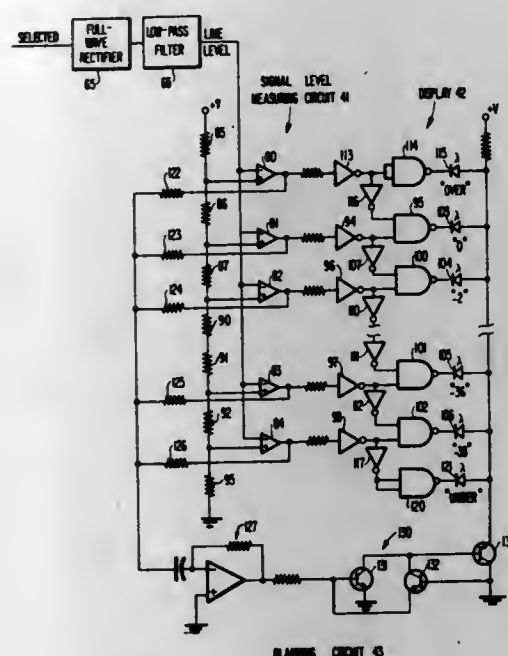
Jerry L. Holsinger, Boston; David E. Williams, Andover; Frank B. Lezotte, Chelmsford, and Don I. Falkenstein, Burlington, all of Mass., assignors to Intertel, Inc., Burlington, Mass.

Filed May 28, 1976, Ser. No. 690,884

Int. Cl.² H04B 3/46

U.S. Cl. 179-175.3 R

21 Claims



1. A device for providing a measurement that represents the power level of a complex, alternating-current signal being conveyed over a data communications line, said measurement device comprising:

- A binary signal generating means having a plurality of outputs, each output corresponding to a different predetermined power level, said generating means generating binary signals at first ones of the outputs in a range defined by the value of the signal on the data communications line, binary signals being absent from the others of said outputs,
- A plurality of visual indicating means connected to said binary signal generating means and arranged in an array, each said visual indicating means corresponding to a different predetermined power level of the signal on the data communications line and to an output of said binary signal generating means representing the same predetermined signal value, corresponding ones of said visual indicating means and said outputs being interconnected, and
- Blanking means connected to all of said visual indicating means and to said binary signal generating means for disabling said visual indicating means upon sensing a predetermined condition of the signal on the data communications line.

4,055,734

KEYBOARD SWITCH ASSEMBLY WITH HINGED PUSHBUTTONS AND CANTILEVERED TERMINAL MEMBERS

Thomas John Hayden, 2244 Mesa Verde Drive, Milpitas, Calif. 95035

Continuation of Ser. No. 428,348, Dec. 26, 1973, abandoned.
This application July 11, 1975, Ser. No. 594,981

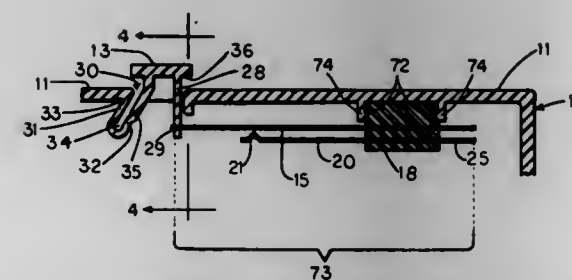
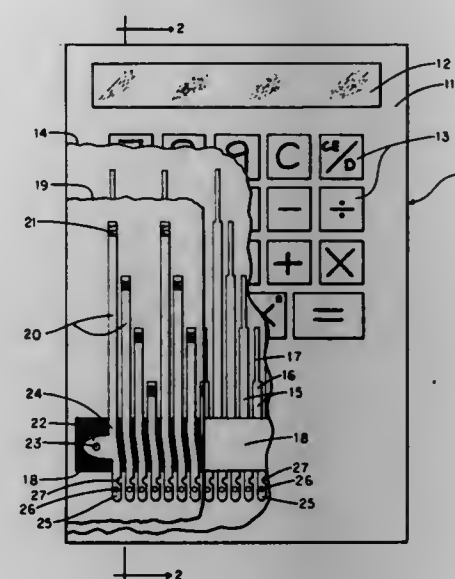
Int. Cl.² H01H 13/14; G06C 7/02

U.S. Cl. 200-5 A

4 Claims

1. A keyboard switch assembly comprising:
a panel member having an upper surface and a plurality of pushbutton apertures,
an equal plurality of pushbuttons,

hinge means integrally formed with said panel member and the associated pushbutton for securing the pushbutton to the panel and within the associated aperture for reciprocal movement therein in a direction normal to said upper surface, said hinge means having a folded web having a trough-like bottom opening in a direction generally toward said upper surface, said web having a first grooved portion extending along the junction between said hinge and said panel and a second grooved portion extending generally parallel with said first grooved portion in the



region between said bottom and the junction between said hinge and said pushbutton, at least some of said pushbuttons each including switch actuating means extending in a first direction away from the surface of said panel; and a plurality of switch means mounted in cooperative relation with said switch actuating means, individual ones of said plurality of switch means including a switch actuating element positioned adjacent an associated one of said plurality of switch actuating means for operable connection therewith when the corresponding pushbutton is actuated.

4,055,735

TOUCH SENSITIVE DEVICE

Joseph J. Eachus, Cambridge, and Theodore S. Graff, Sudbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 23, 1975, Ser. No. 625,272

Int. Cl.² H01H 1/02, 13/70

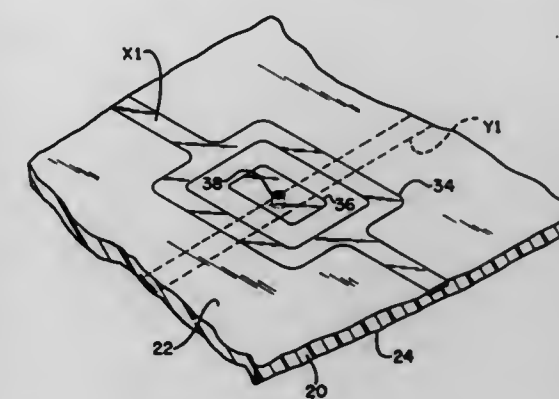
U.S. Cl. 200-5 A

11 Claims

1. A touch sensitive device comprising:
a first layer of material having a plurality of denoted locations on a topmost surface;
a second continuous layer of variable resistance flexible material positioned thereunder, said variable resistance flexible material being pressure sensitive so as to normally be high in resistance when not under an externally applied pressure and low in resistance only at a location that has been subjected to externally applied pressure; and
a third layer comprising a rigid circuit means for defining a plurality of touch sensitive locations said rigid circuit means being positioned underneath said second continu-

ous layer of variable resistance flexible material, said rigid circuit means comprising:

- a first plurality of parallel conductors oriented in a first direction and lying on a first surface of said rigid circuit means, each of said first plurality of conductors being in contact with said second continuous layer of variable resistance flexible material;
- a second plurality of parallel conductors oriented in a second direction and lying on a second surface of said rigid circuit means; and
- at least one conductive terminal on said first surface for each of said second plurality of conductors, each conductive terminal on said first surface being spaced from a respective conductor lying on the first surface, each



conductive terminal on said first surface moreover being in contact with said second continuous layer of variable resistance flexible material, said conductive terminals on said first surface combining with respective conductors lying on said first surface so as to define a plurality of potentially conductive paths through said second continuous layer of variable resistance flexible material said potentially conductive paths thereby defining a plurality of touch sensitive locations located underneath said plurality of denoted locations on the topmost surface of said first layer of material whereby application of a predetermined amount of externally applied pressure to a given denoted location will establish a conductive path thereunder.

4,055,736

PUSH SWITCH

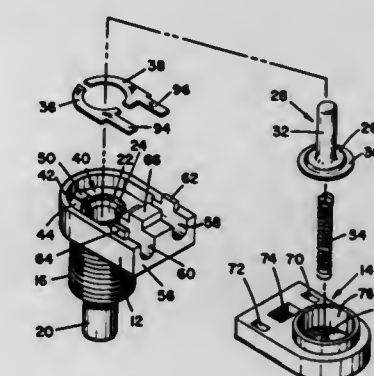
Peter Congelliere, 3321 Yale, Santa Ana, Calif. 92704

Filed Dec. 18, 1975, Ser. No. 641,734

Int. Cl.² H01H 13/04

U.S. Cl. 200-16 A

12 Claims



1. In a switch of the kind that includes a pair of electrically conductive contact elements and a plunger structure having an electrically conducting bridging surface, and means responsive to an actuating force for causing the plunger to be displaced such that said bridging surface is caused during successive actuations to assume a first position bridging said contact element, and a second position in which said bridging surface

is spaced from said contact elements, the improvement which comprises:

said contact elements comprising a pair of C-shaped members formed of sheet material disposed in a plane with the open portion of the C-shape of each facing the other such that together they define segments of an annulus incomplete at diametric points; and
said bridging surface comprising a circular member having an outer diameter greater than the inner diameter of said annulus and less than the outer diameter of said annulus; housing means in the form of a housing comprising a first housing member and a second housing member engaging respectively associated opposite side of the outer peripheral portion of said annulus for retaining said C-shaped members in said plane and for guiding movement of said plunger structure.

4,055,737

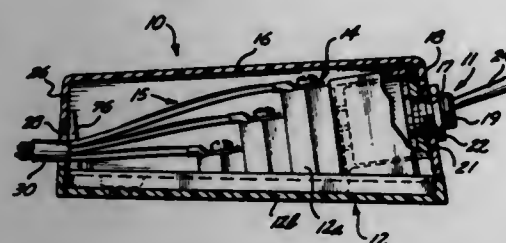
TERMINAL BLOCK ASSEMBLY FOR MOUNTING A SWITCH OR OTHER ELECTRICAL COMPONENT

Harry R. Rasmussen, Tacoma, Wash., assignor to Crest Industries, Inc., Puyallup, Wash.

Filed Dec. 31, 1975, Ser. No. 645,825
Int. Cl.² H01H 9/02

U.S. Cl. 200—51 R

35 Claims



1. An assembly of an electrical component and a terminal block, comprising:

an electrical component having a body and a substantially rigid electrical connection prong mechanically affixed to said body and projecting outwardly therefrom;
terminal connection means;
a base including structure formed of dielectric material that defines a terminal receiving recess and a prong receiving aperture, said terminal receiving recess having an opening through which said terminal connection means is inserted and having an interior wall extending inwardly of said base from said opening, said body of said component being mounted adjacent a surface of said base that is spaced from said recess and said prong receiving aperture being sized and positioned to extend from said surface and enter into said terminal receiving recess through said interior wall thereof at a location spaced inwardly from said opening, said prong being disposed in said prong receiving aperture so that a free end of said prong protrudes into said terminal receiving recess from said aperture in said interior wall;

said terminal connection means being disposed in said terminal receiving recess and having a pair of prong gripping elements, at least one of which is electrically conductive, receiving said prong therebetween, and having tightening means coacting with said prong gripping elements for drawing said elements into mechanical and electrical engagement with said prong, said terminal connection means being sized and oriented with respect to both said terminal receiving recess and said prong receiving aperture so as to anchor said prong in said recess and thus secure said component to said base.

4,055,738

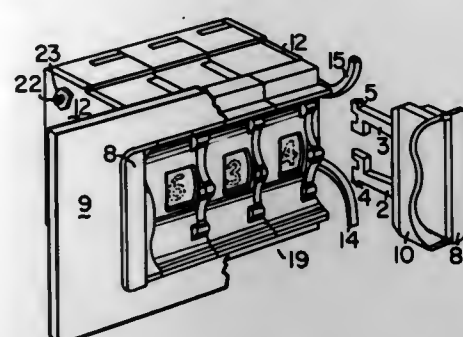
MULTIPLE SWITCH MOUNT

Herbert C. Beck, San Jose, Calif., assignor to Electronic Engineering Co. of California, Santa Ana, Calif.

Filed Mar. 19, 1976, Ser. No. 668,543
Int. Cl.² H01H 9/00

U.S. Cl. 200—296

11 Claims



1. The combination with a device having ends and a panel having a hole with a mount for attaching said device in the hole of said panel, comprising;

- a one first part (1) of said mount lodged at each end of said device within the hole in said panel, between the device and the panel,
- said first part having a lip (8) lying upon the front of said panel
- and two spaced hook arms (2, 3) extending through said hole and behind said panel,
- one second part (12) of the mount mounted upon each of the same said ends of the device behind said panel,
- each said second part having an opening which receives both of said hook arms of a one said first part, and
- each said second part having deformable ears (14, 15) bearing upon the rear of said panel, whereby said device is removably locked to said panel by said first and second parts.

4,055,739

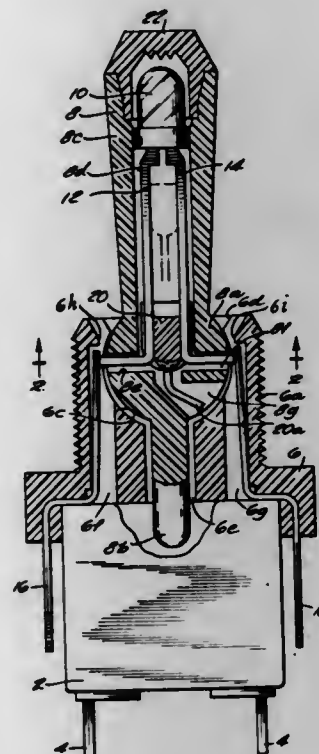
LIGHTED TOGGLE LEVER SWITCH

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 19, 1976, Ser. No. 715,897
Int. Cl.² H01H 9/16

U.S. Cl. 200—315

14 Claims



1. In a switch having a housing enclosing contacts, the combination comprising:

- a bushing at the top of said housing;
- a toggle lever extending through said bushing and having a

middle portion pivotally mounted in said bushing, an inner portion for operating said contacts, and an outer portion having a central bore extending longitudinally there-through to communicate with a pair of lateral holes extending oppositely outwardly through said middle portion coaxial with the pivotal axis of said toggle lever;

a pair of stationary terminals extending up through said bushing adjacent the outer ends of said lateral holes;

a light source having a pair of terminals extending longitudinally in said bore with bent portions extending laterally outwardly through said lateral holes to engage said stationary terminals, and

means maintaining electrical contact between said stationary terminals and said bent portions of said light source terminals and maintaining said light source terminals in spaced-apart relation to prevent shorting of said light source.

4,055,740

INDUCTION HEATING APPARATUS USING A SATURABLE REACTOR FOR POWER CONTROL PURPOSES

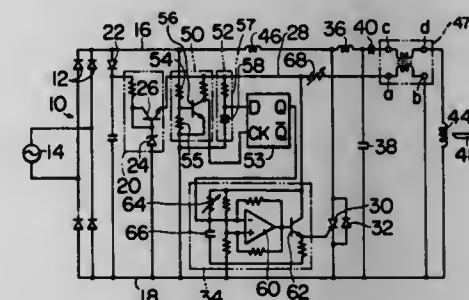
Masatatsu Nakamura; Hideyuki Kominami; Keizo Amagami; Takao Kobayashi, and Tadao Toyooka, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Japan

Filed Mar. 15, 1976, Ser. No. 666,973
Claims priority, application Japan, Mar. 19, 1975, 50-34052

Int. Cl.² H05B 5/04

U.S. Cl. 219—10.49 R

12 Claims



1. An induction heating apparatus comprising:

a power converter adapted to connect to a source of alternating voltage for converting the frequency of the source voltage to a high frequency, including a gated switching device, a resonant circuit including an induction heating coil connected to the gated switching device, a gating circuit providing gating-on pulses that drive said gated switching device into conduction successively, whereby an energization current substantially at said higher frequency is produced in said induction heating coil, a zero crossover detector for detecting the instant when said alternating voltage is substantially at zero to trigger said gating circuit to generate a train of gating-on pulses, first delay means for delaying the generation of said gating-on pulses for a predetermined period from the instant when said power converter is connected to the alternating voltage source, whereby said induction heating coil is electromagnetically coupled to a magnetic cooking ware placed in overlying relation therewith to be heated;

a transformer having a closed magnetic circuit and provided with three parallel limbs connected together by transverse members, a control winding arranged on the central limb and series-connected load windings wound in opposite directions and arranged one on each outer limb and connected in series with said induction heating coil to thereby be energized by said energization current, said transformer including an air gap in each of said outer limbs so that the variation of a current through said control winding linearly alters the magnitude of the current passing through said load windings; and

a power control circuit comprising means for detecting electrical power representative of said electromagnetic coupling, means for comparing the detected power with a reference value to produce a DC control current with

which said control winding is energized, manually adjusting means for controlling said reference level, and second delay means connected between said comparing means and said control winding for delaying the application of said DC control current for a predetermined period from the instant when said power converter is connected to said source voltage for energization.

4,055,741

PLASMA ARC TORCH

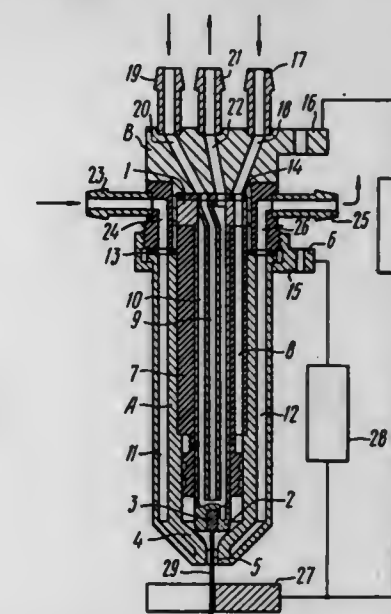
David Grigorievich Bykhovsky, Konjushenny pereulok, 1/16, kv. 18; Alexandr Yakovlevich Medvedev, ulitsa Kalyaeva, 3, kv. 17; Jury Alexandrovich Bogorodsky, prospekt Mechnikova, 14, kv. 163; Vladimir Nikolaevich Firsov, ulitsa Gribaleva, 12, kv. 50, and Yakov Vulfovich Rossomakho, Bolshoi prospekt, 27/1, kv. 40, all of Leningrad, U.S.S.R.

Filed Dec. 8, 1975, Ser. No. 638,941

Int. Cl.² B23K 9/00

U.S. Cl. 219—121 P

7 Claims



1. A plasma arc torch of a two-part design and comprising two detachable and tightly joined first and second parts mating with each other; the first part containing and rigidly interconnecting: an electrode holder, an electrode mounted in said electrode holder, a nozzle with a cylindrical passage disposed coaxially of said electrode; means for supplying an electric current to said nozzle; an electrical insulator located between said electrode holder and said nozzle; passages for a plasma-generating gas and coolant being brought out into the surface mating with said second part; said second part accommodating: means for supplying an electric current to said electrode holder; means for supplying the coolant through passages to said electrode holder and said nozzle; means for supplying the plasma-generating gas through said passages; said passages of said second part being brought out into the mating surface in such a manner that they match with corresponding passages of said first part on the surface of the joint thereof, whereby said first part may be disconnected from said second part thereby simultaneously removing said electrode and said nozzle.

4,055,742

HARD FACING ROD

Harry J. Brown, Lewiston, N.Y.; William D. Forgeng, Las Vegas, Nev., and Charles M. Brown, Lewiston, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 472,048, May 21, 1974, abandoned. This application June 23, 1976, Ser. No. 698,846

Int. Cl.² B23K 35/22

U.S. Cl. 219—145

2 Claims

1. A hard facing rod comprising a metal sheath containing a hard facing material in the form of finely divided particles consisting essentially of (i) at least one type of vanadium carbide (ii) tungsten in solid solution with each type of vanadium

carbide in said composition in an amount from about 10% by weight up to about 67% by weight (iii) cobalt in an amount up to about 50% by weight of said composition; the aggregate amount of all vanadium carbides in said composition being at least about 10% by weight of said composition.

4,055,743

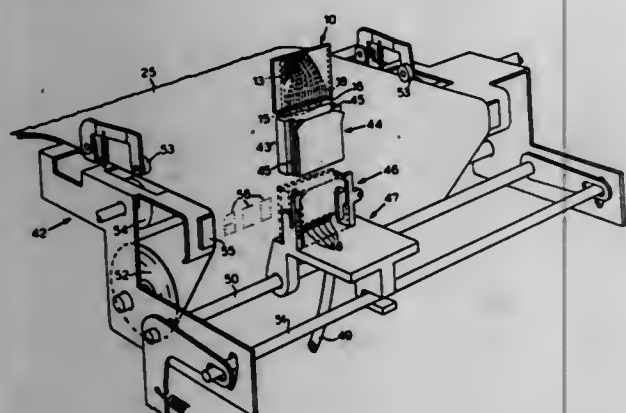
ELECTROTHERMAL PRINT HEAD

Renato Conta, Ivrea (Turin); Lucio Montanari, Cascinette (Turin), and Riccardo Brescia, Ivrea (Turin), all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Division of Ser. No. 512,564, Oct. 7, 1974, Pat. No. 3,967,092.
This application Apr. 9, 1976, Ser. No. 675,352

Claims priority, application Italy, Oct. 23, 1973, 70117/73
Int. Cl.² H05B 1/00

U.S. Cl. 219-216

3 Claims



1. In a non-impact dot-matrix printer of the type comprising: a recording medium, a platen for said recording medium, a print head having a plurality of printing elements and a pattern of conductors for selectively energizing said elements, a support carrying said head, a base member for mounting said support in said printed with said elements in contact with said recording medium, means for positioning and removably fixing said support to said base member, said means comprising:

- a plurality of conductive laminae for contacting said conductors of said pattern when said head is positioned in said base member, releasable latching means for latching said support to said base member, and
- manually operable means for releasing said latching means to remove said support from said base member.

4,055,744

ELECTRICALLY HEATED SOLDERING-DESOLDERING INSTRUMENTS

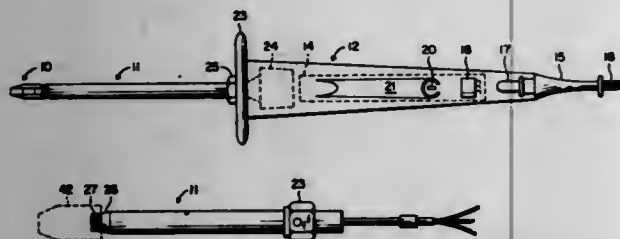
William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

Filed July 16, 1975, Ser. No. 596,395

Int. Cl.² H05B 1/02, 3/42; B23K 3/02, 3/04

U.S. Cl. 219-239

3 Claims



1. In a soldering instrument:

- a substantially cylindrical, thin-walled stainless steel sheath having a reduced diameter front end formed with both internal and external threads which are coaxial with said

sheath and having hexagonal nut formed integrally with its rear portion;

- a substantially cylindrical, highly heat conductive heater cartridge disposed coaxially within said sheath and an externally threaded front end threadingly engaged with said internal threads of said sheath;

an internally threaded soldering tip disposed in threaded engagement over said external threads of said sheath whereby

said front end of said heater cartridge and the threaded portion of said soldering tip are axially coincident and in high thermal energy flow relationship with each other; and

- a heater element of the character to be electrically energized disposed within said cartridge in direct thermal contact therewith.

4,055,745

FOOD COOKING OVEN

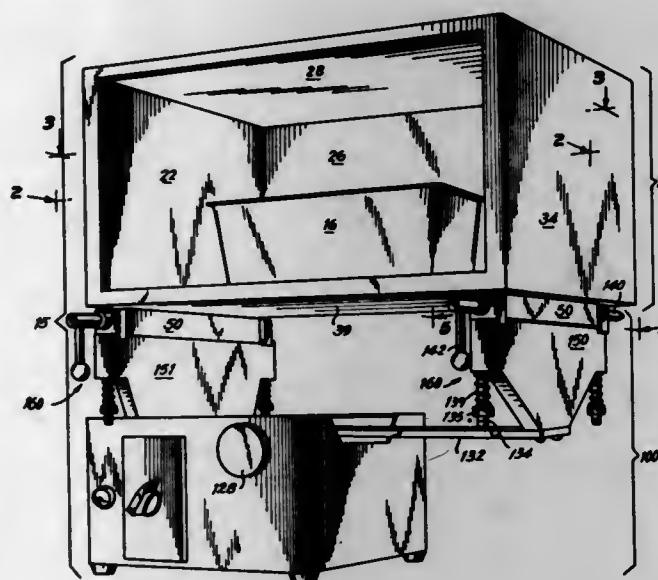
Rodolfo Rodriguez Balaguer, 2607 Grace Drive, Harbor Beach, Fort Lauderdale, Fla. 33316

Filed Apr. 20, 1976, Ser. No. 678,486

Int. Cl.² F27D 11/02

U.S. Cl. 219-406

22 Claims



1. A food cooking oven which comprises:

- a. exterior side, bottom, top and back walls;
- b. a thermally insulated door closing the front of said oven;
- c. interior walls spaced inwardly from said exterior walls and defining the interior of said oven, said oven interior having a volume of at least, approximately, 0.25 cubic feet, said exterior and interior walls together defining a substantially rigid, self-supporting structure, said interior walls being electrically conductive;
- d. thermal and electric insulation means disposed between said interior and exterior walls; and
- e. a pair of rigid, spaced apart, electrical contact members, said contact members being secured to and in electrical contact with at least one of said interior walls and extending along a substantial portion of the depth of said oven and extending outwardly through and beyond the adjacent exterior wall, each of said contact members being adapted to be received within a respective one of a pair of clamps which are connected to a low voltage, high current power supply whereby a non-hazardous, low voltage is impressed across said contacts and thereby an electrical current flows through said interior walls in an amount sufficient to heat the interior of said oven to a food cooking temperature.

4,055,746

METHOD OF AND APPARATUS FOR SECURING AND STORING PERSONAL INFORMATION

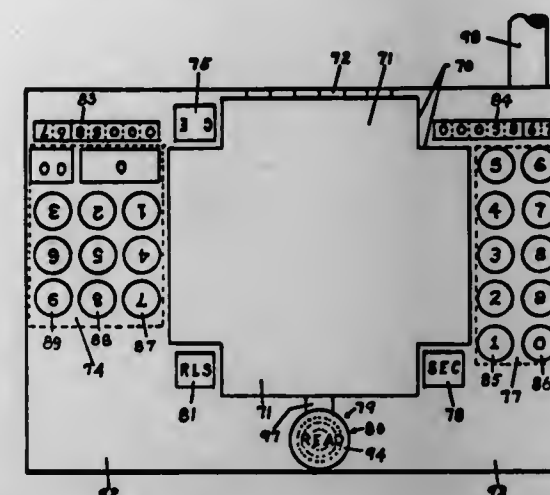
Glen Peterson, 540 S. 83rd East Ave., Tulsa, Okla. 74112

Filed Nov. 7, 1969, Ser. No. 874,760

Int. Cl.² G06K 7/08, 19/06

U.S. Cl. 235-61.7 B

3 Claims



1. An electronic computer system comprised of more than one substantially identical computers each of which includes means for reading and writing binary indicia representative of characters, means for storing information, means for programming said stored information, computer energizing means, alphabetical work writing means and decimal number writing means, said means for storing information comprised of two portions: a first portion of which is permanently contained within each of said computers and fixed with respect to geographic location; a second portion of which is not permanently contained in any of said computers and is not fixed with respect to geographic location, said second portion comprised of a multiplicity of cards retained and controlled by a multiplicity of individuals, and from time to time placed by said individuals in said means for reading and writing binary indicia representative of characters of said computers, with joint means provided within said cards, each of said computers and said computer system for a secure programmed release of information stored on said cards into said first portion of said storage means for storing information, each of said cards comprised of thin parallel sheet members in close proximity to each other, at least one of said sheet members comprised of ferromagnetic substance, said sheet member of ferromagnetic substance comprised of two thin sheets of ferromagnetic material in contact with each other, one of said thin sheets composed of ferromagnetic material having a wide hysteresis loop and a large coercive force, and the highest possible residual magnetism consistent therewith, the second of said thin sheets composed of ferromagnetic material having a narrow hysteresis loop, a small coercive force and high permeability.

4,055,747

APPARATUS AND METHOD FOR THE SYNCHRONOUS READING OF DATA FROM A PUNCHED CARD

Olav V. Jensen, West Vancouver, Canada, assignor to Ebco Industries, Ltd., Richmond, Canada

Filed May 13, 1976, Ser. No. 686,242

Int. Cl.² G06K 7/10; G08C 8/06; G06K 7/08

U.S. Cl. 235-61.11 E

15 Claims

15. The method of synchronously determining the information character encoded as one or more punched data locations of at least one columnar region of a card being moved past an array of sensors wherein each sensor supplies an electrical signal indicative of whether a punched or unpunched card region is currently passing by said sensor comprising the steps of:

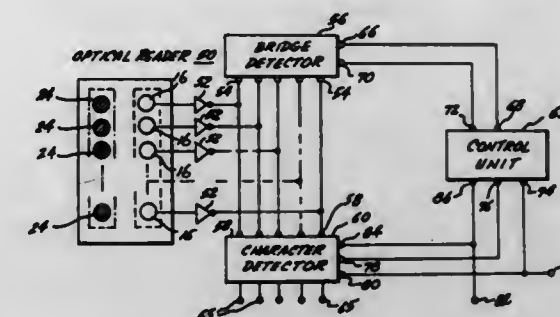
- a. performing a first periodic sampling of each signal supplied by said array of sensors to detect the time at which

an unpunched card region has reached each sensor following the onset of said first periodic sampling;

- b. performing a second periodic sampling of each signal supplied by said array of sensors following the detection that an unpunched region has reached each sensor during said first periodic sampling;

c. comparing the signal sample supplied by each of said sensors at a first predetermined sampling time during said second periodic sampling with the signal sample supplied by the same sensor at the nextmost antecedent sampling time of said second periodic sampling;

- d. detecting when one of said sensors supplies a signal at said first predetermined sampling time during said second



periodic sampling that indicates an unpunched card region passing by said sensor and the same one of said sensors supplies a signal at said nextmost antecedent sampling time of said second periodic sampling that indicates a punched region is passing by said sensor;

- e. supplying said signal supplied by each of said sensors at said nextmost antecedent sampling time of said second periodic sampling as a digital word representative of the information character encoded in that columnar region of said card passing by said sensors at said first sample time of said second periodic sampling; and
- f. repeating steps a, b, c, d and e until said card has passed completely by said sensors.

4,055,748

COMPUTING WEIGHING SCALE

Edwin E. Boshinski, Englewood; Robert C. Meckstroth, Dayton, and Robert M. Rogers, Troy, all of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Dec. 15, 1975, Ser. No. 641,140

Int. Cl.² G01G 23/22; G06F 9/16

U.S. Cl. 364-466

18 Claims

1. In a weighing scale having total price computing capability having

- a platter,
- means for generating code information corresponding to weight of a commodity on said platter including an output for such information,
- display means including a multi-digit numerical indicator,
- means for generating code information corresponding to price per unit weight including an output for such information,
- calculating means having an input connected to accept each said weight code information and said price per unit weight information from said outputs and being operable to multiply the two into a product in code information defining the total price of the weighed commodity,
- said calculating means also having an output for the total price code information,
- indicator means associated with said display means and operable to indicate to what a number displayed by said numerical indicator corresponds,
- control means associated with said calculating means for causing said calculating means to interrogate said means for generating weight code information and said means for generating price per unit weight information and to multiply the weight information entered in said calculating

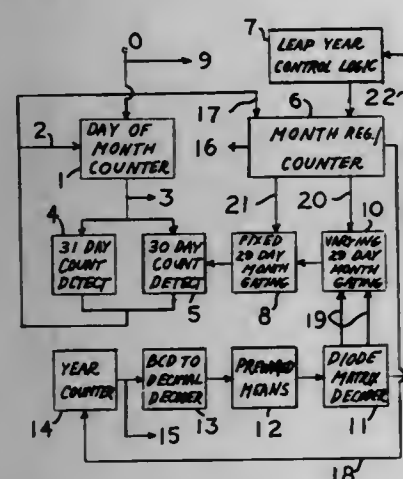
means by the entered price per unit weight; the improvement comprising said control means also including means for causing display at different times of numbers corresponding to at least two of said outputs on the same digit positions of said numerical indicator in a predetermined sequence and to actuate said indicator means to denote the type of information displayed on said numerical indicator.

4,055,749

ELECTRONIC HEBREW CALENDAR AND DATE CALCULATOR

Jonathan Moses Kraushaar, Annandale, Va. 22003
Filed Nov. 26, 1976, Ser. No. 745,243
Int. Cl.² H03K 21/36; G09D 3/00
U.S. Cl. 235—92 PE

12 Claims



1. A self-contained electronic device capable of accurately tracking and displaying the month, day and year of the Hebrew calendar, in the presence of all regular and subtle irregular yearly variations in several of its months over any multiple year period comprising: a month counting and displaying means for indicating twelve calendar months plus a thirteenth leap month, a day counting means for displaying the day of the month and resettable to one after a count of thirty days, except when an external input is present which causes it to reset after twenty-nine days, a day gating means which provides a logic signal to the day counting means causing it to reset for twenty-nine day months, a year counting means for counting and displaying the last digit of the calendar year, a memory means which takes the output of the year counting means and decodes it into outputs which determine the length of yearly varying months and control for the presence of a leap month, a connecting means which provides an appropriate reset condition to the day counter through the day gating means when twenty-nine day months are indicated by the month counter, a connecting means for advancing the month counter when the day counter is reset, a connecting means between the memory means and day gating means to control the day counter for months which vary between twenty-nine and thirty days, and a connecting means between the memory and month counting means to allow the month counting means to count to thirteen for leap years and to twelve for regular years.

4,055,750

HEADING SENSOR FOR VEHICLE DEAD RECKONING SYSTEM

Ernest Jellinek, Haddonfield, N.J., assignor to RCA Corporation, New York, N.Y.
Filed June 7, 1976, Ser. No. 694,043
Int. Cl.² G06F 15/50

U.S. Cl. 364—424

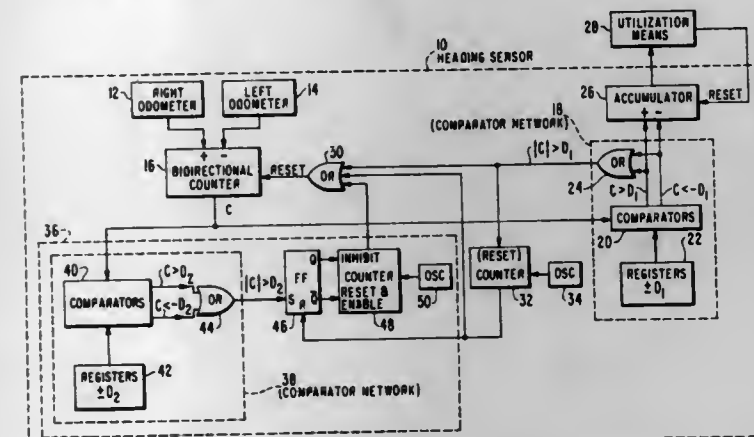
10 Claims

1. An apparatus for determining the heading of a vehicle with respect to a reference direction, said vehicle having a major longitudinal axis and a minor transverse axis, said system being of the type including first means for resettably generating a differential count indicative of the difference in distance traveled by first and second predetermined points on said

vehicle, said differential count having a polarity in accordance with a predetermined convention, said first and second predetermined points being positioned at substantially equal distances from said transverse axis and separated by a predetermined distance in a direction parallel to said transverse axis; wherein the improvement comprises:

quantizing means, responsive to said differential count, for generating output signals when the magnitude of said differential count reaches a first predetermined threshold value; said quantizing means output signals being indicative of the instantaneous polarity of said differential count, and being applied to first means to reset said distance count to zero;

accumulator means, responsive to said quantizing means output signals, for generating an output signal indicative of the accumulated algebraic sum of said polarity signals;



first resetting means, responsive to said differential count, for generating an output signal when the average rate of accrual of increments of said differential count over a first predetermined time period does not exceed a first predetermined rate of accrual; and
second resetting means, responsive to said differential count for generating an output signal when the average rate of accrual of increments of said differential count over a second predetermined time period does not exceed a second predetermined rate of accrual; said second time period being no greater than said first time period, said first and second resetting means output signals being applied to said first means to reset said differential count to zero.

4,055,751

PROCESS CONTROL SYSTEM FOR THE AUTOMATIC ANALYSIS AND REGENERATION OF GALVANIC BATHS

Egon Bussmann, Munich; Bruno Flamme, Neuried, both of Germany; Jacky Vanhumbecq; Johannes Helder, both of Brugge, Belgium, and Hubert De Steur, Drongen, Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 12, 1976, Ser. No. 685,804
Claims priority, application Germany, May 13, 1975, 2521282
Int. Cl.² G01N 27/00; G06F 15/46

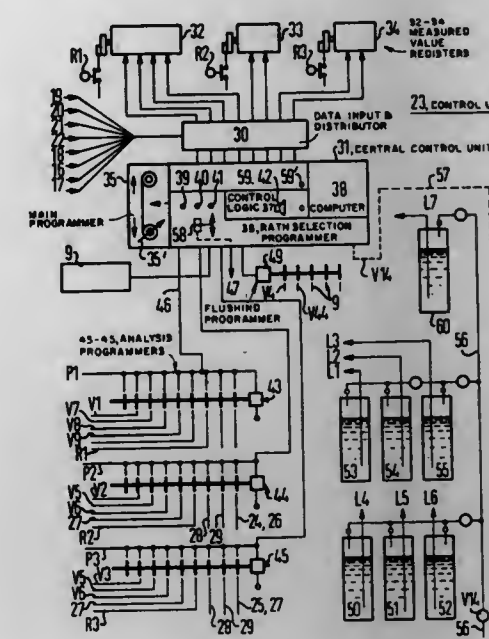
U.S. Cl. 364—500

14 Claims

1. A process control system for monitoring the chemical composition of bath liquid for a plurality of baths, in particular metal depositing baths, said process control system comprising:

a main programmer for operating the control system through a sequence of program steps;
a bath selection programmer connected to said main programmer and to the baths for selecting baths for analysis;
a chemical component analyzer including a plurality of constituent analyzing sections for analyzing respective quantities of respective bath constituents;
a plurality of analysis programmers connected to said analyzer and connected to and operated by said bath selection

programmer to connect selected baths to appropriate analyzer sections;
a supply of bath correcting fluids;
comparison means connected to said analyzer to compare the analyzed actual quantities with respective reference quantities; and



adjusting means connected to said comparison means and connected between said supply and the plurality of baths for supplying correcting fluids to the respective baths in accordance with the differences between the actual and reference quantities.

4,055,752

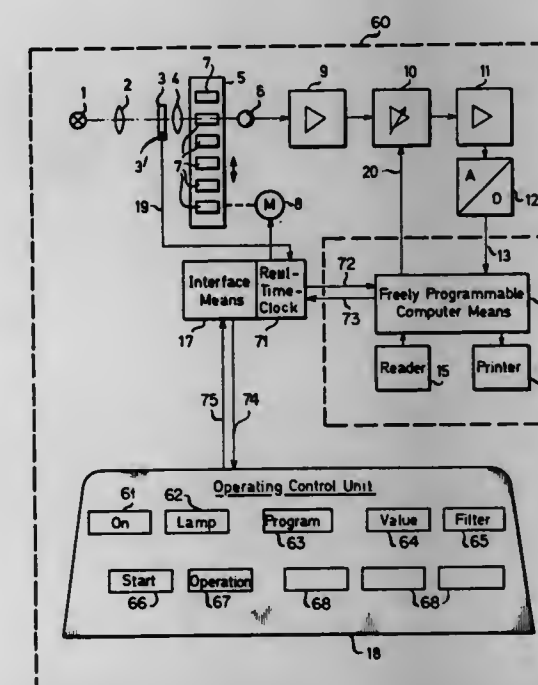
METHOD AND APPARATUS FOR THE DETERMINATION OF ENZYME ACTIVITY

Walter Kappe, Oberkochen; Götz-Reinhard Lampe, Heidenheim, and Harald Neuer, Oberkochen, all of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Württemberg, Germany

Filed Jan. 31, 1975, Ser. No. 546,144
Claims priority, application Germany, Feb. 7, 1974, 2405810
Int. Cl.² G06F 15/42

U.S. Cl. 364—551

17 Claims



15. In combination in enzyme activity determining means, light source and light detector means for determining relative light transmissivity of a sample disposed therebetween, means for repetitively sampling the output of said detector means at spaced points in time relatively large in comparison to the inter-sample interval for any said point in time, computer means for receiving said sampled detector output signals, said

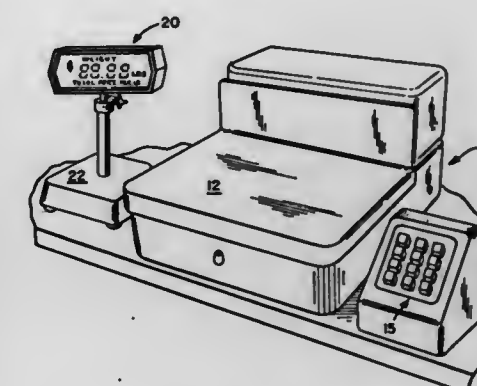
computer means including means for determining statistical light transmissivity for the samples at any point in time, means for fitting a curve to said statistical properties determined by said means therefor, and means for determining the derivative of said curve determined by said curve fitting means.

4,055,753

COMPUTING WEIGHING SCALE

Robert M. Rogers, Troy, and Edwin E. Boshinski, Englewood, both of Ohio, assignors to Hobart Corporation, Troy, Ohio
Filed Dec. 15, 1975, Ser. No. 641,139
Int. Cl.² G01G 23/22; G06F 9/16
U.S. Cl. 364—466

50 Claims



1. In a weighing scale for computing the total value of an article being weighed from a weight input and a price per unit weight input, said scale having an article receiving platter, a weighing system including a weight responsive mechanism connected to said platter and including an electrical weight signal output means, sensing means responsive to changing weight, computing means operatively connected to said weighing mechanism for receiving the weight output signal, means for providing a price per unit weight signal to said computing means for computing total value from the weight and price per unit weight signals, and digital numerical display means for visually displaying numbers identifying the weight, the price per unit weight, and the total price of a given article on the platter upon entry of price per unit weight and computation of the weight times the price per unit weight; the improvement comprising said numerical display means including one multidigit number display connected to show sequentially at least two of said numbers and selectively operable indicator means identifying the number shown on said one display, and sequencer means returning said one display to the beginning of its sequence in response to a change in weight after having once become stabilized and causing the sequence to repeat as far as it progressed prior to such change.

4,055,754

MEMORY DEVICE AND METHOD OF TESTING THE SAME

Gilman D. Chesley, 22431 Starling Drive, Los Altos, Calif. 94022

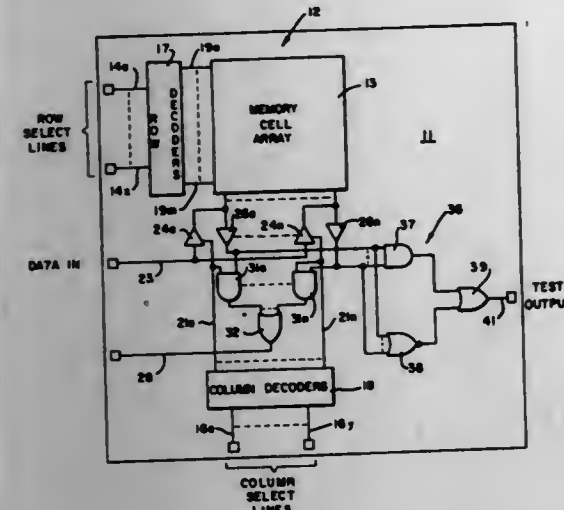
Filed Dec. 22, 1975, Ser. No. 642,765
Int. Cl.² G11C 29/00; G06F 11/00

U.S. Cl. 235—302.3

3 Claims

1. In an integrated circuit memory device: a plurality of memory cells, means for writing data into and reading data out of the memory cells, first coincidence gate means responsive to data read simultaneously out of a group of the memory cells for determining whether all of the data from said group is of a first logic level, second coincidence gate means responsive to data read simultaneously out of the group of cells for determining whether all the data from said group is of a second

logic level, and output gate means responsive to the outputs of the first and second coincidence gate means for delivering an



output signal when the data read out of the group of cells is either all of the first logic level or all of the second logic level.

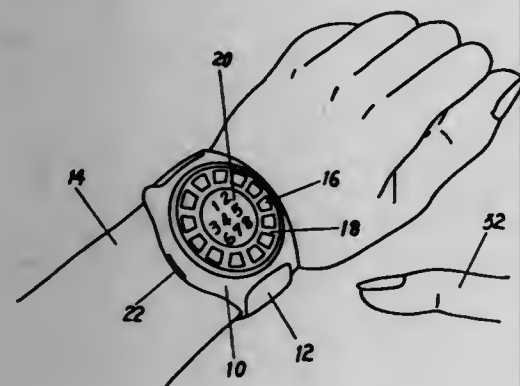
4,055,755

SWITCHING ASSEMBLY IN COMBINATION WRISTWATCH AND CALCULATOR

Tatsuo Nakamura, Akashi; Takehiko Sasaki, Yamatokoriyama; Masaji Yonekawa, Sakurai, and Hidetoshi Maeda, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 15, 1976, Ser. No. 677,441

Claims priority, application Japan, Apr. 16, 1975, 50-5229[U]; Apr. 18, 1975, 50-53886[U]
Int. Cl.² G06F 15/02, 7/38; G04B 47/00; H01H 35/00
U.S. Cl. 364-705

2 Claims



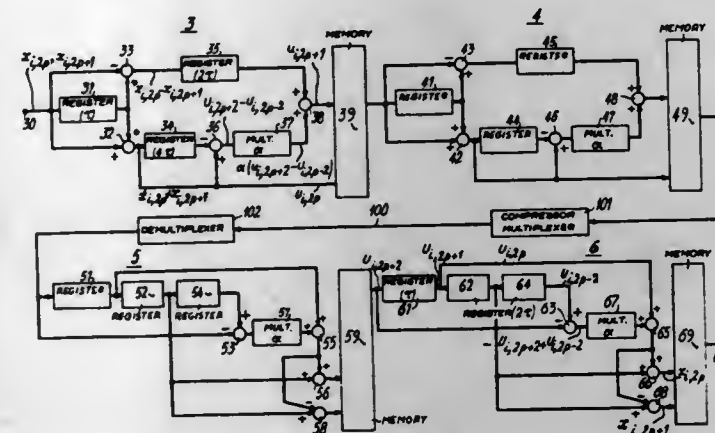
1. A combination wristwatch and calculator including a conductive casing, a front insulating panel, a time keeping circuit, an arithmetic calculation circuit, a key input means for introducing desired information into the arithmetic calculation circuit, and an information display for displaying information stored in the time keeping circuit and the arithmetic calculation circuit, said key input means comprising:

- a plurality of touch electrodes formed on the front insulating panel; and
- a plurality of touch sensitive electronic switching circuits, each of the touch sensitive electronic switching circuits including;
- a C-MOS inverter circuit having a gate terminal and two power supply terminals,
- a power source connected across said power supply terminals,
- two input terminals connected to one of said touch electrodes and to said conductive casing, respectively, and
- circuit means for inverting the condition of said C-MOS inverter circuit when said two input terminal are connected to each other through a human body resistor.

4,055,756
IMAGE CODER-DECODER USING A MATRIX
TRANSFORM WITH WEIGHTED CONTRIBUTION OF
SEVERAL POINTS OF THE IMAGE TO THE
FORMATION OF ONE POINT OF THE TRANSFORM
Jean-Claude Jolivet, St. Michel en Greve, and François-Xavier
Antoine Stouls, Perros Gulrec, both of France, assignors to
Societe Anonyme de Telecommunications, Paris, France
Filed Sept. 30, 1976, Ser. No. 728,189
Claims priority, application France, Oct. 24, 1975, 75.3262
Int. Cl.² G06F 15/34

U.S. Cl. 364-725

5 Claims



1. A matrix transform system for coding images with weighted contribution of several points of the image to each point of the coded image and for decoding coded images with weighted contribution of several points of the coded image to each point of the decoded image, said system comprising:

- a. means for sampling the lines of an image to be coded and forming with said image samples a square matrix associated with the image;
- b. means for splitting said square matrix associated with the image into a plurality of first input component matrices of order $3N \times 3N$ having a central part of order $N \times N$;
- c. means for multiplying each of said first input component matrices by a first rectangular coefficient matrix of order $N \times 3N$ having a square central part in which the coefficients are equal to positive or negative unity and two square lateral parts in which the coefficients are selectively equal to zero and $\pm \alpha$ where α is a predetermined factor smaller than unity, and forming first intermediate matrices of order $N \times 3$;
- d. means for multiplying each of said first intermediate matrices by a second rectangular coefficient matrix of order $3N \times N$ which is the transpose of said first rectangular coefficient matrix, and forming first output matrices of order $N \times N$, each of said first output matrices being the transform of the central part of a first input component matrix;
- e. means for forming with said first output matrices a square matrix associated with the coded image;
- f. means for splitting said square matrix associated with the coded image into a plurality of second input component matrices of order $3N \times 3N$ having a central part of order $N \times N$;
- g. means for multiplying each of said second input component matrices by a third rectangular coefficient matrix of order $N \times 3N$ having a square central part in which the coefficients are equal to positive or negative unity and two square lateral parts in which the coefficients are selectively equal to zero and $(\pm \alpha)$ where α is said predetermined factor smaller than unity and forming second intermediate matrices of order $N \times 3N$;
- h. means for multiplying each of said second intermediate matrices by a fourth rectangular coefficient matrix of order $3N \times N$ which is the transpose of said third rectangular coefficient matrix and forming second output matrices of order $N \times N$, each of said second output matrices

being the transform of the central part of a second input component matrix; and
i. means for forming with said second output matrices a square matrix associated with the decoded image.

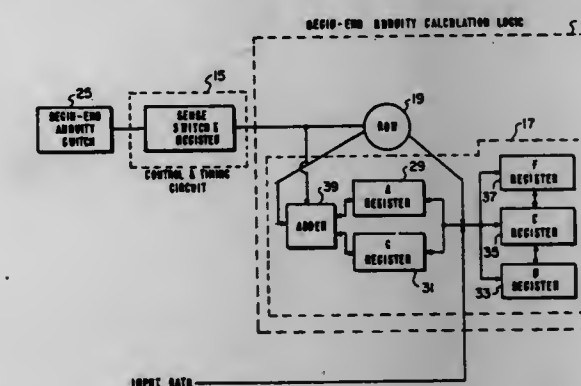
4,055,757

CALCULATOR APPARATUS WITH ANNUITY SWITCH FOR PERFORMING BEGIN-AND-END-PERIOD ANNUITY CALCULATIONS

Lynn W. Tillman, Los Altos; Kent R. Henscheld, Sunnyvale, both of Calif., and Larry D. Smith, Damascus, Md., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Aug. 27, 1976, Ser. No. 718,290
Int. Cl.² G06F 15/30

U.S. Cl. 364-715

4 Claims



1. An apparatus for performing annuity calculations with payments due at one of the beginning and end of each payment period, said apparatus comprising:

- switch means manually settable to one of a first and second positions; and
- processing means coupled to said switch means and coupled to receive input data for performing selected annuity calculations with payment due at one of the beginning and end of each payment period, calculations with payment due at the beginning of each payment period being performed by automatically converting the input data to produce substitute data and mathematically manipulating the substitute data in response to the switch means being set to the first position, and calculations with payment due at the end of each payment period being performed by mathematically manipulating the input data in response to the switch means being set to the second position.

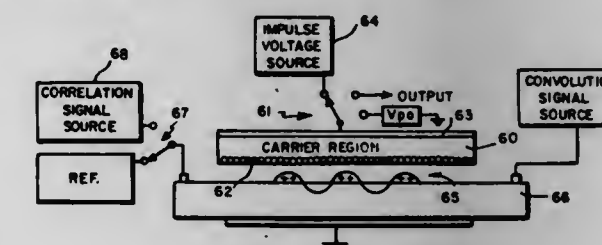
4,055,758

SURFACE WAVE DEVICES FOR PROCESSING SIGNALS Ernest Stern, Concord; Richard C. Williamson, Framingham; Abraham Bers, Arlington, and John H. Cafarella, Swamp- scott, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 555,367, March 5, 1975, Pat. No. 4,016,412.
This application Mar. 31, 1976, Ser. No. 672,345
Int. Cl.² G06G 7/19; H04R 17/00

U.S. Cl. 364-821

6 Claims



1. A device for processing and storing signals comprising a first piezoelectric substrate capable of propagating acoustic wave signals on a selected surface thereof; at least one transducer means formed on said selected surface for generating surface acoustic waves traveling on

said surface along a selected direction thereof in response to electrical signals;
a semiconductor material positioned so as to have a first surface thereof adjacent and spaced from said selected surface of said first substrate, said semiconductor material including a carrier region having a plurality of carriers and a trap region having a plurality of traps substantially at or near said first surface, said trap region forming an interaction region at or near said first surface;
a layer of conductive material disposed on a second surface of said semiconductor material, said layer forming an electrode;
means for providing a first signal at said at least one transducer means to produce a first traveling acoustic wave signal along said selected surface of said first substrate; and
means for applying a second signal to said semiconductor material to cause carriers therein to migrate from said carrier region to said trap region, the interaction of said first traveling acoustic wave signal with said carriers in said trap region thereby causing said carriers to fill said traps and to be retained therein in a selective stationary pattern thereby producing said altered stationary conductivity pattern in said semiconductor material as said first traveling acoustic wave signal travels along said selected surface of said first substrate, said altered stationary conductivity pattern being stored in said semiconductor material and representing the interaction of said first and second signals.

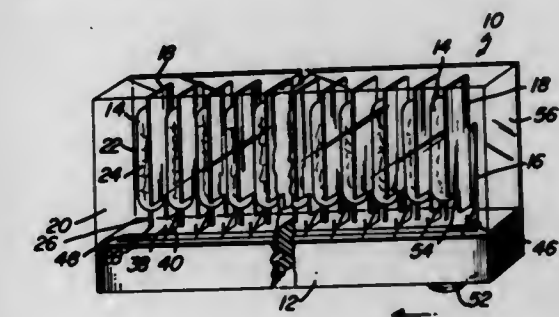
4,055,759

SIGNAL DEVICE USING PERCUSSIVE FLASHLAMPS Andre C. Bouchard, Peabody; Harold H. Hall, Jr., Marblehead; Renaldo Mercaldi, Beverly, and Thomas J. Sentementes, Wakefield, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 14, 1976, Ser. No. 696,107
Int. Cl.² G03B 15/02

U.S. Cl. 362-159

9 Claims



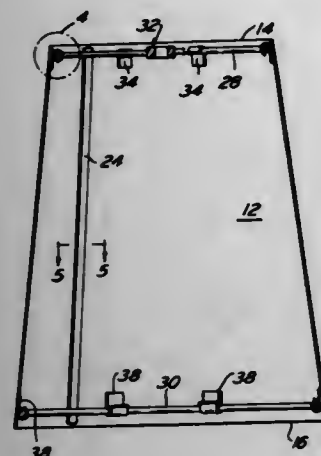
1. A signal device intended for hand operation comprising, in combination:
a support member;
a plurality of percussively-ignitable flashlamps mounted on said support member;
a plurality of preenergized strikers mounted on said support member and releasable to fire said flashlamps;
movable means retained in said support member in operative alignment with respect to said strikers and adapted to be directly actuated by hand; and,
means provided on said movable means for sequentially releasing said preenergized strikers to fire respective ones of said flashlamps in response to successive hand indexing of said movable means.

4,055,760

LAMP SHADE

Alfred L. Weisbrod, 1214 Valley Road, Villanova, Pa. 19085
Filed Jan. 20, 1976, Ser. No. 650,596
Int. Cl.² F21V 1/00

U.S. Cl. 362—352



1. A lamp shade adapted to be shipped in a flat disassembled condition for subsequent assembly comprising two rings, a flat cover sheet of self supporting material, said rings having a plurality of members circumferentially disposed thereon, each of said members being adapted to be adhesively secured to a juxtaposed portion of said cover sheet with the rings in spaced relation, said members being pivotably secured to their respective rings and slidable along their respective rings, and means to join the free edges of said sheet.

4,055,761

LIGHT RECEIVING DEVICE FOR PHOTOELECTRIC CONVERSION ELEMENT

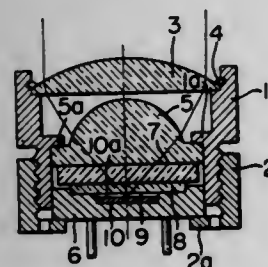
Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,733

Claims priority, application Japan, Mar. 14, 1975, 50-33417[U]

Int. Cl.² H01J 5/02, 39/12

U.S. Cl. 250—239



1. A light receiving device for a photoelectric conversion element, comprising:

- a transparent covering means for covering said conversion element to exclude presence of air between said conversion element and said covering means;
- a transparent, elastic sheet positioned on said covering means;
- a light converging optical system for converging light beams incident on said photoelectric conversion element, said optical system including a lens positioned on said sheet, said lens, said sheet and said covering means being similar in refractive index; and
- means for tightening together said covering means, said sheet and said lens whereby air is excluded from between the contacting surfaces of said covering means and said sheet, and the contacting surfaces of said sheet and said lens.

4,055,762

RADON DAUGHTER DOSIMETER

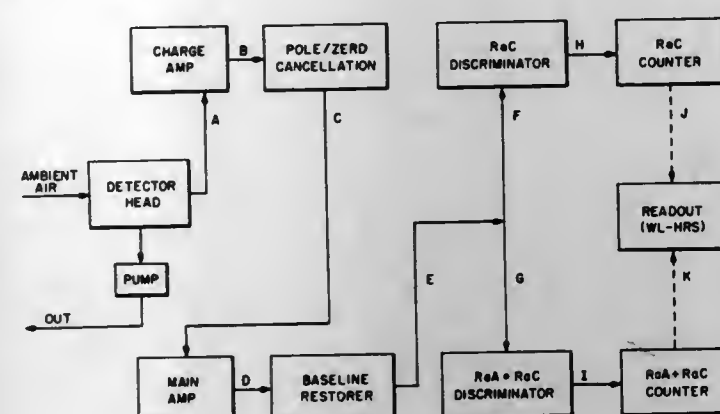
John Durkin, Bethel Park, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 25, 1976, Ser. No. 670,213

Int. Cl.² G01V 5/00

U.S. Cl. 250—253

8 Claims



1. A portable radiation dosimeter unit for continuously measuring the working level exposure to radioactive particles comprising:

- a detector head housing having a filter head and solid state surface barrier radiation detector contained therein; said head housing having an ambient air inlet and outlet adapted to allow air to flow through said filter head before contacting said radiation detector;
- an air pump to force ambient air into said head housing inlet to the filter and radiation detector;
- electronic circuitry connected to said radiation unit for receiving and processing charged electrons received therefrom by converting them to pulses whose heights are representative of the energy levels of detected radioactive particles, said circuitry having means for discriminating and counting the pulses of different heights; and
- a portable self contained power supply operatively connected to said pump and electronic circuitry.

4,055,763

NEUTRON CHARACTERISTIC AND SPECTROSCOPY LOGGING METHODS AND APPARATUS

Stephen Antkwi, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 563,359, March 31, 1975, abandoned.

This application May 17, 1976, Ser. No. 686,781

Int. Cl.² G01V 5/00

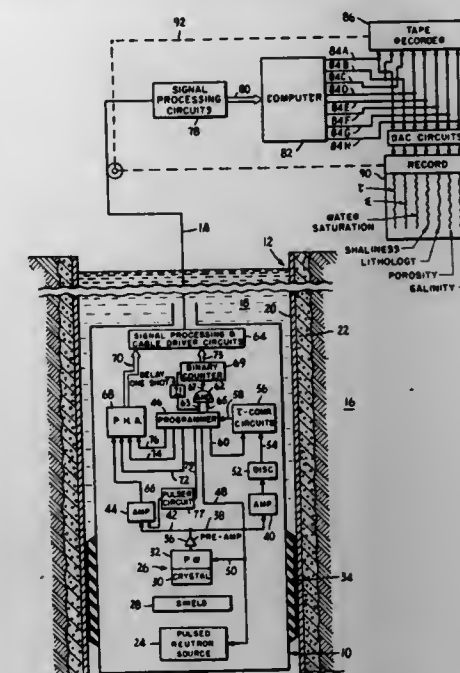
U.S. Cl. 250—270

47 Claims

1. Apparatus for investigating earth formations traversed by a well bore, comprising:

- a well tool adapted to be moved through the well bore; means carried by the well tool for irradiating the formation and other well bore media surrounding the well tool with at least two time-spaced pulses of fast neutrons;
- detector means carried by the well tool for detecting at least in part the time distribution of gamma rays resulting from neutron interactions with nuclei of the irradiated formation and other well bore media following each neutron pulse and for generating a corresponding time distribution of signals representative of the energies of the detected gamma rays;
- means responsive to signals generated by the detector means following the first of said neutron pulses for selecting a portion of the time distribution of signals following the second of said neutron pulses which corresponds to gamma rays resulting predominantly from thermal neutron capture interactions with nuclei of the irradiated formation; and
- means responsive to the detector signals within the selected

portion of the time distribution of signals following said second neutron pulse for analyzing at least a portion of the



energy spectrum of the detected capture gamma rays corresponding to the selected detector signals.

4,055,764

OPTICALLY SELECTIVE, ACOUSTICALLY RESONANT GAS DETECTING TRANSDUCER

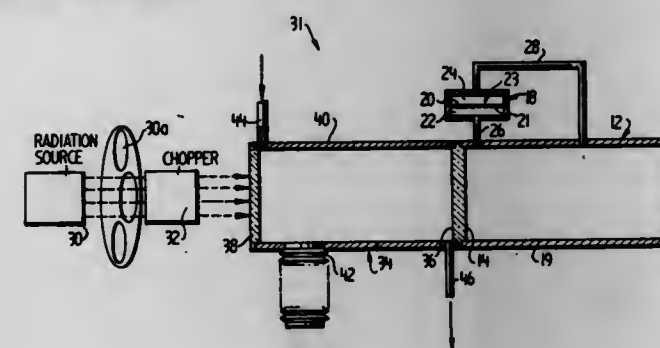
John Dimeff, San Jose, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 22, 1975, Ser. No. 643,043

Int. Cl.² G01J 1/00

U.S. Cl. 250—336

7 Claims



1. Gas detection apparatus comprising:

- a first chamber having a quantity of gas x therein, said chamber having an acoustic resonant frequency;
- a second chamber with a pressure responsive diaphragm dividing said chamber into first and second parts, said diaphragm having a mechanical resonant frequency approximately equal to the acoustic resonant frequency of said first chamber;
- first coupling means for coupling the gas in said first chamber to said first part of said second chamber; said first coupling means permitting said gas pressure variations in said first chamber having a frequency equal to said acoustic resonant frequency to be transmitted to said first part of said chamber and said diaphragm;
- second coupling means for coupling the gas in said first chamber to said second part of said second chamber, said second coupling means permitting only average and low frequency gas pressure variations in said first chamber to be transmitted to said second part of said second chamber and said diaphragm;
- a third chamber containing an unknown gas in which gas x may be present;
- a source of electromagnetic radiation that is intensity modulated at a frequency equal to said acoustic resonant

- frequency, said radiation including at least one spectrum that corresponds to an absorption spectrum of gas x;
- g. said third chamber having opposed end sections that are at least transparent to said spectrum, and said first chamber having at least one wall section that is at least transparent to said spectrum;
- h. said third chamber being positioned between said radiation source and said first chamber and said chambers being oriented to enable said electromagnetic radiation to pass through said third chamber and into said first chamber; and
- i. means for measuring the amplitude of the excursions of said diaphragm, said amplitude being representative of the amount of gas x in said third chamber.

4,055,765

GAMMA CAMERA SYSTEM WITH COMPOSITE SOLID STATE DETECTOR

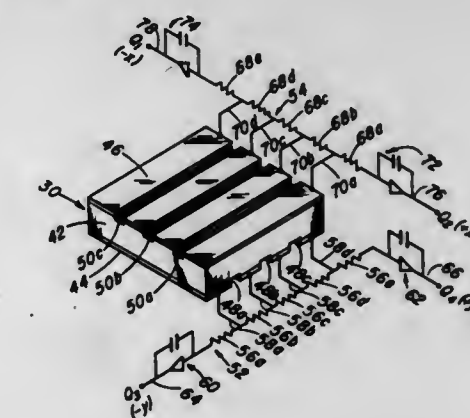
Mark S. Gerber, Columbus, and Don W. Miller, Westerville, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed Apr. 27, 1976, Ser. No. 680,755

Int. Cl.² G01T 1/22

U.S. Cl. 250—370

22 Claims



1. A composite solid state detector for use in deriving a display, by spatial coordinate information, of the distribution or radiation emanating from a source thereof situate within a region of interest, comprising:

- a plurality of solid state detector components, each having a given surface arranged for exposure to impinging radiation and exhibiting discrete interactions therewith at given spatially definable locations;
- said given surface of each said detector component and the surface disposed opposite and substantially parallel thereto, respectively, being associated with impedance means configured to provide, for each of said opposed surfaces, outputs for impedance defined signals relating the said given location of said interactions with one spatial coordinate parameter of one select directional sense; said detector components being arranged to provide groupings of adjacently disposed ones of said given surfaces mutually linearly oriented to exhibit a common said directional sense of said spatial coordinate parameter; and means interconnecting at least two of said outputs associated with each of said surfaces within a given said grouping thereof for collecting said impedance defined signals deriving therefrom.

4,055,766

CONTROL SYSTEM FOR GAMMA CAMERA

Don W. Miller, Westerville, and Mark S. Gerber, Columbus, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed Apr. 27, 1976, Ser. No. 680,754

Int. Cl.² G01T 1/22

U.S. Cl. 250—370

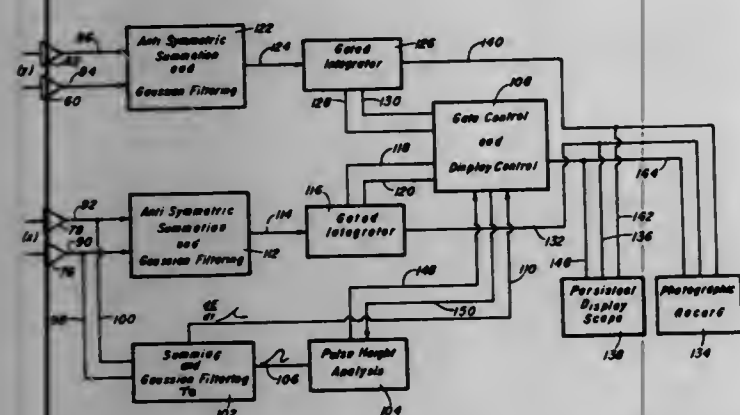
29 Claims

1. In a system for imaging the distribution of a radiation

emitting isotope within a region of interest, said system including solid state strip array type detector means having strip regions which are operatively associated with impedance networks, said networks being arranged to receive radiation-induced charges in spatial disposition corresponding with the interaction location of said radiation upon said strips, said charge receipt being time variant in correspondence with said position of interaction to exhibit a collection time constant, τ_D , the improvement comprising:

amplifier means coupled with said impedance network means and having output signals corresponding with said charge receipt;

first summing means responsive to said amplifier means output signals for deriving a spatial signal corresponding to the spatial orientation of a said interaction location;



second summing means responsive to said amplifier means output signals for deriving an energy signal of value corresponding with the spatial signal;

evaluating means responsive to said second summing means energy signal for evaluating the peak value of said energy signal over a time, t_p , and having a select output when said energy signal peak value lies within predetermined limits;

means for integrating said spatial signal over a time, t_i , to derive an integrated spatial signal, said time, t_i , being greater than said time t_p ;

readout means responsive, when actuated, to receive said integrated spatial signal and derive perceptible information corresponding thereto; and

control means for regulating an operational cycle of said system including the actuation of said readout means only upon the occurrence of said evaluating means select output.

4,055,767

DETECTION APPARATUS FOR X-RAY TOMOGRAPHY
Robert Allemand, Saint Ismier, France, assignor to Commissariat à l'Energie Atomique, Paris, France

Filed June 4, 1976, Ser. No. 692,735

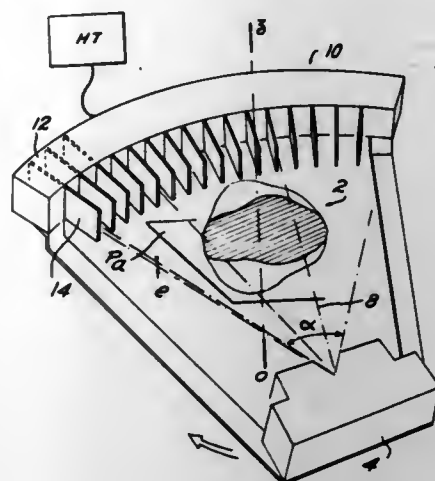
Claims priority, application France, June 19, 1975, 75.19263
Int. Cl.² G01T 1/18

U.S. Cl. 250—385

9 Claims

1. Detection apparatus for use with X-ray tomography apparatus comprising at least one X-ray source adapted to emit X-ray beams to pass through an organ to be analyzed and to thereupon be intercepted by said detection apparatus which comprises multicellular ionization chambers constituted by a single comb-type anode formed by a substantially cylindrical first plate P_1 and a plurality of flat plates P_2 at right angles to said plate P_1 and a plurality of cathodes C_2 , each being formed by a plate which is parallel to one of said plates P_2 , each of said chambers comprising two substantially parallel anode and cathode electrodes separated by a radiation-detecting medium adapted to convert the incident X-rays to electron-ion pairs,

a voltage source connected to said electrodes, and means connected to said electrodes for measuring the charge collected



during a predetermined time interval under the influence of the incident X-rays.

4,055,768

LIGHT MEASURING APPARATUS

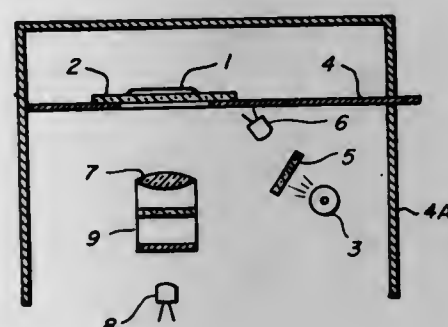
Nathan S. Bromberg, 461 Conant Road, Weston, Mass. 02193

Filed Sept. 7, 1976, Ser. No. 721,065

Int. Cl.² G01N 21/38

U.S. Cl. 250—461 R

6 Claims



1. Apparatus of the type for measuring light emitted, scattered, or reflected from a specimen, the apparatus comprising

a. a source of excitation radiation arranged to illuminate the specimen,

b. modulating means for modulating the excitation radiation,

c. means for emitting a K signal when the specimen has been subjected to a selected amount of excitation radiation,

d. a photodetector arranged to provide an electrical signal in response to the intensity of the light emitted, scattered, or reflected by the specimen,

e. means for amplifying the output signal of the photodetector,

f. a phase sensitive detector having the amplified signal applied to its input,

g. means coupled to the modulating means and deriving signals therefrom which regulate the operation of the phase sensitive detector,

h. an integrator having its input coupled to the output of the phase sensitive detector, and

i. means responsive to the K signal for measuring the quantum of the signal accumulated in the integrator at the emission of the K signal.

4,055,769

METHOD AND APPARATUS FOR CURING, A COATING ON A SUBSTRATE

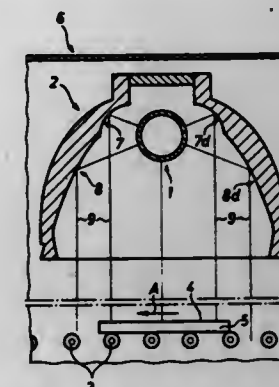
Conrad Sander, Panoramastrasse 55, D-7441 Zizishausen, Germany

Division of Ser. No. 343,179, March 20, 1973, abandoned. This application July 9, 1975, Ser. No. 594,366

Claims priority, application Germany, Mar. 21, 1972, 2213831
Int. Cl.² G01J 1/00

U.S. Cl. 250—492 R

4 Claims



1. An apparatus for curing a coating applied to a substrate, which coating comprises an exothermically reacting organic substance, comprising

a high pressure mercury-vapor tube for producing ultraviolet rays, said tube being located sufficiently distant from said substrate to prevent adverse heating of the substrate or of said organic substance and said tube being designed to produce sufficient radiation density to initiate the exothermic reaction of said organic substance; and

a reflector casing, having a smooth reflective surface, arranged longitudinally about said tube for reflecting said rays into at least one beam directed at said substrate and comprising two opposed concave members spaced from said tube, each such member having a surface defining substantially a quarter circle and an adjacent parabolic configuration on the side facing the tube for focusing such rays into said directed beams, said arrangement of the reflector casing being designed in such a manner that at least one beam of rays with a threshold value which is sufficient to initiate such reaction is produced.

4,055,770

COLLIMATOR ARRANGEMENT FOR A BEAM OF ACCELERATED CHARGED PARTICLES

Jacques Milcamps, and Alain Penet, both of Paris, France, assignors to C.G.R.-Mev., France

Continuation of Ser. No. 339,857, March 9, 1973, abandoned.

This application Aug. 26, 1974, Ser. No. 500,742

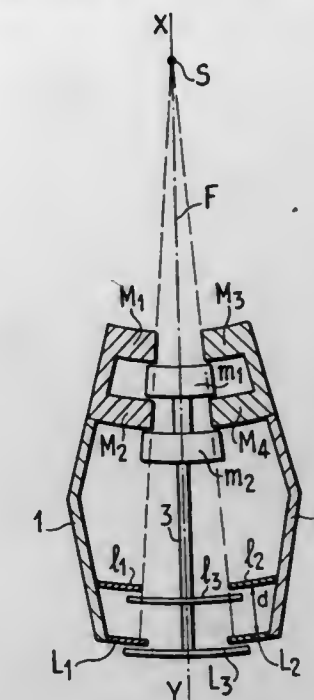
Claims priority, application France, Mar. 15, 1972, 72.08926
Int. Cl.² G21F 5/04

U.S. Cl. 250—505

4 Claims

1. A collimator arrangement, for an accelerated charged particle beam, comprising a first collimator system for partially intercepting said charged particle beam and a second collimator system associated with said first collimator system for intercepting the diffused particles of said beam and the secondary particles produced by said beam impinging upon said first collimator system, said collimator arrangement having an axis XY which is coincidental with the mean path of said beam; said first collimator system comprising four pairs of collimating elements each formed as a jaw, four movable supports, each of said movable supports respectively carrying a pair of said collimating elements thereof separated from each other along the axis XY, each said jaw facing another jaw, said movable supports being mechanically connected to one another and symmetrically disposed with respect to a plane containing said axis XY for movement of said facing jaws toward and away from each other, and said second collimator system comprising four support-rods each mechanically associated with one of

said movable supports for movement therewith, each of said support-rods carrying at least an intermediate metal strip and a terminal metal strip fixed at the free end of said support-rod, the internal edge of each intermediate strip being set back in relation to the internal edge of the terminal strip carried by the



same support-rod, said intermediate strips and terminal strips of each pair of support-rods being thinner in the XY axis direction than said jaws and respectively located opposite one another and symmetrically disposed with respect to a plane containing said axis XY.

4,055,771

TEST BODY FOR A SCANNING TOMOGRAPHIC ANALYTICAL APPARATUS

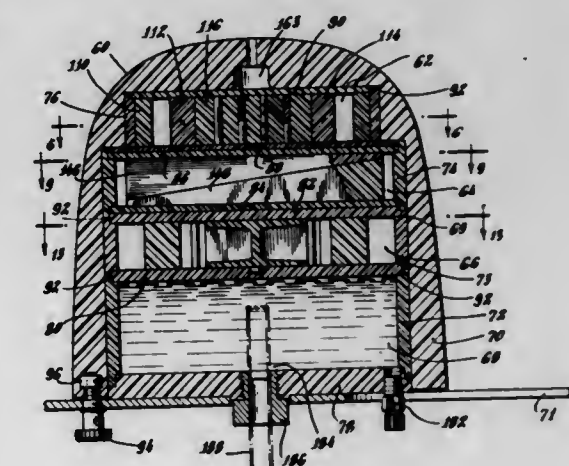
David John Goodenough, Myersville; Kenneth E. Weaver, Gaithersburg, both of Md.; Joseph G. Smreka, and William Clayman, both of Norwalk, Conn., assignors to Alderson Research Laboratories, Inc., Stamford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,801

Int. Cl.² G02B 5/00

U.S. Cl. 250—505

27 Claims



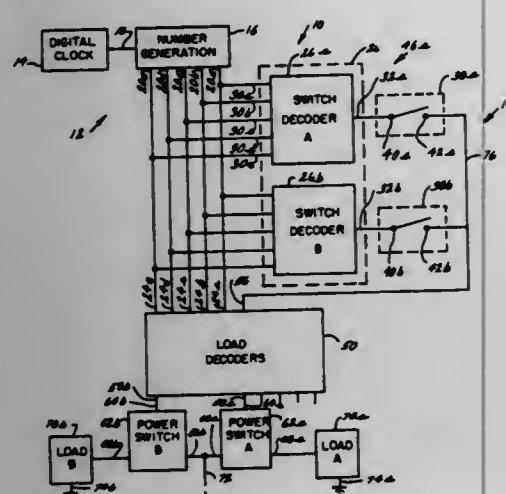
1. A test body for determining an operating characteristic of a tomographic apparatus of a type which is adapted to scan a human body member with an X-ray beam along an edge of a slice through the member, accumulate data in electrical form during the scanning which is representative of variations in the intensity of the transmission of X-ray energy through the member during a plurality of scans, and reconstruct a cross sectional image of the slice from the accumulated data comprising:

A. energy absorption means arranged in layered arrays, each array extending generally parallel to a direction of projec-

tion of the X-ray beam and comprising one or more energy absorption test elements adapted for absorbing electromagnetic energy from an impinging X-ray beam and having a predetermined energy absorption characteristic; and,

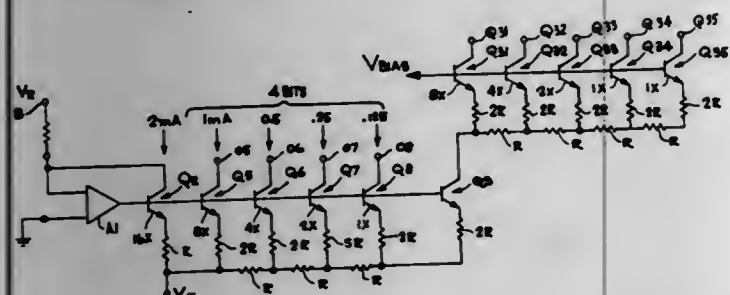
B. means for positioning said energy absorbing means between a scanning X-ray beam and a transmission intensity detector of the apparatus.

4,055,772
DIGITALLY CODED ELECTRICAL SUPPLY SYSTEM
 Tommy Y. Leung, Cassopolis, Mich., assignor to CTS Corporation, Elkhart, Ind.
 Filed Nov. 3, 1975, Ser. No. 628,580
 Int. Cl.² H02G 3/00
 U.S. Cl. 307-10 R 19 Claims



1. In a digitally coded electrical supply system, the combination comprising a code transmission cable having a plurality of code transmission conductors therein, code generator means being connected to said plurality of code transmission conductors for sequentially and cyclically producing digitally coded electrical pulses simultaneously in said code transmission conductors corresponding to respective ones of a plurality of numbers, load decoder means being connected to said code transmission conductors for decoding one of said numbers and for producing a digital output signal when both said load decoder means is activated and said one number is digitally encoded into said code transmission conductors and activating means being connected to said load decoder means for selectively activating said load decoder means.

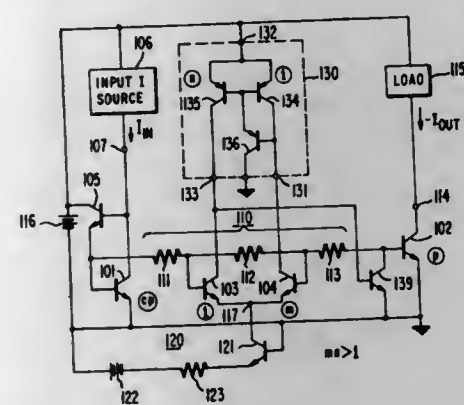
4,055,773
MULTISTAGE ELECTRICAL LADDER FOR DECREMENTING A SIGNAL INTO A PLURALITY OF WEIGHTED SIGNALS
 John A. Schoeff, Los Gatos, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.
 Filed Dec. 22, 1975, Ser. No. 642,770
 Int. Cl.² H03K 13/04
 U.S. Cl. 307-229 13 Claims



1. An improved electrical ladder for use in forming a plurality of weighted signals comprising,
 a master ladder network having an input reference signal means, a first signal scaling means having a plurality of

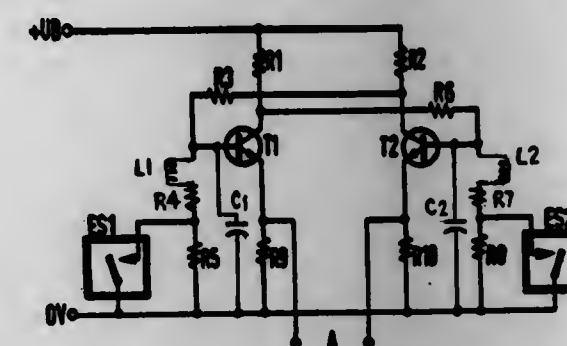
first scaled output devices having a first scaling range connected for receiving said reference signal and dividing it into a plurality of decrementally weighted signals, one of said first output devices associated with each decrementally weighted signal,
 a first terminator means for generating a first remainder signal from said master ladder network, and
 a first slave ladder network having a second signal scaling means having a plurality of second scaled output devices, having a second scaling range, at least some of which is within said first scaling range, said second output devices connected to said master ladder for receiving said generated first remainder signal from said first terminator means and dividing it into a plurality of decrementally weighted signals, one of said second output devices associated with each decrementally weighted signal, and a second terminator means for generating a second remainder signal from said first slave ladder network, said first and second scaled output devices having separate output terminals for providing decremented signal outputs.

4,055,774
CURRENT SCALING APPARATUS
 Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.
 Filed May 27, 1976, Ser. No. 690,719
 Claims priority, application United Kingdom, Sept. 26, 1975, 39619/75
 Int. Cl.² H03K 17/00
 U.S. Cl. 307-296 R 27 Claims



1. A current scaling apparatus comprising, in combination: first and second and third and fourth transistors, each having base and emitter electrodes and a base-emitter junction therebetween and having a collector electrode, said first and said second transistors being of the same conductivity type as each other and having interconnected emitter electrodes, said third and said fourth transistors being of the same conductivity type as each other and having interconnected emitter electrodes;
 means operating said third and said fourth transistors with different densities of current flow through their respective base-emitter junctions for defining a difference between their respective base potentials;
 means for scaling up the difference between the base potentials of said third and said fourth transistors by a fixed ratio; and
 means applying the scaled up difference potential between the base electrodes of said first and said second transistors for determining the ratio between their respective collector currents.

4,055,775
TRANSMISSION CIRCUIT FOR DIRECT CURRENT DATA TRANSMISSION
 Helmut Fiedler, Gartenberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
 Continuation of Ser. No. 464,860, April 29, 1974, which is a continuation of Ser. No. 257,382, May 26, 1973, which is a continuation of Ser. No. 23,000, March 26, 1970, abandoned.
 This application May 14, 1975, Ser. No. 577,448
 Claims priority, application Germany, Apr. 9, 1969, 1918090
 Int. Cl.² H03K 17/60; H04L 25/02
 U.S. Cl. 307-254 6 Claims

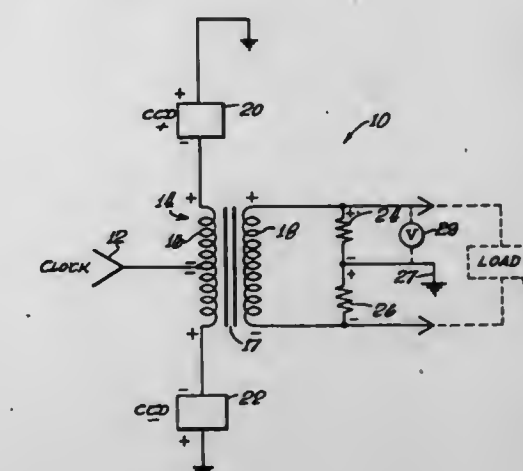


1. Apparatus for producing at different times positive and negative direct current signals responsive to binary signal levels from a data source, said current signals having substantially equal magnitudes and being produced from two output signal terminals, said apparatus having a substantially zero source impedance, comprising:

a source of operating voltage having a pair of output terminals,
 first and second transistors, each having a conductive path established between the collector and emitter thereof and a base electrode, the application of voltages to which causes proportional amounts of current to flow through said conductive path, p1 first and second equal-valued emitter resistances connecting the emitters of said first and second transistors, respectively, to one of said output terminals of said operating voltage source,
 first and second equal-valued collector resistances connecting the collectors of said first and second transistors, respectively, to the other of said output terminals of said operating voltage source,
 first voltage divider means having input terminals connected, respectively, to the collector of said second transistor and to said one output terminal of said operating voltage source and having output terminals connected, respectively, to the base of said first transistor and to said one output terminal of said operating voltage source,
 first switching means coupled to said voltage divider means for varying, responsive to the presence of a first of said binary signal levels, the voltage output at said output terminals of said first voltage divider means,
 second voltage divider means having input terminals connected, respectively, to the collector of said first transistor and to said one output terminal of said operating voltage source and having output terminals connected, respectively, to the base of said second transistor and to said one output terminal of said operating voltage source,
 second switching means coupled to said second voltage divider means for varying, responsive to the presence of a second of said binary signal levels, the voltage output at said output terminals of said second voltage divider means,
 said operating voltage source output, said first and second emitter resistances and the base currents of said first and second transistors being of values such that when said first and second switching means are unoperated, currents of substantially equal values flow through said conductive paths of said first and second transistors and
 connection means connecting said emitters of said first and second transistors, respectively, to said output signal terminals of said apparatus as to produce therefrom direct

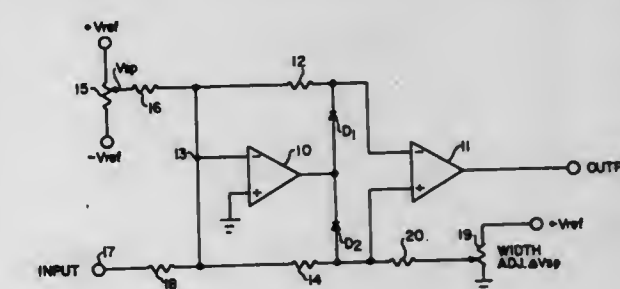
current signals which are a function of the difference between the magnitudes of the currents flowing, respectively, through said first and second transistors.

4,055,776
CCD DIFFERENTIAL CURRENT APPARATUS
 Robert W. Means, Lausanne, Switzerland, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
 Filed Oct. 26, 1976, Ser. No. 735,652
 Int. Cl.² H03K 5/20
 U.S. Cl. 307-355 3 Claims



1. A differential current apparatus for use with a source of clock signals, comprising:
 at least a pair of differentially coupled plural charge coupled solid state devices;
 a center-tapped primary inductor, connected at one end to one of the said pair of charge coupled devices and connected at the other end to the other of said pair of devices, the center tap of said primary inductor connectable to said source of clock signals; and
 a secondary inductor inductively coupled to said center-tapped primary inductor for signal transfer therebetween; whereby when a clocking pulse is applied to the center tap of the primary of the inductor, comprising a differential current is caused by the coupled clock pulses flowing in said center-tapped primary.

4,055,777
WINDOW COMPARATOR
 James M. Black, Quartz Hill, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
 Filed Nov. 2, 1976, Ser. No. 737,974
 Int. Cl.² H03K 5/153
 U.S. Cl. 307-360 6 Claims



1. A window comparator comprised of
 a first means for algebraically subtracting an input signal from a selected set-point voltage to produce a difference output indicating when said input signal exceeds a set-point level established by said set-point voltage, said first means being comprised of an operational amplifier having

an inverting input terminal connected to a summing junction and two feedback circuits connecting the output of said operational amplifier to said summing junction, one feedback circuit comprising a first diode in series with a resistor, the first diode having its anode connected to the output of the first operational amplifier, and the other feedback circuit comprising a second diode in series with a resistor, the second diode having its cathode connected to the output of said first operational amplifier; a first summing resistor coupling said input signal to said summing junction and a second summing resistor coupling said set-point voltage to said summing junction, said set-point voltage being selected for the set-point level at which the linear output of the first operational amplifier crosses from one polarity to another according to when the algebraic difference between the input signal and the set-point voltage changes polarity, and

a second means for algebraically subtracting the difference output of said first means from a selected window-width voltage to produce an output signal of a first level until said difference signal indicates said input signal has exceeded said set-point level and, thereafter, of a second level until said difference signal exceeds said window-width voltage, at which time said second means produces said output signal of said first level while said difference signal continues to exceed said window-width voltage, said second means being comprised of a high gain differential amplifier having one input terminal connected to the junction between the diode and feedback resistor in one of said feedback circuits and a second input terminal connected to the junction between the diode and feedback resistor in the other one of said feedback circuits, and means for connecting said window-width voltage to one of said two input terminals of said differential amplifier.

4,055,778

GENERATOR HOUSING

Georg Binder, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Continuation-in-part of Ser. No. 434,587, Jan. 8, 1974, which is a continuation of Ser. No. 273,189, July 19, 1972, abandoned.

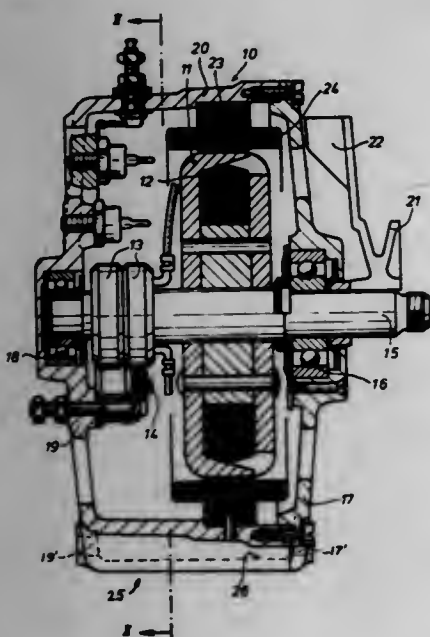
This application Sept. 4, 1975; Ser. No. 610,404

Claims priority, application Germany, Aug. 5, 1971, 7129982[U]

Int. Cl.² H02K 5/00

U.S. Cl. 310—89

10 Claims



1. In a generator for a motor vehicle, a combination comprising a shaft having a longitudinal axis and being rotatable about the same; a pulley rigidly attached to said shaft for driving the same; a rotor affixed to said shaft so as to rotate with the same; a stator surrounding said rotor; and a housing including a substantially cylindrical circumferential wall surrounding said stator in substantial parallelism with said longitudinal axis and

having axially spaced end portions, said circumferential wall being circumferentially bounded by a substantially cylindrical outer surface and a substantially cylindrical inner surface, which surfaces extend over the entire axial length of said circumferential wall, said circumferential wall further having a plurality of openended passages arranged parallel to said longitudinal axis and located entirely within said circumferential wall between said outer surface and said inner surface, said housing further including two axially spaced end walls extending substantially transversely to said longitudinal axis and connected to the respective end portions of said circumferential wall, said end walls having a plurality of openings aligned and merging with the respective passages of said circumferential wall and passing through the respective end walls, said passages and openings being adapted to accommodate holding means for so attaching said housing to the motor vehicle that said holding means extends through the respective ones of said passages in said circumferential wall and respective ones of said openings in said end walls and engages respective parts of said housing so that the housing is pivotable about at least one of said holding means extending through a respective passage and openings but is arrestable in a selected pivoted position by another holding means extending through a different passage and openings, whereby the forces to which said parts of said housing are subjected are reduced, and damage to said parts due to such forces is prevented as a result of the arrangement of said passages within said circumferential wall radially inwardly of said outer surface and radially outwardly of said inner surface, of the location of said openings in said end walls, and of the accommodation of the holding means in said passages and openings.

4,055,779

GAS DISCHARGE LAMP

Jürgen Schäfer, Niedermittlau, Germany, assignor to Original Hanau Quarzlampen GmbH, Hanau, Germany

Filed Aug. 1, 1975, Ser. No. 601,570

Claims priority, application Germany, Aug. 9, 1974, 2438372

Int. Cl.² E05C 7/06

U.S. Cl. 313—220

3 Claims



1. In a vapor discharge lamp the improvement comprising said generally straight tubular radiation body being divided within that portion between the ends of the electrodes into a central sector and end sectors disposed on each side thereof, said sectors being of generally equal length and of generally constant cross sectional area and wherein the cross sectional area of the end sectors is less than that of the center sector for effective uniform light radiation above a predetermined minimum threshold power over approximately 90% of the length of the tubular radiation body between electrodes.

4,055,780

THERMIONIC EMISSION CATHODE HAVING A TIP OF A SINGLE CRYSTAL OF LANTHANUM HEXABORIDE

Shichio Kawai; Takaho Tanaka; Eisuke Bannai; Kenji Uchida, all of Sakura, and Ryuichi Shimizu, Minou, all of Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

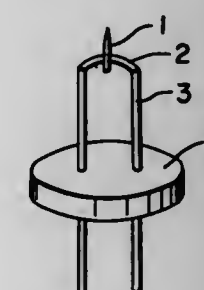
Filed Apr. 12, 1976, Ser. No. 675,963

Claims priority, application Japan, Apr. 10, 1975, 50-43717; Apr. 24, 1975, 50-50135; Sept. 4, 1975, 50-107739

Int. Cl.² H01J 1/14, 19/06; H01K 1/04

U.S. Cl. 313—346 R

8 Claims



1. A thermionic emission cathode which comprises a tip which includes only a single crystal of lanthanum hexaboride.

4,055,781

SPECIAL PURPOSE FLUORESCENT LAMP

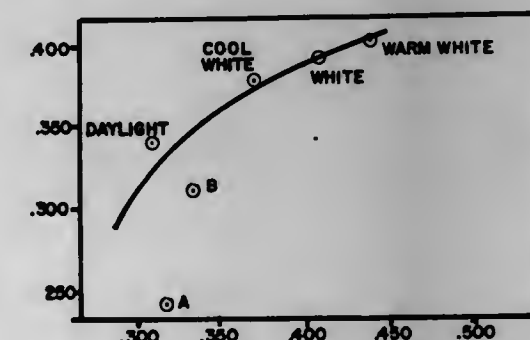
Willy P. Schreurs, Danvers, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Sept. 9, 1974, Ser. No. 504,412

Int. Cl.² H01J 1/63

U.S. Cl. 313—487

1 Claim



1. A fluorescent lamp comprising an envelope filled with an inert gas at low pressure, a filament within said envelope carrying an electron emitting coating of alkaline earth oxide and a coating of four blended phosphors disposed on the interior surface of said envelope, said coating comprising two broad band blue emitters, one broad band orange emitter and a single narrow band emitter peaking in the deep red region of the visible spectrum, said blue emitters being lead activated calcium tungstate and antimony activated calcium fluorophosphate and comprising between 40 to 60 weight percent of the total phosphor weight, said red emitting phosphor being manganese activated magnesium fluorogermanate and comprising between 10 and 30 weight percent of the total phosphor weight, said orange emitting phosphor being tin activated strontium magnesium orthophosphate, the chromaticity of said lamp being in the purple region of the C.I.E. chromaticity chart.

4,055,782

METHOD OF ENHANCING CYCLOTRON BEAM INTENSITY

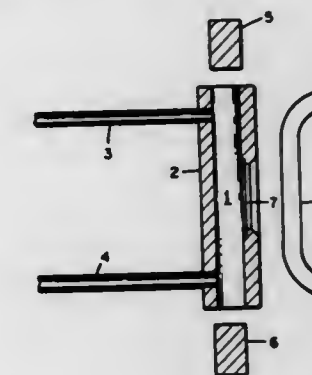
Ed D. Hudson, Knoxville, Tenn., and Merritt L. Mallory, East Lansing, Mich., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 22, 1977, Ser. No. 789,765

Int. Cl.² H05H 7/08, 13/00

U.S. Cl. 315—111.9

4 Claims



1. In a method of operating an isochronous cyclotron comprising the steps of feeding a desired primary feed gas at a selected feed rate to the internal ion source of said cyclotron for producing a plasma of ions in the arc chamber of said ion source; withdrawing and accelerating ions from said arc chamber with the rf system and magnetic field of said cyclotron; and extracting a desired separated ion beam from said accelerated ions in said cyclotron with the ion beam extraction system of said cyclotron, the improvement comprising the steps of feeding a small amount of an easily ionized arc support gas to said arc chamber simultaneously with said feeding of said primary feed gas to said arc chamber, and at the same time reducing the feed rate of said primary feed gas to said arc chamber to a desired lower value such as to maintain the arc voltage and arc current of said ion source at constant values, whereby the desired separated ion beam extracted from said cyclotron has its intensity substantially enhanced over that achievable without the use of said arc support gas.

4,055,783

SPARK SOURCE WITH REGULATION OF SPARK MAGNITUDE BY CONTROL OF SPARK TIMING

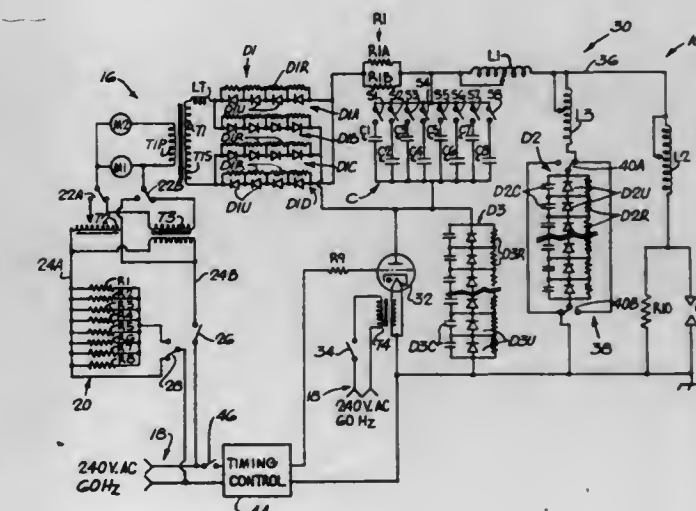
John P. Walters, and David M. Coleman, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 1, 1976, Ser. No. 662,891

Int. Cl.² G01J 3/30; H05B 7/20

U.S. Cl. 315—241 R

22 Claims



1. A spark source, comprising

a high voltage transformer having a secondary winding for supplying alternating current at a high voltage, a storage capacitor, a charging circuit including a rectifier connected between said secondary winding and said capacitor for charging said capacitor, spark gap electrodes having a spark gap therebetween, a discharge circuit including an electronic switching device connected between said capacitor and said spark gap electrodes for discharging said capacitor across said spark gap, said electronic switching device having input means for receiving triggering signals, and control means for supplying a sequence of variably spaced triggering pulses to said input means for producing a sequence of spark cycles in which said capacitor is charged to substantially equal voltages for all of said spark cycles, said control means including variable timing means responsive to the phase angle of the alternating current supplied to said high voltage transformer for varying the timing of each triggering pulse in response to the phase angle variation of the alternating current during the interval subsequent to the preceding triggering pulse.

4,055,784

ELECTRON BEAM DEFLECTION CIRCUIT

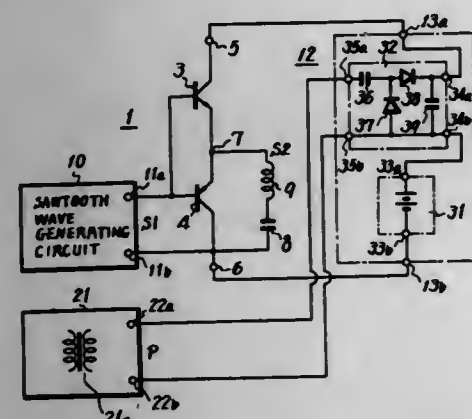
Shigeo Tanaka, Ichikawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 678,737

Claims priority, application Japan, Apr. 24, 1975, 50-50394

Int. Cl.² H01J 29/70, 29/76

U.S. Cl. 315—397



1. A vertical deflection circuit comprising: an output circuit including first and second transistors connected to form a single-ended push-pull amplifiers having an output, an operating voltage terminal connected to said first transistor and adapted to receive an operating voltage for said transistors, a vertical deflection coil connected to said output of the single-ended push-pull amplifier, and means for applying sawtooth wave input signals to said amplifier so as to cause sawtooth wave currents to flow in said vertical deflection coil; and a power supply circuit for supplying said operating voltage to said terminal including D.C. voltage source means for supplying a substantially constant D.C. voltage, A.C. voltage source means for supplying an A.C. voltage, and rectifier means connected with said D.C. and A.C. voltage source means for rectifying said A.C. voltage and producing an additional D.C. voltage which is added to said constant D.C. voltage only during a predetermined portion of each wave of said sawtooth wave input signals for causing the power supply circuit to provide a resulting first operating voltage at said terminal during only said predetermined portion of each wave of the input signals, said rectifier means being inoperative to rectify said A.C. voltage for causing the power supply circuit to apply to said terminal a second operating voltage corresponding substantially to said constant D.C. voltage during the

remaining portion of each wave of said sawtooth wave input signals.

4,055,785

STEPPING MOTOR FOR ELECTRONIC TIMEPIECE

Fumio Nakajima, No. 5-3, 2-chome, Mejiro, Toshima, Tokyo; Takayasu Machida, No. 1562, Noda, Iruma, Saitama, and Kenji Yamada, No. 9-19, 1-chome, Nakamachi, Koganei, Tokyo, all of Japan

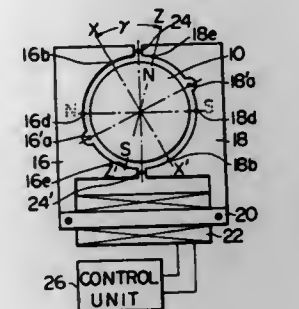
Filed June 18, 1976, Ser. No. 697,364

Claims priority, application Japan, Jan. 12, 1976, 51-2613; Feb. 26, 1976, 51-20495

Int. Cl.² H02K 29/00

U.S. Cl. 318—138

17 Claims



1. A stepping motor comprising a permanent magnet rotor, a stator including a driving coil and stator pole pieces electromagnetically connected thereto, said stator having at least one static equilibrium point at which said rotor is stable, and a control unit electrically connected to said driving coil, said control unit including means for energizing said driving coil to electromagnetically shift the static equilibrium position to a predetermined position.

4,055,786

CONTROL SYSTEM FOR TIME SHARING MULTIPLE STEPPER MOTORS WITH A SINGLE CONTROLLER

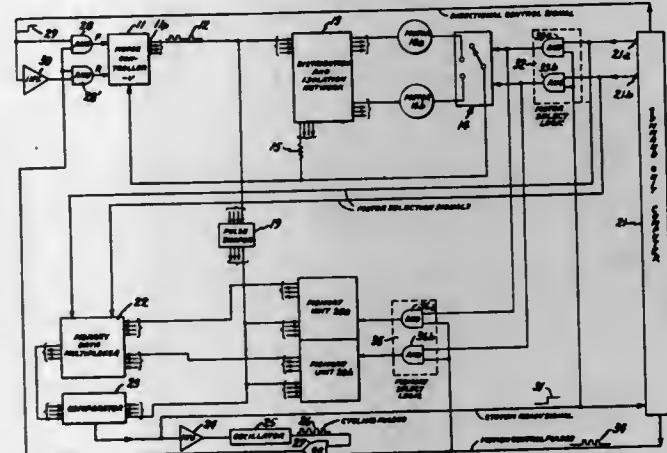
Alfred W. DiMarzio, Pattersonville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 6, 1976, Ser. No. 683,696

Int. Cl.² G05B 11/32

U.S. Cl. 318—562

12 Claims



1. A motor control system for multiple stepper motors comprising a plurality of stepper motors each having a rotor movable by discrete steps upon being supplied with sets of drive pulses determining stator winding combinations to be energized sequentially, a single motor controller for generating said sets of drive pulses in repeating predetermined forward and reverse sequences representing the sequence of winding states for moving a desired motor to a commanded position, a memory unit for each motor for storing drive pulse data representative of said sets of drive pulses and corresponding to the actual motor winding state,

means for selecting one motor and cycling said controller until the actual motor winding state stored in said memory unit and the controller winding state compare, and means for switching the selected motor for energization and successively triggering said controller to move the selected motor to the commanded position while enabling the respective memory unit for entry of drive pulse data.

4,055,787

INTERRUPTABLE NUMERICAL CONTOURING CONTROL SYSTEM WITH RETURN TO PATH SAFEGUARDS

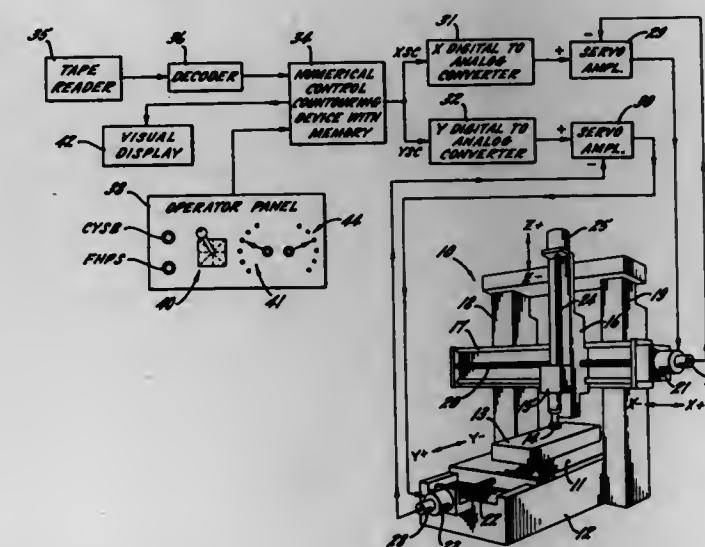
Bruce R. Beadle, and Eugene A. Olig, both of Fond Du Lac, Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed July 28, 1975, Ser. No. 599,591

Int. Cl.² G05B 7/00

U.S. Cl. 318—591

24 Claims



1. In a numerical contouring control system for moving a member simultaneously along plural axes to execute a programmed path, said system including

- a control means responsive to a block of command signals for moving the member along a corresponding path segment defined by such signals, and
- means for supplying successive ones of a program of blocks of command signals to said control means (a) to cause said member to be moved serially through the segments of a programmed path, the improvement comprising

- means for interrupting the sequential operation of said means (a) and (b) and stopping the member at a random point on the path,
- means effective after the member has been so stopped for moving the member to various desired successive locations displaced from the stopping point,
- means for creating signals which directly or indirectly represent the axis component displacements between (i) said stopping point and (ii) the actual location of said member after each movement created by said means (2),
- means for producing a restart signal,
- means responsive to said restart signal for restoring said means (a) and (b) to normal sequential operation, and
- means controlled by said means (3) for disabling said means (5) unless and until said member is positioned at said path stopping point.

4,055,788

MOTOR CONTROL CIRCUIT

William Hancock Greeley, Jr., Marblehead, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 17, 1975, Ser. No. 632,870

Int. Cl.² G05B 5/01

U.S. Cl. 318—624

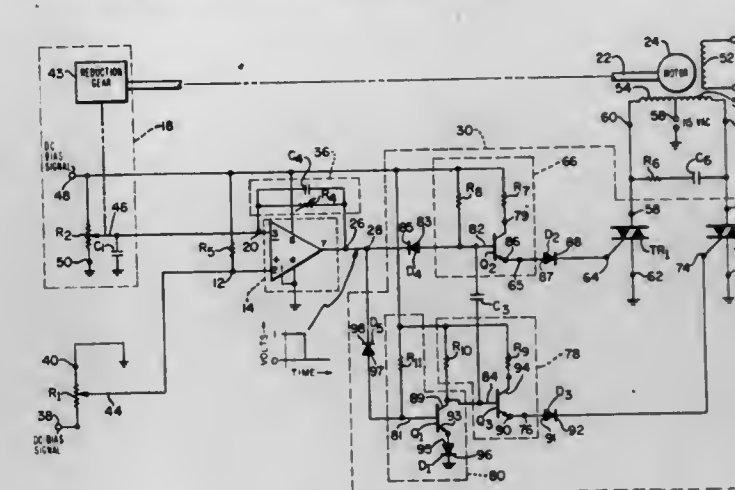
11 Claims

1. A motor control circuit for controlling operation of a

reversible motor having a shaft and motor control windings comprising:

position transducer means coupled to said motor shaft for providing an output electrical signal proportional to a displacement of said motor shaft from a reference motor shaft position;

comparator means having first and second input terminals and an output terminal, said comparator means being arranged to compare magnitude of a reference signal coupled to said comparator first input terminal with magnitude of said position transducer output electrical signal coupled to said comparator second input terminal to provide a motor direction control signal;



feedback means coupled between said comparator second input terminal and said comparator output terminal to cause said comparator means to oscillate to stop said motor operation when a difference in magnitude between said reference and transducer electrical signals is substantially equal to a predetermined magnitude; and

motor direction control means coupled between said comparator output terminal and said motor control windings, said motor direction control means being arranged to generate motor control signals for controlling said motor operation in response to said comparator means output signal.

4,055,789

BATTERY-OPERATED MOTOR WITH BACK EMF CHARGING

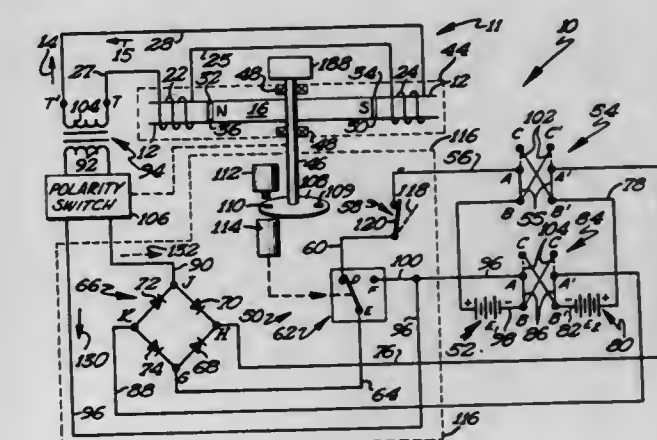
Henry C. Lasater, Cuba, N. Mex., assignor to Donald J. Dimmer, Cuba, N. Mex., a part interest

Filed Dec. 31, 1975, Ser. No. 645,876

Int. Cl.² H02J 7/00; H02P 7/20

U.S. Cl. 320—6

9 Claims



1. In combination with first and second batteries, an energy conserving electrical apparatus for driving a load and recovering otherwise wasted electrical energy, comprising:

- a frame;
- a first rotor movably mounted to said frame for angular displacement along a path and about an axis, said rotor

including a pair of poles and means for producing a magnetic field about said poles;

a first stationary pole member supported by said frame and adjacent said path of said rotor, said member having a pair of poles closely confronting the path of said rotor, said pole member including stationary means for producing a magnetic field about said pole member to interact with said magnetic field of said rotor;

at least one of said means for producing a magnetic field including coil means utilizing electromagnetic induction for establishing a magnetic field;

polarity reversing means electrically connected with said coil means to alternately reverse the electrical polarity of current applied to said coil means to alternately reverse the direction of the magnetic field of said coil means to thereby produce angular displacement of said rotor about said axis;

electrical switching circuitry operatively electrically connected with said coil means, with said first battery and with said second battery, said switching circuitry including a mode selection switch shiftable between a first mode, wherein said switch operatively electrically connects said first battery in series with said second battery to charge said second battery and in series with said coil means to drive said first rotor about said axis, and a second mode, wherein said first battery is disconnected from said coil means and from said second battery and said second battery is connected to said coil means in charging relationship with said coil means to charge said second battery with electrical energy induced in said coil means by said magnetic fields; and

said mode selection switch shifting between said first and second modes in response to angular displacement of said rotor about said axis to energize said coil means from said first battery to thereby drive said rotor about said axis when in said first mode and when in said second mode to conduct current from said coil means to said second battery so that current induced in said coil means by said magnetic fields charges said second battery.

4,055,790

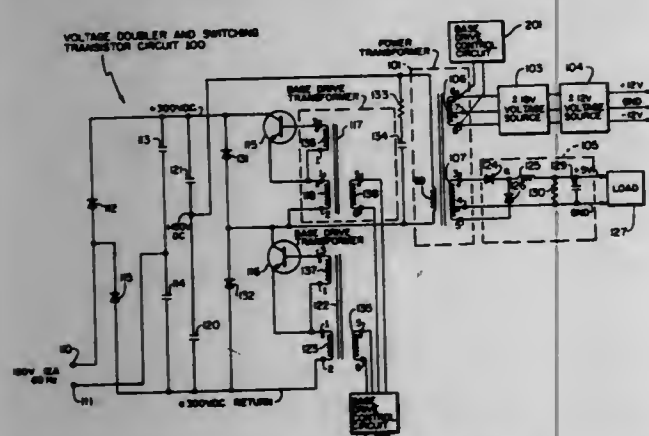
POWER SUPPLY WITH BASE DRIVE CONTROL

James H. Gerding, Framingham, and Albert M. Heyman, Bedford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 29, 1976, Ser. No. 755,391
Int. Cl.² H02M 7/00

U.S. Cl. 363—24

13 Claims



1. A power supply system for converting AC voltage to a low-level DC voltage, said system comprising:

means for converting the AC voltage to a first DC voltage level,

means for transforming the first DC voltage level to the low-level DC voltage, said transforming means including a primary winding having a pair of terminals and at least one secondary winding; and

means for applying the first DC voltage level to said means

for transforming the first DC voltage level to the low-level DC voltage, said means for applying comprising:

first and second transistor switching means, each of said switching means including first and second terminals, said first terminal of said first switching means being connected to said second terminal of said second switching means in common with said first terminal of said primary winding, and said second terminal of first switching means being connected to said second terminal of said primary winding and to said first terminal of said second switching means; and

control means for controlling the switching action of said first and second switching means,

said control means including:

first means inductively coupled to said first and second terminals of said first transistor switching means;

second means inductively coupled to said first and second terminals of said second transistor switching means;

third means connected to said first and second means, said third means being operative to generate first and second sets of pulse signals to be applied to said first means and second means respectively, said first switching means and said second switching means being alternately enabled and disabled in a push-pull mode for operation by said first and second sets of pulse signals respectively.

4,055,791

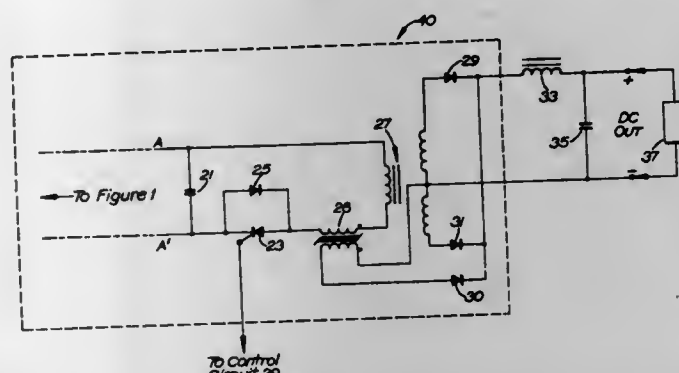
SELF COMMUTATED SCR POWER SUPPLY

Robert J. Bland, Berkeley Heights, and Winfried Seipel, California, both of N.J., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 8, 1975, Ser. No. 610,963
Int. Cl.² H02M 3/315

U.S. Cl. 363—28

5 Claims



1. An apparatus for producing a regulated D.C. power signal comprising:

a pair of input terminals for receiving an input signal; and

power mesh means coupled to the input terminals for producing a selected D.C. power signal, wherein said power mesh means includes:

input and energy storage means coupled to the input terminals for storing energy from the input terminals;

transformer means coupled to the input and energy storage means and having input and output windings;

switching means coupled to the input windings of said transformer means to selectively transfer a portion of the energy stored by the input and energy storage means to the transformer means; and

output rectifying means coupled to the output windings of the transformer means for rectifying the output signal from said transformer means;

a saturable transformer having a primary winding connected between the input winding of said transformer means and said switching means, and having a secondary winding with one end connected to a tap on the output winding of said transformer means; and

a diode having an anode connected to the other end of the secondary winding of the saturable transformer, and a

cathode connected to the common coupling point of said output rectifying means.

4,055,792

ELECTRICAL CONTROL SYSTEM FOR AN EXHAUST GAS SENSOR

Lawrence R. Foote, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

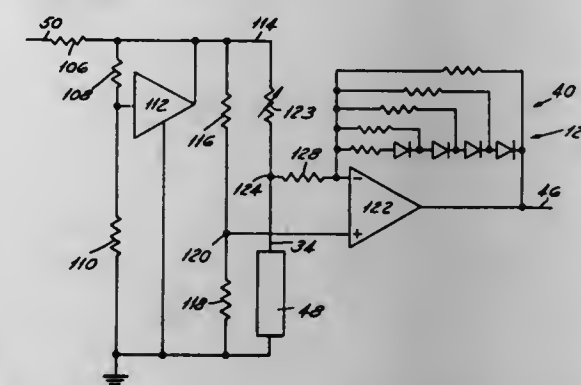
Division of Ser. No. 484,896, July 1, 1974, Pat. No. 3,946,198.

This application Jan. 12, 1976, Ser. No. 648,340

Int. Cl.² G01R 17/02; F02M 7/00

U.S. Cl. 323—19

1 Claim



1. A system for generating an output signal from an exhaust gas sensor which output signal is linear for variations in the air/fuel mixture comprising in combination:

a variable resistance type exhaust gas sensor;

means for generating a regulated voltage;

first voltage divider means, including said sensor, connected to said regulated voltage for generating a signal voltage;

second voltage divider means connected to said regulated voltage in parallel with said first voltage divider means, for generating a reference voltage;

amplifier means having an output terminal and at least two input terminals, said input terminals arranged to receive said signal and reference voltages, respectively; and

circuit means interconnecting said output terminal and one of said input terminals, operative to controllably vary the energization of said sensor whereby the output signal of said amplifier may be rendered linear with respect to changes in the air/fuel ratio of the combustion mixture forming the exhaust gas environment of the sensor; said circuit means comprising:

a plurality of diode members connected electrically in series with each other with a first cathode connected to the amplifier means output terminal and a series resistor interconnecting one of the amplifier input terminals to the series connected diode members;

a resistor interconnecting said one amplifier input terminal to the amplifier output terminal in parallel with said series connected resistor and plurality of diode members; and

a plurality of resistors, less in number by one than the number of diode members and connected between said one amplifier input terminal and the anode/cathode junctions between selected pairs of the series connected diode members on a one-to-one basis.

4,055,793

ELECTRICAL LOAD CONTROLLER

Peter G. Bartlett, Davenport, Iowa, assignor to Automation Systems, Inc., Eldridge, Iowa

Filed July 8, 1976, Ser. No. 703,398

Int. Cl.² G05F 3/04

U.S. Cl. 323—22 SC

8 Claims

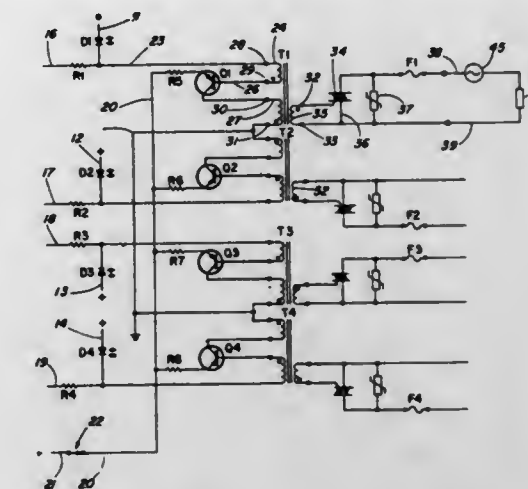
1. An electrical load control comprising:

a triac having a first and second anode and operable to have an electrical load in series with a source of electrical energy coupled across its anodes and having a gate which presents a low impedance to said first anode with a first

polarity signal and which presents a high impedance to said first anode with an opposite polarity signal;

a saturable transformer having a secondary winding, a first end of which is coupled to the triac gate and a second end of which is coupled to said first anode of the triac, and having a primary winding; and

electronic switch means for coupling, in a first condition, electrical current through the primary winding until the



transformer is saturated and for essentially removing current from the primary winding after saturation during a flyback period, until the transformer returns to said first condition, said switch means directing current such that said gate presents a high impedance to said first anode during conduction by the primary winding and said gate presents a low impedance to said first anode when the primary winding is essentially non-conducting during said flyback period.

4,055,794

BASE DRIVE REGULATOR

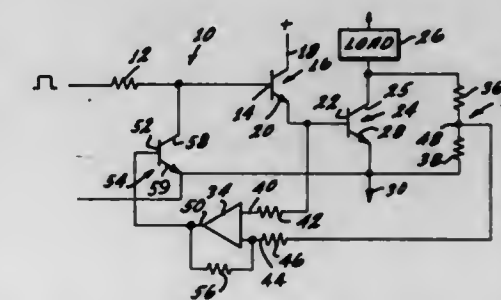
Charles M. Ickes, Chula Vista, and Eugene T. Perusse, San Diego, both of Calif., assignors to Rohr Industries, Incorporated, Chula Vista, Calif.

Filed May 10, 1976, Ser. No. 684,752

Int. Cl.² G05F 1/56

U.S. Cl. 323—22 T

11 Claims



1. A base drive regulator for the output transistor of a switching amplifier comprising:

means for monitoring the collector element voltage of said output transistor;

a source of base drive voltage;

a source of reference voltage, said source of reference voltage is the base element of said output transistor;

means for comparing said collector element voltage and said reference voltage and producing a separate instantaneous output voltage level corresponding to any difference therebetween; and

means for varying the level of said base drive voltage in response to said separate instantaneous, output voltage level for maintaining the conduction of said output transistor just at the edge of saturation wherein said base drive and collector element voltage levels are substantially equal during varying load conditions thereon.

4,055,795

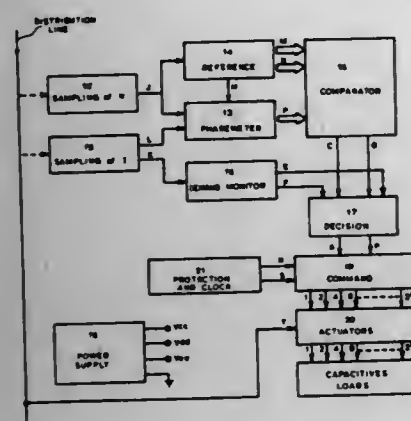
CORRECTION SYSTEM FOR REGULATING THE POWER FACTOR OF AN ELECTRICAL NETWORK Serge Mathieu, Ste-Foy, Canada, assignor to h.o.p. CON-SULAB Inc., Canada

Filed July 15, 1976, Ser. No. 705,462

Int. Cl.² H02J 3/18

U.S. Cl. 323—102

4 Claims



1. A correction system for regulating the power factor of an electrical distribution network, comprising:
means for sampling the potential difference of a distribution line of said network;
means for sampling the current of said distribution line;
means generating and storing first and second predetermined reference limits relating to desired power factors;
means for measuring the phase difference based on the sampled potential difference and the sampled current;
means for comparing the measured phase difference to said predetermined reference limits;
means for monitoring the actual demand of said electrical distribution network; and
means for controlling load actuating means connected to said distribution network in response to information obtained from said comparing means and information obtained from said monitoring means; said load actuation means being connected to capacitive loads whereby one or more capacitive loads may be added to the distribution network when the measured phase difference indicates a corresponding power factor which is below a first of said predetermined reference limits, and may be disconnected from the distribution network when the measured phase difference indicates a corresponding power factor which exceeds a second of said reference limits greater than said first limit; said controlling means being responsive to information obtained from said monitoring means to prevent capacitive loads from being added to the distribution network when the actual demand monitored by said monitoring means is below a predetermined demand value, independently of said information received from said comparing means.

4,055,796

CABLE SUPPORT AND LOCATOR STRUCTURE Richard Allen Nelson, 23 Stonegate Road, LaGrange Park, Ill. 60525

Continuation-in-part of Ser. No. 658,457, Feb. 17, 1976, abandoned. This application Nov. 8, 1976, Ser. No. 739,619

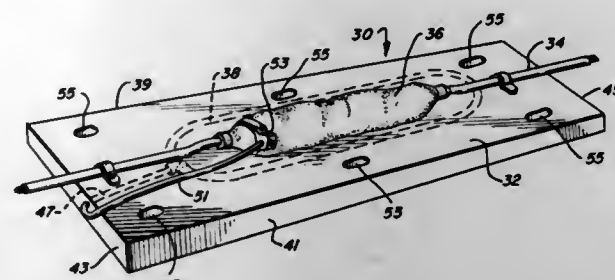
Int. Cl.² G01V 3/08; G01R 31/08

U.S. Cl. 324—3

8 Claims

1. A combined support and locator for underground fixtures for use in conjunction with a metal detector of the type creating an electrical field, comprising in combination,
a support base for supporting an underground fixture thereon,
said support base formed of a moldable material,
metallic means embedded within said support base,
said metallic means having sufficient mass and density such as to respond to the field created by the metal detector,

said base and metallic means being formed as an integral unit,
said metallic means further including a lateral extension portion extending laterally outwardly from said metallic means being similarly embedded within said support base and projecting outwardly from the confines of said support base for a distance,
said lateral extension portion being adapted for interconnection with the cable fixture supported on the support base



for the purpose of grounding the same in order to permit various forms of metal detectors to be utilized to locate the subject support and locator assembly, with the cable fixture supported thereon,
whereby an underground fixture may be supported on said support base and buried, may be re-located by the use of a metal detector of the type creating an electrical field which upon contact with the embedded metallic means will generate a signal to indicate the presence of the support and locator and fixture located thereupon.

4,055,797

ELECTROLYTIC CONDUCTANCE METER

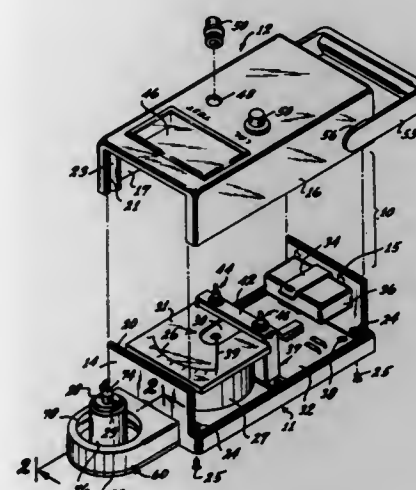
Henry Doeelman, Glendora, Calif., assignor to Devon Products, Inc., Los Angeles, Calif.

Filed May 4, 1976, Ser. No. 683,182

Int. Cl.² G01N 27/42

U.S. Cl. 324—30 R

6 Claims



1. In a portable meter for measuring the conductance of an electrolytic solution, the combination comprising:
a casing;
a meter movement in said casing including a pointer movable relative to a scale viewed through a window on the upper surface of said casing;
an electrical circuit in said casing for controlling the movement of said pointer; and
a mount having a hub rotatably mounted on the end of said casing, said mount including a recessed threaded circular opening on the face thereof with a probe arising from the center thereof having a pair of spaced electrodes connected to the electrical circuit, and said mount being rotatable on its hub such that the probe on the face thereof is in an upright position or a downward position relative to the scale as viewed from the upper surface of said casing.

4,055,798

ROTARY ELECTRIC FIELD INTENSITY MEASURING DEVICE

Gilchiro Kato, 36-12 Yoyogi 1-chome, Shibuya, Tokyo, Japan

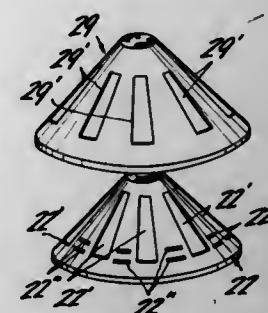
Filed Feb. 27, 1976, Ser. No. 662,281

Claims priority, application Japan, Aug. 25, 1975, 50-102758

Int. Cl.² G01R 5/28, 31/02

U.S. Cl. 324—32

8 Claims



1. A rotary electric field intensity measuring device comprising a housing, stationary frusto-conical electrode means secured to said housing and having alternating voltage inducing means, an induced charge take-out line connected to said stationary electrode means, shielding frusto-conical rotary electrode means spaced above said stationary electrode means and having alternating voltage inducing means in cooperation with said stationary electrode means, and means to rotate said rotary electrode means.

4,055,799

METHOD OF AND DEVICE FOR MEASURING ELASTIC AND DI-ELECTRIC PROPERTIES OF THE DIAPHRAGM OF LIVING CELLS

Hans Coster, New South Wales, Australia; Günter Pilwat, and Ulrich Zimmermann, both of Jülich, Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Germany

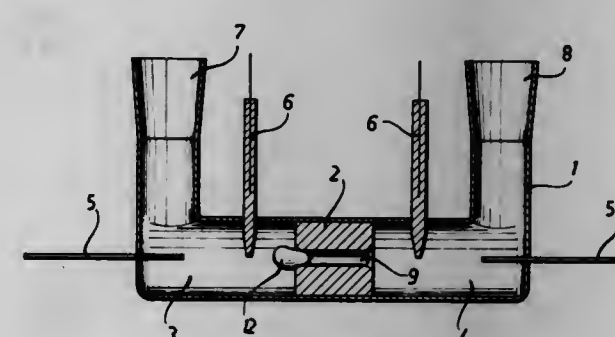
Filed Jan. 22, 1976, Ser. No. 651,337

Claims priority, application Germany, Jan. 23, 1975, 2502621

Int. Cl.² G01N 27/00

U.S. Cl. 324—71 R

5 Claims



1. A method of ascertaining elastic and di-electric properties of the diaphragm of individual living cells of living beings and of the diaphragms of living cells of living beings which living cells are in suspension in a physiological liquid or in an association as a layer of living cells of living beings, which includes the steps of: introducing any member of the group consisting of an individual cell, a plurality of individual cells, a number of individual cells, a layer of cells, and a plurality of layers of cells, into a physiological liquid which has a temperature within the range of from 0° to 40° C and which is electrically conductive and forms an electrolyte solution, locating said member between two electrodes in such a manner that the flow lines of an electric field provided between said two electrodes penetrates the diaphragm of said member introduced into said physiological liquid forming said electrolyte solution, applying to said electrodes a sequence of voltage pulses with a constant pulse duration of from 1 μ s to 10 ms, increasing the amplitude of said voltage pulses between 100 mV and 5 V until at the obtainment of the break-down voltage the resulting measur-

able current pulses greatly increase, and measuring the break-down voltage on two measuring electrodes arranged currentless on both sides of said member provided between said electrodes.

4,055,800

TEST CLIP FOR ELECTRONIC CHIPS

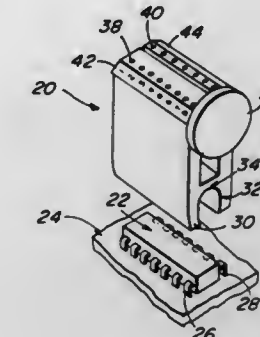
Charles S. Fisk, Boston, and Dietrich Jung, Belmont, both of Mass., assignors to Dietrich Jung, Newton, Mass.

Filed Apr. 16, 1976, Ser. No. 677,757

Int. Cl.² G01R 31/02, 1/06

U.S. Cl. 324—72.5

7 Claims



1. A clip for attachment to electronic chips in order to permit testing thereof, said clip comprising:
a. an integral polymeric body including a pair of clamp elements and a hinge element, said clamp elements being relatively thick for rigidity and said hinge elements being at least partially relatively thin for flexibility along an axis;
b. said clamp elements being pivotable with respect to each other about said axis and having lever portions extending generally away from said axis in one direction and jaw portions extending generally away from said axis in the opposite direction;
c. at least one of said lever portions carrying means for biasing said lever portions away from each other into operative condition and for permitting said lever portions to move toward each other into inoperative condition;
d. said jaw portions having a plurality of open ended slots for seating upon the terminals of said electronic chip;
e. said lever portions having a series of openings extending from the outer extremities of said lever portions to the outer extremities of said jaw portions into communication with said slots; and
f. said means for biasing including manually operable control means.

4,055,801

AUTOMATIC ELECTRONIC TEST EQUIPMENT AND METHOD

Harold L. Pike, R.R. No. 2, Box 134, Castle Rock, Colo. 80104; G. Lamar Thomas, 368 W. Powers Ave., Apt. 201, Littleton, Colo. 80120; Ronald L. Ketchum, 3555 S. Pennsylvania, and John F. Evans, 4135 S. Hazel Court, both of Englewood, Colo. 80110

Filed Aug. 18, 1970, Ser. No. 64,703

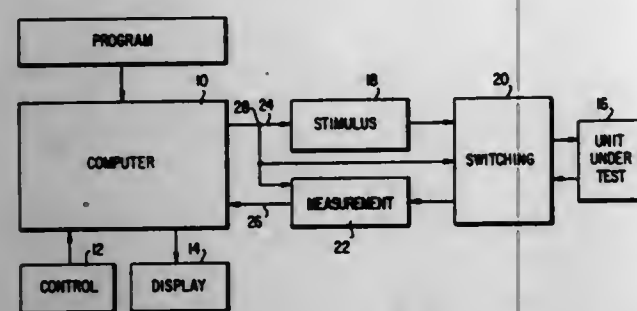
Int. Cl.² G01R 15/12

U.S. Cl. 324—73 R

12 Claims

1. Apparatus for testing electronic equipment comprising:
a general purpose digital computer;
a stimulus unit including: a plurality of digital to analog and a plurality of digital to synchro converters, each of said converters being electrically connected to said computer by a common output bus;
a multiple lead test terminal adapted to be electrically connected to the electronic equipment to be tested;
a measurement unit including an analog to digital converter and a synchro to digital converter, said measurement unit converters being electrically connected to said computer by a common input bus;

a display unit electrically connected to said computer; and switching means responsive to said computer for selectively connecting the converters of said stimulus unit to the leads



of said output terminal, and for selectively connecting the leads of said output terminal to the converters of said measurement unit.

4,055,802

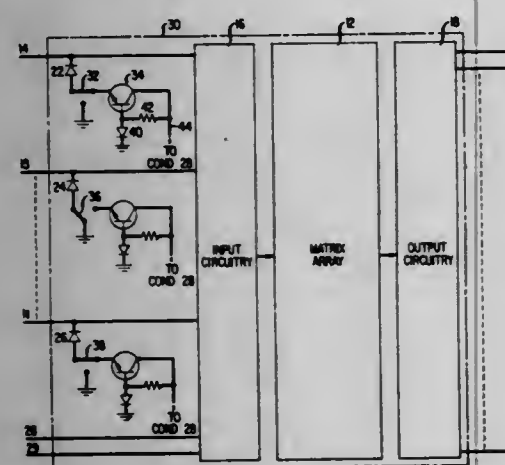
ELECTRICAL IDENTIFICATION OF MULTIPLY CONFIGURABLE CIRCUIT ARRAY

Peter Theodore Panousis, Allentown; Robert Leonard Pritchett, Bath, and Friedolf Michael Smits, Allentown, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1976, Ser. No. 713,910
Int. Cl.² G01R 15/12, 31/30

U.S. Cl. 324—73 AT

8 Claims



1. A method adapted to be utilized in the fabrication of a multicode batch of almost visually indistinguishable but electrically different programmable integrated-circuit chips to make it unnecessary initially to physically mark the chips or to maintain records of the identity of each chip code, said method comprising the steps of

applying electrical interrogation signals to each physically unmarked but already programmed chip to determine the code thereof,

applying electrical test signals to each physically unmarked but already programmed chip in accordance with a unique testing program that respectively corresponds to the identification code of the chip,

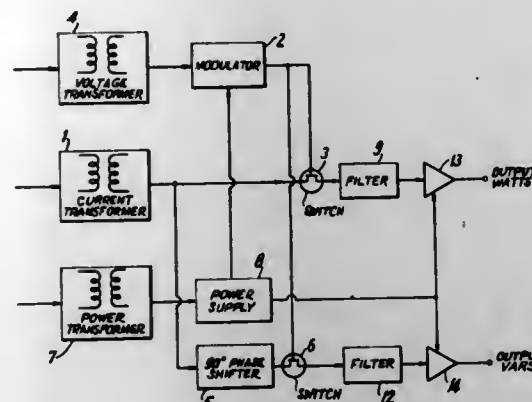
and comparing the output signals obtained from each physically unmarked but already programmed chip in response to said test signals with a standard set of output signals to determine the error condition of the chip.

4,055,803
COMBINED WATT AND VAR TRANSDUCER
Raymond L. Krale, 39 Mountain Rise, Fairport, N.Y. 14450; Barry M. Pressman, 129 Clearview Drive, Penfield, N.Y. 14625, and Maghar S. Chana, 732 Sugar Creek Trail, Webster, N.Y. 14580

Filed Sept. 27, 1976, Ser. No. 726,848
Int. Cl.² G01R 21/06

U.S. Cl. 324—142

10 Claims



1. A watt and var transducer for the simultaneous indication of watts and vars comprising, within the same enclosure, a single voltage transformer means for the measurement of voltage and a single current transformer for the measurement of current;
- a phase shift circuit connected to one of said voltage transformer means and said current transformer;
- a single modulator having an input terminal connected to the other one of the said voltage transformer means and the said current transformer;
- a first electronic switch means having input terminals connected to said phase shift circuit and said modulator, said first electronic switch means combining the waveforms from said phase shift circuit and said modulator;
- a first filter having an input terminal connected to said first electronic switch and an output terminal at which the direct current voltage is proportional to vars on said power line;
- a second electronic switch means having first and second input terminals and having its first input terminal connected to the same one of said voltage transformer means and said current transformer which is connected to said phase shift circuit, said second electronic switch having its second input terminal connected to said modulator, said second electronic switch combining the unshifted waveforms from the said one of said current transformer and voltage transformer means and the waveforms from said modulator; and
- a second filter having an input terminal connected to said second electronic switch and an output at which the direct current voltage is proportional to watts on the said power line.

4,055,804

WATT/WATTHOUR TRANSDUCER AND AMPLIFIER-FILTER THEREFOR

Glenn A. Mayfield, 3060 Wilce Ave., Columbus, Ohio 43202
Continuation of Ser. No. 532,517, Dec. 13, 1974, abandoned.
This application May 14, 1976, Ser. No. 686,457

Int. Cl.² G01R 21/06, 11/32

U.S. Cl. 324—142

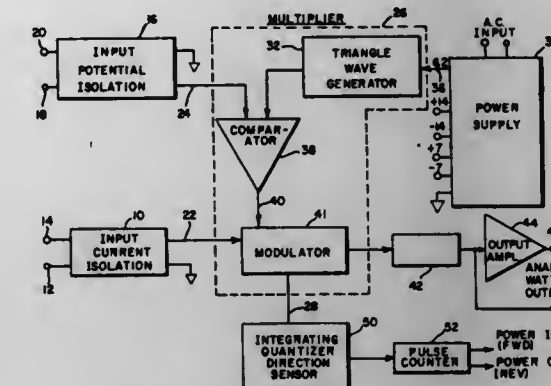
6 Claims

5. A power transducer for providing an output current through an output load which is proportional to the power through a power line, said transducer comprising:

- a. input scaling means connected to a power line and including a current input means and a voltage input means for providing electrical signals proportional to the instantaneous voltage and current of said power line, at least one

of said input means being a high impedance current source;

- b. a multiplier means connected to said input scaling means and having no substantial current path shunting the modulated current, for pulse width modulating the current from said high impedance current source with the signal from the other of said input means to provide output current pulses having an amplitude substantially equal to the amplitude of the instantaneous signal from said high impedance current source and having a pulse width proportional to the amplitude of the other of said signals;



- c. a dc current amplifier having no substantial current path shunting the modulated current and having its input coupled to the output of said multiplier means; and
 - d. a current conducting path serially including said output load and connected across the output of said dc current amplifier and having no substantial intermediate current shunting path;
- whereby a substantially non-shunted current loop is provided serially through said high impedance current source and said output load and wherein the current along said path is proportional to the electrical power flow through said power line.

4,055,805

MULTI-POINT TEST PROBE

Frank J. Ardezzone, Santa Clara, Calif., assignor to Probe Rite, Inc., Santa Clara, Calif.

Filed June 28, 1976, Ser. No. 700,489
Int. Cl.² G01R 31/02, 1/06

U.S. Cl. 324—158 P

12 Claims



1. A probe head assembly for use in testing miniature electronic devices, and comprising: an electrically insulating board having a planar first surface, a planar second surface and an aperture formed in a generally central portion thereof;
- a first plurality of electrically conductive contact strips disposed upon at least one of said surfaces and arrayed along an edge of said board to form a board interconnect means;
- a plurality of probe means each including an elongated body disposed upon said first surface and oriented along a radial line extending outwardly from the center of said aperture, said probe means being affixed to said board by pivot means which permit said probe means to be rotated thereabout in the plane of said first surface and to be moved along said radial lines, each of said probe means further including a contact means affixed to the end of said body nearest said aperture;
- a plurality of electrical conductors respectively coupling

said probe means to different ones of said first contact strips;

support means having a form concentric with said aperture attached to said board, said support means having a raised portion having a hollow inverted generally V-shaped cross-section, a circular guide supported by the support means attached in concentric relation to said aperture, said circular guide having means forming a fulcrum above each probe means; and

elongated lever means including a first end portion for insertion within said raised portion and having means for drivably engaging one of said probe means, said lever means further having a mid-portion for engaging said fulcrum and a second end portion forming an elongated handle, whereby said lever means is movable about said fulcrum to cause said probe means to be moved along said radial lines and pivotally about said pivot means to selectively position said contact means beneath said aperture.

4,055,806

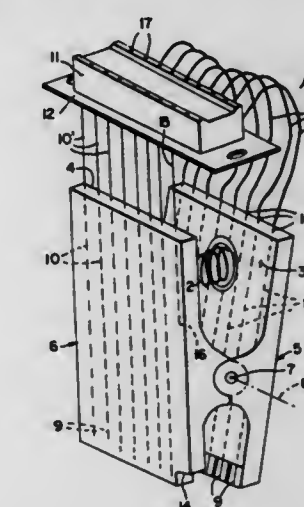
INTEGRATED CIRCUIT SUBSTITUTION DEVICE

Harshad M. Patel, 743 E. Duane Ave., Sunnyvale, Calif. 94086
Filed Jan. 23, 1976, Ser. No. 651,732

Int. Cl.² G01R 31/22, 31/02

U.S. Cl. 324—158 F

4 Claims



1. An integrated circuit substitution device comprising a pricer-like clip on probe having a plurality of engaging contacts arranged in two rows, means to bias said two rows of contacts towards each other normal to the opposed surface intermediate a pair of probe plates, each of said rows to contacts exposed upon a contact edge of said opposed surfaces, the contacts in one of said rows of contacts rigidly electrically connected with rigid connectors to a first row of terminals of an integrated circuit test socket, the contacts in the other row of said contacts flexibly electrically connected with flexible conductors to a second row of terminals of said integrated circuit test socket, the sum of all of said terminals of said integrated circuit test socket exceeding the sum of all of said contacts in both of said rows of contacts, a notch, said notch being located in said contact edge of said opposed surfaces adjacent to one of said contacts whose width is greater than the width of any of said contacts and less than the distance intermediate adjacent edges of a pair of said contacts.

4,055,807

ANTENNA SWITCH

David Joseph Priniski, Hoffman Estates, and Jerry David Meyerhoff, Buffalo Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1976, Ser. No. 670,199

Int. Cl.² H04B 1/48

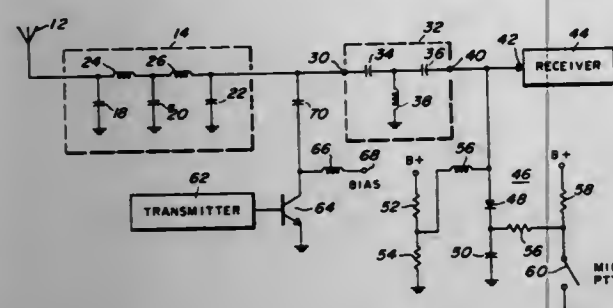
U.S. Cl. 325—21

16 Claims

1. An antenna switch, operable in a transmit or receive

mode, for switching an antenna to either a transmitter or a receiver, respectively, the transmitter and receiver being operable in a frequency band, the antenna switch comprising:

a filter means, having an input and an output, the filter input being coupled to the antenna and the filter output being coupled to the receiver, the filter passing signals from the antenna to the receiver with the antenna switch in the receive mode, the filter forming an anti-resonant circuit to



said frequency band, at its input, when its output is near ground potential, said filter means exhibiting a high pass characteristic for passing signals in said frequency band and at high frequencies when the antenna switch is in the receive mode;

means for coupling the transmitter to the filter input; and means for grounding the filter output when the antenna switch is in the transmit mode.

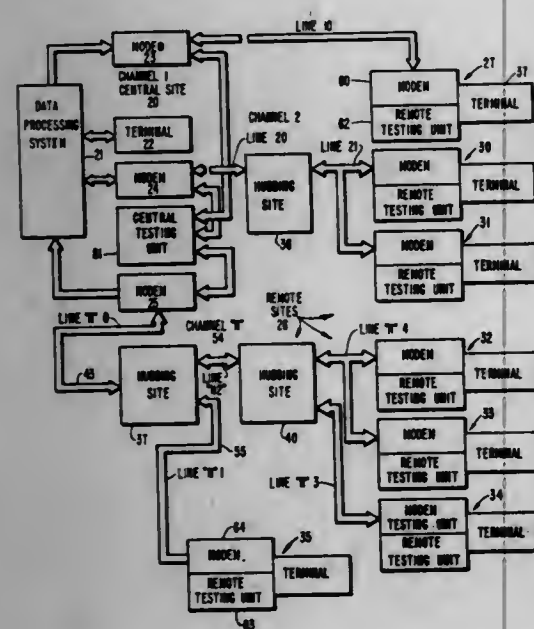
4,055,808 DATA COMMUNICATIONS NETWORK TESTING SYSTEM

Jerry L. Holsinger, Boston; David L. Lyon, Cambridge; David E. Williams, Andover; Frank B. Lezotte, Chelmsford, and Don L. Falkenstein, Burlington, all of Mass., assignors to Intel, Inc., Burlington, Mass.

Filed May 20, 1976, Ser. No. 688,330
Int. Cl.² H04B 1/72

U.S. Cl. 325-67

52 Claims



40. Apparatus for testing the level of a signal on a data transmission means at a remote location in response to a test control signal from a central location in a data communications network, said apparatus being located at the remote location and comprising:

- first means for establishing an acceptable range of signal levels,
- second means connected to the data transmission means for generating continuously a line level signal in response to the signals on the data transmission means,
- means connected to said first means for generating a status signal that indicates when the line level signal is within the predetermined range, and
- means responsive to the receipt of the test control signal

for transmitting a message back to the central location that indicates the status of the line level signal and thereby the level of the signals on the data transmission means.

4,055,809 AMPLIFYING DEVICE

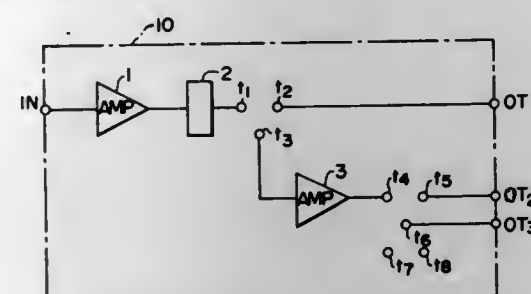
Takeshi Takeuchi, and Mitsuo Takahashi, both of Tokyo, Japan, assignors to Hochiki Corporation, Tokyo, Japan
Filed Apr. 13, 1976, Ser. No. 676,451

Claims priority, application Japan, Apr. 18, 1975, 50-52733[U]

Int. Cl.² H04H 1/02

U.S. Cl. 325-308

3 Claims



- A universal repeater for TV systems having a common antenna, comprising a receptacle housing having two sets of terminal sockets, and two plugs having jacks adapted to fit said terminal socket sets in selected positions, said housing also having a TV signal input terminal and a plurality of TV signal output terminals, said housing also containing electronics signal amplitude modifying circuit means including said terminal sockets and said TV signal input and output terminals, and the first plug containing a directional coupler circuit, and the second plug containing a signal distributing circuit, whereby junctions of the circuit means can be adjusted by changing the angular positions of said plugs with respect to the corresponding terminal sockets without any output at the TV signal output terminals.

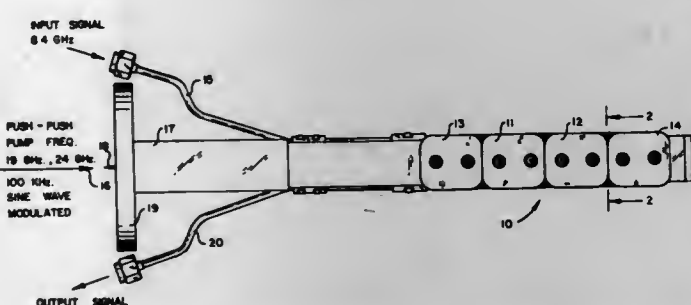
4,055,810 INDEPENDENT GAIN AND BANDWIDTH CONTROL OF A TRAVELING WAVE MASER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and David L. Trowbridge, Sunland, Calif.

Filed July 26, 1976, Ser. No. 708,796
Int. Cl.² H01S 1/02

U.S. Cl. 330-4

12 Claims



- In a traveling wave solid-state maser having a folded-comb structure with an input-output end and a turn-around end, said maser being designed for operation in a push-push pump mode using separate pump frequencies, and said maser having an external magnetic field that is uniform across the full length of the folded comb structure, the combination comprising:

an adjustable electromagnetic means for aiding said uniform external field to a desired bandwidth control level over

half the length of said folded comb structure at a turn-around end thereof;
an adjustable electromagnetic means for bucking said uniform external field to said desired bandwidth control level over half the length of said folded comb structure at an input-output end thereof;
an adjustable electromagnetic means for further aiding said uniform external field to a desired gain control level over one quarter of the length of said folded comb structure from substantially the center of said folded comb structure out toward said turn around; and
an adjustable electromagnetic means for further bucking said uniform external field to said desired gain control level over one quarter of the length of said folded comb structure from substantially the center of said folded comb structure back toward said input-output end.

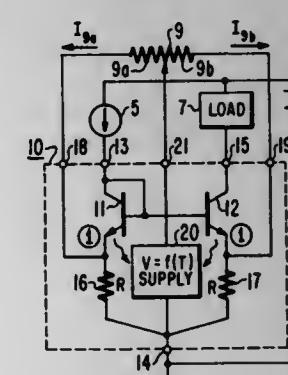
4,055,811 TRANSISTOR AMPLIFIERS

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,589
Int. Cl.² H03F 1/32, 3/04

U.S. Cl. 330-289

5 Claims



- In a transistor amplifier including:
first and second transistors of the same conductivity type, both fabricated from the same basic semiconductor material and operated at substantially the same absolute temperature T, each having base and emitter and collector electrodes, each having a base-emitter junction between its base and emitter electrodes, each having a collector-base junction between its collector and base electrodes;
first and second resistances exhibiting similar coefficients of change with change in temperature and being operated at substantially said absolute temperature T;
said first resistance having a first end connected to the emitter electrode of said first transistor and having a second end, and said second resistance having a first end connected to the emitter electrode of said second transistor and having a second end;
an interconnection of the second ends of said first and said second resistances;
means for applying substantially the same quiescent potentials to the base electrodes of said first and said second transistors, of a polarity respective to a potential at said interconnection for forward-biasing the base-emitter junction of said first and said second transistors;
means for applying a quiescent potential to the collector electrode of said first transistor to condition it for normal transistor operation; and
means for applying a quiescent potential to the collector electrode of said second transistor to condition it for normal transistor operation, an improvement for controlling the ratio between the collector currents of the first and second transistors substantially independently of temperature in the operating temperature range of said first and second transistors which improvement comprises:
means for developing across said first resistance a potential

drop linearly proportional to T in the operating temperature range of said first and second transistors;
means for developing across said second resistance a potential drop linearly proportional to T in the operating temperature range of said first and second transistors; and
means for adjusting at least one of the potential drops across said first and second resistances relative to the other.

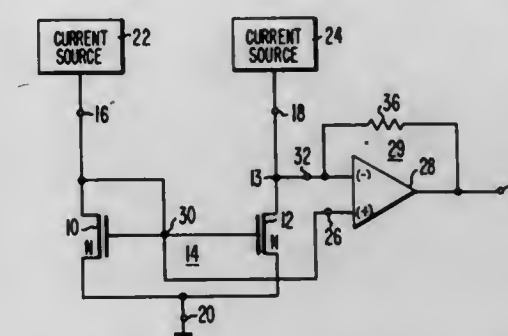
4,055,812 CURRENT SUBTRACTOR

Bruce David Rosenthal, Randolph, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,122
Int. Cl.² H03F 3/45

U.S. Cl. 330-253

10 Claims



- A circuit for obtaining an output signal proportional to the difference between a first input signal current and a second input signal current comprising, in combination:
a current mirror amplifier (CMA) having an input terminal to which said first input signal current is applied, an output terminal to which said second input signal current is applied, and a common terminal connected to a point of reference potential;
a source of bias voltage;
a differential-input amplifier having an inverting input terminal coupled to said output terminal of said CMA, a non-inverting input terminal connected to said source of bias voltage, and an output terminal from which said output signal can be taken; and
means connecting said differential-input amplifier as a current-to-voltage converter, which means includes a direct current feedback path through a resistance connected between said output and said inverting terminals of said amplifier.

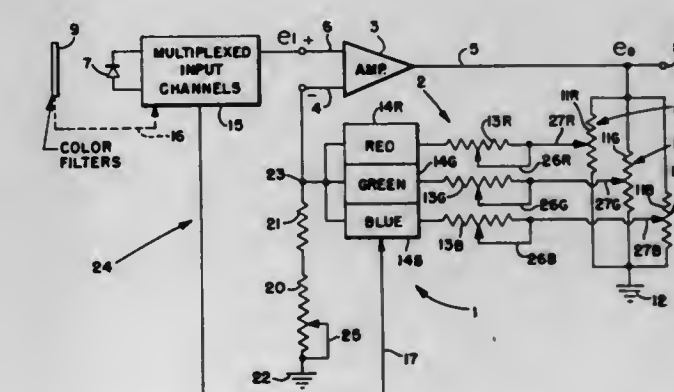
4,055,813 SINGLE ADJUSTMENT MULTIPLE FUNCTION CALIBRATION CIRCUIT

Park French, Aurora, Ohio, assignor to Sterndent Corporation, Mount Vernon, N.Y.

Filed June 16, 1976, Ser. No. 696,787
Int. Cl.² H03F 1/36

U.S. Cl. 330-103

19 Claims



- A circuit for adjustably controlling the fractional amounts of permissible ranges of change of the basic gains of a multiplexed amplifier circuit, which has a plurality of voltage

a substrate capable of supporting surface acoustic waves on a surface thereof;
 an input transducer for launching acoustic waves in a predetermined propagation direction on said surface;
 an array formed by a multiplicity of discrete scatterers on said surface, each of which is of dimensions that are less than a wavelength of said launched acoustic waves and positioned to scatter surface acoustic waves launched in said predetermined direction, said scattered acoustic waves contributing to the formation of reflected surface waves, that propagate at a preselected angle relative to said propagation direction, which are related to said launched acoustic waves through a transfer function that is substantially defined by the dimensions of said scatterers and their relative positioning within said array; and
 an output transducer for receiving said reflected surface waves.

4,055,821

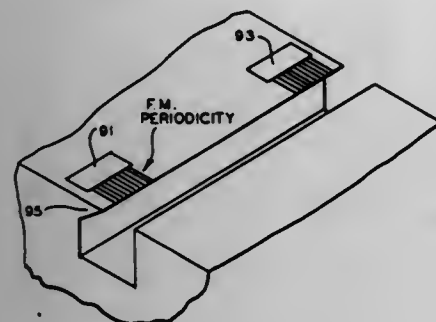
ACOUSTIC RIDGE TRANSVERSAL FILTER

Robert S. Wagers, Richardson, and Clinton S. Hartmann, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 451,718, March 14, 1974, Pat. No. 3,974,464. This application May 11, 1976, Ser. No. 685,243
 Int. Cl.² H03H 7/28, 9/26, 9/30, 9/32

U.S. Cl. 333—70 T

7 Claims



1. A transversal filter comprising:
 a substrate;

a horizontal ledge having at least a top surface portion thereof made of piezoelectric material, said ledge extending outwardly from said substrate with the top surface portion of said ledge being coplanar with the top surface of said substrate, said substrate and said ledge defining an acoustic waveguide; and

at least one tapped transducer deposited on said ledge comprising a transducer pad having a plurality of electrode fingers extending therefrom in a lateral direction toward the edge of said ledge.

4,055,822

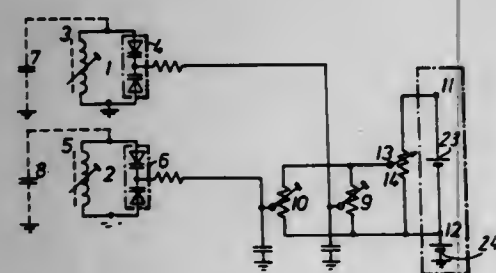
TUNING CIRCUIT ARRANGEMENT

Heinz Rinderle, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
 Filed May 28, 1976, Ser. No. 691,024

Claims priority, application Germany, May 31, 1975, 2524171
 Int. Cl.² H03J 3/18

U.S. Cl. 334—15

5 Claims



1. A circuit for adjusting a tuning circuit, the tuning circuit

including at least one resonant circuit composed of a variable inductance and a variable capacitance constituted by at least one voltage-variable tuning diode, one side of the resonant circuit being connected to a point at circuit ground potential and adjustment of the resonant circuit being effected by changing the resonant circuit inductance and the resonant circuit capacitance, with changing of the resonant circuit capacitance being effected exclusively by varying the tuning voltage of the tuning diode, the tuning circuit further including a source of a variable tuning potential which is variable over a range between maximum and minimum extreme values, each extreme value being different from the circuit ground potential, and said circuit for adjusting comprising at least one adjustment potentiometer connected between a point of said source providing the variable tuning potential and a point of said source permanently providing one of said extreme values, said potentiometer having an adjustable tap connected to provide the tuning voltage for said tuning diode.

4,055,823

ELECTROMAGNETIC VALVE ASSEMBLY MEANS

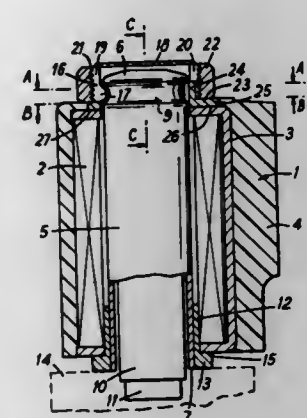
Erik Andersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed May 17, 1976, Ser. No. 686,891

Claims priority, application Germany, May 22, 1975, 2522677
 Int. Cl.² F16K 31/06

U.S. Cl. 335—255

3 Claims



1. An electromagnetic valve assembly comprising, a valve casing, a tube member attached to said casing at one end thereof and having an annularly shaped recess at the other end thereof, a coil surrounding said tube member, a U-shaped yoke partially surrounding said coil having an upper leg spaced from said recess, a housing surrounding said coil and said yoke, an externally threaded axially slotted ring having an internal bead receivable in said recess, a nut threaded on said ring biasing said housing towards said valve casing, and ring having a pair of axially extending slots on opposite sides thereof.

4,055,824

SWITCHABLE PERMANENT MAGNETIC HOLDING DEVICES

Max Baermann, 506 Bensberg, Bezirk, Cologne, Germany
 Filed Apr. 12, 1976, Ser. No. 676,135

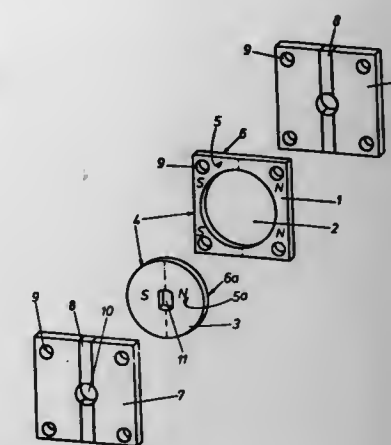
Claims priority, application Germany, Apr. 12, 1976, 2517364
 Int. Cl.² H01F 7/02

U.S. Cl. 335—288

7 Claims

1. A switchable permanent magnetic holding device for releasably holding ferromagnetic objects, comprising at least two spaced pairs of flat at least first and second pole plates separated by a non-magnetic medium; first and second permanent magnets disposed in the space between said pairs of pole plates, said first magnet being in the form of a flat plate of permanent magnet material and having a circular opening therethrough, said second magnet being in the form of a circular disc of permanent magnet material disposed in said opening and relatively movable to said first magnet, said magnets being

magnetized in a direction through pole plates and each having at least two magnetic pole pairs of opposite magnetic polarity, the pole pairs of said first magnet and said second magnet each



facing a separate pole plate, the pole pairs of said second magnet in one relative position reinforcing the polarity of said first magnet and in a second position opposing the polarity of said first magnet.

4,055,825

VOLTAGE TRANSFORMER FOR HIGH VOLTAGE

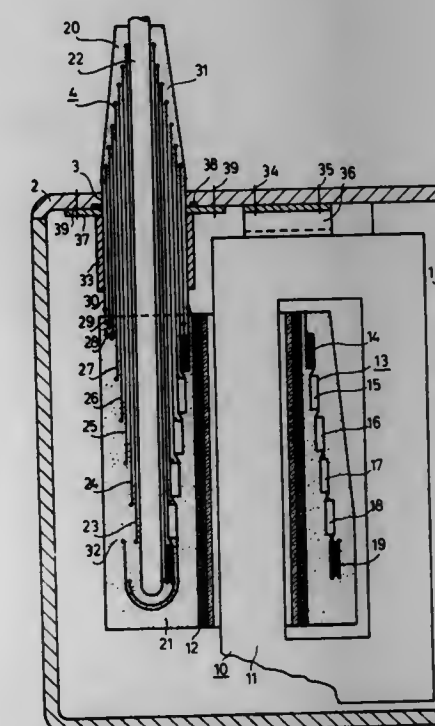
Gerhard Kleen; Heinz Schiemann, and Karl Allmendinger, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 29, 1976, Ser. No. 745,692

Claims priority, application Germany, Nov. 28, 1975, 2554143
 Int. Cl.² H01F 15/14, 27/00

U.S. Cl. 336—70

11 Claims



1. In a voltage transformer for high voltages, said transformer including an insulating body carrying a high potential winding surrounding an iron core and a bushing laterally joined to said body, the high potential winding including a plurality of subwindings whose spacings from said iron core increase stepwise with voltage, the improvement comprising:
 a plurality of control electrodes in the form of conducting cylinders disposed concentrically with respect to the longitudinal axis of the bushing, thereby providing control of said bushing at both its ends;
 said high potential winding being arranged adjacent a side of the bushing so that its width extends over the control length of said side;
 and said subwindings being metallically connected to the

respective conducting cylinders so as to cause a uniform voltage distribution during surge voltages.

4,055,826

RESILIENTLY SUPPORTED WINDINGS IN AN ELECTRICAL REACTOR

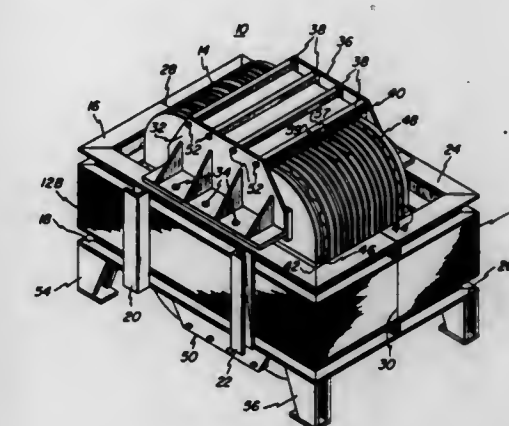
Joseph Phillip Franz, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Apr. 29, 1976, Ser. No. 681,724

Int. Cl.² H01F 27/30

U.S. Cl. 336—100

11 Claims



1. In an electrical reactor:
 a. a stack of interconnected electrical windings;
 b. a magnetizable core having outer members formed in a generally rectangular assembly substantially surrounding said windings and having an inner member disposed inside said windings;
 c. at least one pair of cross members respectively disposed adjacent to sides of said windings in quadrature with said outer members and each having opposite ends fixedly attached to said outer members; and
 d. resilient means for restricting relative movement of said windings, said resilient means comprising:
 i. a first ripple spring assembly disposed in compression between said windings and a part of said outer members that is adjacent to said windings,
 ii. a second ripple spring assembly disposed in compression between said windings and a part of said inner member that is adjacent to said windings, and
 iii. a third ripple spring assembly disposed in compression between said windings and a first one of said cross members,
 each of said ripple spring assemblies comprising an insulating sheet impregnated with a curable plastic resin and formed in a substantially uniform ripple pattern.

4,055,827

ELECTRIC FUSE

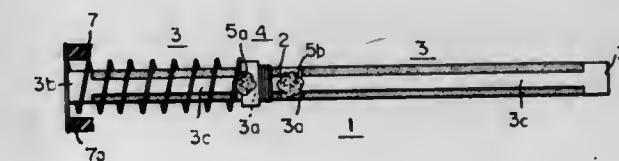
Edward J. Knapp, Jr., Merrimac, Mass., assignor to Gould, Inc., Newburyport, Mass.

Continuation-in-part of Ser. No. 739,555, Nov. 8, 1976. This application Nov. 10, 1976, Ser. No. 740,402

Int. Cl.² H01H 85/04

U.S. Cl. 337—297

4 Claims



1. An electric fuse including
 a. an elongated partially metal clad strip of electric insulating material, said strip having a center area from which the metal overlay is entirely removed to form an insulating gap;

- b. a bridge member extending across said insulating gap and conductively interconnecting portions of said metal overlay left on said strip;
- c. a pair of soft solder joints effecting said conductive interconnection;
- d. said bridge member having a pair of arms projecting beyond said elongated metal clad strip;
- e. a helical extension spring having a relatively small diameter at one end and a relatively large diameter at the other end thereof, said one end of said spring being affixed to said arms of said bridge member; and
- f. a tubular member of insulating material supporting said large diameter end of said spring.

4,055,828

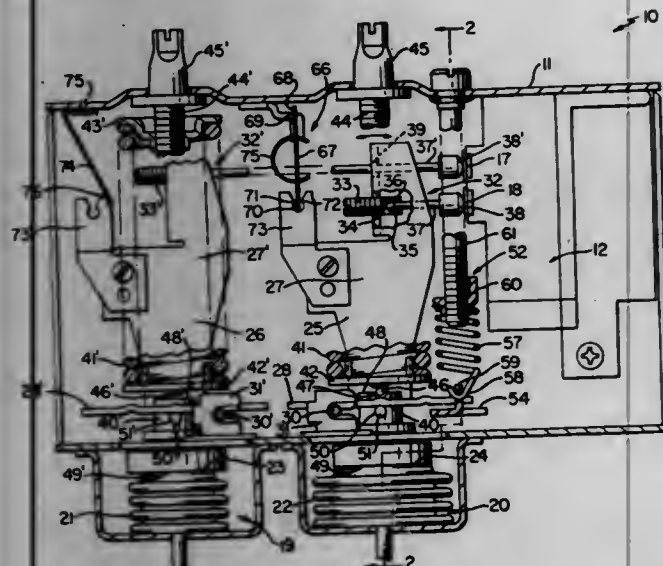
CONDITION RESPONSIVE CONTROL DEVICE

Werner R. Baner, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed July 16, 1975, Ser. No. 596,104
Int. Cl.² H01H 37/76

U.S. Cl. 337-308

14 Claims



1. In a control device having a housing means carrying a condition responsive means and an electrical switch to be operated by said condition responsive means, said housing means having a pivotally mounted lever to translate motion from a movable wall of said condition responsive means to said switch and having a range spring means to oppose movement of said movable wall in one direction thereof, an actuator disposed between said movable wall of said condition responsive means and said range spring means and being engageable therewith, said actuator being unitary between said movable wall and said range spring means and carrying a pin that is operatively associated with said lever to cause pivoting movement of said lever as said actuator is moved relative to said housing means, said actuator having opposed ends for respectively engaging said range spring means and said movable wall of said condition responsive means, the improvement wherein said range spring means has misalignment compensating means engaging its respective end of said actuator.

4,055,829

FUSIBLE LINKS AND PROCESS FOR PRODUCING SAME

Donald Ray Rueggesser, Waterloo, Ind., assignor to Elsie Manufacturing Company, Waterloo, Ind.

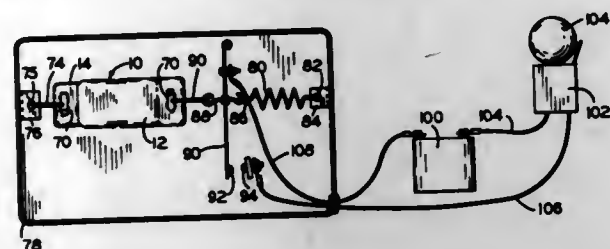
Filed Mar. 3, 1975, Ser. No. 554,650
Int. Cl.² H01H 37/76

U.S. Cl. 337-416

5 Claims

1. A non-creeping, break-away fuse consisting of a pair of substantially flat, thin cross-section interlocked rectangular plates which are constructed to be complementarily interfitted, one within the other, and each including a marginal flange extending around at least two of the opposite edges thereof, and when in interlocked relation are confronting one with

respect to the other, a triangular indentation one along each of the opposite two edges of said flanges which are interfitted and caused to ride one against the other to force said links perpendicularly apart when either of said links is moved longitudinally relative to the other against the connection whose



strength is solely dependent upon the solder connection, a non-tucked solder coating which fuses the confronting surfaces of said edges and the flat surfaces of said links together and is adapted to sudden non-creeping release of such connection at a predetermined temperature.

4,055,830

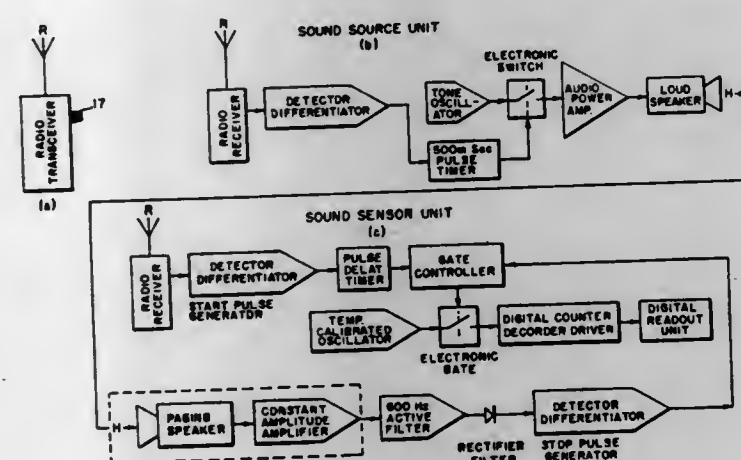
SONIC MEASURING SYSTEM

Wallace C. Wilson, Vancouver, Wash., and Ralph W. Shoemaker, Portland, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 14, 1976, Ser. No. 705,362
Int. Cl.² G01S 11/00

U.S. Cl. 340-16 R

8 Claims



1. A distance measuring system comprising:
a sound source having means for emitting a sound wave with a fixed frequency in the lower audio range;
a sound sensor separated from said sound source the distance to be measured for sensing the emitted sound wave, said sensor having counting means and means for displaying the distance measured between the sound source and sensor;
a radio transmitter for simultaneously transmitting a wave of fixed frequency to both said sound source and sound sensor to trigger both the sending of the sound wave and the initiation of the counting cycle by said sensor's counting means; and
means in said sound sensor for stopping said counting cycle when said emitted sound wave first is received thereat; said counted cycles being a function of said distance to be measured and displayed at said means for displaying.

4,055,831

SYSTEM FOR INDICATING INTERRUPTION IN OPERATION OF AUTOMOTIVE LAMPS

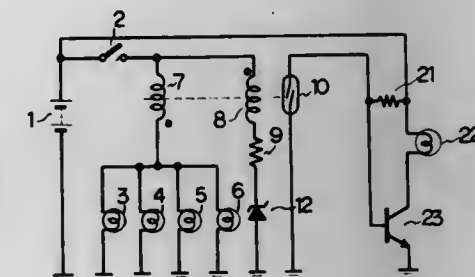
Yasuhiko Sakurai; Toshio Ishida, and Teruo Kusumoto, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 10, 1975, Ser. No. 639,347

Claims priority, application Japan, Dec. 11, 1974, 49-150571
Int. Cl.² B60Q 1/26

U.S. Cl. 340-80

2 Claims



1. A system for indicating interruption in operation of automotive lamps comprising;
a voltage source;
a plurality of automotive lamps;
a switch and a current winding connected between said source and said automotive lamps, said switch being operable to connect said source to the lamps for energization thereof and for passing current through said winding thereby generating magnetomotive force in proportion to the amount of current flowing therethrough;
a voltage winding connected to said source via said switch for generating a magnetomotive force opposite to that generated by said current winding;
a zener diode connected in series with said voltage winding for allowing current to flow from the source through said voltage winding only when voltage applied across said diode exceeds a predetermined value;
additional switch means actuated in response to the net magnetomotive force generated by said windings; and
indicating means connected to said additional switch means and responsive to the actuation of said additional switch means when at least one of said lamps is inoperative.

4,055,832

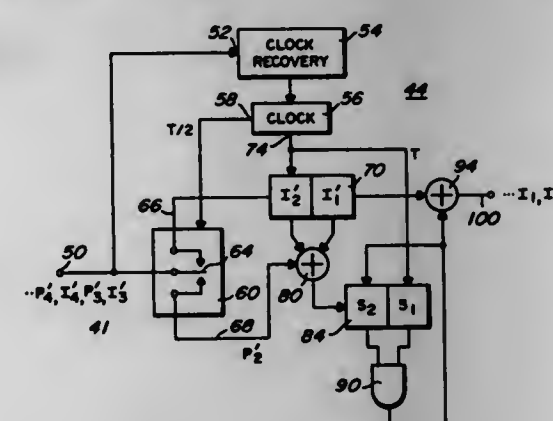
ONE-ERROR CORRECTION CONVOLUTIONAL CODING SYSTEM

John En, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 24, 1975, Ser. No. 616,337
Int. Cl.² G06F 11/12

U.S. Cl. 340-146.1 AQ

16 Claims



12. In an error correcting system for correcting random errors in a parity encoded bit stream having no more than every fourth successive bit in error, a decoder for extracting

and correcting information bits from the stream, the decoder comprising:

means for receiving the bit stream;
information bit sample and storage means having only two stages, the information bit sample and storage means having a first stage coupled to the receiving means for receiving the information bits and a last stage;
syndrome bit generating means having inputs and an output, the inputs being connected to the first and last stage of the information bit sample and storage means, and to the receiving means, the syndrome bit generating means including modulo-2 adder means for taking the modulo-2 sum of the received information bits stored in the stages connected to the syndrome bit generating means and a received parity bit associated therewith to thereby generate a syndrome bit in response to each received parity bit and the stored information bits associated therewith at the output;
syndrome bit sample and storage means having two stages, the syndrome bit sample and storage means having a first stage connected to the output of the syndrome bit generating means, and a last stage;
correction signal generating means having inputs connected to the two stages of the syndrome bit sample and storage means, the correction signal generating means being responsive to the syndrome bits stored in the stages connected thereto for providing a correction signal at the output thereof only when both of the stored syndrome bits have the same predetermined value;
correcting means connected to the last stage of the information bit sample and storage means and the output of the correction signal generating means for correcting information bits received from the information bit sample and storage means in response to the correction signal from the correction signal generating means; and
clock means connected to the information bit sample and storage means and the syndrome bit sample and storage means for sequentially shifting each of the information bits and the syndrome bits, respectively, through each of the respective sample and storage means from the respective first stage to the respective last stage thereof.

4,055,833

METHOD OF DERIVING CHARACTERISTIC CONTOURS FROM A COLORED PICTURE

Rolf Eric Rothfjell, Luntmakargatan 52, Box 3254, S-103 65 Stockholm 3, Sweden

Filed June 10, 1975, Ser. No. 585,668

Claims priority, application Sweden, June 14, 1974, 7407887
Int. Cl.² G06K 9/08

U.S. Cl. 340-146.3 E

5 Claims



1. A method of producing an identity document comprising the steps of making corresponding multicolored and blue monochromatic photographs of the face of a person to be identified, the monochromatic photograph being made with the contrast of the image enhanced so that only areas of great color intensity are reproduced, and mounting both photographs on a support.

4,055,834

METHOD AND A DEVICE FOR AUTOMATIC PATTERN RECOGNITION OF LIQUID CONTAINERS

Tore Planke, 3180 Nykirke, Norway

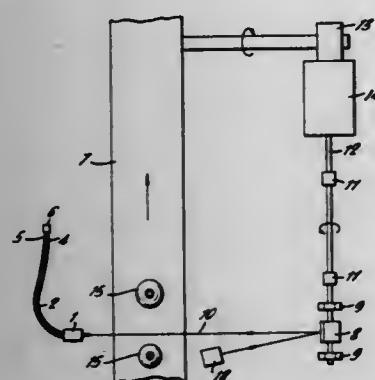
Filed May 27, 1976, Ser. No. 690,466

Claims priority, application Norway, June 3, 1975, 751950

Int. Cl.² G06K 9/00

U.S. Cl. 340—146.3 F

12 Claims



1. A method for automatic recognition of containers of varying size and shape comprising storing data related to container sizes and shapes in a memory unit, transporting containers to be recognized along a transport path at a first speed, disposing a light receiving unit comprising a plurality of receivers on one side of said path, directing a narrow beam of light from the other side of said path to fall on said light receiving unit, causing said light beam to strike each receiver sequentially, repeating said process of causing said light beam sequentially to strike each receiver, cyclically at a rate directly related to said first speed, generating, in a form compatible with said data, signals distinguishing between those receivers obscured by a container passing said light receiving unit and those not so obscured and comparing said signals with said data to identify that container.

4,055,835

LINE-SEIZING APPARATUS

Douglas R. Thornton, Maywood, and Jerome Smigee, Chicago, both of Ill., assignors to Manitou Systems, Inc., Bensenville, Ill.

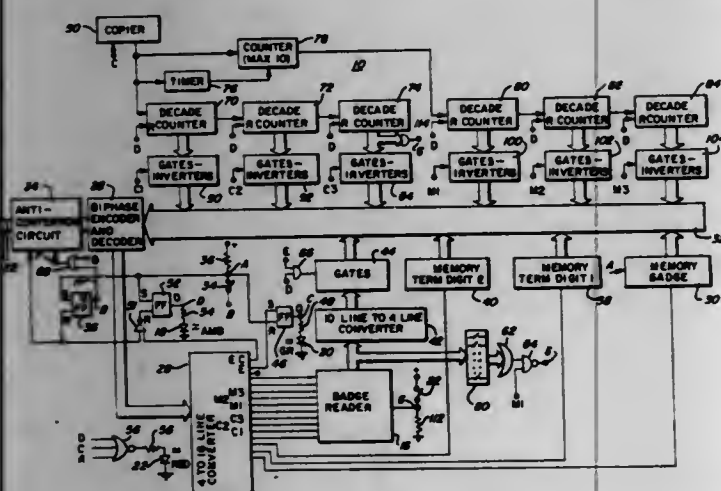
Continuation of Ser. No. 605,754, Aug. 18, 1975, abandoned.

This application July 2, 1976, Ser. No. 702,001

Int. Cl.² H04Q 3/00

U.S. Cl. 340—147 LP

11 Claims



1. Line-seizing apparatus for establishing communication over a data line used in association with apparatus for generating an electric signal on the data line, said electric signal having a parameter with a nominal value when the data line is not in use, and comprising:

connecting means for coupling the line-seizing apparatus to the data line;

first parameter detection means coupled to said connecting means and generating a first electrical signal at an output when the parameter of the signal at said connecting means

differs from the nominal value by an amount not exceeding a first predetermined amount;

second parameter detection means coupled to said terminal means and generating a second electrical signal at an output when the parameter of the signal at said connecting means differs from the nominal value by an amount not less than a second predetermined amount, said second predetermined amount being greater than said first predetermined amount;

first circuit means for repetitively generating a third electrical signal at an output;

second circuit means for generating a fourth electrical signal at an output when it is desired to seize the data line;

third circuit means for altering the impedance presented at said connecting means by the line-seizing apparatus in response to a fifth electrical signal at an input; and

fourth circuit means coupled to said first parameter detection means output, said second parameter detection means output, said first circuit means output, said second circuit means output, and said third circuit means input for applying said fifth electrical signal to said third circuit means input in response to the simultaneous occurrence of said first, third, and fourth electrical signals and preventing said fifth electrical signal from being applied to said third circuit means input in response to the occurrence of said second electrical signal.

4,055,836

CHARGE TRANSFER READOUT CIRCUITS

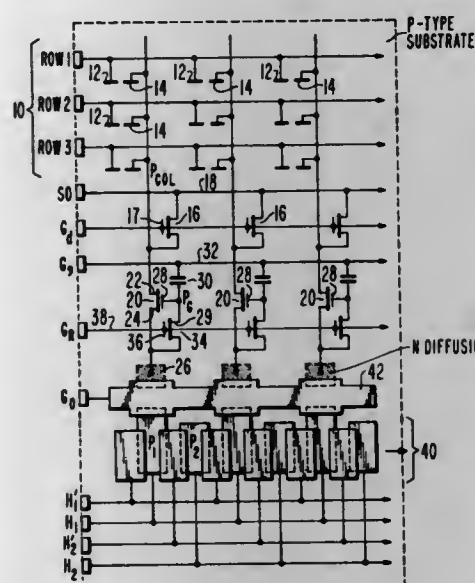
Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 26, 1976, Ser. No. 718,075

Int. Cl.² G11C 7/06; H04N 3/14

U.S. Cl. 340—173 R

20 Claims



1. In combination:

a field effect transistor having source, drain and gate electrodes, said drain electrode coupled to a circuit point which can be electrically floated;

means coupled to said source electrode for placing the same at a reference voltage level (V_0);

means ac coupled to said gate electrode for inducing thereon a potential greater than one threshold voltage (V_{th}) above V_0 in the forward direction;

means providing a low impedance dc path between said gate and drain electrodes during the time said induced potential is present at said gate electrode and while said drain electrode is electrically floating, whereby charge carriers are conducted through the source-to-drain electrode path of said transistor until the voltage difference between said source and gate electrodes reduces to a value substantially equal to V_{th} , whereupon conduction ceases through said source-to-drain electrode path; and

means for opening said dc path while said voltage difference

between said source and gate electrodes is substantially equal to V_{th} , whereby a quiescent forward bias V_{th} is established between said source and gate electrodes.

4,055,837

DYNAMIC SINGLE-TRANSISTOR MEMORY ELEMENT FOR RELATIVELY PERMANENT MEMORIES

Karl-Ulrich Stein, Munich, and Karlheinz Horninger, Eglharting, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

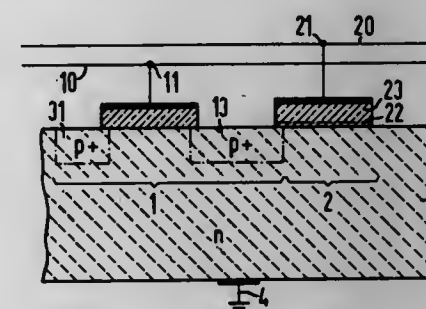
Filed Oct. 22, 1975, Ser. No. 624,710

Claims priority, application Germany, Oct. 22, 1974, 2450116

Int. Cl.² G11C 11/40

U.S. Cl. 340—173 R

23 Claims



1. Dynamic single-transistor memory element connected to a word line and a bit line comprising:

a transistor having at least two terminals and a gate terminal, connected at one of said terminals with said bit line and at said gate terminal with said word line;

a capacitor having at least two electrodes connected at one of said electrodes in series to one of said two terminals of said transistor;

wherein said single-transistor memory element comprises a write line, said capacitor is a metal dielectric semiconductor capacitor, said dielectric comprises a plurality of selective activation states and said electrode which is not connected with said transistor is connected with said write line.

4,055,838

FERROELECTRIC INFORMATION OPTICAL STORAGE DEVICE WITH SELF BIASING

Jean Pierre Huignard, and François Micheron, both of Paris, France, assignors to Thomson-CSF, Paris, France

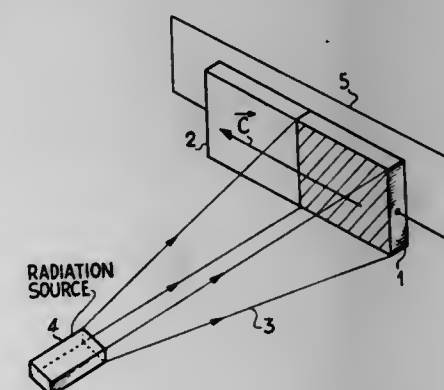
Filed May 7, 1976, Ser. No. 684,385

Claims priority, application France, May 16, 1975, 75.15438

Int. Cl.² G11B 7/02, 9/02

U.S. Cl. 340—173.2

6 Claims



1. An information optical storage device comprising a lightly doped non-reduced ferroelectric crystal for holographic storage of information, a heavily doped reduced photocell crystal, having an absorption frequency band, adapted for being photoexcited by means of a uniform luminous radiation having a frequency band within said absorption band, said photocell crystal thus producing an electrical field, and direct connecting means for applying said electrical field to said ferroelectric crystal, being formed by the common edge be-

tween the two crystals and by a conductor wire connecting the two faces opposite the said common edge, said ferroelectric crystal having a very much higher resistivity than said photocell crystal.

4,055,839

FOALING ALARM

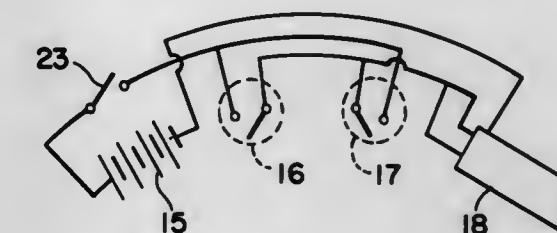
Leonard T. Skeggs, Kirtland, Ohio, assignor to Locust Farms, Inc., Kirtland, Ohio

Continuation-in-part of Ser. No. 598,749, July 25, 1975, abandoned. This application June 23, 1976, Ser. No. 698,948

Int. Cl.² G08B 21/00

U.S. Cl. 340—279

21 Claims



1. A foaling alarm for signalling the foaling of a mare comprising a device adapted to encircle a mare's body and including an upper portion having a recess to embrace the withers to prevent circumferential displacement of said device, and a flexible girth means connected to said upper portion to engage under the forepart of the belly behind the front legs; transmitter means and position sensing switch means carried by said upper portion; said transmitter means, when energized, being operative to emit a signal of predetermined frequency; said position sensing switch means being operative to energize said transmitter means only when the mare is in foaling position on her side; and remote receiver and alarm signal system means; said receiver means being tuned to said transmitter signal and operative in response thereto to actuate said alarm signal system to provide an alarm signal for summoning aid to facilitate the birth of the foal.

4,055,840

REUSABLE SAFETY WARNING DEVICE

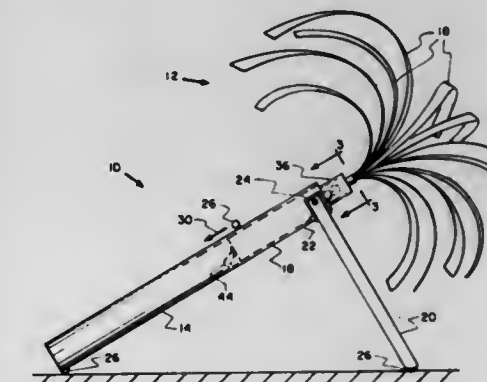
Anton R. Uchytel, 4265 NE. Halsey, Apt. 212, Portland, Ore. 97213, and Ray L. Gorder, 10 SW. Ash, Portland, Ore. 97204

Filed Mar. 1, 1976, Ser. No. 662,713

Int. Cl.² G08C 5/00

U.S. Cl. 340—321

9 Claims



1. A reusable safety warning device, comprising an elongate tubular body member, a plurality of thin, streamer-like, flexible shiny strips of glossy reflective material attached to said body member and adapted to protrude longitudinally outward from one end thereof for a first portion of their respective lengths, diverge from one another in a plurality of directions for a second portion of their respective lengths and then droop at their protruding ends under the force of gravity so as to produce a pompon-like array of said strips, and means partially

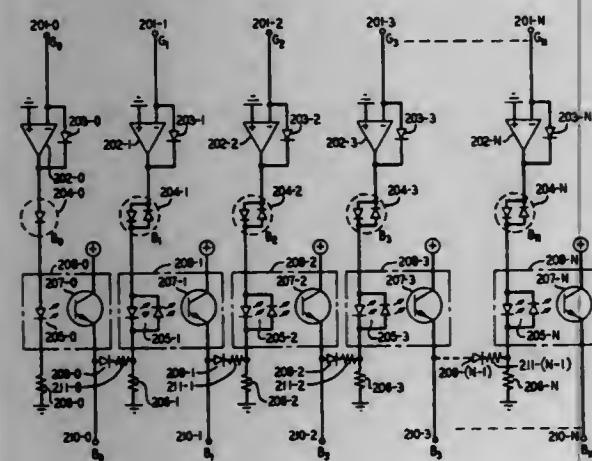
disposed within said body member for retracting said flexible strips into said body member.

4,055,841

OPTICAL GRAY TO BINARY CODE CONVERTER
Charles David Crawford, Burlington, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 9, 1976, Ser. No. 665,332
Int. Cl.² H03K 13/24

U.S. Cl. 340—347 DD

11 Claims



1. Apparatus for converting information bits in a first binary code to information bits in a second binary code which comprises:

- a plurality of input means for supplying a corresponding plurality of signals representative of information bits in the first binary code ordered in a predetermined sequence from a most significant bit to a least significant bit;
- a first plurality of radiant energy emitting means associated with and connected on a one-to-one basis in predetermined circuit relationship with the individual ones of said plurality of input means in said sequence; and
- a first plurality of radiant energy responsive means associated on a one-to-one basis with at least said most significant through the next to least significant ones of said first plurality of radiant energy emitting means and being connected on a one-to-one basis in predetermined circuit relationship with the next less significant one in said sequence of said first plurality of radiant energy emitting means, the individual ones of said first plurality of radiant energy responsive means being responsive to radiant energy emitted from said associated radiant energy emitting means for controllably supplying a potential to said next less significant radiant energy emitting means, wherein a potential developed by said most significant input means determines the conductive state of the most significant one of said first plurality of radiant energy emitting means and wherein the conductive state of the individual remaining ones of said first plurality of radiant energy emitting means in said sequence is determined cooperatively by the potential supplied by said radiant energy responsive means connected in circuit relationship therewith and the potential developed by said associated input means; said conductive states of said first plurality of radiant energy emitting means being indicative of information bits in the second binary code.

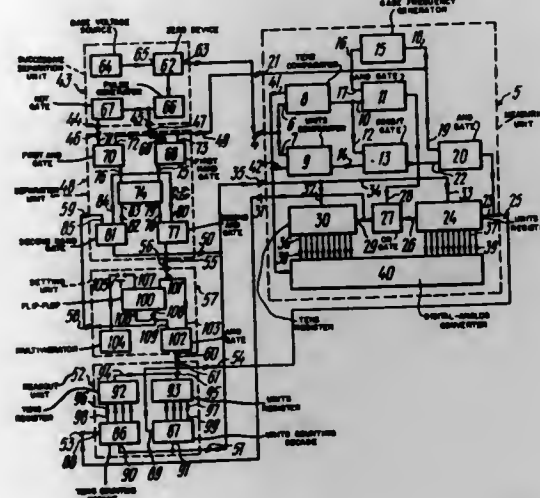
4,055,842 DIGITAL DEVICE FOR MEASURING SINGLE AND MULTIPLE IMPACT PULSES

Alexandr Sergeevich Yakshin, ulitsa Malaya Filevskaya, 66, kv. 104; Oleg Nikolaevich Novikov, ulitsa Kuznetsky most, 18/7, kv. 6; Dmitry Alexeevich Grechinsky, ulitsa Tolbukhina, 8, korpus 2, kv. 48; Viktor Alexandrovich Klochko, ulitsa Oktyabrskaya, 38, kv. 374, and Viktor Georgievich Rygalin, 3-Dorozhny proezd, 5 korpus 2, kv. 103, all of Moscow, U.S.S.R.

Filed Dec. 22, 1975, Ser. No. 643,027
Claims priority, application U.S.S.R., Dec. 24, 1974, 2088810
Int. Cl.² H03K 13/02

U.S. Cl. 340—347 AD

6 Claims



1. A digital device for measuring single and multiple impact impulses comprising: a converter for converting impact impulses into electrical signals; an amplifier of electrical signals, the input of which is connected to an output of said converter; an electrical signal filter, the input of which is connected to an output of said amplifier; a measuring unit, for measuring the peak value of impact pulses and having inputs and outputs, a first input of which is connected to an output of said filter; a tens comparator of said measuring unit having inputs; a first input of said units comparator being connected to a first input of said tens comparator and together serve as said first input of said measuring unit; a successive separation unit, for successive separation of impact pulse time intervals and pauses therebetween, and having an input connected to said first input of said measuring unit and outputs; a base frequency generator of said measuring unit having an output; a separation unit, for separation of a first transcription pulse and a group of further reset pulses from a train of high-frequency pulses within a given interval between two successive impact pulses having inputs and outputs, a first input and a second input of which are connected to a first output and a second output of said successive separation unit and a third input of which is connected to a first output of said base frequency generator, which serves as a first output of said measuring unit; a tens register of said measuring unit having inputs and outputs; a units register of said measuring unit having inputs and outputs; gate means of said measuring unit providing electrical connection of the output of said tens comparator, the output of said units comparator and said outputs of said base frequency generator with said inputs of said tens and units registers; a reset line of said tens and units registers; a digital-analog converter of said measuring unit having a group of inputs connected to a group of outputs of said tens register and of outputs of said units register and having an output connected to a second input of a group of inputs connected to a group of said tens comparator and of said units comparator; a readout unit, for readout of information on single and multiple impact pulses, having inputs, a first and a second input being connected to the input of said tens register and of said units register, which serve respectively as a second and a third output of said separation unit and to said reset line

which serves as a second input of said measuring unit; a setting unit, for setting operational modes for measuring single and multiple impact pulses, having an input connected to a second output of said separation unit, a first output connected to a fourth input of said separation unit and a second output connected to a fourth input of said readout unit, said transcription pulses being effective to transfer the measured peak value information of the impact pulses to storage means prior to a resetting of said measuring means by said resetting pulses, and the measurement of a next succeeding impact pulse, whereby the device is reset and prepared for further measurements in the interval between pulses.

4,055,843

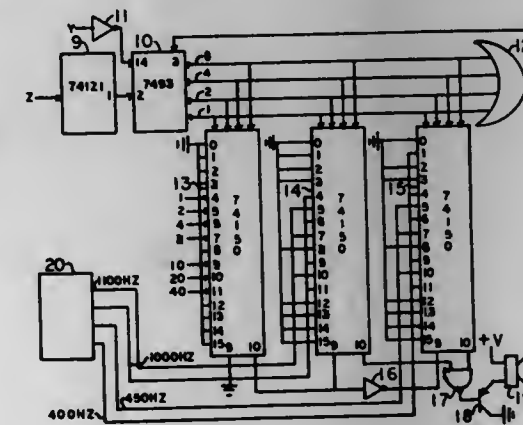
ANNUNCIATOR FOR USE WITH ELECTRONIC DIGITAL CLOCK

Ronald O. Whitaker, 4719 Squire Drive, Indianapolis, Ind. 46241

Filed Feb. 23, 1976, Ser. No. 660,611
Int. Cl.² G04C 21/04

U.S. Cl. 340—384 E

8 Claims



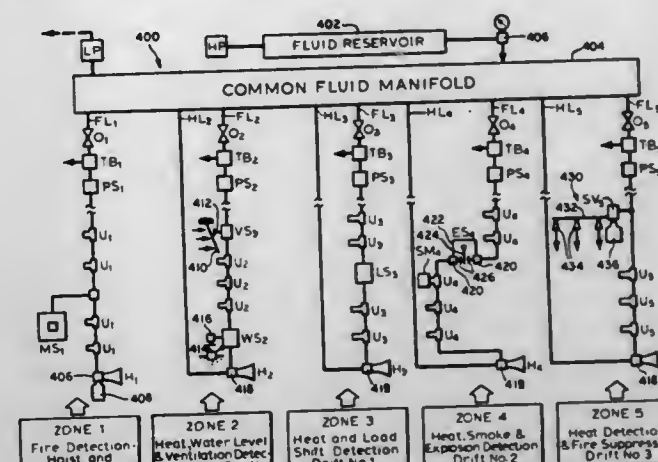
1. An annunciator system comprising: a source of data signals, a subset of said data signals at any particular instant being in a high state, the remaining subset of said data signals being in a low state; initiator means adapted for delivering an initiation signal when an announcement is to be made; a time slot generator for generating a sequence of time slots and adapted for receiving said initiation signal and in response thereto adapted for generating a sequence of sets of time slot signals, each of said sets identifying a respective time slot in said sequence of time slots; an audio frequency signal generator means adapted for generating a low frequency signal and for generating a high frequency signal; audio output means adapted for receiving an input signal and adapted for delivering in response thereto an audio tone of like frequency; and selector means adapted for receiving as selector input said sets of time slot signals, said selector means adapted for receiving as data input said data signals, said selector means being adapted for associating each of said data signals with a respective time slot, said selector means adapted for selecting and causing to be delivered to said audio output means a particular one of said audio signals during those of said time slots for which said respective data signals are high and for selecting and causing to be delivered to said audio output means the other of said audio signals during those of said time slots for which said respective data signals are low.

4,055,844

DETECTION SYSTEM

Lloyd H. Hornbostel, Jr., Beloit, Wis., assignor to Beloit Management & Research Center, Beloit, Wis.
Continuation-in-part of Ser. No. 368,609, June 11, 1973, abandoned. This application Apr. 19, 1974, Ser. No. 462,456
Int. Cl.² G08B 19/00; A62C 37/24, 37/02
U.S. Cl. 340—420

13 Claims



5. A static fluid system for detecting a change in ambient conditions comprising: a closed elongate fluid line having an absolute fluid line pressure differing from the absolute ambient pressure of the line environment; means coupled to said line to maintain said line pressure in said closed fluid line; a plurality of means for sensing ambient conditions positioned in said line and adapted to normally maintain the fluid continuity and closed static fluid integrity of said line, at least one of said sensing means being responsive to a first selected change in the ambient conditions of the line environment and at least one other of said condition-sensing means being responsive to a second selected change in said line environment, said sensing means being operative to open said closed fluid line to a fluid flow at an initial flow rate which changes said line pressure to said ambient pressure; one of said sensing means comprising a ventilation monitoring system including a pressure-responsive valve coupled to said line and biased normally closed to maintain the fluid integrity of said line and air-flow detection means being arranged to maintain said valve closed under selected normal air flow conditions in said line environment and further arranged to open said valve and change said line pressure to ambient pressure in response to a selected air flow change; means coupled to said line for creating a signal in response to the change of said line pressure to ambient pressure, said signal creating means connected to signal activation means through connecting means separate from said fluid line; and means for restricting fluid flow from said pressure maintaining means to said line both before and after the change of said line pressure, said flow restricting means having an effective flow area such that the fluid flow therethrough is substantially lower than said initial flow rate, said restricting means also being operative to permit fluid flow into said line to compensate for line leakage and to preclude the re-establishment of said line pressure when said line is opened by sensing means.

4,055,845

ANTENNA ERECTING SYSTEM

Ray C. Ladrack, 961 Lornaberry Lane, Columbus, Ohio 43213
Filed June 14, 1976, Ser. No. 696,033
Int. Cl.² H01Q 1/32, 3/00

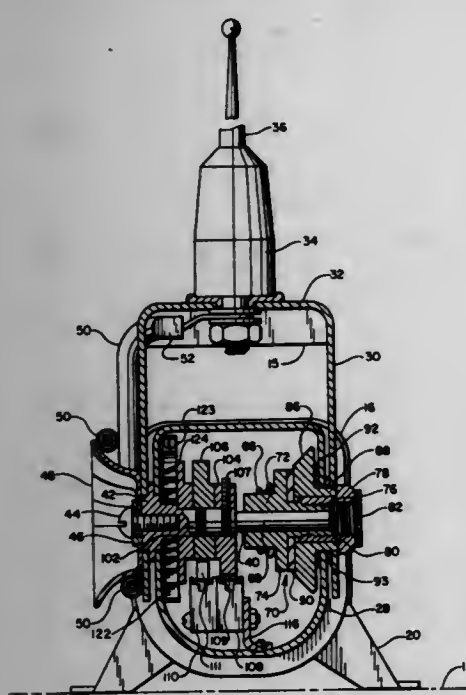
U.S. Cl. 343—715

10 Claims

1. An improved system for effecting the movement of a

communications antenna between a first and an operational orientation comprising:

- electric motor means including a winding energizable from a source and having a drive output;
- drive means coupled for movement in driven relationship with said motor means drive output and in driving relationship with said antenna for selectively moving said antenna between said orientations;
- first switch means selectively actuatable to alter between first and second circuit conditions;
- second switch means selectively actuatable to alter between first and second circuit conditions;
- switch actuator means configured and arranged for operation in correspondence with said antenna movement between said first and operational orientations, for actuating said first switch means to alter from said first to said second circuit condition when said antenna closely approaches and attains said operational orientation, for actuating said second switch means to alter from said first to said second circuit condition when said antenna closely approaches and attains said first orientation, said first and second switch means first circuit condition permitting an energization of said electric motor means winding,



double pole switch means connectable to convey power from said source, manually actuatable to assume first and second circuit conditions and coupled for selective circuit completing relationships with said motor means winding through said first and second switch means, said double pole switch means being arranged for effecting conveyance, when in said first circuit condition, of current from said source to energize said winding in one polar sense through said first switch means when said first switch means is in said first circuit condition to effect movement of said antenna toward said operational orientation and, being arranged for effecting conveyance, when in said second circuit condition, of current from said source to energize said winding in another polar sense through said second switch means when said second switch means is in said first circuit condition to effect movement of said antenna toward said first orientation, and

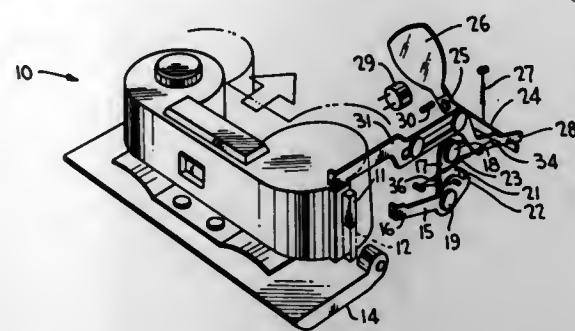
first status indicator means having a visually perceptible state when energized, and arranged for energization from said source through a circuit including said winding and said double pole switch means when in said first circuit condition and when said first switch means is in said second circuit condition.

4,055,846
FILM CARTRIDGE ANTI-TILTING ARRANGEMENT
Akira Yamanaka, Sakai, and Toshiaki Matsumoto, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1976, Ser. No. 718,675
Claims priority, application Japan, Aug. 29, 1975, 50-105267
Int. Cl.² G03B 17/26, 7/00

U.S. Cl. 354—21

9 Claims



1. A camera having a chamber open at one end for the reception of a film cartridge, a cover mounted on the camera for closing said open end of said chamber, an arrangement on said camera operable upon the closing of said cover for avoiding any tilting of the cartridge upon insertion thereof into said chamber and for controlling an exposure condition of the camera depending on the species of the film such as the film sensitivity contained within the cartridge which has on a side wall thereof a signal element of a selected size corresponding with the species of the film, said arrangement comprising:

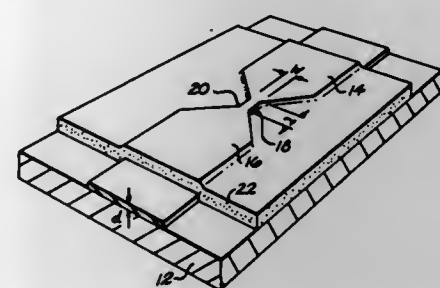
- a movable detecting member extending toward said open end;
- spring means on the camera urging said detecting member for movement toward said open end;
- an adjusting member mounted for movement together with said detecting member for controlling an exposure condition of the camera; and
- release means for actuating said detecting member for movement thereof against the force of said spring means away from said open end upon the closing of said cover, said release means including a release lever extending partly outwardly of said open end and being mounted for movement away from said open end upon the closing of said cover; whereby any tilting of the cartridge inserted within said chamber is avoided by the release of the force of said spring means acting against the signal element having a predetermined size causing it to bear against said detecting member.

4,055,847
GERMANIUM COATED MICROBRIDGE AND METHOD
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Louis B. Holderman, Boyds, Md., and Palmer N. Peters, Huntsville, Ala.

Filed Aug. 13, 1976, Ser. No. 714,158
Int. Cl.² H01L 39/22, 27/12, 45/00

U.S. Cl. 357—5

9 Claims



1. A microbridge device for use in a superconductive quantum interference device comprising:

- a supporting substrate;
- a first element of superconductive material carried on said substrate;
- a second element of superconductive material carried on said substrate adjacent said first element defining a space therebetween;
- connecting means bridging said space and connecting said first and second elements to establish an electrical weak link therebetween;
- a coating of semiconductor material adjacent said first and second elements and said space electrically shunting said connecting means at room temperatures to prevent the destruction of said device by minute currents while acting as a dielectric permitting normal electrical behavior at cryogenic temperatures.

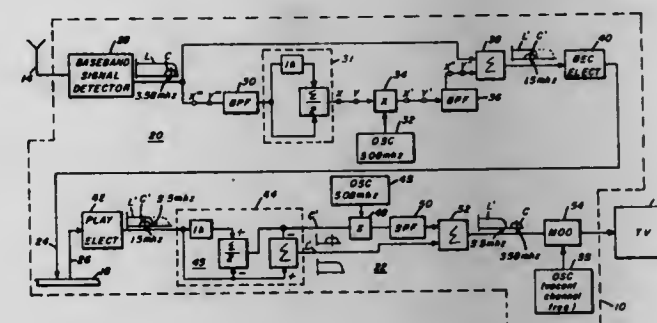
4,055,848
SIGNAL PROCESSING FOR OFF-AIR VIDEO RECORDER

William T. Fearnside, Fishers, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,100
Int. Cl.² H04N 5/76

U.S. Cl. 358—8

10 Claims



6. Apparatus for recording an NTSC-type television signal on a recording medium, said apparatus being adapted for use with playback apparatus having means for combing apart interleaved chroma and luminance signal information, and comprising:

- a. means for isolating that part of the signal spectrum containing interleaved chroma and luminance signal information;
- b. comb filter means for removing luminance signal information from said isolated signal spectrum part to produce an isolated signal spectrum part containing substantially only chroma signal information;
- c. means in addition to said comb filter for reducing the vertical resolution of the chroma signal information;
- d. means for shifting in frequency said isolated signal spectrum part containing substantially only chroma signal information so that it overlays and interleaves with, spectrum-wise, that part of the signal spectrum of the NTSC-type signal containing only luminance signal information; and
- e. means for simultaneously applying said shifted chroma signal information, and the luminance signal information corresponding to that part of the signal spectrum of the NTSC-type signal containing only luminance signal information, to a common recording track of said recording medium,

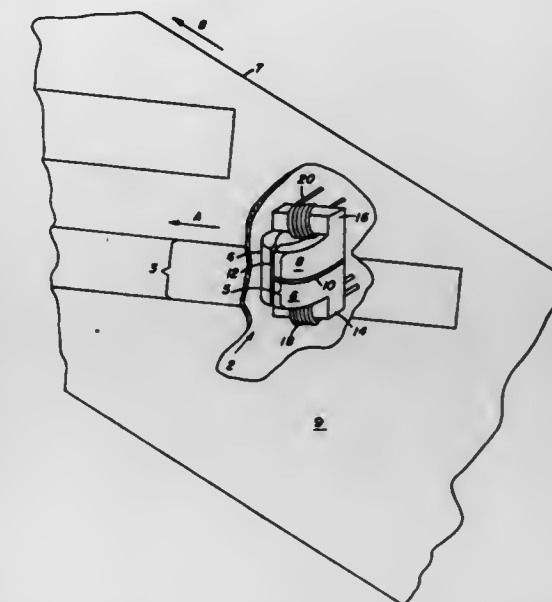
said means for reducing chroma vertical resolution being adapted to do so to reduce the bleeding of chroma signal information into the playback luminance signal channel during the combing apart of the shifted chroma signal information and said luminance signal information, thereby to mitigate horizontally travelling video artifacts.

4,055,849
MAGNETIC HEAD POSITIONING AND PLAYBACK APPARATUS UTILIZING A SPLIT HEAD FOR SELF-TRACKING AND SELECTIVE REPRODUCTION
William Kelsey Hickok, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 15, 1976, Ser. No. 677,100
Int. Cl.² G11B 5/26

U.S. Cl. 360—77

2 Claims



1. A magnetic head positioning and playback apparatus for use with a magnetic head having a playback gap for reproducing a signal from a magnetic track on a track bearing record carrier, the head comprising a first pole piece and a second pole piece, the pole pieces having end surfaces each defining and being separated by the playback gap, non-magnetic means dividing the first pole piece including its end surface into first and second portions such that the playback gap is correspondingly divided, magnetic means respectively coupling each of said first and second portions to the second of said pole pieces to form first and second magnetic circuits, the improvement wherein the positioning and playback apparatus further comprises:

- electrical means coupled to each of said magnetic circuits simultaneously operative in a first mode for providing from the first and second magnetic circuits a tracking error signal having a component indicative of the magnitude and direction of the error in the position of the head relative to the magnetic track and in a second mode for providing a playback signal from the first and second magnetic circuits;
- comparator means for monitoring said tracking error signal and for providing a switching signal when the value of said tracking error signal exceeds a predetermined level indicative of a disturbance in the magnetic track which is being predominantly reproduced by the first of the magnetic circuits; and
- switching means responsive to said switching signal for cooperating with said electrical means operative in said second mode for providing an alternate playback signal from the second magnetic circuit, whereby said alternate playback signal is provided from that magnetic circuit which is not predominantly affected by the disturbance in the magnetic track.

4,055,850
CAPACITOR WITH ELECTRODE CONTAINING NICKEL
Sri Prakash, Simpsonville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

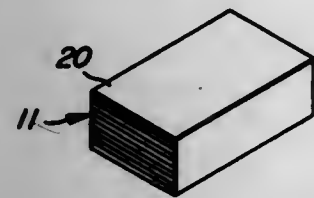
Filed Dec. 23, 1975, Ser. No. 643,755
Int. Cl.² H01G 1/01

U.S. Cl. 361—305

2 Claims

1. A dielectric substrate having thereon a metallization hav-

ing a metal constituent consisting of finely divided particles of at least one member selected from the group consisting of gold, silver, platinum, palladium and alloys thereof, and containing



nickel oxide, the ratio of nickel in the metallization, calculated as elemental nickel, to the total of gold, silver, platinum and palladium being in the range of about 1 to 9 to 1 to 4.

4,055,851

MEMORY MODULE WITH MEANS FOR GENERATING A CONTROL SIGNAL THAT INHIBITS A SUBSEQUENT OVERLAPPED MEMORY CYCLE DURING A READING OPERATION PORTION OF A READING MEMORY CYCLE

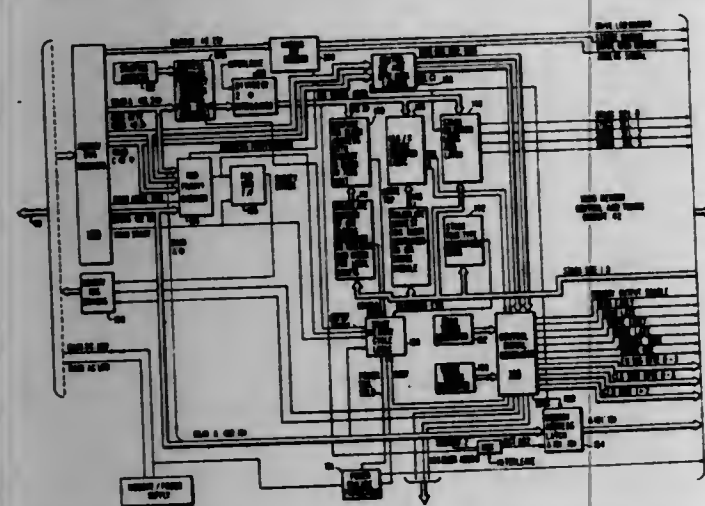
Stephen R. Jenkins, Acton; Thomas A. Northrup, Westford, and Robert E. Stewart, Stow, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 13, 1976, Ser. No. 658,113

Int. Cl.² G06F 13/06

U.S. Cl. 364—200

5 Claims



1. A random access memory module for connection over a

bus to a digital data processing system that, for each of successive memory cycles including reading and writing memory cycles, initiates a data transfer by transmitting binary address signals and asynchronous control signals that include a starting control signal for initiating a data transfer with said memory module and a binary direction control signal for controlling the direction of the data transfer between said random access memory module and the digital data processing system, said random access memory module comprising:

A. addressable storage means for storing digital data in addressable storage locations therein,

B. address decoding means for producing an enabling signal when said address decoding means receives, from the digital data processing system, binary address signals that identify a said storage location in said addressable storage means, and

C. control means connected to said addressable storage means and said address decoding means, said control means including:

i. memory cycle control means responsive to the enabling signal and the starting control signal for producing a selected one of the reading and writing memory cycles, each said memory cycle including a reading operation during which digital data is retrieved from an identified one of said locations in said addressable storage means and a succeeding writing operation during which data is stored in said identified location in said addressable storage means,

ii. timing signal means for generating a timing signal that corresponds to the interval of a reading operation during the operation of said memory cycle control means,

iii. reading signal means for generating a reading signal in response to a state of the direction control signal that designates a transfer of digital data from said memory module to the digital data processing system, and

iv. means responsive to said timing signal means and to said reading signal means for transmitting to the digital data processing system a BUS OCCUPIED signal that is coterminous with the timing signal during a reading cycle, the BUS OCCUPIED signal inhibiting the initiation of any successive memory cycles by the digital data processing system until the completion of a reading operation during a reading memory cycle and the termination of the BUS OCCUPIED signal.

DESIGN PATENTS

GRANTED OCTOBER 25, 1977

ERRATA

For	See
CLASS	PATENT NO.
015-032.....	246,176

DESIGNS

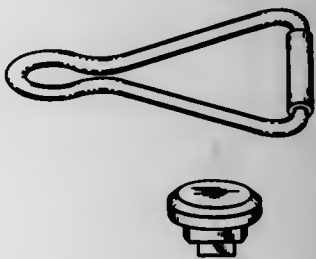
OCTOBER 25, 1977

246,141

FASTENER

Harry E. Mazur, P.O. Box 4508, Palm Springs, Calif. 92262
Filed Jan. 6, 1975, Ser. No. 538,539
Term of patent 14 years
Int. Cl. D2-07

U.S. Cl. D2-409

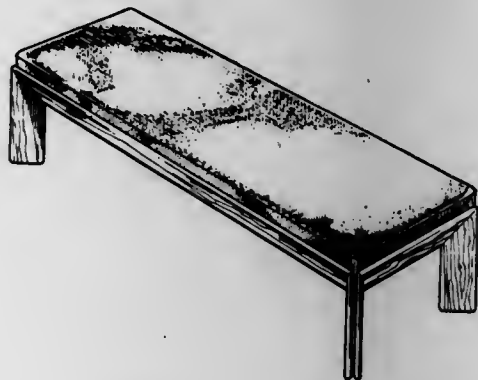


246,142

BENCH OR SIMILAR ARTICLE

Jules M. Heumann, South San Francisco, Calif., assignor to
Metropolitan Furniture Manufacturing Company, South San
Francisco, Calif.
Division of Ser. No. 595,564, July 14, 1975. This application
Sept. 22, 1976, Ser. No. 725,661
Term of patent 14 years
Int. Cl. D6-01

U.S. Cl. D6-58

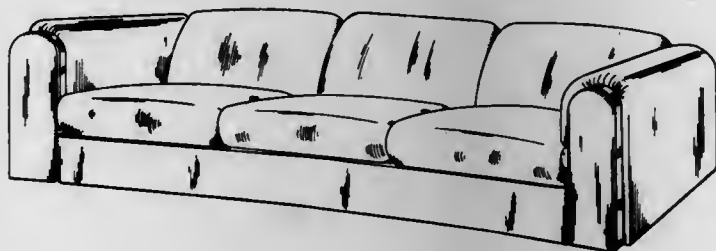


246,143

SEAT

Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger
Industries, Inc., Jefferson, Wis.
Filed June 11, 1976, Ser. No. 695,132
Term of patent 7 years
Int. Cl. D6-01

U.S. Cl. D6-63

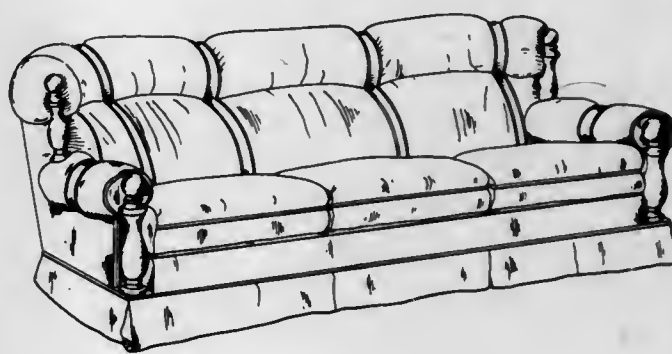


246,144

SEAT

Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger
Industries, Inc., Jefferson, Wis.
Filed June 11, 1976, Ser. No. 695,134
Term of patent 7 years
Int. Cl. D6-01

U.S. Cl. D6-63



246,145

HANGING SUPPORT FOR ARTICLES

Lee Hendricks, 3445 W. 190th, Torrance, Calif. 90504
Filed Mar. 18, 1976, Ser. No. 667,887
Term of patent 7 years
Int. Cl. D6-04; D11-02

U.S. Cl. D6-113



246,146

CHEST OF DRAWERS

Robert K. S. Han, 999 Green St., No. 2701, San Francisco, Calif. 94133

Filed June 18, 1976, Ser. No. 697,343

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—145



246,148

DISPENSING RACK FOR CONTACT LENS VIALS

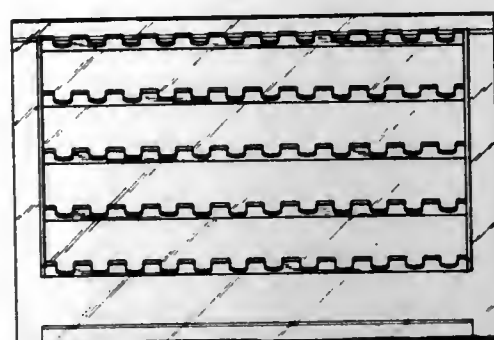
Edwin F. Kusek, Arlington Heights, Ill., assignor to Wesley-Jessen Inc., Chicago, Ill.

Filed June 18, 1976, Ser. No. 697,522

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—188



246,147

COMBINED MULTIPLE CABINET AND SHELF STORAGE UNIT

Walter Müller, 3 Eschenstrasse, 8603 Schwerzenbach, Switzerland

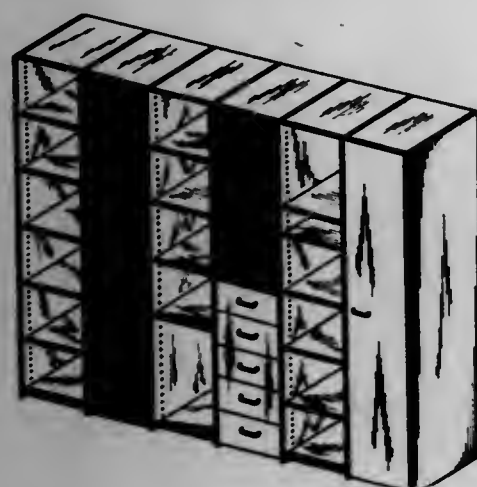
Filed May 27, 1976, Ser. No. 690,568

Claims priority, application Germany, Dec. 12, 1975, 849

Term of patent 14 years

Int. Cl. D6—04

U.S. Cl. D6—164



246,149

ELECTRIC FOOD COOKER

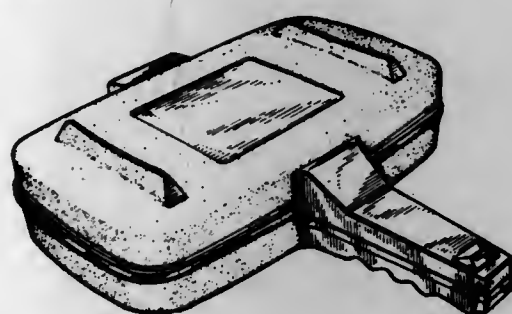
Monte L. Levin, New York, N.Y., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed May 17, 1976, Ser. No. 687,027

Term of patent 14 years

Int. Cl. D7—02

U.S. Cl. D7—94



246,150

CITRUS FRUIT JUICE EXTRACTOR

Bisked U. Evangelista, 1363 Skyhawk Circle, Virginia Beach, Va. 23454

Filed Dec. 9, 1975, Ser. No. 639,071

Term of patent 14 years

Int. Cl. D7—04

U.S. Cl. D7—48



246,152

ANCHORING DEVICE FOR PLANTS

Emil Thomas Luoma, 1555 Pleasant Hill, Lafayette, Calif. 94549

Filed Oct. 3, 1975, Ser. No. 619,445

Term of patent 14 years

Int. Cl. D11—02; D8—08

U.S. Cl. D8—1



246,153

CONTOURED GRADING RAKE

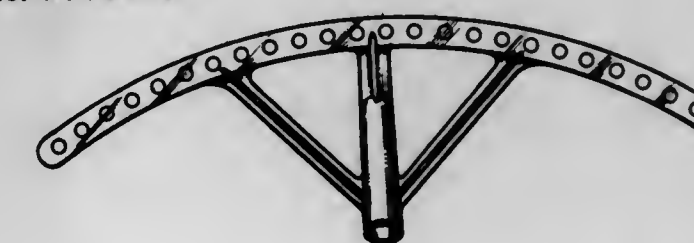
Charles J. Insalaco, Pigeon Swamp Road, South Windham, Conn. 06266

Filed Sept. 15, 1976, Ser. No. 723,663

Term of patent 14 years

Int. Cl. D8—05

U.S. Cl. D8—13



246,151

PORTABLE COOKING STOVE

Ming Kong Chan, 58 Pau Chung Street, Tokwawan, Kowloon, Hong Kong

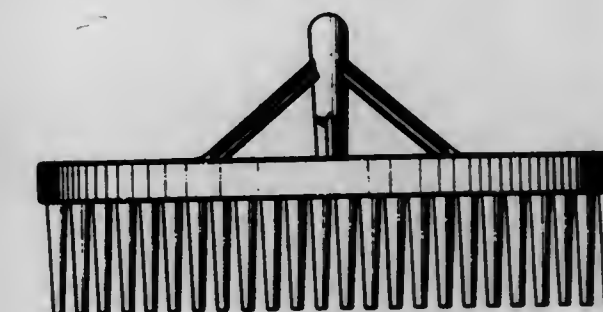
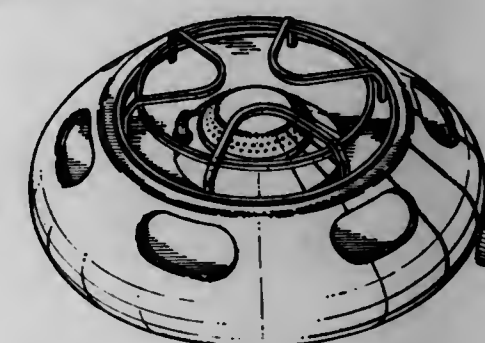
Filed July 29, 1975, Ser. No. 600,047

Claims priority, application United Kingdom, May 20, 1975, 971137/75

Term of patent 14 years

Int. Cl. D7—04

U.S. Cl. D7—110



246,154

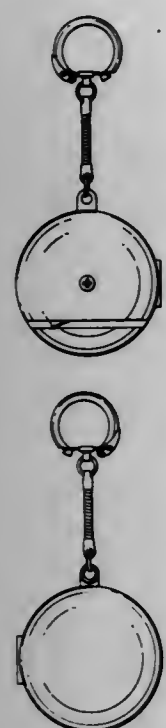
COMBINED LETTER OPENER AND KEY HOLDER
Chak-Pui Tsang, No. 80, Bonham Road Block B1, 28th floor,
Hong Kong

Filed Jan. 7, 1976, Ser. No. 647,324

Claims priority, application United Kingdom, July 16, 1975,
971843/75

Term of patent 14 years
Int. Cl. D3—01

U.S. Cl. D8—104



246,155

SQUEEZE BOTTLE OR THE LIKE

Earl Hoyt, 127 E. Crescent Ave., Ramsey, N.J. 07446

Filed May 4, 1976, Ser. No. 683,443

Term of patent 14 years
Int. Cl. D9—01

U.S. Cl. D9—2



246,156

COMBINED BOTTLE AND CAP THEREFOR

Ralph A. Muscatello, Norwood, and Kent M. Wright, Sudbury,
both of Mass., assignors to The Gillette Company, Boston,
Mass.

Continuation-in-part of Ser. No. D375,815, July 2, 1973. This
application May 2, 1975, Ser. No. 574,020

Term of patent 14 years
Int. Cl. D9—01

U.S. Cl. D9—71



246,157

END CLOSURE FOR A CONTAINER

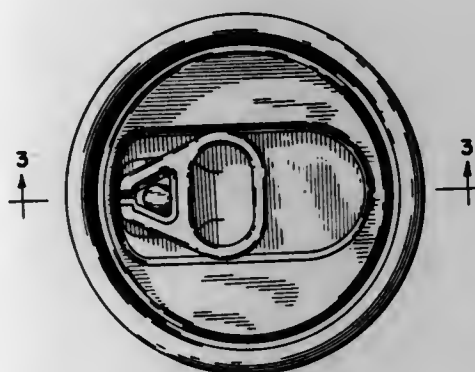
Max G. Kocour, Kenilworth, and Arthur P. Zandel, Mount
Prospect, both of Ill., assignors to National Can Corporation,
Chicago, Ill.

Filed Mar. 1, 1976, Ser. No. 662,364

Term of patent 14 years

Int. Cl. D9—07

U.S. Cl. D9—255



246,158

DIGITAL CLOCK

Andrew Durco, Jr., Dallas, Tex., assignor to Mostek Corpora-
tion, Carrollton, Tex.

Division of Ser. No. 441,264, Feb. 11, 1974. This application

Mar. 1, 1976, Ser. No. 663,597

Term of patent 14 years

Int. Cl. D10—01

U.S. Cl. D10—15



246,159

LIGHTING AND APPLIANCE TIMER

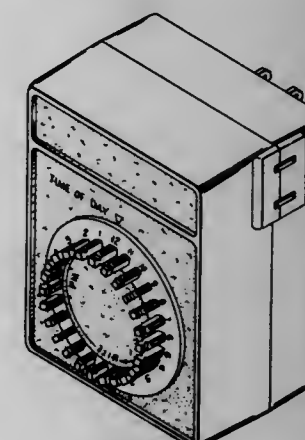
Robert Podall, Northbrook, Ill., assignor to AMF Incorporated,
White Plains, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,989

Term of patent 14 years

Int. Cl. D10—03

U.S. Cl. D10—40



246,160

REFLECTOR

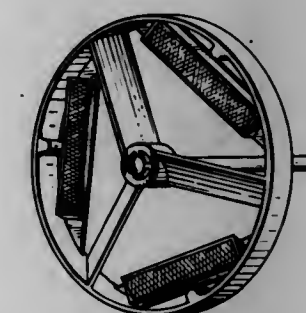
Robert A. Lattie, 2292 E. Claire, Phoenix, Ariz. 85020

Filed Mar. 22, 1976, Ser. No. 668,372

Term of patent 14 years

Int. Cl. D10—06

U.S. Cl. D10—111



246,161

REFLECTOR

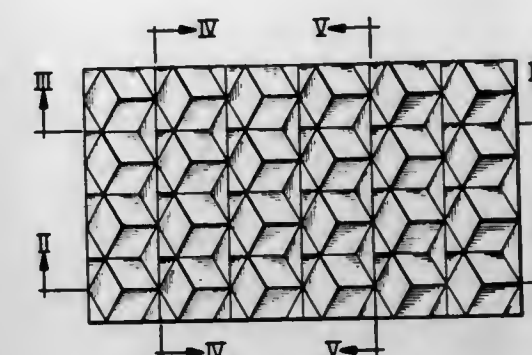
Henry Lindner, Wood Dale, Ill., assignor to Beatrice Foods Co.

Filed June 25, 1976, Ser. No. 699,943

Term of patent 14 years

Int. Cl. D10—06

U.S. Cl. D10—111



246,162

REFLECTOR

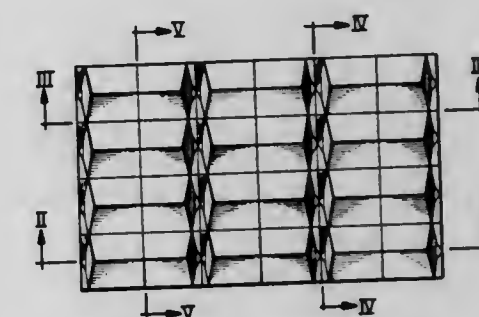
Henry Lindner, Wood Dale, Ill., assignor to Beatrice Foods Co.

Filed June 25, 1976, Ser. No. 699,944

Term of patent 14 years

Int. Cl. D10—06

U.S. Cl. D10—111



246,163

REFLECTOR

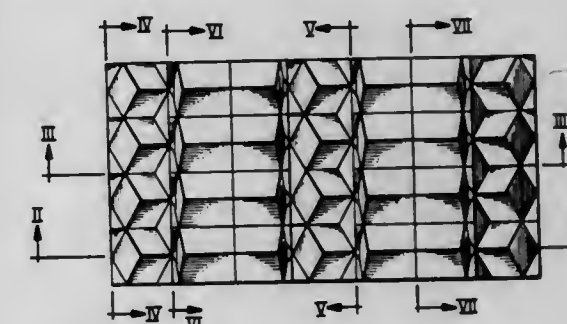
Henry Lindner, Wood Dale, Ill., assignor to Beatrice Foods Co.

Filed June 25, 1976, Ser. No. 699,945

Term of patent 14 years

Int. Cl. D10—06

U.S. Cl. D10—111



246,164

ELECTRONIC WATCH

Dale R. Koehler, Westwood, N.J., assignor to Balova Watch Company, Inc., Flushing, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,833

Term of patent 14 years

Int. Cl. D10—07

U.S. Cl. D10—124



246,166

BOAT HULL

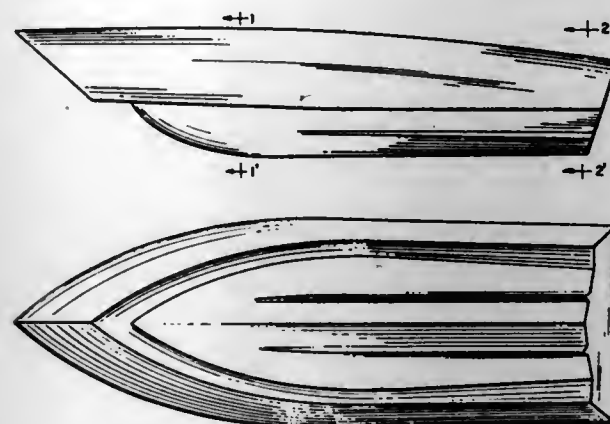
Robert P. Meek, P.O. Box 234C, Goleta, Calif. 93017

Continuation of Ser. No. 496,700, Aug. 12, 1974. This application Mar. 8, 1976, Ser. No. 665,162

Term of patent 14 years

Int. Cl. D12—06

U.S. Cl. D12—62



246,165

CART

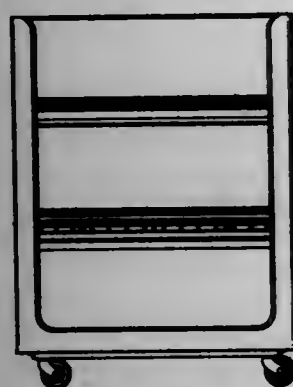
Stephen A. Bacskay, Bloomington, and Sidney Messeri, West Orange, both of N.J., assignors to Outlook in Plastics Corporation, Inc. and Tingae, Brown & Co., part interest to each

Filed Nov. 17, 1976, Ser. No. 742,549

Term of patent 14 years

Int. Cl. D12—02

U.S. Cl. D12—29



246,167

TOOL FOR DIGGING AND LAYING OF SUBMARINE CABLE

Stig Ture Carlsson, Spanga; Viktor Scuka, Upplands Balinge, and Bo Magnus Rasmussen, Handen, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

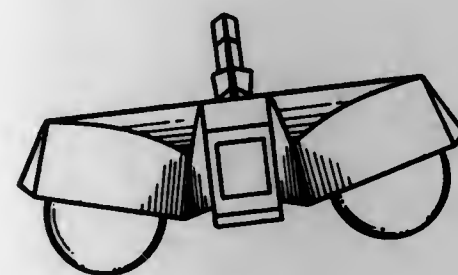
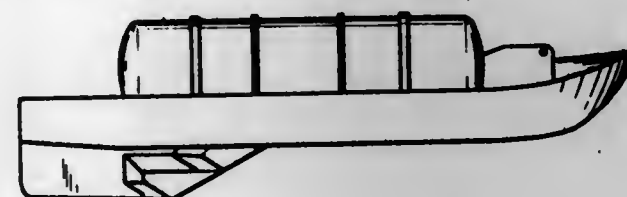
Filed Oct. 22, 1976, Ser. No. 734,803

Claims priority, application Sweden, May 3, 1976, 76-0964

Term of patent 14 years

Int. Cl. D12—99

U.S. Cl. D12—65



246,168

MAN POWERED AIRPLANE

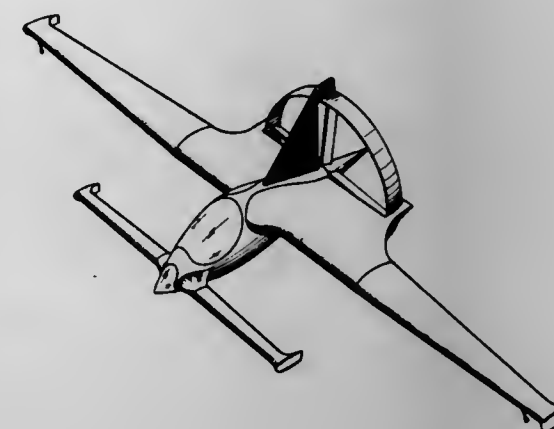
Donald S. Landrus, 978 Kimball Drive, Reno, Nev. 89502

Filed May 17, 1976, Ser. No. 686,728

Term of patent 14 years

Int. Cl. D12—07

U.S. Cl. D12—78



246,170

BICYCLE COWLING

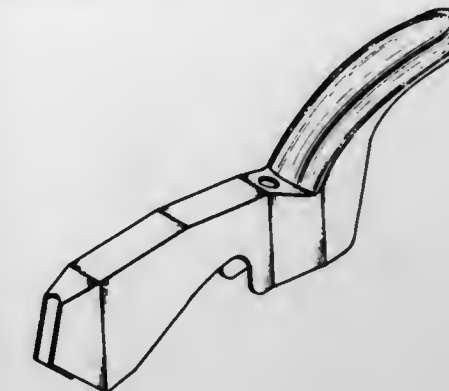
Michael E. Powers, 910 Hampton Road, Arcadia, Calif. 91006

Filed Apr. 12, 1976, Ser. No. 675,982

Term of patent 14 years

Int. Cl. D12—11

U.S. Cl. D12—111



246,171

BICYCLE

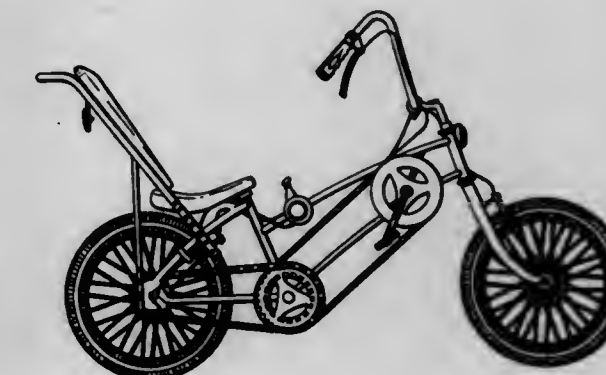
Jackie L. Dodd, Rte. 4, Drew Road, Cumming, Ga. 30130

Filed June 7, 1976, Ser. No. 693,478

Term of patent 14 years

Int. Cl. D12—11

U.S. Cl. D12—111



246,169

VENDING VEHICLE BODY FOR SELLING AND DISPENSING FROZEN DESERTS OR THE LIKE

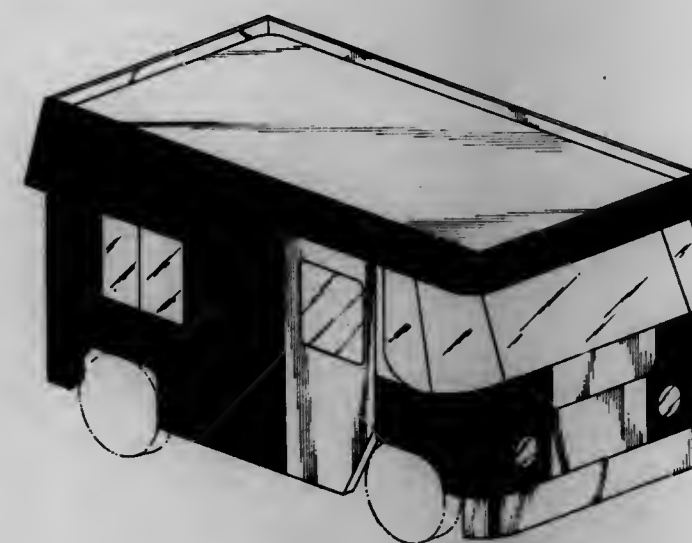
Gary Spencer, 518 Lake View Terrace, Webster, N.Y. 14580

Filed June 21, 1974, Ser. No. 481,658

Term of patent 3½ years

Int. Cl. D12—08

U.S. Cl. D12—99



246,172

WHEEL FOR MOTOR-CYCLES

Tullio Campagnolo, Corso Padova, 168, Vicenza 36100, Italy

Filed May 25, 1976, Ser. No. 689,838

Claims priority, application Italy, Dec. 1, 1975, 22800/75

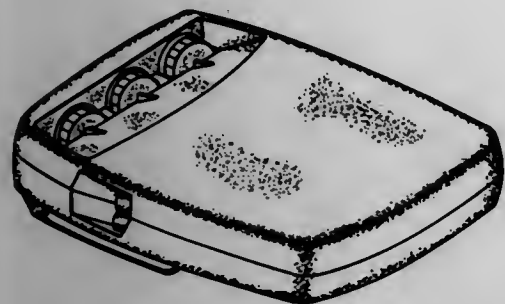
Term of patent 14 years

Int. Cl. D12—16

U.S. Cl. D12—205



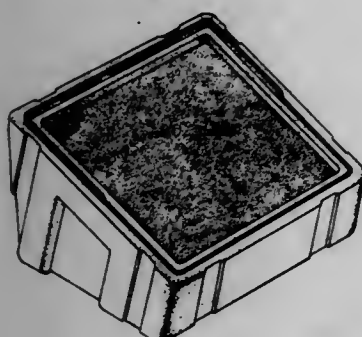
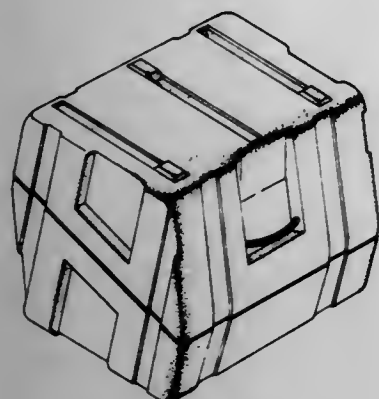
246,173
CONTROL UNIT FOR ELECTRONIC NEURAL STIMULATOR
 Kenneth M. Levin, 51 Cornell Ave., Larkspur, Calif. 94939
 Filed Jan. 19, 1976, Ser. No. 650,209
 Term of patent 14 years
 Int. Cl. D13—03; D24—02
 U.S. Cl. D13—32



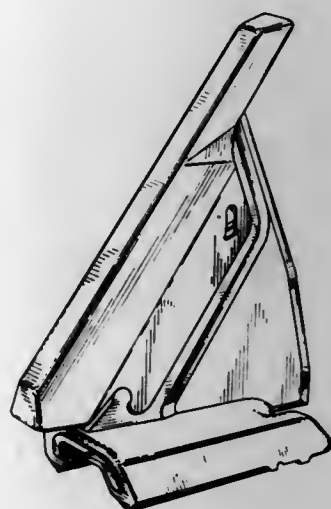
246,175
HEADPHONE APPARATUS
 Gary Adam Stubelick, 791 Tremont St., Studio E316, Boston, Mass. 02118
 Filed Jan. 12, 1976, Ser. No. 648,461
 Term of patent 14 years
 Int. Cl. D14—03
 U.S. Cl. D14—36



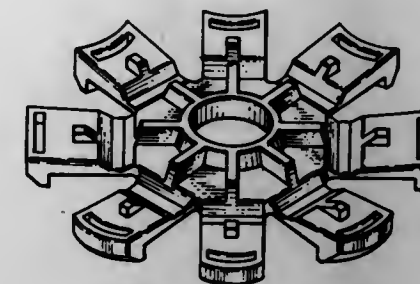
246,174
SPEAKER ENCLOSURES
 Timothy L. Griffin, Jr., Locks Pond Road, Shutesbury, Mass. 01072
 Filed Oct. 7, 1976, Ser. No. 730,693
 Term of patent 14 years
 Int. Cl. D14—01
 U.S. Cl. D14—33



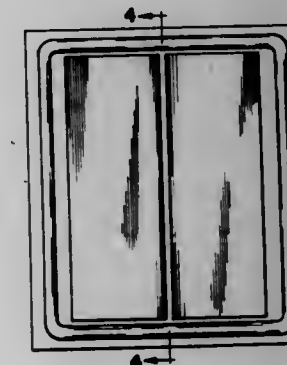
246,176
ADAPTER FOR CORNER SHAPED TOOTH FOR EXCAVATING, DIGGING OR BUCKET LOADING EQUIPMENT
 Sten Johan Dahlberg, Karlskoga; Jouko Kalevi Korpi, Degerfors, both of Sweden, and Ulf Robert Larsson, Brampton, Canada, assignors to AB Bofors, Bofors, Sweden
 Filed Dec. 15, 1975, Ser. No. 640,989
 Claims priority, application Sweden, June 19, 1975, 751270
 Term of patent 14 years
 Int. Cl. D15—04
 U.S. Cl. D15—32



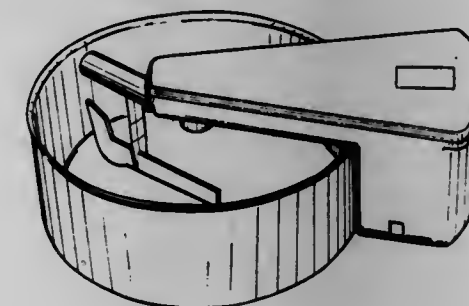
246,177
DISK CLAMPING ELEMENT
 Warren L. Dalziel, Monte Sereno, Calif., assignor to Shugart Associates, Sunnyvale, Calif.
 Filed Mar. 10, 1976, Ser. No. 665,710
 Term of patent 14 years
 Int. Cl. D14—02
 U.S. Cl. D14—40



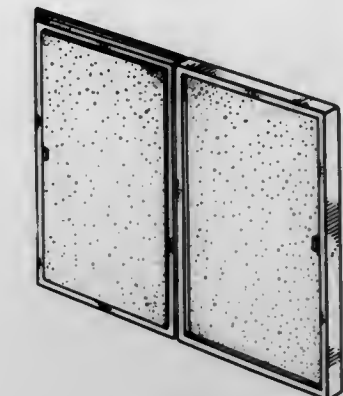
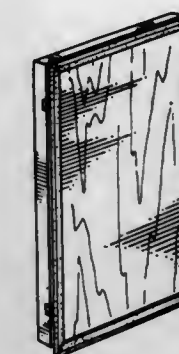
246,178
CLOSURE AND BEZEL FOR DISK RECORDERS AND THE LIKE
 Otto R. Butsch, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.
 Filed Dec. 12, 1975, Ser. No. 640,047
 Term of patent 14 years
 Int. Cl. D14—02
 U.S. Cl. D14—40



246,179
ELECTRIC ICE-CREAM FREEZER
 Andre Faivre, Dijon, France, assignor to S E B, Selongey, France
 Continuation-in-part of Ser. No. 577,887, May 15, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,126
 Claims priority, application France, Nov. 15, 1974, 74.100; Apr. 30, 1976, 76.130
 Term of patent 14 years
 Int. Cl. D15—02
 U.S. Cl. D15—82



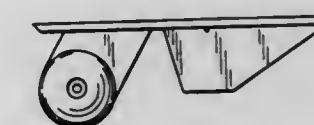
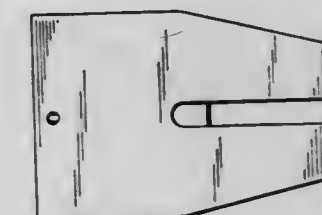
246,180
CABINET BULLETIN BOARD
 Loretta H. Yamauchi, 18943 San Antonio St., Fountain Valley, Calif. 92708
 Filed Dec. 11, 1975, Ser. No. 639,984
 Term of patent 14 years
 Int. Cl. D19—07
 U.S. Cl. D19—52



246,181
FISHING ROD HANDLE
 Thomas E. Sweeney, 52 Main St., Kingston, N.J. 08528
 Filed July 28, 1976, Ser. No. 709,538
 Term of patent 14 years
 Int. Cl. D22—05
 U.S. Cl. D22—23



246,182
DIVING SINKER
 Joseph F. Neary, Novato, Calif., assignor to Troller Corporation, Sausalito, Calif.
 Filed Nov. 10, 1976, Ser. No. 740,512
 Term of patent 14 years
 Int. Cl. D22—05
 U.S. Cl. D22—30



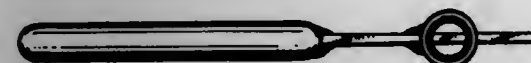
246,183

SPRINKLER STANDARD

Robert Donald Keen, 20601 Skouras Drive, Canoga Park, Calif. 91306

Filed Mar. 29, 1976, Ser. No. 671,345
Term of patent 7 years
Int. Cl. D23—01

U.S. Cl. D23—7



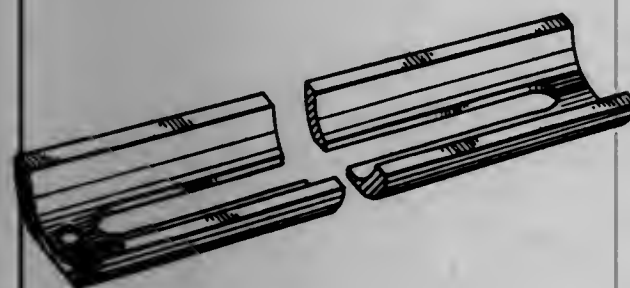
246,184

BOAT FOR CARRYING ARTICLES INTO AND OUT OF FURNACES

John Kadla, Colonia, N.J., assignor to Codi Corporation, Fair Lawn, N.J.

Filed Mar. 26, 1976, Ser. No. 670,667
Term of patent 14 years
Int. Cl. D23—03

U.S. Cl. D23—127



246,185

AIR FRESHENER OR THE LIKE

Francis Edward Husband Bradburne, Carlinghurst Road, Blackburn, Lancashire, England

Filed Oct. 18, 1976, Ser. No. 733,451
Claims priority, application United Kingdom, Apr. 21, 1976, 975382/76Term of patent 14 years
Int. Cl. D23—04

U.S. Cl. D23—150



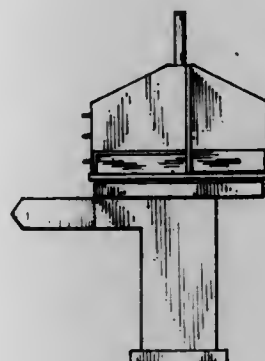
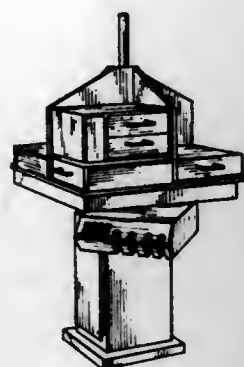
246,186

OPHTHALMIC SUPPORT STAND

Dale A. Rorabaugh, San Diego, Calif., assignor to Surgical Mechanical Research, Inc., Newport Beach, Calif.

Filed Sept. 2, 1976, Ser. No. 719,792
Term of patent 14 years
Int. Cl. D24—01

U.S. Cl. D24—1.1



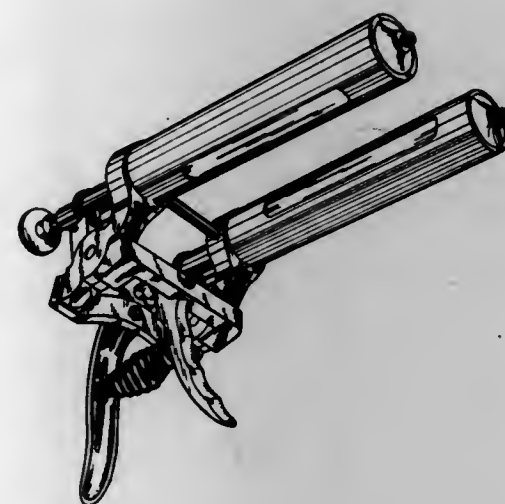
246,187

DOUBLE SYRINGE

Samuel W. DeArment, 3516 Arapahoe, Fort Collins, Colo. 80521

Filed Nov. 10, 1975, Ser. No. 630,436
Term of patent 14 years
Int. Cl. D24—02

U.S. Cl. D24—14



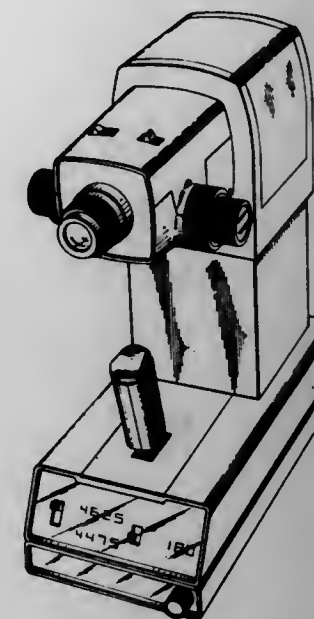
246,188

OPHTHALMOMETER OR SIMILAR ARTICLE

Paul A. Jordan, Fairport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Sept. 13, 1976, Ser. No. 722,984
Term of patent 14 years
Int. Cl. D24—02

U.S. Cl. D24—17



246,189

ELECTROAURICULAR THERAPY PROBE

Harold E. Smith, 7120 NW. Overlook Drive, Vancouver, Wash. 98665

Filed Sept. 24, 1975, Ser. No. 616,188
Term of patent 14 years
Int. Cl. D24—02

U.S. Cl. D24—17



246,190

HEPATIC OCCLUSION CLAMP

Joseph Hodge, Spartanburg, S.C., assignor to Pilling Co., Fort Washington, Pa.

Filed Feb. 26, 1976, Ser. No. 661,628
Term of patent 14 years
Int. Cl. D24—02; D6—02

U.S. Cl. D24—27



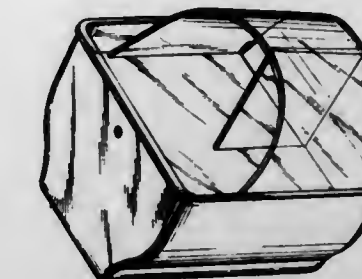
246,191

SWAB DISPENSER

John A. Russo, Westport; David E. Ham, Stamford, both of Conn., and Jean Pierre Vitrac, Paris, France, assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Dec. 2, 1975, Ser. No. 637,033
Term of patent 14 years
Int. Cl. D24—02

U.S. Cl. D24—33



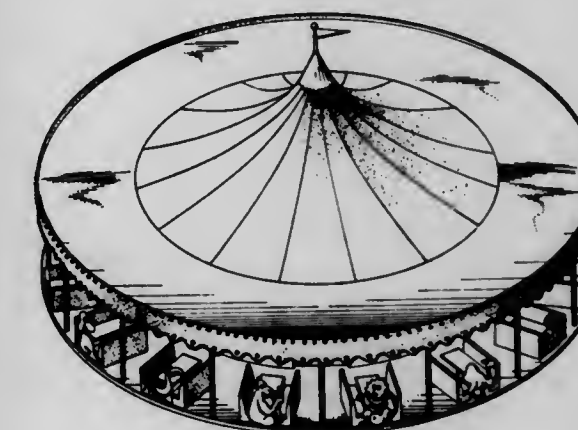
246,192

BUILDING FOR DISPENSING ICE CREAM

Harold D. Albright, Jr., 2201 Providence Road, Charlotte, N.C. 28211

Filed July 12, 1976, Ser. No. 704,239
Term of patent 14 years
Int. Cl. D25—03

U.S. Cl. D25—9



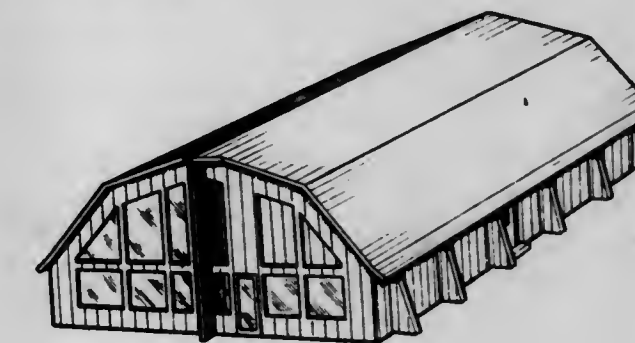
246,193

BUILDING

Sandra Lee Reckwald, 1145 Valley Road, Mackinaw City, Mich. 49701

Filed Sept. 2, 1976, Ser. No. 719,921
Term of patent 14 years
Int. Cl. D25—03

U.S. Cl. D25—24

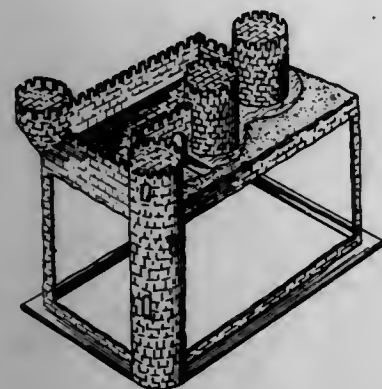


246,194
AQUARIUM COVER

Scott F. Akers, 1515 Fort Davis Place, SE., Washington, D.C. 20021

Filed Sept. 28, 1976, Ser. No. 727,601
Term of patent 14 years
Int. Cl. D30-02

U.S. Cl. D30-12



246,195
BOY DOLL

Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Friedlich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe

Filed Jan. 23, 1976, Ser. No. 651,720
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-4 R

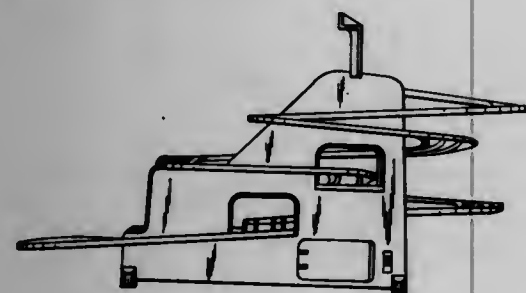


246,196
TOY RACING TRACKWAY

Toshio Suzuki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Nov. 5, 1975, Ser. No. 628,946
Claims priority, application Japan, June 3, 1975, 50-22156
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-5 CC

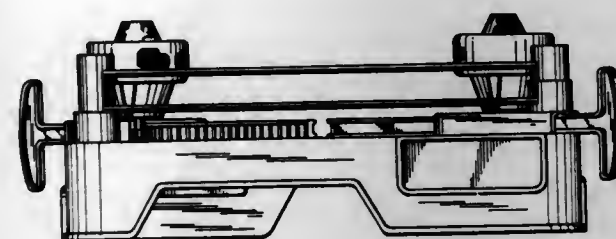


246,197
STYLIZED BOXING GAME APPARATUS, OR SIMILAR ARTICLE

Tetsuo Iwanami, Matsudo, Japan, assignor to Sanyei Corporation, Nagoya, Japan

Filed July 24, 1975, Ser. No. 598,776
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-15 AD

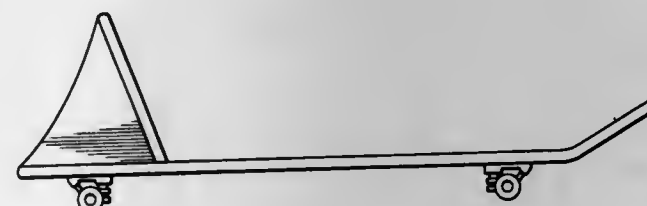


246,198
COASTER

Douglas H. Rose, 1725 Via De Alba, Rancho Santa Fe, Calif. 92067

Filed Apr. 13, 1976, Ser. No. 676,693
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-15 AJ



246,199
ARTICULATED TOY FIGURE

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed May 17, 1976, Ser. No. 686,735
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-15 AD

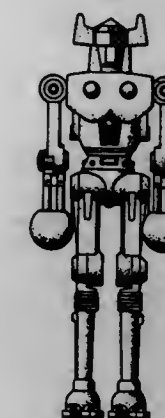


246,200
ARTICULATED TOY FIGURE

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed May 17, 1976, Ser. No. 686,786
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-15 AD

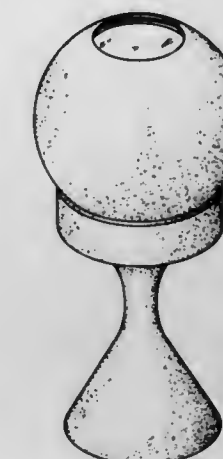


246,202
ANIMATION LAMP

Henry J. Oppermann, 617 Westland Drive, Greensburg, Pa. 15601

Filed June 17, 1975, Ser. No. 587,710
Term of patent 14 years
Int. Cl. D26-05

U.S. Cl. D48-20 R



246,201
ARTICULATED TOY FIGURE

Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed May 17, 1976, Ser. No. 686,960
Term of patent 14 years
Int. Cl. D21-01

U.S. Cl. D34-15 AD

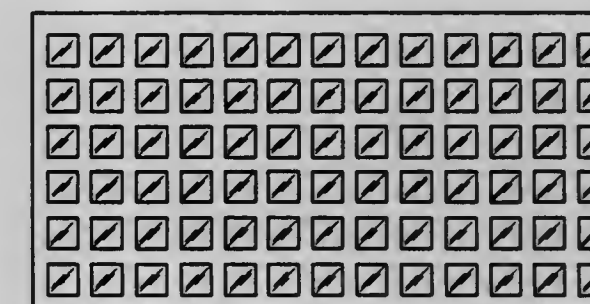


246,203
LIGHTING PANEL

Edward H. Harris, 1065 E. Flamingo Road, Apt. 524, Las Vegas, Nev. 89109

Filed Apr. 26, 1976, Ser. No. 680,585
Term of patent 14 years
Int. Cl. D26-05

U.S. Cl. D48-23 R



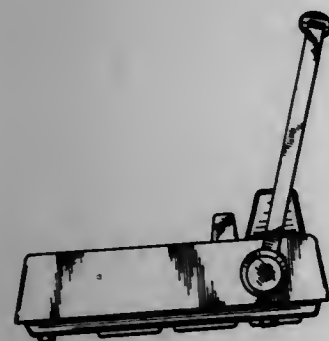
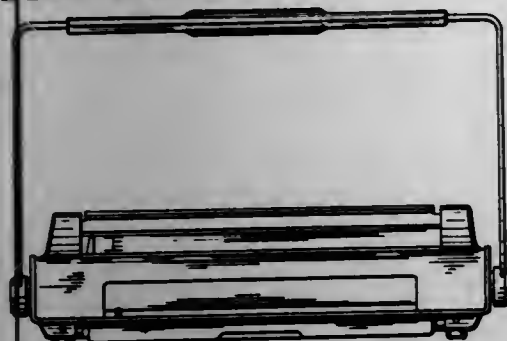
246,204

BOOK BINDING MACHINE

James G. Balmer, Bloomfield Hills, and Peter E. Linder, Southfield, both of Mich., assignors to Velo-Bind, Inc., Sunnyvale, Calif.

Filed Oct. 28, 1975, Ser. No. 626,287
Term of patent 14 years
Int. Cl. D18-04

U.S. Cl. D64-11 R



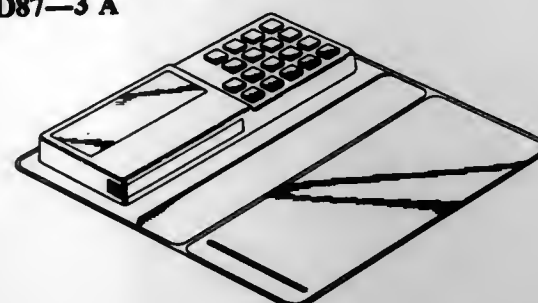
246,205

COMBINED WALLET AND CALCULATOR

Peter Howard Lewis, 12A Turtle Cove Villas, Redhill Road, Tai Tam, Hong Kong

Filed Sept. 16, 1975, Ser. No. 613,863
Term of patent 14 years
Int. Cl. D3-01

U.S. Cl. D87-3 A



LIST OF PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF OCTOBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- A.C.I. Operations Pty. Ltd.: See—
Hammond, Michael George Ridler, 4,055,032, Cl. 53-14.000.
- A. Christiaens Societe Anonyme: See—
Delarge, Jacques E.; Lapiere, Charles L.; and Georges, Andre H., 4,055,650, Cl. 424-263.000.
- A. H. Emery Company, The: See—
Brackett, George E., 4,055,227, Cl. 177-208.000.
- A. J. Gerrard & Company: See—
Simich, Emil; and Traxinger, Walter R., 4,055,115, Cl. 100-34.000.
- Simich, Emil, 4,055,328, Cl. 254-79.000.
- AAI Corporation: See—
Sweeney, Patrick E., 4,055,332, Cl. 266-48.000.
- Aasgaard, Alvin L. P., III: See—
Kamp, Walter B.; Kimmel, Richard L.; and Aasgaard, Alvin L. P., III, 4,054,993, Cl. 30-276.000.
- AB Svenska Flakfabriken: See—
Larkfeldt, Birger, 4,055,112, Cl. 98-33.00A.
- AB Ziristor: See—
Sjostrand, Uno Roland; and Johansson, Goran Karl Nils, 4,055,035, Cl. 53-167.000.
- Abbott Laboratories: See—
Tomiooka, Shinji; Mori, Yasuki; Nara, Takashi; and Shirahata, Kunikatsu, 4,055,715, Cl. 536-17.000.
- Abbott, Phillip Andrew, to Brown & Root, Inc. Deck section loading. 4,055,264, Cl. 214-152.000.
- Abe, Naohiro: See—
Fujikura, Masakuni; and Abe, Naohiro, 4,055,448, Cl. 148-38.000.
- Abel, Heinz: See—
Schafer, Paul; Abel, Heinz; and Mayer, Fritz, 4,055,393, Cl. 8-62.000.
- Aberg, Martin Birger. Safety device for gear wheels. 4,055,092, Cl. 74-439.000.
- Abraham, Robert C.; and Cline, James E. D., to Perlec Computer Corporation. Phase locked loop for synchronizing VCO with digital data pulses. 4,055,814, Cl. 331-1.00A.
- Abrahams, Siegfried: See—
Berlin, Herbert; Abrahams, Siegfried; and Brand, Peter, 4,055,192, Cl. 131-84.00B.
- ACF Industries, Incorporated: See—
Freeman, John W.; Jones, Thomas M.; and Reagan, Harold D., 4,054,978, Cl. 29-157.10R.
- Vyval, Larry A., 4,055,325, Cl. 251-328.000.
- Ackeret, Peter, to Salter Housewares Limited. Food comminuting device. 4,055,308, Cl. 241-100.000.
- Ackrell, Jack; and Muchowski, Joseph M., to Syntex (U.S.A.) Inc. 6,11-Dihydrodibenzothiepin-11-one-3-thioacetates. 4,055,574, Cl. 260-327.00B.
- Adachi, Keiichi: See—
Masuda, Takao; and Adachi, Keiichi, 4,055,432, Cl. 96-114.100.
- Adamson, Arthur P.; Sargisson, Donald F.; and Stotler, Charles L., Jr., to United States of America, National Aeronautics and Space Administration. Integrated gas turbine engine-nacelle. 4,055,041, Cl. 60-226.00R.
- Addressograph Multigraph Corporation: See—
Baltazzi, Evan Serge; and Datta, Pabitra, 4,055,684, Cl. 427-18.000.
- Aeberli, Max, to Sandoz Ltd. Monoazo and diazo compounds having optionally further substituted 2-acyl-, carboxy- or cyano-benzothienyl diazo component radicals. 4,055,556, Cl. 260-152.000.
- Aeg-Telefunken Kabelwerke Aktiengesellschaft: See—
Heumann, Heinz; Saure, Manfred; Wagner, Heinz; and Wartusch, Johann, 4,055,504, Cl. 252-63.200.
- Afanasiev, Vladimir Konstantinovich: See—
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich, 4,055,039, Cl. 57-34.0AT.
- Agfa-Gevaert Aktiengesellschaft: See—
Bayer, Gunther; Fitzky, Hans Georg; Hoyer, Herbert; Luttgens, Gunter; and Muller-Bardorff, Wolfgang, 4,055,685, Cl. 96-87.00R.
- Bergthaller, Peter; Himmelmann, Wolfgang; Sauerteig, Wolfgang; and Rosenhahn, Lothar, 4,055,427, Cl. 96-67.000.
- Feneberg, Paul; and Krekeler, Ulrich, 4,055,378, Cl. 351-160.000.
- Kaiser, Michael; and Schaffer, Ludwig, 4,055,289, Cl. 226-92.000.
- Aharoni, Shaul M.: See—
Prevorsek, Dusan C.; and Aharoni, Shaul M., 4,055,606, Cl. 260-835.000.
- Ahmed, Adel Abdel Aziz, to RCA Corporation. Current scaling apparatus. 4,055,774, Cl. 307-296.00R.
- Airway Industries, Inc.: See—
Weiner, Jay H., 4,055,239, Cl. 190-50.000.
- Aishin Seiki Kabushiki Kaisha: See—
Numazawa, Akio; Nakamura, Hiroyuki; Kurita, Tokio; Horie, Kouji; and Kondo, Toshio, 4,055,237, Cl. 188-73.400.
- Akai Kikai Kogyo Co., Ltd.: See—
Moore, Takuo, 4,055,487, Cl. 209-44.000.
- Akamatsu, Takashi: See—
Hotta, Seiji; and Akamatsu, Takashi, 4,055,565, Cl. 260-281.00N.
- Akimov, Jury Stepanovich; Sushkov, Valery Petrovich; and Kurinny, Vladimir Ivanovich. Method for producing semiconductor matrix of light-emitting elements utilizing ion implantation and diffusion heating. 4,055,443, Cl. 148-1.500.
- Akiyama, Minoru: See—
Ishida, Torao; Shirai, Takashi; and Akiyama, Minoru, 4,055,716, Cl. 536-23.000.
- Akrosil Corporation: See—
Kapral, Ales M., 4,055,613, Cl. 264-46.400.
- Aktiebolaget Leo: See—
Hogberg, Bertil; Fax, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,055,638, Cl. 424-219.000.
- Aktiebolaget Tudor: See—
Borjesson, Anders, 4,054,990, Cl. 29-623.100.
- Akzona Incorporated: See—
Friedman, Stephen B.; and Linnecke, Carl B., 4,055,394, Cl. 23-253.0TP.
- Stelwagen, Willem, 4,055,220, Cl. 165-89.000.
- Albright, Larry E.: See—
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,055,262, Cl. 214-140.000.
- Alcan Research and Development Limited: See—
Sivilotti, Olivo Giuseppe, 4,055,474, Cl. 204-70.000.
- Alderson Research Laboratories, Inc.: See—
Goodenough, David John; Weaver, Kenneth E.; Smrcka, Joseph G.; and Clayman, William, 4,055,771, Cl. 250-505.000.
- Aleniusson, Sven Goran, to Isolering Aktiebolaget Isenta. Method for the application of a protection cover around heat or cool insulated tube bends. 4,054,985, Cl. 29-416.000.
- Alger, Donald L.: See—
Steinberg, Robert; Alger, Donald L.; and Cooper, Dale W., 4,055,686, Cl. 427-124.000.
- Allan, Thomas T.; and Wilcox, David E., to Flanders Filters, Inc. Method and apparatus for the leak testing of filters. 4,055,075, Cl. 73-40.700.
- Allegheny Ludlum Industries, Inc.: See—
Martin, Jack P.; and Gray, Thomas H., 4,055,062, Cl. 72-47.000.
- Allemard, Robert, to Commissariat a l'Energie Atomique. Detection apparatus for X-ray tomography. 4,055,767, Cl. 250-385.000.
- Allied Chemical Corporation: See—
Murphy, Kevin P.; and Stahl, Richard F., 4,055,049, Cl. 60-651.000.
- Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., 4,055,054, Cl. 62-114.000.
- Prevorsek, Dusan C.; and Aharoni, Shaul M., 4,055,606, Cl. 260-835.000.
- Taub, Bernard; and Ostrozyński, Robert Leopold, 4,055,521, Cl. 260-2.5AF.
- Allinquant, Fernand Michel; and Allinquant, Jacques Gabriel. Sealing means for a longitudinally displaceable rod. 4,055,352, Cl. 277-152.000.
- Allinquant, Jacques Gabriel: See—
Allinquant, Fernand Michel; and Allinquant, Jacques Gabriel, 4,055,352, Cl. 277-152.000.
- Allmendinger, Karl: See—
Kleen, Gerhard; Schiemann, Heinz; and Allmendinger, Karl, 4,055,825, Cl. 336-70.000.
- Allori, Raymond J.: See—
Kestian, Anthony M.; and Allori, Raymond J., 4,055,230, Cl. 180-89.100.
- Alpha Industries, Inc.: See—
Borzum, Alexander, 4,055,096, Cl. 83-37.000.
- Borzum, Alexander, 4,055,100, Cl. 83-454.000.
- Alumax Inc.: See—
Stephens, Wilbur E., 4,055,334, Cl. 266-138.000.
- Aluminum Company of America: See—
Kronenwetter, Howard W.; and Schultz, Freddy R., 4,055,271, Cl. 220-64.000.
- Alvarez, Francisco S.; and Van Horn, Albert R., to Syntex (U.S.A.) Inc. Novel prostaglandin intermediates and process for the production thereof. 4,055,564, Cl. 542-413.000.
- Alza Corporation: See—
Weinschenker, Ned M.; and Andersen, Niels H., 4,055,593, Cl. 260-514.00D.
- Amabili, Arnaldo. Combination crown twist-off closure cap. 4,055,266, Cl. 215-252.000.

Amagami, Keizo: See—
Nakamura, Masatatsu; Kominami, Hideyuki; Amagami, Keizo; Kabayashi, Takao; and Toyooka, Tadao, 4,055,740, Cl. 219-1049R.

Amatsu, Hideo: See—
Tozawa, Keizaburo; Amatsu, Hideo; Takahashi, Shinichiro; Fujimoto, Kazumi; and Ikeda, Kishio, 4,055,372, Cl. 312-15.000.

American Can Company: See—
Beese, Ronald E., 4,055,272, Cl. 220-64.000.

American Filtrona Corporation: See—
Holden, Herbert K.; and Mansfield, Peter W., 4,055,108, Cl. 93-1.00C.

American Home Products Corporation: See—
Chai, Sie-Yearl; and Yardley, John P., 4,055,553, Cl. 260-112.50S.

American Optical Corporation: See—
Winthrop, John Talley, 4,055,379, Cl. 351-171.000.

American Sterilizer Company: See—
Vig, Satinder K.; Koester, Harold J.; and Berg, William H., Jr., 4,054,965, Cl. 16-35.00D.

Waldron, Stephen H., 4,055,185, Cl. 128-305.100.

AMF Incorporated: See—
Rosa, Haldon, 4,055,093, Cl. 74-501.00R.

AMI Industries, Inc.: See—
Bengtsson, Robert J., 4,055,320, Cl. 248-501.000.

Andersen, Erik, to Danfoss A/S. Electromagnetic valve assembly means, 4,055,823, Cl. 335-255.000.

Andersen, Niels H.: See—
Weinsbenker, Ned M.; and Andersen, Niels H., 4,055,593, Cl. 260-514.00D.

Andersen, Peter B.; Winter, Claus; and Hendel, Siegfried H., to Inbauprodukt Innenaussysteme GmbH & Co., KG. Furniture construction system, 4,055,373, Cl. 312-263.000.

Anglo-American Clays Corporation: See—
Nott, Alan J., 4,055,485, Cl. 209-3.000.

Angus, Ronald Joseph; and Lacy, James Volney, to Bell Telephone Laboratories, Incorporated. Key telephone lamp control circuit, 4,055,731, Cl. 179-99.000.

Anselment, Wolfgang; and Gritschmeier, Walter, to Robert Bosch G.m.b.H. Lubricating powder and method of producing same and relatively slideable components, 4,055,503, Cl. 252-12.000.

Antkivi, Stephen, to Schlumberger Technology Corporation. Neutron characteristic and spectroscopy logging methods and apparatus, 4,054,763, Cl. 250-270.000.

Aoyagi, Takaaki: See—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.

Applied Power, Inc.: See—
Bayorgeon, Jeffrey T.; Vandalen, Dirk J.; and Legrand, Pierre N., 4,055,061, Cl. 72-32.000.

Arderzone, Frank J., to Probe Rite, Inc. Multi-point test probe, 4,055,805, Cl. 324-158.00P.

Arizona Chemical Company: See—
Schluenz, Robert William; and Davis, Curry Beach, 4,055,576, Cl. 260-346.000.

Armour Pharmaceutical Company: See—
Colescott, Robert L.; Kaiser, Emil; Bossinger, Charles D.; and Cook, Paul L., 4,055,524, Cl. 260-8.000.

Slibbe, Martin O., 4,055,664, Cl. 424-330.000.

Armstrong Cork Company: See—
Dieck, Ronald L.; and Quinn, Edwin J., 4,055,520, Cl. 260-2.50R.

Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., 4,055,523, Cl. 260-2.50R.

Dieck, Ronald L.; and Quinn, Edwin J., 4,055,545, Cl. 260-47.00P.

Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, to Snam Progetti S.p.A. Process for producing stabilized olefin terpolymers and stabilized olefin terpolymers produced according to said process, 4,055,535, Cl. 260-45.70R.

Arya, Vishwa Prakash; and Nagarajan, Kuppuswamy, to Ciba-Geigy Corporation. Condensed pyrrole mercapto compounds having hypotensive and decongestant properties, 4,055,647, Cl. 424-251.000.

Asahi Kasei Kogyo Kabushiki Kaisha: See—
Ishida, Torao; Shirai, Takashi; and Akiyama, Minoru, 4,055,716, Cl. 536-23.000.

Yano, Nobumitsu; Fukinbara, Itaru; Yoshida, Koji; and Korenaga, Tokiyoshi, 4,055,674, Cl. 426-430.000.

Ascher, Gerd; and Reinshagen, Hellmuth, to Sandoz Ltd. 1-(5-Nitrothiazolyl)-2-(3-piperazinomethyl)-imidazolidinones-2 and corresponding imino and thiones, 4,055,646, Cl. 424-250.000.

Ashida, Kaneyoshi; Ohtani, Masaaki; Yokoyama, Takashi; and Ohkubo, Shiochi, to Mitsubishi Chemical Industries Ltd. Process for producing an isocyanate-based polymer having reduced smoke generation, 4,055,522, Cl. 260-2.5AW.

Ashland Oil, Inc.: See—
Kim, Young D., 4,055,528, Cl. 260-29.300.

Atlantic Richfield Company: See—
McCoy, John J.; and Zajack, John G., 4,055,630, Cl. 423-509.000.

Rosenthal, Rudolph; and Shawl, Edward T., 4,055,629, Cl. 423-509.000.

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Pauluis, Gerard J.; and Miller, Alistair I., 4,055,398, Cl. 23-270.50W.

Atsumi, Senji: See—
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Augustin, Hans-Georg: See—
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Automatic Liquid Packaging, Inc.: See—
Komendowski, Henry, 4,055,282, Cl. 222-421.000.

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Yoli, Alfred H.; and Husain, Iqbal, 4,055,508, Cl. 252-301.10W.

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B. F. Goodrich Company, The: See—
Chasar, Dwight William, 4,055,540, Cl. 260-45.95C.

Kroenke, William Joseph, 4,055,537, Cl. 260-45.75D.

Kroenke, William Joseph, 4,055,538, Cl. 260-45.75P.

Riew, Changkiu Keith, 4,055,541, Cl. 260-47.0EN.

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Babushkina, Natalya Borisovna: See—
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezenenov, Sergei Vladimirovich, 4,055,039, Cl. 57-34.0AT.

Badertscher, Ernest; Chaveron, Michel; and Wenner, Valentin, to Societe d'Assistance Technique pour Produits Nestle S.A. Solubilization of casein, 4,055,555, Cl. 260-119.000.

Baermann, Max. Switchable permanent magnetic holding devices, 4,055,824, Cl. 335-288.000.

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Bahr, William J. Adjustable hair-clipping devices, 4,054,991, Cl. 30-231.000.

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Erickson, Randall L.; and Bailey, Terry R., 4,055,377, Cl. 350-105.000.

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Bakhanova, Lia Nakhshonovna: See—
Gvesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexander Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tashvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.

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Balaz, Alexander; Bone, David P.; and Shannon, Edward L., to Quaker Oats Company, The. Method of making a dry-type pet food, 4,055,681, Cl. 426-656.000.

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Krips, Herbert; and Podhorsky, Miroslav, 4,055,063, Cl. 72-62.000.

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Ball, Dorothy P.; and Ball, Charles E., 4,054,984, Cl. 29-237.000.

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Kawai, Shichio; Tanaka, Takahashi; Bannai, Eisuke; Uchida, Kenji; and Shimizu, Ryuichi, 4,055,780, Cl. 313-346.00R.

Barber, Womack Hardy, Jr. Lamp fixture conversion method, 4,055,374, Cl. 316-2.000.

Barer, Sol J.; Valenti, Peter C.; and Marchwinski, Michael, to National Patent Development Corporation. Halogenated acylamino acids as fungicides, 4,055,663, Cl. 424-319.000.

Barry-Wehmiller Company: See—
Klamm, Robert L.; and Day, Maurice R., 4,055,252, Cl. 209-74.00M.

Barthel, Alfred, to Union Carbide Corporation. Cryogenic storage container, 4,055,268, Cl. 220-9.00C.

Bartlett, Peter G., to Automation Systems, Inc. Electrical load controller, 4,055,793, Cl. 323-22.0SC.

Bartley, William W., to Wean United, Inc. Apparatus for removing fluid in a piston cylinder assembly, 4,055,107, Cl. 92-86.500.

Bartolini, Robert Alfred; and Bloom, Allen, to RCA Corporation. Organic medium for thin-phase holography, 4,055,423, Cl. 96-27.00H.

BASF Aktiengesellschaft: See—
Patsch, Manfred; and Vamvakaris, Christos, 4,055,568, Cl. 260-302.00H.

Bates, Richard L.: See—
D'Antonio, Nicholas F.; Bates, Richard L.; and French, Richard W., 4,055,078, Cl. 73-88.50R.

Battelle Memorial Institute: See—
Stambaugh, Edgel P.; and Sachs, George F., 4,055,400, Cl. 44-1.00R.

Battersby, John; Forbes, Eric Simon; and Reid, Angus Joseph Dickson, to British Petroleum Company Limited, The. Gasoline composition, 4,055,402, Cl. 44-58.000.

Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., to Clark Equipment Company. Loader main frame for skid steer loader, 4,055,262, Cl. 214-140.000.

Bauer, Werner R., to Robertshaw Controls Company. Condition responsive control device, 4,055,828, Cl. 337-308.000.

Bayer Aktiengesellschaft: See—
Goebel, Hermann, 4,055,558, Cl. 260-166.000.

Hoffmann, Hellmut; Hamann, Ingeborg; and Stendel, Wilhelm, 4,055,571, Cl. 260-308.00R.

Hucks, Uwe; and Vernalen, Hugo, 4,055,611, Cl. 264-6.000.

Niederprum, Hans; Klein, Heinz Gunter; and Meussdoerffer, Johann-Nikolaus, 4,055,458, Cl. 156-663.000.

Wiesel, Manfred; and Sommer, Richard, 4,055,557, Cl. 260-162.000.

Bayer, Gunther; Fitzky, Hans Georg; Hoyer, Herbert; Luttgens, Gunter; and Muller-Bardorff, Wolfgang, to Agfa-Gevaert Aktiengesellschaft. Process for the improvement of the adhesion of photographic layers to a film web by means of a corona treatment, 4,055,685, Cl. 96-87.00R.

Bayorgeon, Jeffrey T.; Vandalen, Dirk J.; and Legrand, Pierre N., to Applied Power, Inc. Apparatus for reforming and straightening vehicles, 4,055,061, Cl. 72-32.000.

Beadle, Bruce R.; and Olig, Eugene A., to Giddings & Lewis, Inc. Interruptible numerical contouring control system with return to path safeguards, 4,055,787, Cl. 318-591.000.

Bearden, Roby, Jr.: See—
Mertzweiler, Joseph K.; and Bearden, Roby, Jr., 4,055,483, Cl. 208-213.000.

Beaujot, Norbert: See—
Brockman, Arnold; and Beaujot, Norbert, 4,055,148, Cl. 119-103.000.

Beavon, David K.; and Jirus, Earl J., to Ralph M. Parsons Company, The. Reducing gas generator, 4,055,401, Cl. 23-277.00C.

Beck, Herbert C., to Electronic Engineering Co. of California. Multiple switch mount, 4,055,738, Cl. 200-296.000.

Beck, Kurt-Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, to Bergwerksverband GmbH. Method of restricting the formation of dust when feeding coal into coke ovens, 4,055,471, Cl. 201-20.000.

Becker, Frederick R., III, to Metropolitan Wire Corporation. Bumper assembly for a rolling cart, 4,055,362, Cl. 293-62.000.

Beecham Group Limited: See—
Green, Joseph; and Cawthorne, Michael Anthony, 4,055,635, Cl. 424-78.000.

Beery, Floyd T., to Hallmark Cards, Incorporated. Polyolefin web having remountable adhesive bonded thereto, 4,055,698, Cl. 428-262.000.

Beese, Ronald E., to American Can Company, Containers, 4,055,272, Cl. 220-64.000.

Belanger, Inc.: See—
Belanger, James A., 4,055,028, Cl. 51-334.000.

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Bell, Heather, to Raymond Lee Organization, Inc., The, a part interest. Account and file book, 4,055,008, Cl. 40-104.190.

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Bell Telephone Laboratories, Incorporated: See—
Angner, Ronald Joseph; and Lacy, James Volney, 4,055,731, Cl. 179-99.000.

Crawford, Charles David, 4,055,841, Cl. 340-347.0DD.

Panousis, Peter Theodore; Pritchett, Robert Leonard; and Smits, Friedolf Michael, 4,055,802, Cl. 324-73.0AT.

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Buckley, David A.; and Belli, Frank G., 4,055,418, Cl. 96-1.0PS.

Bellina, Russell Frank; and Fost, Dennis Lynn, to Du Pont de Nemours, E. I., and Company. Miticidal and apicidal method utilizing 2-higher alkyl-3-hydroxy-1,4-naphthoquinone carboxylic acid esters, 4,055,661, Cl. 424-311.000.

Bellino, Jim. Bicycle lock, 4,055,060, Cl. 70-234.000.

Belmont, Edward Bruce, to RJR Foods, Inc. Package for storing and transporting tortillas or tacos, 4,055,670, Cl. 426-119.000.

Beloit Management & Research Center: See—
Hornbostel, Lloyd H., Jr., 4,055,844, Cl. 340-420.000.

Benedick, William B.; and Daniel, Charles J., to United States of America, Energy Research and Development Administration. Explosion containment device, 4,055,247, Cl. 206-3.000.

Benezra, Leo L.; Hill, David W.; Rihihaki, Arnold; and Tsai, Shan-Pu, to Diamond Shamrock Corporation. Method for lowering chlorate content of alkali metal hydroxides, 4,055,476, Cl. 204-98.000.

Bengtsson, Robert J., to AMI Industries, Inc. Chair clamp and restraint, 4,055,320, Cl. 248-501.000.

Bennett, Gregory B., to Sandoz, Inc. Furo(3,4-E)-as-triazines and corresponding 4-oxides as sleep inducers and minor tranquilizers, 4,055,643, Cl. 424-249.000.

Bennett, Richard Nelson: See—
Rosen, Sidney; and Bennett, Richard Nelson, 4,055,281, Cl. 222-309.000.

Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal;

and Petrow, Vladimir, to Richardson-Merrell Inc. Method of treating benign prostatic hypertrophy, 4,055,641, Cl. 424-242.000.

Berg, William H., Jr.: See—
Vig, Satinder K.; Koester, Harold J.; and Berg, William H., Jr., 4,054,965, Cl. 16-35.00D.

Berger, Heinz: See—
Gehring, Thilo; and Berger, Heinz, 4,055,157, Cl. 123-117.00R.

Bergthaller, Peter; Himmelmann, Wolfgang; Sauerteig, Wolfgang; and Rosenhahn, Lothar, to Agfa-Gevaert Aktiengesellschaft. Process of hardening a silver halide photographic material with a 1-carbamoyloxypyridinium salt, 4,055,427, Cl. 96-67.000.

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Beck, Kurt-Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, 4,055,471, Cl. 201-20.000.

Kolling, Georg; and Romey, Ingo, 4,055,583, Cl. 423-447.400.

Berlin, Herbert; Abrahams, Siegfried; and Brand, Peter, to Hauni-Werke Korber & Co., KG. Recovery of reusable tobacco particles in machines for the production of plain and filter tipped smokers products, 4,055,192, Cl. 131-84.00B.

Bernardot, Andre R.: See—
Raisin, Jean-Pierre A.; and Bernardot, Andre R., 4,055,244, Cl. 198-345.000.

Bernstein, Dell L. Curettement device, 4,055,167, Cl. 128-2.00B.

Bers, Abraham: See—
Stern, Ernest; Williamson, Richard C.; Bers, Abraham; and Cafarella, John H., 4,055,758, Cl. 364-821.000.

Bertelli, Aldo, to Rorer Italiana S.p.A. Derivatives of aminomethylcyclohexanecarboxylic acid, 4,055,580, Cl. 260-404.500.

Best, Francis Brian, to JWI Ltd. Method and apparatus for preventing the adherence of polarized foreign particles to paper machine components, 4,055,459, Cl. 162-192.000.

Bicking, John B.: See—
Cragoe, Edward J., Jr.; and Bicking, John B., 4,055,597, Cl. 260-534.00M.

Bieri, Hans, to Hydrostress Aktiengesellschaft. Clamping device, especially for rock or concrete drills, 4,055,353, Cl. 279-2.00R.

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Binder, Georg, to Robert Bosch G.m.b.H. Generator housing, 4,055,778, Cl. 310-89.000.

Binoche, Michel, to SKM. Equipment for spraying paint and the like, 4,055,300, Cl. 239-15.000.

Bjors, Nils G. Work piece clamp arrangements, 4,055,385, Cl. 85-1.0SS.

Blace, Zdenko: See—
Peska, Jan; Stamberg, Jiri; and Blace, Zdenko, 4,055,510, Cl. 252-426.000.

Black, James M., to United States of America, National Aeronautics and Space Administration. Window comparator, 4,055,777, Cl. 307-36.000.

Blair, Richard L. Cap for a widemouthed container, 4,055,267, Cl. 215-254.000.

Bland, Robert J.; and Seipel, Winfried, to Hewlett-Packard Company. Self commutated SCR power supply, 4,055,791, Cl. 363-28.000.

Blandin Wood Products: See—
Withoff, Alfred J.; and Schultz, David C., 4,055,205, Cl. 144-281.00R.

Blankenship, Charles P.: See—
Oldrieve, Robert E.; and Blankenship, Charles P., 4,055,416, Cl. 75-124.000.

Blaser, Don E.; and Molstedt, Byron V., to Exxon Research & Engineering Co. Elutriation in a fluid coking process, 4,055,484, Cl. 208-127.000.

Blaul, John Joseph, to Illinois Tool Works Inc. Locking fastener device, 4,055,208, Cl. 151-37.000.

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Bartolini, Robert Alfred; and Bloom, Allen, 4,055,423, Cl. 96-27.00H.

Blue, Maurice R. Battery terminal post cleaner, 4,055,687, Cl. 427-142.000.

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Boeing Company, The: See—
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Lynn, William Fred; and Walker, Gordon Marvin, 4,055,369, Cl. 308-187.100.

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Bolhofer, William A., to Merck & Co., Inc. N-(Sulfo-lower alkyl) amides of (3-trifluoromethylphenoxy) (4-chlorophenyl)acetic acid, 4,055,592, Cl. 260-507.00R.

Bonaiti, Francesco, to Tekma Kinomat S.p.A. Taping device in coil winders, 4,055,310, Cl. 242-7.080.

Bondarev, Konstantin Timofeevich: See—
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibrailovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.

Bone, David P.: See—
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- Borden, Inc.: See—
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- Bordt, Dale E.: See—
Torrey, Harry L.; Torrey, Helen T.; and Bordt, Dale E., 4,055,466, Cl. 195-1.700.
- Borjesson, Anders, to Aktiebolaget Tudor. Method of arranging electrodes of storage batteries. 4,054,990, Cl. 29-623.100.
- Borostyan, Stephen, to Xerox Corporation. Transfer charge maintaining system. 4,055,380, Cl. 355-3.00R.
- Borzym, Alexander, to Alpha Industries, Inc. Die set for cutting I-beam. 4,055,096, Cl. 83-37.000.
- Borzym, Alexander, to Alpha Industries, Inc. Severing knife for tube cutoff apparatus. 4,055,100, Cl. 83-454.000.
- Boshinski, Edwin E.; Meckstroth, Robert C.; and Rogers, Robert M., to Hobart Corporation. Computing weighing scale. 4,055,748, Cl. 364-466.000.
- Boshinski, Edwin E.: See—
Rogers, Robert M.; and Boshinski, Edwin E., 4,055,753, Cl. 364-466.000.
- Bossinger, Charles D.: See—
Colescott, Robert L.; Kaiser, Emil; Bossinger, Charles D.; and Cook, Paul I., 4,055,524, Cl. 260-8.000.
- Bott, John A. Vehicle article carrier. 4,055,284, Cl. 224-42.10D.
- Bott, John A. Article supporting slat. 4,055,285, Cl. 224-42.10D.
- Bouchard, Andre C.; Hall, Harold H., Jr.; Mercaldi, Renaldo; and Sentementes, Thomas J., to GTE Sylvania Incorporated. Signal device using percussive flashlamps. 4,055,759, Cl. 362-159.000.
- Boynton, Kenneth G., to Hollis Engineering, Inc. Circuit board assembly. 4,055,725, Cl. 174-68.500.
- Brackett, George E., to A. H. Emery Company, The. Heavy duty hydraulic weighing apparatus. 4,055,227, Cl. 177-208.000.
- Brand, Glenn C. Coin operated timer. 4,055,243, Cl. 194-61.000.
- Brand, Peter: See—
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- Brandenstein, Manfred: See—
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- Breide, Max. Lifting device for batteries and the like. 4,055,364, Cl. 294-63.00B.
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- Brescia, Riccardo: See—
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- Bridgeman, James Earl, to Mor-Flo Industries, Inc. Heat exchanger for solar energy. 4,054,981, Cl. 29-157.30R.
- Bridgestone Tire Company Limited: See—
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- Brinkmeier, Friedhelm, to Windmoller & Holscher. Apparatus for compressing and packaging stacks of flat superposed sheet articles. 4,055,034, Cl. 53-124.00C.
- British Petroleum Company Limited, The: See—
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- Dickson, 4,055,402, Cl. 44-58.000.
- McCarroll, John James; Clark, John Trevor Kent; and Tension, Stephen Robert, 4,055,628, Cl. 423-448.000.
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- Brockman's Service Ltd.: See—
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- Bronberg, Nathan S. Light measuring apparatus. 4,055,768, Cl. 250-44.100R.
- Brown, Charles M.: See—
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- Brown, Erben G., to Golden State Helicopter, Inc. Agrichemical spraying system. 4,055,303, Cl. 239-142.000.
- Brown, Harry J.; Forger, William D.; and Brown, Charles M., to Union Carbide Corporation. Hard facing rod. 4,055,742, Cl. 219-145.000.
- Brown, Ronald P.; and Harden, Jerrell W. Sub-soil breaking, surface-soil conditioning and planter machine. 4,055,126, Cl. 111-85.000.
- Brown & Root, Inc.: See—
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- Bryant, Herman G., Jr.: See—
Norman, Vello; and Bryant, Herman G., Jr., 4,055,191, Cl. 131-9.000.
- Buchanan, John Gordon, to JWI Ltd. Paper machine shake. 4,055,460, Cl. 162-209.000.
- Buck, Robert J. Electronic temperature control system for thermostatic control. 4,055,296, Cl. 236-1.00C.
- Buckley, David A.; and Belli, Frank G., to Xerox Corporation. Migration imaging method using an imaging member employing a surface skin. 4,055,418, Cl. 96-1.0PS.
- Buecher, Roger W.: See—
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- Bukac, Zbynek; Sebenda, Jan; and Suchy, Richard, to Ceskoslovenska akademie ved. Hot-melt adhesives based on anionic terpolymers of lactams. 4,055,552, Cl. 260-78.00L.
- Burger, Richard A.: See—
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- Burgi, Henry R. Camper lifter device. 4,055,327, Cl. 254-47.000.
- Burkl, Erich: See—
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- Burley, David R., to Tile Council of America, Inc. Adhesive joint dressing compositions containing an alkali thickenable polymer. 4,055,529, Cl. 260-29.6RW.
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- Burroughs Corporation: See—
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- Burton, Elwin E. Skateboard with brake. 4,055,234, Cl. 188-2.00R.
- Bussmann, Egon; Flamme, Bruno; Vanhumbecq, Jacky; Helder, Johannes; and De Steur, Hubert, to Siemens Aktiengesellschaft. Process control system for the automatic analysis and regeneration of galvanic baths. 4,055,751, Cl. 364-500.000.
- Buxbaum, Lothar: See—
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- Bykhovsky, David Grigorievich; Medvedev, Alexandr Yakovlevich; Bogorodsky, Yuri Alexandrovich; Firsov, Vladimir Nikolaevich; and Rossomakho, Yakov Vulfovich. Plasma arc torch. 4,055,741, Cl. 219-121.00P.
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- Cafarella, John H.: See—
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- Cairns, Hugh; Chambers, Albert; and Lee, Thomas Brian, to Fisons Limited. 6,8-Di-*t*-butyl-4-oxo-4H-1-benzopyran-2-carboxylic acid and derivative for the prevention of asthmatic symptoms. 4,055,654, Cl. 424-283.000.
- Calcagno, Benedetto: See—
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- Calumet Petrochemicals, Inc.: See—
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- Camid Intermatic: See—
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- Camirand, Wayne M.: See—
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- Campbell, Gerald Allan: See—
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- Campbell, Steven J.: See—
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- Caporusso, Alessandro; and Caporusso, Mario. Portable manually controlled hydraulic pipe bending apparatus. 4,055,069, Cl. 72-389.000.
- Caporusso, Mario: See—
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- Cappiello, Luciano. Gas saving device. 4,055,159, Cl. 123-119.00B.
- Carabatas, Philip M.; and Williams, Gordon L., to Sterling Drug Inc. Tetra-(lower-alkyl)-3-(3-nitrophenyl)-1,5-pentanediene-1,2,4,5-tetracarboxylates. 4,055,588, Cl. 560-23.000.
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- Carliale, Richard S. Method and apparatus for severing and edge-sealing thermoplastic films, and product. 4,055,452, Cl. 156-251.000.
- Carnegie, Frank, Jr., to Camid Intermatic. Impulse heat-sealing machine. 4,055,456, Cl. 156-366.000.
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- Cassidy, Hugh I. Permeable liner having concrete setting retardant. 4,055,322, Cl. 249-187.00R.
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- Schexnayder, Lawrence F., 4,055,046, Cl. 60-428.000.
- Sogge, John W., 4,055,368, Cl. 305-57.000.
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- Cawthorne, Michael Anthony: See—
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- Centre Technique Industriel dit Institut Textile de France: See—
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- Champion International Corporation: See—
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- Chase, Wendell D., to United States of America, National Aeronautics and Space Administration. Full color hybrid display for aircraft simulators. 4,055,004, Cl. 35-12.00N.
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- Cheng, Thomas T., to Union Carbide Corporation. Novel polyamide adhesives and method of preparation. 4,055,525, Cl. 260-18.00N.
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- Choy S.A.: See—
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- Cecl, Georg; and Mueller, Willy, 4,055,559, Cl. 260-176.000.
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- Fischer, Hanspeter, 4,055,411, Cl. 71-92.000.
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- Kny, Hermann, 4,055,584, Cl. 260-448.20E.
- Koller, Stefan; Pacher, Marielise; and Emmenegger, Karl, 4,055,392, Cl. 8-21.00C.
- Nachbur, Hermann; and Maeder, Arthur, 4,055,689, Cl. 427-379.000.
- Rosenberger, Siegfried, 4,055,539, Cl. 260-45.95C.
- Schafer, Paul; Abel, Heinz; and Mayer, Fritz, 4,055,393, Cl. 8-62.000.
- Wheeler, Ian Robert; and Robertson, George Heddle, 4,055,440, Cl. 106-288.00Q.
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- Clark, John Trevor Kent: See—
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- Clarke Chapman, Ltd.: See—
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- Claxton, George P.: See—
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- Collins, William J. Device and method for obtaining one or more samples of liquid. 4,055,086, Cl. 73-425.40R.
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- Continental Oil Company: See—
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- Eisenman, Leonard J. Bulk bed. 4,055,265, Cl. 214-17.00D.
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- Huntress, Charles B., 4,055,233, Cl. 181-135.000.
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- En, John, to Motorola, Inc. One-error correction convolutional coding system. 4,055,832, Cl. 340-146.1AQ.
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- Essex Group, Inc.: See—
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- Ethyl Corporation: See—
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- Falkenstein, Don I.: See—
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- Fuchs, Werner Karl Heinz. Sensor. 4,055,090, Cl. 73-510.000.
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- Masuda, Takao; and Adachi, Keiichi, 4,055,432, Cl. 96-114.100.
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- Futamura, Kazumasa: See—
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- G. D. Searle & Co.: See—
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- GAF Corporation: See—
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- Gallay S.A.: See—
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- Georges, Andre H.: See—
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- Gerber, Arthur H., to Horizons Incorporated, a division of Horizons Research Incorporated. Upgraded aromatic polyester material in powder form. 4,055,534, Cl. 260-45.7PH.
- Gerber, Mark S.; and Miller, Don W., to Ohio State University, The. Gamma camera system with composite solid state detector. 4,055,765, Cl. 250-370.000.
- Gerber, Mark S.: See—
Miller, Don W.; and Gerber, Mark S., 4,055,766, Cl. 250-370.000.
- Gerding, James H.; and Heyman, Albert M., to Honeywell Information Systems Inc. Power supply with base drive control. 4,055,790, Cl. 363-24.000.
- Gesellschaft fur Kernforschung m.b.H.: See—
Waldenmeier, Gunter; and Hempelmann, Wilhelm, 4,055,274, Cl. 220-256.000.
- Gewako S.A.: See—
Tangen, Walter, 4,054,961, Cl. 9-11.00A.
- Ghetti, Giuseppe: See—
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, 4,055,535, Cl. 260-45.70R.
- Giddings & Lewis, Inc.: See—
Beadle, Bruce R.; and Olig, Eugene A., 4,055,787, Cl. 318-591.000.
- Plummer, Harvey R., 4,054,977, Cl. 407-108.000.
- Gilbert Sacks Enterprises, Inc.: See—
Martinez, Daniel G., 4,055,341, Cl. 273-86.00C.
- Gillette Company, The: See—
Greeley, William Hancock, Jr., 4,055,788, Cl. 318-624.000.
- Goebel, Hermann, to Bayer Aktiengesellschaft. Tetrakisazo dyestuffs. 4,055,558, Cl. 260-166.000.
- Golden State Helicopter, Inc.: See—
Brown, Erben G., 4,055,303, Cl. 239-142.000.
- Goldstein, Gideon, to Sloan-Kettering Institute for Cancer Research. Immunoassay for thymopoietin. 4,055,633, Cl. 424-1.000.
- Golius, Tamara Efimovna: See—
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alekseevna; Sarkisov, Pavel Dzhibrailovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolevich, 4,055,436, Cl. 106-52.000.
- Gontar, Herbert. Retainable tab construction for sealed cans. 4,055,275, Cl. 220-269.000.
- Gonzalez, Ed. Solar energy collector. 4,055,162, Cl. 126-271.000.
- Goodenough, David John; Weaver, Kenneth E.; Smrcka, Joseph G.; and Clayman, William, to Alderson Research Laboratories, Inc. Test body for a scanning tomographic analytical apparatus. 4,055,771, Cl. 250-505.000.
- Goodfellow, Anthony Gerald, to Dunlop Limited. Tire manufacture. 4,055,619, Cl. 264-258.000.
- Goodwin, Joseph E. Unitary club retainer for golf bags. 4,055,207, Cl. 150-1.50R.
- Gorder, Ray L.: See—
Uchytel, Anton R.; and Gorder, Ray L., 4,055,840, Cl. 340-321.000.
- Gorski, Robert A.: See—
Dastur, Kavsy D.; and Gorski, Robert A., 4,055,507, Cl. 252-162.000.
- Goto, Masaru: See—
Fujita, Shigemitsu; and Goto, Masaru, 4,055,618, Cl. 264-141.000.
- Gottfried Bischoff Bau Kompl. Gasreinigungs und Wasserruckkühlanlagen Kommanditgesellschaft: See—
Hegemann, Karl-Rudolf, 4,055,331, Cl. 266-44.000.
- Gouda, Keijiro: See—
Motai, Yoichi; Gouda, Keijiro; and Isono, Atsuya, 4,055,137, Cl. 114-230.000.
- Gould, Inc.: See—
Knapp, Edward J., Jr., 4,055,827, Cl. 337-297.000.
- Graff, Theodore S.: See—
Eachus, Joseph J.; and Graff, Theodore S., 4,055,735, Cl. 200-5.00A.
- Graham, Robert H., to R. A. Pearson Co. Flap laminating mechanism for carton blanks. 4,055,110, Cl. 93-49.00R.
- Gramespacher, Herbert; and Feisel, Armin, to Georg Fischer Aktiengesellschaft. Tool changing device for a lathe. 4,055,095, Cl. 82-36.00A.
- Gravestock, Michael B.: See—
Johnson, William S.; and Gravestock, Michael B., 4,055,603, Cl. 260-617.00R.
- Gray, Frederick W., to Colgate-Palmolive Company. Activated per-compound bleaching compositions. 4,055,505, Cl. 252-102.000.
- Gray, Thomas H.: See—
Martin, Jack P.; and Gray, Thomas H., 4,055,062, Cl. 72-47.000.
- Grechinsky, Dmitry Alexeevich: See—
Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klockko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich, 4,055,842, Cl. 340-347.0AD.
- Greeley, William Hancock, Jr., to Gillette Company, The. Motor control circuit. 4,055,788, Cl. 318-624.000.

Green, Douglas: See—
Simpson, Hugh Walter; and Green, Douglas, 4,055,166, Cl. 128-2.00H.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Kewanee Industries. Method of preparing capped polymers. 4,055,712, Cl. 526-11.100.

Green, Joseph; and Cawthorne, Michael Anthony, to Beecham Group Limited. Fibrinolytic compositions. 4,055,635, Cl. 424-78.000.

Greene, James Albert. In-case bottle filling apparatus. 4,055,202, Cl. 141-59.000.

Greene, Robert D.: See—
Farr, Emory W.; and Greene, Robert D., 4,055,080, Cl. 73-139.000.

Gress, Rashad S., to Boeing Company, The. Aft main deck split level galley. 4,055,317, Cl. 244-118.00P.

Grimm, Carl W. Composite shop trailer. 4,055,206, Cl. 144-285.000.

Grimm, J. Martin; Claxton, George P.; and MacKenzie, Robert D., to Richardson-Merrell Inc. α -Alkylbenzyl lactamides. 4,055,561, Cl. 240-239.00B.

Gritschmeier, Walter: See—
Anselmet, Wolfgang; and Gritschmeier, Walter, 4,055,503, Cl. 252-12.000.

Grossman, Milton J. Knife and bread board attachment. 4,054,994, Cl. 30-296.00R.

Gruber, Wilhelm; and Schroeder, Guenter, to Rohm GmbH. Method of making carboxylic acid esters. 4,055,590, Cl. 560-179.000.

Grunwell, Joyce Francis: See—
Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal; and Petrow, Vladimir, 4,055,641, Cl. 424-242.000.

GTE Sylvania Incorporated: See—
Bouchard, Andre C.; Hall, Harold H., Jr.; Mercaldi, Renaldo; and Sentementes, Thomas J., 4,055,759, Cl. 362-159.000.

Schreurs, Willy P., 4,055,781, Cl. 313-487.000.

Gundalupi, Mario. Process for treating gases in the ammonia synthesis. 4,055,627, Cl. 423-359.000.

Gulf Oil Corporation: See—
Muldrow, Barney P., Jr., 4,055,122, Cl. 102-23.000.

Gundlach, S.A.: See—
Salguero, Hugo A. Teran, 4,055,156, Cl. 123-8.330.

Guntzner, Fred G.; Edwards, Dale; and Lanning, John A., to Lifetime Carbide Company. Adjustable wobble dado assembly having improved dynamic balance. 4,055,204, Cl. 144-238.000.

Gurney, John A.: See—
Gander, Robert J.; and Gurney, John A., 4,055,659, Cl. 424-305.000.

Gusarov, Anatoly Alexandrovich; and Shatalov, Lev Nizolaevich. Method of balancing rotors. 4,055,683, Cl. 427-8.000.

Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., to M & T Chemicals Inc. Additive-containing fibers. 4,055,702, Cl. 428-398.000.

Gvlesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailevich; Tskvitinidze, Alexander Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Ilarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tatishvili, Otari Vardenovich. Device for pipeline transportation of loads by fluid flow. 4,055,315, Cl. 243-33.000.

H.A.P. CONSULAB Inc.: See—
Mathieu, Serge, 4,055,795, Cl. 323-102.000.

Hass, Rudy M. Chemical tracer method of and structure for determination of instantaneous and total mass and volume fluid flow. 4,055,083, Cl. 73-194.00E.

Haber, Donald F.: See—
Jasperson, Robert E.; Erb, Charles G.; Haber, Donald F.; and Pouring, Andrew A., 4,055,121, Cl. 102-14.000.

Habermehl, Diethard: See—
Beck, Kurt-Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, 4,055,471, Cl. 201-20.000.

Habermeier, Jürgen: See—
Herzog, Hans; Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jürgen, 4,055,570, Cl. 548-301.000.

Habler, Adam L. Holder for a smoking-pipe. 4,055,283, Cl. 224-5.00R.

Hudgraft, Robert B.; and Martin, John J., to Reichhold Chemicals, Inc. Starch latex composition. 4,055,694, Cl. 428-95.000.

Hagedorn, Hans. Package stacking method and apparatus. 4,055,256, Cl. 214-6.0DK.

Haiges, Adolf, to Suevia Haiges KG, Firma. Neck frame for cattle. 4,055,149, Cl. 119-147.00A.

Hall, Harold H., Jr.: See—
Bouchard, Andre C.; Hall, Harold H., Jr.; Mercaldi, Renaldo; and Sentementes, Thomas J., 4,055,759, Cl. 362-159.000.

Hallmark Cards, Incorporated: See—
Beery, Floyd T., 4,055,698, Cl. 428-262.000.

Hamilton, Joel A.: See—
Mahaffy, Reid A.; Hamilton, Joel A.; and Pinney, Wesley W., 4,055,671, Cl. 426-123.000.

Hamlin, Thomas J.: See—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,055,340, Cl. 271-236.000.

Hammann, Ingeborg: See—
Hoffmann, Hellmut; Hammann, Ingeborg; and Stendel, Wilhelm, 4,055,571, Cl. 260-308.00R.

Hammond, Grover M., to Leisure Manufacturing Co., Inc. Scissors jack. 4,055,329, Cl. 254-86.00R.

Hammond, Michael George Ridler, to A.C.I. Operations Pty. Ltd. Process for forming sealed liquid filled bags. 4,055,032, Cl. 53-14.000.

Hanna Mining Company, The: See—
McGauley, Patrick J.; and Dor, Abraham A., 4,055,631, Cl. 423-558.000.

Hansen, Howard A.: See—
Casey, Thomas P.; Hansen, Howard A.; Klett, Gene R.; and Olthoff, James A., 4,055,223, Cl. 172-777.000.

Hara, Hideo, to Kabushiki Kaisha Komatsu Seisakusho. Safety device for hydraulically driven vehicles. 4,055,047, Cl. 60-444.000.

Haraikawa, Tetsuo; and Ito, Hiroshi, to Tokico Ltd. Anti-squeal device in disc brake. 4,055,238, Cl. 188-73.500.

Harbottle, William E., to Timken Company, The. Adjusting process for bearings. 4,054,999, Cl. 33-181.0AT.

Harden, Jerrell W.: See—
Brown, Ronald P.; and Harden, Jerrell W., 4,055,126, Cl. 111-85.000.

Hardtmann, Goetz E.; and Coppola, Gary M., to Sandoz, Inc. 5-Substituted-6H[1]-benzopyrano[3,2-c][1,8]naphthyridine-6,7-(6H)-diones. 4,055,566, Cl. 260-295.00A.

Hare, Clive H.: See—
Fahimian, John; and Hare, Clive H., 4,055,704, Cl. 428-411.000.

Hare, George H.: See—
Hunts, Barney D.; Hare, George H.; and Eaton, Bradley, 4,055,129, Cl. 112-158.00E.

Harold Phelps, Inc.: See—
Phelps, Harold E., 4,055,609, Cl. 261-36.00A.

Harper-Wyman Company: See—
Stohrer, Charles E., Jr.; Huff, Norman M.; and Micinski, Leonard J., 4,055,132, Cl. 113-116.0EE.

Harrigan, Roy M. Drug delivery device for preventing contact of undissolved drug with the stomach lining. 4,055,178, Cl. 128-260.000.

Harshaw Chemical Company, The: See—
Swinehart, Carl F., 4,055,457, Cl. 156-616.00R.

Harshman, Jack D.: See—
Roberts, Arnold E.; and Harshman, Jack D., 4,055,116, Cl. 101-79.000.

Hartmann, Clinton S.: See—
Wagers, Robert S.; and Hartmann, Clinton S., 4,055,819, Cl. 333-30.00R.

Wagers, Robert S.; and Hartmann, Clinton S., 4,055,821, Cl. 333-70.00T.

Harvey, Edward Henry. Constructional toy and element therefor. 4,055,019, Cl. 46-30.000.

Hasegawa, Eiichi; and Yazawa, Kenichiro, to Fuji Photo Film Co., Ltd. Light sensitive material containing an ethylene compound dye former, an organic polymer compound containing chlorine and a plasticizer. 4,055,430, Cl. 96-90.00R.

Hasegawa, Seitaro: See—
Hasegawa, Tsuneo; and Hasegawa, Seitaro, 4,055,490, Cl. 210-17.000.

Hasegawa, Tsuneo; and Hasegawa, Seitaro, to Seisukikogyo Co., Ltd. Activated sludge process. 4,055,490, Cl. 210-17.000.

Haskell, Theodore Herbert: See—
Baker, David Clarkston; and Haskell, Theodore Herbert, 4,055,717, Cl. 536-26.000.

Hattler, Louis R.; and Menon, Sukumaran K., to Xerox Corporation. Release material application seal. 4,055,143, Cl. 118-60.000.

Hauni-Werke Korber & Co., KG: See—
Berlin, Herbert; Abrahams, Siegfried; and Brand, Peter, 4,055,192, Cl. 131-84.00B.

Hautala, Earl: See—
Popper, Karel; Schultz, William G.; Camirand, Wayne M.; Hautala, Earl; Robertson, George H.; Crawford, Ladell; and Finkle, Bernard J., 4,055,675, Cl. 426-470.000.

Havlik, Vaclav. Game apparatus. 4,055,345, Cl. 273-131.0AC.

Hay, Harold R. Process and apparatus for solar distillation. 4,055,473, Cl. 202-234.000.

Hayakawa, Mitsuru: See—
Watanabe, Yasuaki; Okabe, Yukio; Hayakawa, Mitsuru; Ikemura, Yuichi; Fujita, Yasuhiro; and Murakami, Daisuke, 4,055,817, Cl. 331-117.00R.

Hayden, Thomas John. Keyboard switch assembly with hinged push-buttons and cantilevered terminal members. 4,055,734, Cl. 200-5.00A.

Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, to Imperial Chemical Industries Limited. Substituted aryloxy-3,3,3-trifluoro-2-propionic acids, esters and salts thereof. 4,055,595, Cl. 260-520.00B.

Hayward, Glenn L., to Leeson Corporation. Die construction. 4,055,389, Cl. 425-466.000.

Hegemann, Karl-Rudolf, to Gottfried Bischoff Bau Kompl. Gasreinigung und Wasserrückkühlanlagen Kommanditgesellschaft. Method of cleaning stack gas and using same for generation of electric power. 4,055,331, Cl. 266-44.000.

Heidelberg, Gotz. Systems for magnetically supporting a vehicle. 4,055,123, Cl. 104-148.0LM.

Heinsohn, Howard H., Jr.: See—
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,055,691, Cl. 426-534.000.

Heithoff, Robert B.; and Pecoraro, George A., to PPG Industries, Inc. Apparatus for the manufacture of flat glass having a glass refractory delivery piece and method of installation. 4,055,407, Cl. 65-27.000.

Helder, Johannes: See—
Bussmann, Egon; Flamme, Bruno; Vanhumbeeck, Jacky; Helder, Johannes; and De Steur, Hubert, 4,055,751, Cl. 364-500.000.

Helmstetter, Gerald J., to National Starch and Chemical Corporation. Gel strength enhancer for gelatin compositions including an oxidized polysaccharide. 4,055,554, Cl. 260-117.000.

Hempelmann, Wilhelm: See—
Waldenmeier, Gunter; and Hempelmann, Wilhelm, 4,055,274, Cl. 220-256.000.

Hendel, Siegfried H.: See—
Andresen, Peter B.; Winter, Claus; and Hendel, Siegfried H., 4,055,373, Cl. 312-263.000.

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Christophliemk, Peter; Friedemann, Wolfgang; Vaeth, Ernst; and Worms, Karl-Heinz, 4,055,622, Cl. 423-118.000.

Rupilius, Wolfgang; and Stein, Werner, 4,055,492, Cl. 210-21.000.

Henry Manufacturing Co., Inc.: See—
Crops, John L.; McEwen, Stephen N.; and Myerholtz, Arthur D., 4,055,497, Cl. 210-91.000.

Henscheid, Kent R.: See—
Tillman, Lynn W.; Henscheid, Kent R.; and Smith, Larry D., 4,055,757, Cl. 364-715.000.

Herman, Richard Frederick, to United States of America, Energy Research and Development Administration. Nozzle seal. 4,055,199, Cl. 137-590.000.

Heronemus, William E.: See—
Mager, David; and Heronemus, William E., 4,055,145, Cl. 119-2.000.

Herzog, Hans; Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jürgen, to Ciba-Geigy Corporation. Imidazolidine-4,5-dione dicarboxylic acids and derivatives. 4,055,570, Cl. 548-301.000.

Hesselgren, Sven-Gunnar. Method and apparatus for disinfecting fluid medium removed from the oral cavity of a human being. 4,054,998, Cl. 32-33.000.

Heumann, Heinz; Saure, Manfred; Wagner, Heinz; and Wartusch, Johann, to Licentia Patent-Verwaltungs-G.m.b.H.; and Aeg-Telefunken Kabelwerke Aktiengesellschaft. Stabilizer in a high voltage insulation on a polyolefin base. 4,055,504, Cl. 252-63.200.

Hewlett-Packard Company: See—
Bland, Robert J.; and Seipel, Winfried, 4,055,791, Cl. 363-28.000.

Tillman, Lynn W.; Henscheid, Kent R.; and Smith, Larry D., 4,055,757, Cl. 364-715.000.

Heybourne, Robert Howard: See—
Clements, Herbert Arthur; and Heybourne, Robert Howard, 4,055,240, Cl. 192-67.00A.

Heyman, Albert M.: See—
Gerding, James H.; and Heyman, Albert M., 4,055,790, Cl. 363-24.000.

Hickey, Christopher Daniel Dowling. Road vehicles. 4,055,355, Cl. 280-179.00A.

Hickok, William Kelsey, to Eastman Kodak Company. Magnetic head positioning and playback apparatus utilizing a split head for self-tracking and selective reproduction. 4,055,849, Cl. 360-77.000.

Hidaka Engineering Co., Ltd.: See—
Kozima, Toyoo, 4,055,067, Cl. 72-328.000.

High Voltage Engineering Corporation: See—
Merrill, Edward Wilson, 4,055,682, Cl. 427-2.000.

Hijikata, Akiko: See—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,636, Cl. 424-177.000.

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Hill, David W.: See—
Benezra, Leo L.; Hill, David W.; Riihimaki, Arnold; and Tsai, Shan-Pu, 4,055,476, Cl. 204-98.000.

Himmelmann, Wolfgang: See—
Bergthaller, Peter; Himmelmann, Wolfgang; Sauerteig, Wolfgang; and Rosenhahn, Lothar, 4,055,427, Cl. 96-67.000.

Hinton, Norman Alexander: See—
Sheaff, Edward Thomas; and Hinton, Norman Alexander, 4,055,470, Cl. 195-127.000.

Hirose, Kiyonobu; Ishida, Shuichi; and Omori, Kaoru, to Nippon Kayaku Kabushiki Kaisha. Derivatives of N-(2,2-dichlorovinyl) salicylamide and use thereof as bactericides, fungicides and algicides for industry. 4,055,639, Cl. 424-230.000.

Hirose, Kiyonobu; Ishida, Shuichi; and Omori, Kaoru, to Nippon Kayaku Co., Ltd. Compositions and methods for controlling the growth of bacteria, fungi and algae using certain derivatives of N-(2,2-dichlorovinyl)salicylamides. 4,055,640, Cl. 424-230.000.

Hirsch, Arthur; Spiegel, Francis X.; and Ramsbottom, John M., to Standard Packaging Corporation. Controlled atmosphere package. 4,055,672, Cl. 426-127.000.

Hirshman, Justin L.: See—
Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,055,702, Cl. 428-398.000.

Hitachi Chemical Company, Ltd.: See—
Chu, Tzong Jeng; and Konii, Susumu, 4,055,546, Cl. 260-51.00R.

Hitachi, Ltd.: See—
Honkawa, Tadashi; Fukuda, Kenji; and Shimizu, Mikio, 4,055,395, Cl. 23-253.00R.

Ho, Irving T.; and Riseman, Jacob, to International Business Machines Corporation. High reliability, low leakage, self-aligned silicon gate FET and method of fabricating same. 4,054,989, Cl. 29-571.000.

Hobart Corporation: See—
Boshinski, Edwin E.; Meckstroth, Robert C.; and Rogers, Robert M., 4,055,748, Cl. 364-466.000.

Rogers, Robert M.; and Boshinski, Edwin E., 4,055,753, Cl. 364-466.000.

Hochiki Corporation: See—
Takeuchi, Takeshi; and Takahashi, Mitsuo, 4,055,809, Cl. 325-308.000.

Hodogaya Chemical Co., Ltd.: See—
Yoshida, Hiroyuki; and Saga, Katumi, 4,055,624, Cl. 423-235.000.

Hoechst Aktiengesellschaft: See—
Bock, Jürgen; and Strutz, Hans-Jürgen, 4,055,311, Cl. 242-18.0DD.

Hoechst, Lonnie D.: See—
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,055,262, Cl. 214-140.000.

Hoffman, Robert T.; and Buecher, Roger W., to United States of America, Navy. Controllable gas generator. 4,055,632, Cl. 423-657.000.

Hoffmann, Hellmut; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-[1-Alkyl-5-substituted-mercaptoptriazol(3-yl)]-phosphoric(phosphonic) acid esters and ester-amides. 4,055,571, Cl. 260-308.00R.

Hoffmann-La Roche, Inc.: See—
Brenner, Wolf; Erlemann, Gustav; and Pauling, Horst, 4,055,634, Cl. 424-47.000.

Hogan, Edward Merrick: See—
Fowler, John Rayford; and Hogan, Edward Merrick, 4,055,201, Cl. 139-421.000.

Hogberg, Bertil; Fex, Hans; Perkle, Torsten; Veige, Sten; and Fredholm, Bo, to Aktiebolaget Leo. Novel compounds, compositions containing such compounds, processes for their preparation and methods of treatment. 4,055,638, Cl. 424-219.000.

Holden, Herbert K.; and Mansfield, Peter W., to American Filtrona Corporation. Crimper assembly. 4,055,108, Cl. 93-1.00C.

Holderman, Louis B.: See—
United States of America, National Aeronautics and Space Administration; Holderman, Louis B.; and Peters, Palmer N., 4,055,847, Cl. 357-5.000.

Holland Company: See—
Chierici, Osvaldo F.; and Murphy, Richard F., 4,055,254, Cl. 213-61.000.

Holland Mechanics B.V.: See—
Damman, Cornelis Christiaan, 4,054,982, Cl. 29-159.100.

Hollingsworth, Charles M.: See—
Kosicki, Witold W.; and Hollingsworth, Charles M., 4,055,020, Cl. 46-161.000.

Hollis Engineering, Inc.: See—
Boynton, Kenneth G., 4,055,725, Cl. 174-68.500.

Holmes, Donald E.; Howard, Wayne R.; Fisher, John F.; and Zeller, Burton S., to Clark Equipment Company. Drive line disconnect mechanism. 4,055,228, Cl. 180-14.00B.

Holmes, Edmund Thompson; and Campbell, Gerald Allan, to Eastman Kodak Company. Inhibitor barrier layers for photographic materials. 4,055,429, Cl. 96-74.000.

Holsinger, Jerry L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., to Intel, Inc. Line level signal measuring device. 4,055,733, Cl. 179-175.30R.

Holsinger, Jerry L.; Lyon, David L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., to Intel, Inc. Data communications network testing system. 4,055,808, Cl. 325-67.000.

Homs, Douglas M. Transparent dial and outer transparent cover for scale with zero-setting adjustment. 4,055,141, Cl. 116-129.00F.

Honeywell Information Systems Inc.: See—
Eachus, Joseph J.; and Graff, Theodore S., 4,055,735, Cl. 200-5.00A.

Gerding, James H.; and Heyman, Albert M., 4,055,790, Cl. 363-24.000.

Honkawa, Tadashi; Fukuda, Kenji; and Shimizu, Mikio, to Hitachi, Ltd. Analysis apparatus. 4,055,395, Cl. 23-253.00R.

Honlinger, Herwig, to Gebr. Hofmann KG, Maschinenfabrik. Method and apparatus for improving the ride characteristics of motor vehicle wheels. 4,055,081, Cl. 73-146.000.

Honna, Kosaku: See—
Kawata, Noboru; Honna, Kosaku; and Sugahara, Hirozo, 4,055,721, Cl. 560-207.000.

Hooker Chemicals & Plastics Corporation: See—
Hopkins, George C.; and Merrifield, D. Bruce, 4,055,581, Cl. 260-429.900.

Scharf, Daniel J., 4,055,591, Cl. 260-502.500.

Hopkins, George C.; and Merrifield, D. Bruce, to Hooker Chemicals & Plastics Corporation. Heat and light stabilizers for halogen containing polymeric resins. 4,055,581, Cl. 260-429.900.

Hopkins Manufacturing Corporation: See—
Mayhew, Theron T., 4,055,250, Cl. 206-457.000.

Horie, Kouji: See—
Numazawa, Akio; Nakamura, Hiroyuki; Kurita, Tokio; Horie, Kouji; and Kondo, Toshio, 4,055,237, Cl. 188-73.400.

Horizons Incorporated, a division of Horizons Research Incorporated: See—
Gerber, Arthur H., 4,055,534, Cl. 260-45.7PH.

Hornbostel, Lloyd H., Jr., to Beloit Management & Research Center. Detection system. 4,055,844, Cl. 340-420.000.

Horninger, Karlheinz: See—
Stein, Karl-Ulrich; and Horninger, Karlheinz, 4,055,837, Cl. 340-173.00R.

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Hosoya, Minoru, to Kao Soap Co., Ltd. Carton with integral separable measuring vessel. 4,055,292, Cl. 229-17.00M.

- Hosfeld Manufacturing Co.: See—
Whetstone, Cecil, Jr.; and Burns, Anthony G., 4,055,065, Cl. 72-217.000.
- Hotta, Seiji; and Akamatsu, Takashi, to Sumitomo Chemical Company, Limited. Optical brightening agents of naphthalimide derivatives. 4,055,565, Cl. 260-281.00N.
- Houlihan, William J., to Sandoz, Inc. Hydroxyalkyl substituted-4,5-dihydropyridazin(2H)-3-ones. 4,055,644, Cl. 260-250.0AH.
- Howard, Wayne R.: See—
Holmes, Donald E.; Howard, Wayne R.; Fisher, John F.; and Zeller, Burton S., 4,055,228, Cl. 180-14.00B.
- Howatt, George F., to New England Envelope Manufacturing Co. Envelope machine. 4,055,111, Cl. 93-61.00R.
- Hoya Glass Works, Ltd.: See—
Sagara, Hiroji, 4,055,435, Cl. 106-52.000.
- Hoyer, Herbert: See—
Bayer, Gunther; Fitzky, Hans Georg; Hoyer, Herbert; Luttgens, Gunter; and Muller-Bardorff, Wolfgang, 4,055,685, Cl. 96-87.00R.
- Hrbay, John O., Jr., to Rain Jet Corporation. Shower head with divergent impact effect nozzle. 4,055,301, Cl. 239-101.000.
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- Hsu, Thomas C.; and Miller, John L., to Westvaco Corporation. Apparatus for forming a fiber oriented handsheet. 4,055,462, Cl. 162-382.000.
- Huber-Emden, Helmut; Eschle, Karl; and Maeder, Arthur, to Ciba-Geigy Corporation. N-(Alkylhydrobenzyl)-alkylthio- and mercaptoacetamides. 4,055,599, Cl. 260-562.00S.
- Hucks, Uwe; and Vernalen, Hugo, to Bayer Aktiengesellschaft. Short glass fibers covered with polymeric materials. 4,055,611, Cl. 264-6.000.
- Hudson, Ed D.; and Mallory, Merrit L., to United States of America, Energy Research and Development Administration. Method of enhancing cyclotron beam intensity. 4,055,782, Cl. 315-111.900.
- Huff, Norman M.: See—
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- Hughes, Alexander W., Jr. Resettable toy phonograph. 4,055,351, Cl. 174-15.00R.
- Hughes, John F.; and Dalkin, Stanislaw. Plug valve assembly. 4,055,324, Cl. 251-309.000.
- Hughes Tool Company: See—
Dyer, Billy F., 4,055,338, Cl. 267-125.000.
- Millaps, Stuart C., 4,055,225, Cl. 175-228.000.
- Huhta-Koivisto, Esko; and Piironen, Pekka Elis. Methods and systems relating to undulating motion. 4,055,018, Cl. 43-42.480.
- Huignard, Jean Pierre; and Micheron, Francois; to Thomson-CSF. Ferroelectric information optical storage device with self biasing. 4,055,838, Cl. 340-173.200.
- Hunt, Archie F.; and Moss, Jack J. Golf putting practice device having mechanical calculators. 4,055,349, Cl. 273-179.00A.
- Hunter, Leon; and Petty, Walter L., to Shell Oil Company. Polycyanodifluoroamino ethers, their preparation and utilization. 4,055,516, Cl. 260-2.00A.
- Huntress, Charles B., to Electronic Engineering Co. of California. Ear coupler. 4,055,233, Cl. 181-135.000.
- Hunts, Barney D.; Hare, George H.; and Eaton, Bradley, to Singer Company, The. Digital differential capacitance proximity switch. 4,055,129, Cl. 112-158.00E.
- Hurley, Joseph John, to J. & P. Coats Limited. Tank for holding liquid. 4,055,269, Cl. 220-10.000.
- Husain, Iqbal: See—
Yoli, Alfred H.; and Husain, Iqbal, 4,055,508, Cl. 252-301.10W.
- Hydrostress Aktiengesellschaft: See—
Bieri, Hans, 4,055,353, Cl. 279-2.00R.
- Iannelli, Frank M., to Tannetics, Inc. Excess pressure relieving valve. 4,055,198, Cl. 137-116.500.
- ICI Australia Limited: See—
Sujansky, Vladimir, 4,055,450, Cl. 149-60.000.
- Ickes, Charles M.; and Perusse, Eugene T., to Rohr Industries, Incorporated. Base drive regulator. 4,055,794, Cl. 323-22.00T.
- Idemitsu Kosan Company, Ltd.: See—
Kawata, Noboru; Honna, Kosaku; and Sugahara, Hirozo, 4,055,721, Cl. 560-207.000.
- Ikar, Shinichi, to Kubota, Masao. Lead-acid storage battery. 4,055,711, Cl. 429-143.000.
- Ikawa, Kazuo: See—
Ogawa, Naoki; and Ikawa, Kazuo, 4,055,375, Cl. 339-6.00R.
- Iked, Kishio: See—
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- Ikeda, Yasuo. Method of manufacturing electric resistors. 4,055,615, Cl. 264-105.000.
- Ikemura, Yuichi: See—
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- Illinois Tool Works Inc.: See—
Blaul, John Joseph, 4,055,208, Cl. 151-37.000.
- Imai, Takayoshi: See—
Tajima, Eiichi; Yamamoto, Kaname; and Imai, Takayoshi, 4,055,453, Cl. 156-279.000.
- Imperial Chemical Industries Limited: See—
Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, 4,055,595, Cl. 260-520.00B.
- Langley, Philip Edward; and Tulip, Robert, 4,055,600, Cl. 260-586.00P.
- Last, Anthony Graham Marshall; and Rixon, John Albert, 4,055,695, Cl. 428-195.000.
- Inbauprodukt Innenausbauesysteme GmbH & Co., KG: See—
Andresen, Peter B.; Winter, Claus; and Hendel, Siegfried H., 4,055,373, Cl. 312-263.000.
- Ing. C. Olivetti & C., S.p.A.: See—
Conta, Renato; Montanari, Lucio; and Brescia, Riccardo, 4,055,743, Cl. 219-216.000.
- Inmont Corporation: See—
Civardi, Frank Peter, 4,055,693, Cl. 428-91.000.
- Inskip, Mark D.: See—
Poppe, Wassily W.; and Inskip, Mark D., 4,055,608, Cl. 260-857.00L.
- International Business Machines: See—
Smith, Archibald W., 4,055,815, Cl. 331-94.50H.
- International Business Machines Corporation: See—
Ho, Irving T.; and Riseman, Jacob, 4,054,989, Cl. 29-571.000.
- Orlandi, John Victor; Poley, Neil Myron; and Wilson, Donald Miller, 4,055,219, Cl. 219-390.000.
- International Computers Limited: See—
Munday, Basil Sidney, 4,055,117, Cl. 101-93.140.
- International Flavors & Fragrances Inc.: See—
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,055,691, Cl. 426-534.000.
- Evers, William John, 4,055,578, Cl. 260-347.200.
- Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,055,506, Cl. 252-132.000.
- International Harvester Company: See—
Kestian, Anthony M.; and Allori, Raymond J., 4,055,230, Cl. 180-89.100.
- International Telephone and Telegraph Corporation: See—
November, Milton H., 4,055,082, Cl. 73-194.00R.
- Woskow, Robert M., 4,055,816, Cl. 331-32.000.
- Intertel, Inc.: See—
Holsinger, Jerry L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., 4,055,733, Cl. 179-175.30R.
- Holsinger, Jerry L.; Lyon, David L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., 4,055,808, Cl. 423-79.000.
- Inui, Taiji: See—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.
- Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased (by Shiozaki, Hiroko, legal representative), to Yamanouchi Pharmaceutical Co., Ltd. 20-Alkoxy-16-alkyl prostadienoic acid derivatives. 4,055,589, Cl. 560-121.000.
- Ireco Chemicals: See—
Wasson, Daniel A., 4,055,449, Cl. 149-2.000.
- Irie, Takefumi: See—
Okudaira, Shigenori; Takahashi, Mitsuo; Irie, Takefumi; Itoh, Eiji; and Kashiwagi, Koh, 4,055,621, Cl. 423-79.000.
- Ishida, Shuichi: See—
Hirose, Kiyonobu; Ishida, Shuichi; and Omori, Kaoru, 4,055,639, Cl. 424-230.000.
- Hirose, Kiyonobu; Ishida, Shuichi; and Omori, Kaoru, 4,055,640, Cl. 424-230.000.
- Ishida, Torao; Shirai, Takashi; and Akiyama, Minoru, to Asahi Kasei Kogyo Kabushiki Kaisha. N⁴-Acyl-1-arabinofuranosylcytosine-5'-esters. 4,055,716, Cl. 536-23.000.
- Ishida, Toshio: See—
Sakurai, Yasuhiko; Ishida, Toshio; and Kusumoto, Teruo, 4,055,831, Cl. 340-80.000.
- Ishii, Tsumoru: See—
Ogawa, Junkichi; Ishii, Tsumoru; and Shimamura, Isao, 4,055,426, Cl. 96-66.400.
- Ishii, Yoshio: See—
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.
- Ishikawa Tekko Kabushiki Kaisha: See—
Yamamoto, Mitsuo, 4,055,708, Cl. 429-10.000.
- Isolerings Aktiebolaget Isenta: See—
Aleniusson, Sven Goran, 4,054,985, Cl. 29-416.000.
- Isono, Atsuya: See—
Motai, Yoichi; Gouda, Keiji; and Isono, Atsuya, 4,055,137, Cl. 114-230.000.
- Ito, Hiroshi: See—
Haraikawa, Tetsuo; and Ito, Hiroshi, 4,055,238, Cl. 188-73.500.
- Itoh, Eiji: See—
Okudaira, Shigenori; Takahashi, Mitsuo; Irie, Takefumi; Itoh, Eiji; and Kashiwagi, Koh, 4,055,621, Cl. 423-79.000.
- Ivanov, Lev Nikolaevich: See—
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstan-

- tinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich, 4,055,039, Cl. 57-34.0AT.
- Iwamoto, Hidenori: See—
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.
- J. & P. Coats Limited: See—
Hurley, Joseph John, 4,055,269, Cl. 220-10.000.
- Jackson, Melvin R., to United States of America, National Aeronautics and Space Administration. Directionally solidified eutectic γ - γ' nickel-base superalloys. 4,055,447, Cl. 148-32.000.
- Janke, Robert W. Wax applicator for skis. 4,054,962, Cl. 15-105.000.
- Japan Exlan Company Limited: See—
Sawanishi, Shigeru; Ozaki, Masahiko; and Katagawa, Kikuji, 4,055,493, Cl. 210-31.00C.
- Jarreau, Charles L., Sr., to Calumet Petrochemicals, Inc. Phenol alkylation. 4,055,605, Cl. 260-624.00R.
- Jarvis, William Joseph, to Coal Industry (Patents) Limited. Longwall machine with captivating bracket. 4,055,367, Cl. 299-53.000.
- Jasperson, Robert E.; Erb, Charles G.; Haber, Donald F.; and Pouring, Andrew A., to Trident Engineering Assoc., Inc. Depth controlled naval mine. 4,055,121, Cl. 102-14.000.
- Jeffreys, George A.; Price, Jean L.; and Tobey, James F., to George A. Jeffreys & Co., Inc. Animal feed yeast supplement from dried whey yeast bran process. 4,055,666, Cl. 426-31.000.
- Jellinek, Ernest, to RCA Corporation. Heading sensor for vehicle dead reckoning system. 4,055,750, Cl. 364-424.000.
- Jenkins, Stephen R.; Northrup, Thomas A.; and Stewart, Robert E., to Digital Equipment Corporation. Memory module with means for generating a control signal that inhibits a subsequent overlapped memory cycle during a reading operation portion of a reading memory cycle. 4,055,851, Cl. 364-200.000.
- Jensen, Olav V., to Ebo Industries, Ltd. Apparatus and method for the synchronous reading of data from a punched card. 4,055,747, Cl. 235-61.11E.
- Jirus, Earl J.: See—
Beavon, David K.; and Jirus, Earl J., 4,055,401, Cl. 23-277.00C.
- Jiveman, Jan: See—
Fridlund, Gosta; and Jiveman, Jan, 4,055,010, Cl. 40-124.000.
- Johanns, Rudolph W. Animal breeding chart. 4,055,009, Cl. 40-107.000.
- Johansson, Goran Karl Nils: See—
Sjostrand, Uno Roland; and Johansson, Goran Karl Nils, 4,055,035, Cl. 53-167.000.
- Johns, Herman S., to Medical Specialties, Inc. Apparatus for molding a protective pad. 4,055,388, Cl. 425-4.00R.
- Johns-Manville Corporation: See—
Chen, Alwin Bennett; and Pallo, John Matthew, 4,055,434, Cl. 106-50.000.
- Zeller, Robert Dale; and Sullivan, Daryl Dean, 4,055,383, Cl. 356-229.000.
- Johnson, Alexander L.; and Sweetser, Philip B., to Du Pont de Nemours, E. I., and Company. Pyrazole plant growth regulants. 4,055,409, Cl. 71-76.000.
- Johnson, Anderson F., Jr.: See—
Fegley, Charles R.; and Johnson, Anderson F., Jr., 4,055,277, Cl. 222-5.000.
- Johnson, Bruce W. Earth handling apparatus. 4,055,007, Cl. 37-126.0AE.
- Johnson, Harlan B., to PPG Industries, Inc. Electrolyzing brine using an anode coated with an intermetallic compound. 4,055,477, Cl. 204-98.000.
- Johnson & Johnson: See—
Gander, Robert J.; and Gurney, John A., 4,055,659, Cl. 424-305.000.
- Sack, Georges H., 4,055,003, Cl. 34-155.000.
- Torney, Harry L.; Torney, Helen T.; and Bordt, Dale E., 4,055,466, Cl. 195-1.700.
- Tritsch, Ludwig, 4,055,181, Cl. 128-287.000.
- Johnson, W. Delmar: See—
Moczygemba, George A.; Johnson, W. Delmar; and Clark, Earl, 4,055,713, Cl. 526-207.000.
- Johnson, William S.; and Gravestock, Michael B., to Leland Stanford Junior University, The Board of Trustees of. Alkynyl terminating groups in biogenetic-like cyclizations to steroids. 4,055,603, Cl. 260-617.00R.
- Johnston, James R.: See—
Moertel, George B.; and Johnston, James R., 4,054,973, Cl. 24-205.00R.
- Johnston, John O'Neal: See—
Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal; and Petrow, Vladimir, 4,055,641, Cl. 424-242.000.
- Jolivet, Jean-Claude; and Stouls, Francois-Xavier Antoine, to Societe Anonyme de Telecommunications. Image coder-decoder using a matrix transform with weighted contribution of several points of the image to the formation of one point of the transform. 4,055,756, Cl. 364-725.000.
- Jones, Dennis J., to Tumble Not Tumbler, Inc. Spill-resistant container. 4,055,273, Cl. 220-70.000.
- Jones, James H.: See—
Cragoe, Edward J., Jr.; and Jones, James H., 4,055,596, Cl. 260-534.00M.
- Jones, Robert L. Solar energy collector and sun tracking concentrator. 4,055,161, Cl. 126-271.000.
- Jones, Russell E.: See—
Laiche, Emile J.; and Jones, Russell E., 4,055,337, Cl. 267-101.000.
- Jones, Thomas M.: See—
Freeman, John W.; Jones, Thomas M.; and Reagan, Harold D., 4,054,978, Cl. 29-157.10R.
- Jozwiak, Edward L., Jr.; and Das, Surya K., to PPG Industries, Inc. Method and resinous vehicles for electrodeposition. 4,055,527, Cl. 260-23.70A.
- Jung, Dietrich: See—
Fisk, Charles S.; and Jung, Dietrich, 4,055,800, Cl. 324-72.500.
- Justice, David D.: See—
Dotson, Ronald L.; Justice, David D.; and Kuo, Han C., 4,055,475, Cl. 204-98.000.
- JWI Ltd.: See—
Best, Francis Brian, 4,055,459, Cl. 162-192.000.
- Buchanan, John Gordon, 4,055,460, Cl. 162-209.000.
- K-Vet Limited: See—
Sheaff, Edward Thomas; and Hinton, Norman Alexander, 4,055,470, Cl. 195-127.000.
- Kabushiki Kaisha Komatsu Seisakusho: See—
Hara, Hideo, 4,055,047, Cl. 60-444.000.
- Kabushiki Kaisha Sato Kenkyusho: See—
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- Kadono, Mamoru: See—
Fujisawa, Masao; Makise, Mitsugu; and Kadono, Mamoru, 4,055,136, Cl. 114-219.000.
- Kadzhelashvili, Zauri Mikhailovich: See—
Gveseliani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tashvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.
- Kageyama, Yoichi; Kato, Yozo; and Kosugi, Hisao, to Mitsubishi Chemical Industries Ltd. Catalyst for producing cycloolefin and method for making the same. 4,055,512, Cl. 252-441.000.
- Kainmuller, Thomas: See—
Herzog, Hans; Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,055,570, Cl. 548-301.000.
- Kaiser, Emil: See—
Colescott, Robert L.; Kaiser, Emil; Bossinger, Charles D.; and Cook, Paul L., 4,055,524, Cl. 260-8.000.
- Kaiser, Michael; and Schaffer, Ludwig, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus. 4,055,289, Cl. 226-92.000.
- Kakitani, Haruaki; and Sugino, Satoru, to Mitsubishi Monsanto Chemical Company. Vinyl chloride resin composition. 4,055,518, Cl. 260-2.5AM.
- Kalapos, Josef: See—
Mueller, Roman; and Kalapos, Josef, 4,055,673, Cl. 426-231.000.
- Kalbow, Heinz. Cleaning, scouring and/or polishing pads. 4,055,029, Cl. 51-395.000.
- Kaltenberg, Hans-Georg: See—
Kampf, Fritz; and Kaltenberg, Hans-Georg, 4,055,218, Cl. 165-1.000.
- Kamada, Kensuke; Minami, Shunsuke; and Yoshida, Kanji, to Mitsubishi Rayon Co., Ltd. Porous polypropylene hollow filaments and method making the same. 4,055,696, Cl. 428-398.000.
- Kamm, Wolfgang, to Maschinenfabrik Wifag. Apparatus for adjusting a tensioning device in plate cylinders of rotary printing machines. 4,055,120, Cl. 101-378.000.
- Kamp, Walter B.; Kimmel, Richard L.; and Aagaard, Alvin L. P., III. Rotary cutting assembly having novel flail. 4,054,993, Cl. 30-276.000.
- Kampf, Fritz; and Kaltenberg, Hans-Georg, to Vereinigte Aluminium-Werke Aktiengesellschaft. Method and arrangement for changing the temperature of fluids which form incrustations. 4,055,218, Cl. 165-1.000.
- Kan, Osamu, to Dai Nippon Insatsu Kabushiki Kaisha. Method and apparatus for producing self-standing bags. 4,055,109, Cl. 93-35.00R.
- Kaneko, Katsuyoshi, to Maruwa Echo Co., Ltd. Detachable luggage caster roller. 4,054,964, Cl. 16-20.000.
- Kao Soap Co., Ltd.: See—
Hosoya, Minoru, 4,055,292, Cl. 229-17.00M.
- Kappe, Walter; Lampe, Gotz-Reinhard; and Neuer, Harald, to Carl Zeiss-Stiftung. Method and apparatus for the determination of enzyme activity. 4,055,752, Cl. 364-551.000.
- Kapral, Ales M., to Akrosil Corporation. Production of three-dimensional designs. 4,055,613, Cl. 264-46.400.
- Karami, Hamzeh, to Colgate-Palmolive Company. Absorbent article with retained hydrocolloid material. 4,055,180, Cl. 128-287.000.
- Karami, Hamzeh, to Colgate-Palmolive Company. Absorbent pad. 4,055,184, Cl. 128-287.000.
- Kashiwagi, Koh: See—
Okudaira, Shigenori; Takahashi, Mitsuo; Irie, Takefumi; Itoh, Eiji; and Kashiwagi, Koh, 4,055,621, Cl. 423-79.000.
- Katagawa, Kikuji: See—
Sawanishi, Shigeru; Ozaki, Masahiko; and Katagawa, Kikuji, 4,055,493, Cl. 210-31.00C.
- Kataoka, Yushin: See—
Okamoto, Masahiro; Nemoto, Makoto; Kataoka, Yushin; and Tokugawa, Yoshiharu, 4,055,585, Cl. 260-453.0SP.
- Kato, Giichiro. Rotary electric field intensity measuring device. 4,055,798, Cl. 324-32.000.
- Kato, Nobuyuki: See—
Yoshimura, Hisashi; Yukimoto, Sadao; Matsumoto, Takashi; Konno, Isago; Kato, Nobuyuki; Ohtani, Tadao; and Kubo, Takao, 4,055,732, Cl. 179-117.000.
- Kato, Yozo: See—
Kageyama, Yoichi; Kato, Yozo; and Kosugi, Hisao, 4,055,512, Cl. 252-441.000.

- Kato, Tadayoshi, to Fujitsu Limited. Partial response, quadrature amplitude modulation system. 4,055,727, Cl. 178-68.000.
- Kats, Mindert; and Sleumer, Hendrikus Bernardus, to U.S. Philips Corporation. Appliance for making coffee and the like. 4,055,114, Cl. 99-280.000.
- Katsenes, Philip K. Modifiable gun stock. 4,055,016, Cl. 42-71.00R.
- Kattenberg, Hans Robert; and Verburg, Charles Cornelis, to Lever Brothers Company. Plastic fat product. 4,055,679, Cl. 426-607.000.
- Katz, George M.: See—
- Auerbach, Albert A.; Katz, George M.; and Steinberg, Sidney, 4,055,189, Cl. 128-419.0PG.
- Kawahara, Akira, to Ryusyo Industrial Co., Ltd. Clamping device. 4,054,971, Cl. 24-68.0CD.
- Kawai, Shichio; Tanaka, Takahito; Bannai, Eisuke; Uchida, Kenji; and Shimizu, Ryuichi, to National Institute for Researches in Inorganic Materials. Thermionic emission cathode having a tip of a single crystal of lanthanum hexaboride. 4,055,780, Cl. 313-346.00R.
- Kawinco Industries: See—
- Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,055,712, Cl. 526-11.100.
- Kawata, Noboru; Honna, Kosaku; and Sugahara, Hirozo, to Idemitsu Kasei Company, Ltd. Method of producing unsaturated carbonyl compounds. 4,055,721, Cl. 560-207.000.
- Kazantsev, Lev Seliverstovich: See—
- Lukyanov, Jury Sergeevich; Kazantsev, Lev Seliverstovich; Pomeschikov, Andrei Grigorievich; and Skvortsov, Gennady Fedorovich, 4,055,722, Cl. 13-16.000.
- Keane, Thomas J., to Detrex Chemical Industries, Inc. Immersion type metal degreaser with compression-expansion system for heating and cooling of liquid solvent and solvent vapors. 4,055,196, Cl. 134-107.000.
- Keen, Ralph H.; and Seaman, Gary G., to Western Electric Company, Inc. Method for separating sections of a covering on a cable. 4,055,616, Cl. 264-139.000.
- Keiper K.G.: See—
- Putsch, Ulrich; and Klingelhofer, Gerd, 4,054,966, Cl. 16-143.000.
- Keller, Douglas V., Jr.: See—
- Smith, Clay D.; and Keller, Douglas V., Jr., 4,055,480, Cl. 208-11.0LE.
- Kelly, Ray G.; Pruitt, Kenneth R., Sr.; and Kershman, Alvin L., to Sismark, Inc. Food bar and process of preparing same. 4,055,669, Cl. 426-93.000.
- Kendall Company, The: See—
- Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., 4,055,187, Cl. 128-349.00B.
- Swallow, Roger T., 4,054,952, Cl. 2-338.000.
- Ker-Train Systems N.V.: See—
- Kerr, John Hugh, 4,055,091, Cl. 74-394.000.
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- MacKenzie, Robert D.: See—
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- MacLeay, Ronald E.: See—
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- MacMillan Bloedel Limited: See—
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- MacNeill, Robert L.: See—
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- Magnusson, Alan B.: See—
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- Mallory, Merrit L.: See—
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- Manitou Systems, Inc.: See—
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- Marchwinski, Michael: See—
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- Marres, George; and D'Alesandris, Loreto B., to Veeder Industries, Inc. Method of mounting a wheel retaining ring on a wheel support shaft. 4,054,986, Cl. 29-434.000.
- Marsan, Mario S., to Procter & Gamble Company. The Fabric treating compositions and articles. 4,055,248, Cl. 206-500.
- Marsden, James Glenn; and Orenski, Peter Joseph, to Union Carbide Corporation. Azido-silane compositions. 4,055,701, Cl. 428-391.000.
- Marsee, Frederick J., to Ethyl Corporation. Exhaust recirculation. 4,055,158, Cl. 123-119.00A.
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- Martin, John J.: See—
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- Martinez, Daniel G., to Gilbert Sacks Enterprises, Inc. Tilting maze race game. 4,055,341, Cl. 273-86.00C.
- Martinez, Ginez. Silencer for internal combustion engines. 4,055,231, Cl. 181-241.000.
- Martinez, John. Hairdresser's storage and dispenser case. 4,055,194, Cl. 132-39.000.
- Maruwa Echo Co., Ltd.: See—
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- Maruzen Sewing Machine Co., Ltd.: See—
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- Marzoni, Pettersen B., Jr. Word building game. 4,055,348, Cl. 273-146.000.
- Maschinenfabrik Wifag: See—
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- Matsumoto, Tervu, to Epoch Co., Ltd. Baseball game amusement device. 4,055,342, Cl. 273-88.000.
- Matsumoto, Toshiaki: See—
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- Matthewman, Ian: See—
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- Mayhew, Theron T., to Hopkins Manufacturing Corporation. Folding blank, vehicle simulating display. 4,055,250, Cl. 206-457.000.
- Maytag Company, The: See—
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- McWhorter, Daniel M.: See—
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- Mercaldi, Renaldo: See—
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- Christy, Marcia Elizabeth, 4,055,665, Cl. 424-330.000.
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- Merrifield, D. Bruce: See—
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- Meyerhoff, Jerry David: See—
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- Moses, Adolph. Door lock attachment. 4,055,361, Cl. 292-359.000.
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- Mueller, Willy: See—
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- Myers, Robert Weston: See—
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- NGK Spark Plug Co., Ltd.: See—
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- Nott, Alan J., to Anglo-American Clays Corporation. Method for improving clay brightness utilizing magnetic separation. 4,055,485, Cl. 209-3.000.
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- Novemler, Milton H., to International Telephone and Telegraph Corporation. Net oil computer. 4,055,082, Cl. 73-194.00R.
- Novikov, Oleg Nikolaevich: See—
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- Olthoff, James A.: See—
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- Pennwalt Corporation: See—
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 Kiyokawa, Shin; Sakaguchi, Shokichi; and Takeuchi, Toru, 4,055,526, Cl. 264-22.000.
 Sakellaris, Peter C.: See—
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 Salguero, Hugo A. Teran, to Gundlach, S.A. Rotary engine, 4,055,156, Cl. 123-8.330.
 Salter Housewares Limited: See—
 Ackeret, Peter, 4,055,308, Cl. 241-100.000.
 Sandahl, Joel E.: See—
 Stapleford, Gary N.; and Sandahl, Joel E., 4,055,730, Cl. 179-84.0VF.
 Sandberg, Glenn A.; Richards, Louis R.; and Stoub, James W., to Formax, Inc. Food patty molding machine, 4,054,967, Cl. 17-32.000.
 Sander, Conrad. Method and apparatus for curing, a coating on a substrate, 4,055,769, Cl. 250-492.00R.
 Sanders, Duane: See—
 Crawford, G. Roger; Sanders, Duane; and Shill, David B., 4,055,203, Cl. 141-73.000.
 Sanders, William J., to Robertshaw Controls Company. Needle valve member for a control device and method of making the same, 4,055,326, Cl. 251-351.000.
 Sandoz, Inc.: See—
 Bennett, Gregory B., 4,055,643, Cl. 424-249.000.
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 Houlihan, William J., 4,055,644, Cl. 260-250.0AH.
 Simpson, William R.; and Strohschein, Robert J., 4,055,649, Cl. 424-263.000.
 Sandoz Ltd.: See—
 Aeberli, Max, 4,055,556, Cl. 260-152.000.
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 Soma, Nobuo; Yoshioka, Takao; Kurumada, Tomoyuki; and Morimura, Syoji, 4,055,536, Cl. 260-45.80N.
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 Pavlushkin, Nikolai Mikhchevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraevich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.
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 Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Printing head for portable labeling machine, or the like, 4,055,118, Cl. 101-10.000.
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 Bergthaller, Peter; Himmelmann, Wolfgang; Sauerteig, Wolfgang; and Rosenhahn, Lothar, 4,055,427, Cl. 96-67.000.
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 Schafer, Jergen, to Original Hanau Quarzlampe GmbH. Gas discharge lamp, 4,055,779, Cl. 313-220.000.
 Schafer, Paul; Abel, Heinz; and Mayer, Fritz, to Ciba-Geigy Corporation. Propylene oxide reaction products, process for their manufacture and their use, 4,055,393, Cl. 8-62.000.
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 Kaiser, Michael; and Schaffer, Ludwig, 4,055,289, Cl. 226-92.000.
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- Scharf, Daniel J., to Hooker Chemicals & Plastics Corporation. Phosphonomethyl compounds. 4,055,591, Cl. 260-502.500.
- Scheding, Horst. Conveying and retaining apparatus. 4,055,139, Cl. 114-270.000.
- Schenk, Wolfgang: See—
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- Schoenayder, Lawrence F., to Caterpillar Tractor Co. Control system having override for fluid operated work elements. 4,055,046, Cl. 60-428.000.
- Schiemann, Heinz: See—
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- Schimmel, Vernon R., to Symons Corporation. Inside concrete core-wall form with particular three-way hinge assemblies therefor. 4,055,321, Cl. 249-182.000.
- Schluenz, Robert William; and Davis, Curry Beach, to Arizona Chemical Company. Process for the preparation of terpene-maleic anhydrides containing less than 15% di-adduct. 4,055,576, Cl. 260-346.600.
- Schumberger Technology Corporation: See—
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- Schmanski, Donald W., to Fiberite Corporation. Woven material with filling threads at angles other than right angles. 4,055,697, Cl. 418-113.000.
- Schmid, Charles F. Portable mount for radios in motor vehicles. 4,055,286, Cl. 224-42.2R.
- Schmidt, Franz: See—
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- Schmidt, Gunther: See—
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- Schmidt, Terrance L.; and Thompson, Marion E., to Maytronics Group, Inc. The. Lighted greeting cards. 4,055,014, Cl. 40-152.200.
- Schmidt, Walter; and Stahlin, Walter, to Prolizenz AG. Crucible. 4,055,391, Cl. 432-264.000.
- Schneider, Willi A. Sheet material de-stacking machine. 4,055,258, Cl. 214-8.50C.
- Schneider, Willi A. Re-stacking device for stacking partial stacks of sheet material to form a complete stack. 4,055,261, Cl. 214-6.00G.
- Schoeff, John A., to Precision Monolithics, Inc. Multistage electrical ladder for decrementing a signal into a plurality of weighted signals. 4,055,773, Cl. 307-229.000.
- Scholl, Inc.: See—
Hsiung, Du Yung, 4,055,699, Cl. 428-311.000.
- Schow, Virgil L. Muffler and tail pipe expander and cleaner. 4,055,064, Cl. 72-118.000.
- Schreurs, Willy P., to GTE Sylvania Incorporated. Special purpose fluorescent lamp. 4,055,781, Cl. 313-487.000.
- Schroeder, Guenter: See—
Gruber, Wilhelm; and Schroeder, Guenter, 4,055,590, Cl. 560-179.000.
- Schuette, Wilhelm: See—
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- Schultz, David C.: See—
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- Schultz, Freddy R.: See—
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- Schultz, William G.: See—
Popper, Karel; Schultz, William G.; Camirand, Wayne M.; Hautala, Earl; Robertson, George H.; Crawford, Ladell; and Finkle, Bernard J., 4,055,675, Cl. 426-470.000.
- Schurger, Rainer: See—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,055,371, Cl. 308-201.000.
- Schwinn, Joseph Michael, to Ecodyne Corporation. Non-clog water distribution nozzle. 4,055,305, Cl. 239-524.000.
- SCM Corporation: See—
Close, Ralph E.; and Orosnik, William, 4,055,575, Cl. 260-345.500.
- Ehmann, William J., 4,055,601, Cl. 260-593.00R.
- Scondo, Christian: See—
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- Scrugg, Robert L.; and Parker, Alfred B. Carbonaceous boiler. 4,055,165, Cl. 126-400.000.
- Scribaine, Alexander, to Merck & Co., Inc. Novel anti-hypertensive compositions. 4,055,645, Cl. 424-250.000.
- Seaman, Gary G.: See—
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- Sebenda, Jan: See—
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- Seese, Ray Bruce; and Watson, Bela Lee, to Union Carbide Corporation. Apparatus for improved cleaning of pipeline inlets. 4,055,025, Cl. 51-411.000.
- Seipel, Winfried: See—
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- Seisukogyo Co., Ltd.: See—
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- Seitel, Norbert F.: See—
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- Seitz, Paul L.: See—
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- Sell, Joseph W.: See—
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- Senger, Gerhard Franz-Josef, to Uniroyal Aktiengesellschaft. Pneumatic radial tire tread pattern. 4,055,209, Cl. 152-209.00R.
- Sentementes, Thomas J.: See—
Bouchard, Andre C.; Hall, Harold H., Jr.; Mercaldi, Renaldo; and Sentementes, Thomas J., 4,055,759, Cl. 362-159.000.
- Seppo, Arnold Ivanovich. Orthopaedic endoapparatus designed to grow a new live shoulder and hip joint, to reconstruct a deformed joint or to restore a pathologically dysplastic and congenitally luxated joint. 4,054,955, Cl. 3-1.910.
- Servco Company, a division of Smith International, Inc., The: See—
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- Sever, James A.: See—
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- Seymour, Joseph A., to Lawrence Peska, Associates, Inc. Dispensing shower head. 4,055,278, Cl. 222-42.000.
- Shannon, Edward L.: See—
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- Sharowsky, Robert: See—
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- Sharp, James E., to Union Special Corporation. Hem folding attachment. 4,055,127, Cl. 112-143.000.
- Sharp Kabushiki Kaisha: See—
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- Sharpe, Donald M. Hikers cart. 4,055,354, Cl. 280-47.310.
- Shatalov, Lev Nixolaevich: See—
Gusarov, Anatoly Alexandrovich; and Shatalov, Lev Nixolaevich, 4,055,683, Cl. 427-8.000.
- Shaw, James L.: See—
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- Shawl, Edward T.: See—
Rosenthal, Rudolph; and Shaw, Edward T., 4,055,629, Cl. 423-509.000.
- Sheaff, Edward Thomas; and Hinton, Norman Alexander, to K-Vet Limited. Device for examining biological specimens. 4,055,470, Cl. 195-127.000.
- Shell Oil Company: See—
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- Sheppard, Chester S.; and MacLeay, Ronald E., to Pennwalt Corporation. Azo free radical initiators containing ultraviolet light stabilizing groups. 4,055,714, Cl. 526-208.000.
- Sherezadashvili, Andrei Illarionovich; Kadzhelashvili, Zauri Mikheilovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tashvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.
- Sherwood Medical Industries Inc.: See—
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- Shibata, Jitsu, to Mitsubishi Kaihatsu Kabushiki Kaisha. Deep-sea ore collecting and hoisting apparatus. 4,055,006, Cl. 37-69.000.
- Shields, James A. Identification device for vehicles. 4,055,013, Cl. 40-129.00C.
- Shill, David B.: See—
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- Shimamura, Isao: See—
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- Shimizu, Mikio: See—
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- Shimizu, Ryuichi: See—
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- Shimomura, Jun, to Nippon Kogaku K.K. Light receiving device for photoelectric conversion element. 4,055,761, Cl. 250-239.000.
- Shiozaki, Hiroko, legal representative: See—
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.
- Shiozaki, Tetsuya, deceased: See—
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.
- Shirahata, Kunikatsu: See—
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- Shirai, Takashi: See—
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- Shishkarev, Eduard Evgenievich: See—
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- Shoemaker, Ralph W.: See—
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- Shringarpurey, Sudhir K.: See—
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- Shriver, Edward L., to United States of America, National Aeronautics and Space Administration. Semiconductor projectile impact detector. 4,055,089, Cl. 73-432.00R.
- Shu, Peter: See—
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- Shuster, Edward J.: See—
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- Sibrava, Joseph, to Perkin-Elmer Corporation, The. Sample transport with rotary air interlock charging and discharging means. 4,055,259, Cl. 214-17.00A.
- Siebert, Werner: See—
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- Siemens Aktiengesellschaft: See—
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- Fiedler, Helmut, 4,055,775, Cl. 307-254.000.
- Kleen, Gerhard; Schiemann, Heinz; and Allmendinger, Karl, 4,055,825, Cl. 336-70.000.
- Stein, Karl-Ulrich; and Hominger, Karlheinz, 4,055,837, Cl. 340-173.00R.
- Sigma Lutin, narodni podnik: See—
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- Simich, Emil; and Traxinger, Walter R., to A. J. Gerrard & Company. Bale-tie interlock device. 4,055,115, Cl. 100-34.000.
- Simich, Emil, to A. J. Gerrard & Company. Bale-tie joiner tool. 4,055,328, Cl. 254-79.000.
- Simonet, Guy: See—
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- Simpson, Hugh Walter; and Green, Douglas. Apparatus for making surface temperature measurements on the human body. 4,055,166, Cl. 128-2.00H.
- Simpson, William R.; and Strohschein, Robert J., to Sandoz, Inc. 4-Alkyl-2,6-di-(secondary or tertiary alkyl)amino-3-formylpyridines pharmaceutical compositions thereof and their use in the treatment of obesity and diabetes. 4,055,649, Cl. 424-263.000.
- Singer Company, The: See—
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- Larsen, Robert H.; and Minalga, Philip F., 4,055,130, Cl. 112-158.00R.
- O'Brien, James Eugene; and Ostapczuk, Edward Walter, 4,055,131, Cl. 112-158.00E.
- Siri, Joseph J.; and Knapp, John P., to Siri Systems, Inc. Wood cleaning and separating apparatus. 4,055,488, Cl. 209-173.000.
- Siri Systems, Inc.: See—
Siri, Joseph J.; and Knapp, John P., 4,055,488, Cl. 209-173.000.
- Sivillotti, Olivo Giuseppe, to Alcan Research and Development Limited. Procedures and apparatus for electrolytic production of metals. 4,055,474, Cl. 204-70.000.
- Sjostrand, Uno Roland; and Johansson, Goran Karl Nils, to AB Ziritor. Method and an arrangement for the purification of air in packing machines. 4,055,035, Cl. 53-167.000.
- Skeggs, Leonard T., to Locust Farms, Inc. Foaling alarm. 4,055,839, Cl. 340-279.000.
- SKF Industrial Trading and Development Company, B.V.: See—
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- Ziekman, Paul; and van Riet, Jan A. P., 4,055,382, Cl. 356-210.000.
- Skibbe, Martin O., to Armour Pharmaceutical Company. Pharmaceutical preparations containing 4-(4-biphenyl) butylamines and treatment of the animal organism therewith. 4,055,664, Cl. 424-330.000.
- SKM: See—
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- Skvortsov, Gennady Fedorovich: See—
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- Sleumer, Hendrikus Bernardus: See—
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- Sloan-Kettering Institute for Cancer Research: See—
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- Slonaker, Robert O.; and Emerson, Jack L., to Owens-Corning Fiberglass Corporation. Apparatus for making glass fibers material. 4,055,406, Cl. 65-11.00W.
- Smiglee, Jerome: See—
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- Smith, Archibald W., to International Business Machines. Q-switching injection laser with oxygen implanted region. 4,055,815, Cl. 331-94.50H.
- Smith, Clay D.; and Keller, Douglas V., Jr., to Standard Oil Company. Multi-phase separation methods and apparatus. 4,055,480, Cl. 208-11.0LE.
- Smith, Gerald W.: See—
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- Smith, James Walker: See—
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- Smith, Larry D.: See—
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- Smith, Richard E.: See—
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- SmithKline Corporation: See—
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- Smits, Friedolf Michael: See—
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- Smrcka, Joseph G.: See—
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- Smrt, Thomas J., to Fox Valley Marking Systems, Inc. Automatic feeding apparatus. 4,055,146, Cl. 119-51.110.
- Snam Progetti S.p.A.: See—
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, 4,055,535, Cl. 260-45.70R.
- Snoke, Roy Eugene; and Klein, Gerald Wayne, to Eastman Kodak Company. Purification of microbial enzyme extracts using synthetic polyelectrolytes. 4,055,469, Cl. 195-66.00R.
- Societa' Italiana Resine S.I.R. S.p.A.: See—
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- Societe Anonyme de Telecommunications: See—
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- Societe Anonyme Roure Bertrand Dupont: See—
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- Societe d'Assistance Technique pour Produits Nestle S.A.: See—
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- Sogge, John W., to Caterpillar Tractor Co. Biasing element having one or more force stages. 4,055,368, Cl. 305-57.000.
- Soley, Warren G., to Magnetics International, Inc. Magnetic separator for solid waste. 4,055,489, Cl. 209-223.00R.
- Solie, Leland P., to Sperry Rand Corporation. Reflective dot array for acoustic wave processing. 4,055,820, Cl. 333-30.00R.
- Solomon, David E., to KMS Fusion, Inc. Container for hydrogen isotopes. 4,055,276, Cl. 222-3.000.
- Soma, Nobuo; Yoshioka, Takao; Kurumada, Tomoyuki; and Morimura, Syyoji, to Sankyo Company Limited. 4'-Bipiperidylidene derivatives and their use as stabilizers. 4,055,536, Cl. 260-45.80N.
- Sommer, Richard: See—
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- Sony Corporation: See—
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- Tozawa, Keizaburo; Amatsu, Hideo; Takahashi, Shinichiro; Fujimoto, Kazumi; and Ikeda, Kishio, 4,055,372, Cl. 312-15.000.
- Sorocin, Viera. Collapsible carry-all cart. 4,055,357, Cl. 280-641.000.
- Soucie, Claude. Rotating maze game device. 4,055,344, Cl. 273-110.000.
- Sperling, Phillip. Fabric hanging and pleating bracket with stabilizing elements. 4,055,211, Cl. 160-327.000.
- Sperry Rand Corporation: See—
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- Wesner, Charles R., 4,055,135, Cl. 114-144.00E.
- Spiegel, Francis X.: See—
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- Spinner, Joseph R.: See—
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- Square S.A.: See—
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- Stahl, Richard F.: See—
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- Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., 4,055,054, Cl. 62-114.000.
- Stahlin, Walter: See—
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- Stal-Laval Turbin AB: See—
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- Stambaugh, Edgel P.; and Sachs, George F., to Battelle Memorial Institute. Extracting sulfur and ash. 4,055,400, Cl. 44-1.00R.
- Stamberg, Jiri: See—
Peska, Jan; Stamberg, Jiri; and Blace, Zdenko, 4,055,510, Cl. 252-426.000.
- Standard Oil Company: See—
Smith, Clay D.; and Keller, Douglas V., Jr., 4,055,480, Cl. 208-11.0LE.
- Standard Oil Company (Indiana): See—
Parrish, David R., 4,055,399, Cl. 23-230.00EP.
- Poppe, Wassily; and Fielding, Ivor R., 4,055,530, Cl. 260-29.6RW.
- Poppe, Wassily W.; and Inskip, Mark D., 4,055,608, Cl. 260-857.00L.
- Standard Packaging Corporation: See—
Hirsch, Arthur; Spiegel, Francis X.; and Ramsbottom, John M., 4,055,672, Cl. 426-127.000.
- Standard-Thomson Corporation: See—
Wilson, Earl L., 4,055,298, Cl. 236-34.500.

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Assisted pneumatic transport and registration apparatus. 4,055,340, Cl. 271-236.000.

Stanke, Jurgen: See—
Dederra, Helmut; Schmidt, Gunther; and Stanke, Jurgen, 4,055,044, Cl. 60-265.000.

Stapleford, Gary N.; and Sandahl, Joel E., to Comex Systems, Inc. Circuit for detecting dial pulses. 4,055,730, Cl. 179-84.0VF.

Statz, Wilbert A. Small game holder. 4,054,968, Cl. 17-44.200.

Steena, Stephan; and Leibert, Curt H., to United States of America, National Aeronautics and Space Administration. Thermal barrier coating system. 4,055,705, Cl. 428-633.000.

Stefan, Mihaly; Nagy, Tibor; and Daroczi, Sandor, to Csepeli Femmu. Process for the removal of alloying impurities in a slag-covered copper refining bath. 4,055,415, Cl. 75-74.000.

Stein, Karl-Ulrich; and Horninger, Karlheinz, to Siemens Aktiengesellschaft. Dynamic single-transistor memory element for relatively permanent memories. 4,055,837, Cl. 340-173.00R.

Stein, Werner: See—
Rupilius, Wolfgang; and Stein, Werner, 4,055,492, Cl. 210-21.000.

Steinberg, Robert; Alger, Donald L.; and Cooper, Dale W., to United States of America, National Aeronautics and Space Administration. Method of forming metal hydride films. 4,055,686, Cl. 427-124.000.

Steinberg, Sidney: See—
Auerbach, Albert A.; Katz, George M.; and Steinberg, Sidney, 4,055,189, Cl. 128-419.0PG.

Stelwagen, Willem, to Akzona Incorporated. Transfer of heat between two bodies. 4,055,220, Cl. 165-89.000.

Stendel, Wilhelm: See—
Hoffmann, Helmut; Hammann, Ingeborg; and Stendel, Wilhelm, 4,055,571, Cl. 260-308.00R.

Stephens, Wilbur E., to Aluma Inc. Recycle burner system. 4,055,334, Cl. 266-138.000.

Sterck, Lothar: See—
Saffran, Helmut; and Sterck, Lothar, 4,055,577, Cl. 260-346.700.

Sterling Drug Inc.: See—
Carabateas, Philip M.; and Williams, Gordon L., 4,055,588, Cl. 560-23.000.

Christiansen, Robert George, 4,055,562, Cl. 260-239.55R.

Stern, Ernest; Williamson, Richard C.; Bers, Abraham; and Cafarella, John H., to Massachusetts Institute of Technology. Surface wave devices for processing signals. 4,055,758, Cl. 364-821.000.

Stentand Corporation: See—
French, Park, 4,055,813, Cl. 330-103.000.

Stewart, Robert E.: See—
Jenkins, Stephen R.; Northrup, Thomas A.; and Stewart, Robert E., 4,055,851, Cl. 364-200.000.

Stouffer, Charles E., Jr.; Huff, Norman M.; and Micinski, Leonard J., to Harper-Wyman Company. Method of forming ports in a fuel burner. 4,055,132, Cl. 113-116.0EE.

Stolov, Nicolay Stepanov: See—
Ronnquist, Axel Georg; Lindahl, Erik Tommie; and Stolov, Nicolay Stepanov, 4,055,700, Cl. 428-366.000.

Stotler, Charles L., Jr.: See—
Adamson, Arthur P.; Sargisson, Donald F.; and Stotler, Charles L., Jr., 4,055,041, Cl. 60-226.00R.

Stoub, James W.: See—
Sandberg, Glenn A.; Richards, Louis R.; and Stoub, James W., 4,054,967, Cl. 17-32.000.

Stouls, Francois-Xavier Antoine: See—
Jolivet, Jean-Claude; and Stouls, Francois-Xavier Antoine, 4,055,756, Cl. 364-725.000.

Sumaglia, Melchior M., to Container Corporation of America. Tray with reinforced walls. 4,055,293, Cl. 229-31.0FS.

Stumess, Richard, to Whatman Reeve Angel Limited. Compressed air dryer. 4,055,403, Cl. 55-31.000.

Stekalov, Anatoly Vasilievich: See—
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Stekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraevlovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.

Strohschein, Robert J.: See—
Simpson, William R.; and Strohschein, Robert J., 4,055,649, Cl. 424-263.000.

Strutz, Hans-Jurgen: See—
Bock, Jurgen; and Strutz, Hans-Jurgen, 4,055,311, Cl. 242-18.0DD.

Stuart, Edwin G. Surface projectile game apparatus. 4,055,343, Cl. 273-108.000.

Stubbings, James Henry, to Potomac Applied Mechanics, Inc. Band and roller saw arrangement. 4,055,102, Cl. 83-749.000.

Suchy, Richard: See—
Bukac, Zbynek; Sebenda, Jan; and Suchy, Richard, 4,055,552, Cl. 260-78.00L.

Svevia Haiges KG, Firma: See—
Haiges, Adolf, 4,055,149, Cl. 119-147.00A.

Sugahara, Hirozo: See—
Kawata, Noboru; Honna, Kosaku; and Sugahara, Hirozo, 4,055,721, Cl. 560-207.000.

Sugino, Satoru: See—
Kakitani, Haruaki; and Sugino, Satoru, 4,055,518, Cl. 260-2.5AM.

Sujansky, Vladimir, to ICI Australia Limited. Explosive composition containing amine solvating agent. 4,055,450, Cl. 149-60.000.

Sukman, Edwin L.: See—
Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,055,702, Cl. 428-398.000.

Sullivan, Daryl Dean: See—
Zeller, Robert Dale; and Sullivan, Daryl Dean, 4,055,383, Cl. 356-229.000.

Sullivan, Thomas R.; Christenson, Roger M.; Das, Surya K.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Acrylic coating compositions. 4,055,607, Cl. 260-851.000.

Sumitomo Chemical Company, Limited: See—
Hotta, Seiji; and Akamatsu, Takashi, 4,055,565, Cl. 260-281.00N.

Okamoto, Masahiro; Nemoto, Makoto; Kataoka, Yushin; and Tokugawa, Yoshiharu, 4,055,585, Cl. 260-453.0SP.

Sundberg, Leif, to Wamac A.B. Device with collecting basket for collecting printed matter in a pile and discharging the same. 4,055,245, Cl. 198-422.000.

Sunmark, Inc.: See—
Kelly, Ray G.; Pruitt, Kenneth R., Sr.; and Kershman, Alvin L., 4,055,669, Cl. 426-93.000.

Suntech, Inc.: See—
Norton, Richard V., 4,055,587, Cl. 260-465.00C.

Sushkov, Valery Petrovich: See—
Akimov, Jury Stepanovich; Sushkov, Valery Petrovich; and Kurinny, Vladimir Ivanovich, 4,055,443, Cl. 148-1.500.

Swallow, Roger T., to Kendall Company, The. Belt assembly. 4,054,952, Cl. 2-338.000.

Swanson, Billy L., to Phillips Petroleum Company. Method and composition for acidizing subterranean formations. 4,055,502, Cl. 252-8.55C.

Sweeney, Patrick E., to AAI Corporation. Cutting torch arrangement. 4,055,332, Cl. 266-48.000.

Sweetser, Philip B.: See—
Johnson, Alexander L.; and Sweetser, Philip B., 4,055,409, Cl. 71-76.000.

Swinehart, Carl F., to Harshaw Chemical Company, The. Method for growing absorption-free alkali metal halide single crystals. 4,055,457, Cl. 156-616.00R.

Symons Corporation: See—
Schimmel, Vernon R., 4,055,321, Cl. 249-182.000.

Syntex (U.S.A.) Inc.: See—
Ackrell, Jack; and Muchowski, Joseph M., 4,055,574, Cl. 260-327.00B.

Alvarez, Francisco S.; and Van Horn, Albert R., 4,055,564, Cl. 542-413.000.

Walker, Keith A. M., 4,055,652, Cl. 424-273.00R.

Taga, Yasuyoshi; and Wakasone, Masaharu, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing granular potassium sorbate. 4,055,617, Cl. 264-141.000.

Taguchi, Yoshinobu: See—
Masuzima, Sho; Takahashi, Tetsuo; Taguchi, Yoshinobu; and Fujita, Hisashi, 4,054,988, Cl. 29-564.600.

Tajima, Eiichi; Yamamoto, Kaname; and Imai, Takayoshi, to Tajima Roofing Co., Ltd. Process for producing laminated bituminous roofing membrane. 4,055,453, Cl. 156-279.000.

Tajima Roofing Co., Ltd.: See—
Tajima, Eiichi; Yamamoto, Kaname; and Imai, Takayoshi, 4,055,453, Cl. 156-279.000.

Takahashi, Mitsuo: See—
Okudaira, Shigenori; Takahashi, Mitsuo; Irie, Takefumi; Itoh, Eiji; and Kashiwagi, Koh, 4,055,621, Cl. 423-79.000.

Takeuchi, Takeshi; and Takahashi, Mitsuo, 4,055,809, Cl. 325-308.000.

Takahashi, Shinichiro: See—
Tozawa, Keizaburo; Amatsu, Hideo; Takahashi, Shinichiro; Fujimoto, Kazumi; and Ikeda, Kishio, 4,055,372, Cl. 312-15.000.

Takahashi, Tetsuo: See—
Masuzima, Sho; Takahashi, Tetsuo; Taguchi, Yoshinobu; and Fujita, Hisashi, 4,054,988, Cl. 29-564.600.

Takamatsu, Akira: See—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.

Takeda, Hideichi: See—
Okawa, Taro; and Takeda, Hideichi, 4,055,031, Cl. 52-172.000.

Takeuchi, Takeshi; and Takahashi, Mitsuo, to Hochiki Corporation. Amplifying device. 4,055,809, Cl. 325-308.000.

Takeuchi, Tomio: See—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.

Takeuchi, Toru: See—
Kiyokawa, Shin; Sakaguchi, Shokichi; and Takeuchi, Toru, 4,055,526, Cl. 264-22.000.

Tall, Albert: See—
Thimons, Edward D.; Vinson, Robert P.; Kissell, Fred N.; and Tall, Albert, 4,055,074, Cl. 73-40.000.

Tamao, Yoshikuni: See—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Toru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,636, Cl. 424-177.000.

Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Toru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,651, Cl. 424-267.000.

Tamas, Attila J., to Clark Equipment Company. Battery extractor for vehicles. 4,055,260, Cl. 214-44.00R.

Tamura, Toshinari: See—
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.

Tanaka, Hiroshi; Ogisu, Noriyuki; and Urakawa, Akira, to Nichibe Fuji Cycle Co., Ltd. Bicycle brake device with increased braking power. 4,055,235, Cl. 188-24.000.

Tanaka, Shigeo, to Sony Corporation. Electron beam deflection circuit. 4,055,784, Cl. 315-397.000.

Tanaka, Takaho: See—
Kawai, Shichio; Tanaka, Takaho; Bannai, Eisuke; Uchida, Kenji; and Shimizu, Ryuichi, 4,055,780, Cl. 313-346.00R.

Tangen, Walter, to Gewako S.A. Stabilizing device for an inflatable raft. 4,054,961, Cl. 9-11.00A.

Tannetics, Inc.: See—
Iannelli, Frank M., 4,055,198, Cl. 137-116.500.

Tany, Michio. Electrical therapeutic apparatus. 4,055,190, Cl. 128-422.000.

Tasman Joinery Company Limited: See—
Duckett, Herbert John, 4,055,318, Cl. 248-243.000.

Tassoney, Joseph P.: See—
Choi, Charles K.; and Tassoney, Joseph P., 4,055,486, Cl. 209-11.000.

Tatishvili, Otari Vardenovich: See—
Gvelesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tatishvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.

Taub, Bernard; and Ostrozyński, Robert Leopold, to Allied Chemical Corporation. Constant boiling ternary compositions and the process for using such compositions in the preparation of polyurethane foam. 4,055,521, Cl. 260-2.5AF.

Taylor, Clarence R. Electric shaver head cleaning device. 4,054,963, Cl. 15-310.000.

Taylor & Gaskin: See—
Zalewski, Norman G., 4,055,246, Cl. 198-575.000.

Taylor, Lynn Johnston; and Troy, Henry Neal, to Owens-Illinois, Inc. Process for recovering, recycling and reusing a composite container. 4,055,441, Cl. 134-10.000.

Tech, Kurt O.: See—
Chynoweth, Lawrence L.; and Tech, Kurt O., 4,055,386, Cl. 408-13.000.

Teisseire, Paul Jose, to Societe Anonyme Rouse Bertrand Dupont. Intermediates useful for the production of norpatchoulanol. 4,055,594, Cl. 260-514.00G.

Tekma Kinomat S.p.A.: See—
Bonaiti, Francesco, 4,055,310, Cl. 242-7.080.

Tennison, Stephen Robert: See—
McCarroll, John James; Clark, John Trevor Kent; and Tennison, Stephen Robert, 4,055,628, Cl. 423-448.000.

Tewesley, Eric William; and Matthewman, Ian, to Wildt Mellor Bromley Limited. Electronic control data transmission for knitting machines. 4,055,058, Cl. 66-50.00R.

Texas Instruments Incorporated: See—
Rao, G. R. Mohan, 4,055,444, Cl. 148-1.500.

Wagers, Robert S.; and Hartmann, Clinton S., 4,055,819, Cl. 333-30.00R.

Wagers, Robert S.; and Hartmann, Clinton S., 4,055,821, Cl. 333-70.00R.

Textron Inc.: See—
Moertel, George B.; and Johnston, James R., 4,054,973, Cl. 24-205.00R.

Tezuka, Toru: See—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Toru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,636, Cl. 424-177.000.

Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Toru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,651, Cl. 424-267.000.

Thermoguard Insulation Co.: See—
Crawford, G. Roger; Sanders, Duane; and Shill, David B., 4,055,203, Cl. 141-73.000.

Thimons, Edward D.; Vinson, Robert P.; Kissell, Fred N.; and Tall, Albert, to United States of America, Interior. Window method for measuring leakage. 4,055,074, Cl. 73-40.000.

Thomas, G. Lamar: See—
Pike, Harold L.; Thomas, G. Lamar; Ketchum, Ronald L.; and Evans, John F., 4,055,801, Cl. 324-73.00R.

Thompson, Darrell R., to Celanese Corporation. Stabilized acetonitrile solvent containing polyacrylonitrile compositions and method of forming same. 4,055,532, Cl. 260-32.400.

Thompson, Harold. Mini bench rest. 4,055,017, Cl. 42-94.000.

Thompson, Henry Clark, to Thompson, Henry Clark. Simultaneously foamed resin and magnesium oxychloride cement. 4,055,519, Cl. 260-2.5AK.

Thompson, Hugh C.: See—
Osofsky, Irving B.; and Thompson, Hugh C., 4,055,104, Cl. 89-1.00A.

Thompson, Marion E.: See—
Schmidt, Terrance L.; and Thompson, Marion E., 4,055,014, Cl. 40-152.200.

Thomson-CSF: See—
Huignard, Jean Pierre; and Micheron, Francois, 4,055,838, Cl. 340-173.200.

Lyon-Caen, Robert; and Ngu Tung, Pham, 4,055,728, Cl. 179-15.0AT.

Thornon, Douglas R.; and Smiglee, Jerome, to Manitou Systems, Inc. Line-seizing apparatus. 4,055,835, Cl. 340-147.0LP.

Thorp, Jeffrey Meyrick: See—
Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, 4,055,595, Cl. 260-520.00B.

Three Bond Co., Ltd.: See—
Saito, Tsutomu, 4,055,542, Cl. 260-47.0UA.

Thummel, Rudolph C.: See—
Dawes, Dag; and Thummel, Rudolph C., 4,055,572, Cl. 260-308.00R.

Thun-Hohenstein, Carl, to Reflex Mobelpflegemittel-Erzeugung Konrad Schischlik & Sohne. Accessory for use with vacuum cleaners or vacuum-cleaning conduits. 4,055,405, Cl. 55-216.000.

Tile Council of America, Inc.: See—
Burley, David R., 4,055,529, Cl. 260-29.6RW.

Tillman, Lynn W.; Henscheid, Kent R.; and Smith, Larry D., to Hewlett-Packard Company. Calculator apparatus with annuity switch for performing begin-and-end-period annuity calculations. 4,055,757, Cl. 364-715.000.

Timken Company, The: See—
Hartbottle, William E., 4,054,999, Cl. 33-181.0AT.

Timpa, Judy D.: See—
Chance, Leon H.; and Timpa, Judy D., 4,055,720, Cl. 544-205.000.

Tobey, James F.: See—
Jeffreys, George A.; Price, Jean L.; and Tobey, James F., 4,055,666, Cl. 426-31.000.

Tokico Ltd.: See—
Haraikawa, Tetsuo; and Ito, Hiroshi, 4,055,238, Cl. 188-73.500.

Tokugawa, Yoshiharu: See—
Okamoto, Masahiro; Nemoto, Makoto; Kataoka, Yushin; and Tokugawa, Yoshiharu, 4,055,585, Cl. 260-453.0SP.

Tokui, Masaaki: See—
Komiya, Yoshiro; Uchida, Kunihiko; and Tokui, Masaaki, 4,055,417, Cl. 75-142.000.

Tokyo Denki Kagaku Kogyo Kabushiki Kaisha: See—
Masuzima, Sho; Takahashi, Tetsuo; Taguchi, Yoshinobu; and Fujita, Hisashi, 4,054,988, Cl. 29-564.600.

Tokyo Gihatsu Seiki Company Limited: See—
Nakayama, Taisuke; and Nakajima, Sokichi, 4,054,954, Cl. 3-1.000.

Tomioka, Kenichi: See—
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.

Tomioka, Shinji; Mori, Yasuki; Nara, Takashi; and Shirahata, Kunikatsu, to Abbott Laboratories. Method of producing 1-N-[L-(-)- α -hydroxy- γ -aminobutyryl]XK-62-2. 4,055,715, Cl. 536-17.000.

Tone, Hiroshi: See—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.

Tonomura, Shinji: See—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Toru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,636, Cl. 424-177.000.

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Torney, Harry L.; Torney, Helen T.; and Bordt, Dale E., to Johnson & Johnson. Culture medium for tissue culture techniques. 4,055,466, Cl. 195-1.700.

Torney, Helen T.: See—
Torney, Harry L.; Torney, Helen T.; and Bordt, Dale E., 4,055,466, Cl. 195-1.700.

Torres, Jose Marcelo, to Combustion Engineering, Inc. Automatic motion inhibit system for a nuclear power generating system. 4,055,463, Cl. 176-24.00R.

Toyoooka, Tadao: See—
Nakamura, Masatatsu; Kominami, Hideyuki; Amagami, Keizo; Kobayashi, Takao; and Toyoooka, Tadao, 4,055,740, Cl. 219-10.49R.

Toyota Jidosha Kogyo Kabushiki Kaisha: See—
Futamura, Kazumasa, 4,055,045, Cl. 60-322.000.

Komiyama, Yoshiro; Uchida, Kunihiko; and Tokui, Masaaki, 4,055,417, Cl. 75-142.000.

Konishi, Masami; and Futamura, Kazumasa, 4,055,043, Cl. 60-282.000.

Kono, Toshiyuki, 4,055,153, Cl. 123-8.090.

Kono, Toshiyuki, 4,055,154, Cl. 123-8.090.

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Numazawa, Akio; Nakamura, Hiroyuki; Kurita, Tokio; Horie, Kouji; and Kondo, Toshio, 4,055,237, Cl. 188-73.400.

Tozawa, Keizaburo; Amatsu, Hideo; Takahashi, Shinichiro; Fujimoto, Kazumi; and Ikeda, Kishio, to Sony Corporation. Storage receptacle for magnetic tape cassette. 4,055,372, Cl. 312-15.000.

Traise, John E. Combined mailer and return envelope assembly. 4,055,294, Cl. 229-69.000.

Traxinger, Walter R.: See—
Simich, Emil; and Traxinger, Walter R., 4,055,115, Cl. 100-34.000.

Trident Engineering Assoc., Inc.: See—
Jasperon, Robert E.; Erb, Charles G.; Haber, Donald F.; and Pouring, Andrew A., 4,055,121, Cl. 102-14.000.

Tripp, Dwight E. Centrifugal clutch mechanism. 4,055,241, Cl. 192-105.0CE.

Tritsch, Ludwig, to Johnson & Johnson. Tape closure having release means integral with diaper backing sheet. 4,055,181, Cl. 128-287.000.

Tropen, Michele. Centrifugal granulometer. 4,055,076, Cl. 73-61.400.

Trowbridge, David L.: See—
United States of America, National Aeronautics and Space Administration; and Trowbridge, David L., 4,055,810, Cl. 330-4.000.

Troy, Henry Neal: See—
Taylor, Lynn Johnston; and Troy, Henry Neal, 4,055,441, Cl. 134-10.000.

Tsai, Shan-Pu: See—
Benezra, Leo L.; Hill, David W.; Riihimaki, Arnold; and Tsai, Shan-Pu, 4,055,476, Cl. 204-98.000.

Tskvitinidze, Alexandr Shalvovich: See—
Gvelesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tashvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.

Tulip, Robert: See—
Langley, Philip Edward; and Tulip, Robert, 4,055,600, Cl. 260-586.00P.

Tumble Not Tumbler, Inc.: See—
Jones, Dennis J., 4,055,273, Cl. 220-70.000.

Turner, John A.; and Ritchie, Gordon J. Electrical position resolving by zero-crossing delay. 4,055,726, Cl. 178-18.000.

Tuunnen, Risto, to Valmet Oy. Paper machine with single-wire and curved twin-wire formers. 4,055,461, Cl. 162-290.000.

Tushvili, Otari Shalvovich: See—
Gvelesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tashvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.

Tweet, David E.: See—
Panandiker, K. A. Pai; and Tweet, David E., 4,055,550, Cl. 260-77.5AA.

Panandiker, K. A. Pai; and Tweet, David E., 4,055,551, Cl. 260-77.5AA.

Uchida, Kenji: See—
Kawai, Shichio; Tanaka, Takaho; Bannai, Eisuke; Uchida, Kenji; and Shimizu, Ryuichi, 4,055,780, Cl. 313-346.00R.

Uchida, Kunihiko: See—
Komiya, Yoshiro; Uchida, Kunihiko; and Tokui, Masaaki, 4,055,417, Cl. 75-142.000.

Udhytil, Anton R.; and Gorder, Ray L. Reusable safety warning device. 4,055,840, Cl. 340-321.000.

Ultra-Centrifuge Nederland N.V.: See—
van Heel, Hubertus Johannes Gerardus, 4,055,397, Cl. 23-264.000.

Ulyanov, Viktor Leonidovich; Shishkarev, Eduard Evgenievich; Nazarenko, Valentin Vasilievich; Yavich, Vladimir Efimovich, deceased; and by Yavich, Maria Semenovna, administrator. Vacuum casting machine. 4,055,216, Cl. 164-258.000.

Umazawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, to Sanraku-Ocean Co., Ltd. Processes for producing physiologically active peptide and its N-acyl derivatives. 4,055,468, Cl. 195-29.000.

Underwood, J. Larry. Multiple chamber package. 4,055,270, Cl. 220-23.000.

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Barthel, Alfred, 4,055,268, Cl. 220-9.00C.

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Marsden, James Glenn; and Orenski, Peter Joseph, 4,055,701, Cl. 428-391.000.

Prakash, Sri, 4,055,850, Cl. 361-305.000.

Roberts, Rene, 4,055,549, Cl. 260-77.5AN.

Seese, Ray Bruce; and Watson, Bela Lee, 4,055,025, Cl. 51-411.000.

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Sharp, James E., 4,055,127, Cl. 112-143.000.

Uniroyal Aktiengesellschaft: See—
Senger, Gerhard Franz-Josef, 4,055,209, Cl. 152-209.00R.

United Aircraft Products, Inc.: See—
Freshcorn, Ivan Gene, 4,055,472, Cl. 204-32.00R.

United States of America
Agriculture: See—
Chance, Leon H.; and Timpa, Judy D., 4,055,720, Cl. 544-205.000.

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Dudziak, Thaddeus J., 4,055,079, Cl. 73-117.300.

Wiese, Harold H.; and Wildman, James E., 4,055,105, Cl. 89-43.00R.

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Benedick, William B.; and Daniel, Charles J., 4,055,247, Cl. 206-3.000.

Herman, Richard Frederick, 4,055,199, Cl. 137-590.000.

Hudson, Ed D.; and Mallory, Merrit L., 4,055,782, Cl. 315-111.900.

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Finney, James Lee, 4,055,051, Cl. 61-45.00B.

Thimons, Edward D.; Vinson, Robert P.; Kissell, Fred N.; and Tall, Albert, 4,055,074, Cl. 73-40.000.

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Holderman, Louis B.; and Peters, Palmer N. Germanium coated microbridge and method. 4,055,847, Cl. 357-5.000.

Sakellaris, Peter C. Automatic fluid dispenser. 4,055,147, Cl. 119-72.500.

Trowbridge, David L. Independent gain and bandwidth control of a traveling wave maser. 4,055,810, Cl. 330-4.000.

Udike, Otis L. Apparatus for measuring a sorbate dispersed in a fluid stream. 4,055,072, Cl. 73-23.000.

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Adamson, Arthur P.; Sargisson, Donald F.; and Stotler, Charles L., Jr., 4,055,041, Cl. 307-360.000.

Black, James M., 4,055,777, Cl. 307-360.000.

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Means, Robert W., 4,055,776, Cl. 307-355.000.

Medford, Robert C., 4,055,709, Cl. 429-49.000.

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Kats, Mindert; and Sleumer, Hendrikus Bernardus, 4,055,114, Cl. 99-280.000.

Verhoeven, Robertus Jozefus Maria; and Ong, Daniel, 4,055,350, Cl. 274-10.00S.

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Carleton, Peter S.; Ewen, James H., Jr.; and Reymore, Harold E., Jr., 4,055,548, Cl. 260-77.5AT.

Nelson, Norman A., 4,055,602, Cl. 250-613.00D.

White, David R., 4,055,563, Cl. 542-413.000.

Urakawa, Akira: See—
Tanaka, Hiroshi; Ogisu, Noriyuki; and Urakawa, Akira, 4,055,235, Cl. 188-24.000.

Vaeth, Ernst: See—
Christophliemk, Peter; Friedemann, Wolfgang; Vaeth, Ernst; and Worms, Karl-Heinz, 4,055,622, Cl. 423-118.000.

Vajna, Eugenio: See—
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, 4,055,535, Cl. 260-45.70R.

Valenti, Peter C.: See—
Barer, Sol J.; Valenti, Peter C.; and Marchwinski, Michael, 4,055,663, Cl. 424-319.000.

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Lundquist, Ingemar H., 4,055,176, Cl. 128-214.00C.

Valmet Oy: See—
Turunen, Risto, 4,055,461, Cl. 162-290.000.

Vamvakaris, Christos: See—
Patsch, Manfred; and Vamvakaris, Christos, 4,055,568, Cl. 260-302.00H.

Vandelen, Dirk J.: See—
Bayorgeon, Jeffrey T.; Vandelen, Dirk J.; and Legrand, Pierre N., 4,055,061, Cl. 72-32.000.

Vanderford, Wallace Snow, to Leeds & Northrup Company. Heater support element for electric furnace. 4,055,723, Cl. 13-25.000.

van der Lely, Cornelis. Soil cultivating implements. 4,055,221, Cl. 172-47.000.

Vandling, John M., to Exxon Research & Engineering Co. Apparatus for the direct connection of ancillary equipment to a telephone network. 4,055,729, Cl. 179-2.00C.

van Heel, Hubertus Johannes Gerardus, to Ultra-Centrifuge Nederland N.V. Apparatus for separating a sublimation product from a gas. 4,055,397, Cl. 23-264.000.

Van Horn, Albert R.: See—
Alvarez, Francisco S.; and Van Horn, Albert R., 4,055,564, Cl. 542-413.000.

Vanhumbbeck, Jacky: See—
Busmann, Egon; Flamme, Bruno; Vanhumbbeck, Jacky; Helder, Johannes; and De Steur, Hubert, 4,055,751, Cl. 364-500.000.

van Riet, Jan A. P.: See—
Ziekman, Paul; and van Riet, Jan A. P., 4,055,382, Cl. 356-210.000.

van Staveren, Hendricus Cornelis: See—
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,055,037, Cl. 56-16.400.

Van Vliet, Raymond August: See—
Ryan, Arthur Sensor; and Van Vliet, Raymond August, 4,055,183, Cl. 128-287.000.

Vasquez, Jose Arthur. Measured material delivery apparatus and method. 4,055,255, Cl. 214-2.000.

Veeder Industries, Inc.: See—
Marres, George; and D'Alesandris, Loreto B., 4,054,986, Cl. 29-434.000.

Veige, Sten: See—
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,055,638, Cl. 424-219.000.

Velsicol Chemical Corporation: See—
Wu, Chin Ching; and Krenzer, John, 4,055,569, Cl. 260-305.000.

Vemco Products, Inc.: See—
Gatland, Geoffrey H.; and Robitaille, Kenneth L., 4,055,023, Cl. 49-28.000.

Verburg, Charles Cornelis: See—
Kattenberg, Hans Robert; and Verburg, Charles Cornelis, 4,055,679, Cl. 426-607.000.

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Kampf, Fritz; and Kaltenberg, Hans-Georg, 4,055,218, Cl. 165-1.000.

Verhoeven, Robertus Jozefus Maria; and Ong, Daniel, to U.S. Philips Corporation. Changer pin for a record changer. 4,055,350, Cl. 274-10.00S.

Vernaleken, Hugo: See—
Hucks, Uwe; and Vernaleken, Hugo, 4,055,611, Cl. 264-6.000.

Vianova Kunstharz A.G.: See—
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Victor Company of Japan, Limited: See—
Watanabe, Yasuaki; Okabe, Yukio; Hayakawa, Mitsuru; Ikemura, Yuichi; Fujita, Yasuhiro; and Murakami, Daisuke, 4,055,817, Cl. 331-117.00R.

Vidalenq, Maurice. Gas boiler, particularly for central heating. 4,055,152, Cl. 122-235.00R.

Vig, Satinder K.; Koester, Harold J.; and Berg, William H., Jr., to American Sterilizer Company. Self aligning magnetic locking device for module swivel caster assembly. 4,054,965, Cl. 16-35.00D.

Vinals, Joaquin: See—
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,055,506, Cl. 252-132.000.

Vinson, Robert P.: See—
Thimons, Edward D.; Vinson, Robert P.; Kissell, Fred N.; and Tall, Albert, 4,055,074, Cl. 73-40.000.

Vock, Manfred Hugo: See—
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,055,691, Cl. 426-534.000.

Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,055,506, Cl. 252-132.000.

Vogel, Ralph A., to Essex Group, Inc. Control system and method for controlling the oxygen content in continuously cast metal. 4,055,212, Cl. 164-4.000.

Vogt, James E. Fishing tool. 4,054,969, Cl. 17-68.000.

Vonco Products, Inc.: See—
Laske, Louis Lawrence, 4,055,454, Cl. 156-290.000.

Voronkov, Mikhail Grigorievich; Platonova, Ada Timofeevna; Mansurova, Ljudmila Andreevna; Kuznetsov, Igor Georgievich; Zelchan, Gunar Izidorovich; and Dyakov, Valery Mikhailovich. Medicinal preparation for healing wounds and treating dermatitis using 1-(chloromethyl)silatrane. 4,055,637, Cl. 424-184.000.

Voss, Charles J.; and Nykiel, Theodore, to Bell & Howell Company. Method of developing electrostatic images using wide latitude toner. 4,055,419, Cl. 96-1.0LY.

Vyval, Larry A., to ACF Industries, Incorporated. Lubricant pocket for pressed in gate valve seat. 4,055,325, Cl. 251-328.000.

Wada, Shigetaka; and Atsumi, Senji, to NGK Insulators, Ltd. Barium titanate ceramic. 4,055,438, Cl. 106-73.320.

Wade, Betty Alma: See—
Lauer, John B.; and Wade, Betty Alma, 4,055,381, Cl. 355-75.000.

Wagers, Robert S.; and Hartmann, Clinton S., to Texas Instruments Incorporated. Acoustic ridge delay line. 4,055,819, Cl. 333-30.00R.

Wagers, Robert S.; and Hartmann, Clinton S., to Texas Instruments Incorporated. Acoustic ridge transversal filter. 4,055,821, Cl. 333-70.00T.

Wagner, Heinz: See—
Heumann, Heinz; Saure, Manfred; Wagner, Heinz; and Wartusch, Johann, 4,055,504, Cl. 252-63.200.

Wakasone, Masaharu: See—
Taga, Yasuyoshi; and Wakasone, Masaharu, 4,055,617, Cl. 264-141.000.

Waldenmeier, Gunter; and Hempelmann, Wilhelm, to Gesellschaft fur Kernforschung m.b.H. Dual lid for closing coupled openings. 4,055,274, Cl. 220-256.000.

Waldron, Stephen H., to American Sterilizer Company. Rotary drill for surgeons. 4,055,185, Cl. 128-305.100.

Walker, Gordon Marvin: See—
Lynn, William Fred; and Walker, Gordon Marvin, 4,055,369, Cl. 308-187.100.

Walker, Keith A. M., to Syntex (U.S.A.) Inc. 1-[β (R-thio)phenethyl]-imidazoles and derivatives thereof. 4,055,652, Cl. 424-273.00R.

Walters, John P.; and Coleman, David M., to Wisconsin Alumni Research Foundation. Spark source with regulation of spark magnitude by control of spark timing. 4,055,783, Cl. 315-241.00R.

Wamac AB: See—
Sundberg, Leif, 4,055,245, Cl. 198-422.000.

Warner-Lehman Corporation: See—
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Wartusch, Johann: See—
Heumann, Heinz; Saure, Manfred; Wagner, Heinz; and Wartusch, Johann, 4,055,504, Cl. 252-63.200.

Wasson, Daniel A., to Ireco Chemicals. Aqueous blasting composition with crystal habit modifier. 4,055,449, Cl. 149-2.000.

Wat, Edward Koon Wah, to Du Pont de Nemours, E. I., and Company. Phenylureidomimidazolidinediones as plant protectants. 4,055,412, Cl. 71-92.000.

Watanabe, Tetsuya: See—
Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; and Nakamura, Tadashi, 4,055,623, Cl. 423-235.000.

Watanabe, Yasuaki; Okabe, Yukio; Hayakawa, Mitsuru; Ikemura, Yuichi; Fujita, Yasuhiro; and Murakami, Daisuke, to Matsushita Electric Industrial Company Limited; and Victor Company of Japan, Limited. Variable frequency oscillator. 4,055,817, Cl. 331-117.00R.

Watson, Bela Lee: See—
Seese, Ray Bruce; and Watson, Bela Lee, 4,055,025, Cl. 51-411.000.

Wavin B.V.: See—
Leloux, Arnoldus Willem Jan, 4,055,098, Cl. 83-309.000.

Weagle, James A., to Krueger Metal Products, Inc. Folding training table. 4,055,124, Cl. 108-132.000.

Wean United, Inc.: See—
Bartley, William W., 4,055,107, Cl. 92-86.500.

Weaver, Kenneth E.: See—
Goodenough, David John; Weaver, Kenneth E.; Smrcka, Joseph G.; and Clayman, William, 4,055,771, Cl. 250-505.000.

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Weber, Robert W., to Servco Company, a division of Smith International, Inc., The. Underreamer having splined torque transmitting connection between telescoping portions for control of cutter position. 4,055,226, Cl. 175-273.000.

Weed Eater, Inc.: See—
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Weimer, Dean R., to Continental Oil Company. Method for increasing the water dispersibility of alpha alumina monohydrate. 4,055,509, Cl. 252-363.500.

Weimer, Paul Kessler, to RCA Corporation. Charge transfer readout circuits. 4,055,836, Cl. 340-173.00R.

Weiner, Jay H., to Airway Industries, Inc. Luggage case. 4,055,239, Cl. 190-50.000.

Weinschenker, Ned M.; and Andersen, Niels H., to Alza Corporation. Alkyl diethers of prostaglandins. 4,055,593, Cl. 260-514.00D.

Weinschenker, Ned M., to Dynapol. Process for the reduction of aldehydes and ketones to the corresponding carbinols. 4,055,604, Cl. 260-618.00H.

Weisbrod, Alfred L. Lamp shade. 4,055,760, Cl. 362-352.000.

Wenger, George Michael: See—
Chu, Tze Yao; and Wenger, George Michael, 4,055,217, Cl. 165-1.000.

Wenner, Valentin: See—
Badertscher, Ernest; Chaverson, Michel; and Wenner, Valentin, 4,055,555, Cl. 260-119.000.

Werner, James L.: See—
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Wesner, Charles R., to Sperry Rand Corporation. Rudder error detector. 4,055,135, Cl. 114-144.00E.

Wessely, Eugene, to Gallay S.A. Method and apparatus for triple roll seaming end closures to container bodies. 4,055,133, Cl. 113-120.00Y.

Western Electric Company, Inc.: See—
Chu, Tze Yao; and Wenger, George Michael, 4,055,217, Cl. 165-1.000.

Keen, Ralph H.; and Seaman, Gary G., 4,055,616, Cl. 264-139.000.

Westvaco Corporation: See—
Hsu, Thomas C.; and Miller, John L., 4,055,462, Cl. 162-382.000.

Wetterhorn, Richard Harry, to Dresser Industries, Inc. Motion amplifier for condition responsive gauge instrument. 4,055,085, Cl. 73-418.000.

Weyerhaeuser Company: See—
Ryan, Arthur Sensor; and Van Vliet, Raymond August, 4,055,183, Cl. 128-287.000.

Whatman Reeve Angel Limited: See—
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Wheatley, Carl Franklin, Jr., to RCA Corporation. Transistor amplifiers. 4,055,811, Cl. 330-289.000.

Wheeler, Ian Robert; and Robertson, George Heddle, to Ciba-Geigy Corporation. Pigment compositions. 4,055,440, Cl. 106-288.00Q.

Wheelock, Kenneth S., to Exxon Research & Engineering Co. Perovskite catalysts and process for their preparation. 4,055,513, Cl. 252-462.000.

Whetstone, Cecil, Jr.; and Burns, Anthony G., to Hossfeld Manufacturing Co. Method and apparatus for simultaneous edge bending of stair rail cap stock and channel stock. 4,055,065, Cl. 72-217.000.

Whitaker, Randal O. Annunciator for use with electronic digital clock. 4,055,843, Cl. 340-384.00E.
 White, David R., to Upjohn Company, The. Cyano intermediates for prostaglandins. 4,055,563, Cl. 542-413.000.
 White, Lyall B. Method of broiling. 4,055,677, Cl. 426-438.000.
 Widham, Ernest G. Toilet of compost type. 4,054,958, Cl. 4-144.000.
 Wiese, Harold H., and Wildman, James E., to United States of America, Army. Method and apparatus for visually locating the position of a floating piston inside of a cylinder. 4,055,105, Cl. 89-43.00R.
 Wiesel, Manfred; and Sommer, Richard, to Bayer Aktiengesellschaft. Sulfonamidobenzene-azo-aminopyrazole dyestuffs. 4,055,557, Cl. 240-162.000.
 Wilcox, David E.: See—
 Allan, Thomas T.; and Wilcox, David E., 4,055,075, Cl. 73-40.700.
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 Willett Mellor Bromley Limited: See—
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 Holsinger, Jerry L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., 4,055,733, Cl. 179-175.30R.
 Holsinger, Jerry L.; Lyon, David L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., 4,055,808, Cl. 325-67.000.
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 Williams Patent Crusher and Pulverizer Company: See—
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 Williams, Richard R. Animal oiler device. 4,055,150, Cl. 119-157.000.
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 Wilson, Donald Miller: See—
 Orlandi, John Victor; Poley, Neil Myron; and Wilson, Donald Miller, 4,055,219, Cl. 219-390.000.
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 Wilson, Harry R. Table saw. 4,055,160, Cl. 125-13.05S.
 Wilson, Homer M., to Petrolite Corporation. Coulometric titrator. 4,055,478, Cl. 204-195.00T.
 Wilson, Wallace C.; and Shoemaker, Ralph W., to United States of America, Interior. Sonic measuring system. 4,055,830, Cl. 340-46.00R.
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 Wingate, Sidney A.; and Dreano, Edward L., Jr., to Dynamics Research Corporation. Gage stop assembly. 4,055,070, Cl. 72-461.000.
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 Andresen, Peter B.; Winter, Claus; and Hendel, Siegfried H., 4,055,373, Cl. 312-263.000.
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 Wittnebel, Bruce W.; and Lowrey, R. Dean, to Minnesota Mining and Manufacturing Company. Additive for inhibitor removing bath. 4,055,422, Cl. 96-22.000.
 Wojtowicz, John A., to Olin Corporation. Process for producing trichloroisocyanuric acid from selected symmetrical triazines. 4,055,719, Cl. 544-190.000.
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 Woskow, Robert M., to International Telephone and Telegraph Corporation. Voltage stress stabilized saw device. 4,055,816, Cl. 331-32.000.
 Wu, Chin Ching; and Krenzer, John, to Velsicol Chemical Corporation. 1-Benzothiazolyl-5-acyloxymidazolidinones. 4,055,569, Cl. 260-305.000.
 Wu-Heng, Tu. Apparatus for automatic gas ignition control. 4,055,164, Cl. 126-351.000.
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 Hattler, Louis R.; and Menon, Sukumaran K., 4,055,143, Cl. 118-60.000.

Limburg, William W.; and Pai, Damodar M., 4,055,420, Cl. 96-1.50N.
 Looney, John H., 4,055,339, Cl. 271-173.000.
 Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,055,340, Cl. 271-236.000.
 Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich. Digital device for measuring single and multiple impact impulses. 4,055,842, Cl. 340-347.0AD.
 Yamada, Kenji: See—
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 Yanagisawa, Isao: See—
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 Ulyanov, Viktor Leonidovich; Shishkarev, Eduard Evgenievich; Nazarenko, Valentin Vasilievich; Yavich, Vladimir Efimovich, deceased; and Yavich, Maria Semenovna, administrator, 4,055,216, Cl. 164-258.000.
 Yavich, Vladimir Efimovich, deceased: See—
 Ulyanov, Viktor Leonidovich; Shishkarev, Eduard Evgenievich; Nazarenko, Valentin Vasilievich; Yavich, Vladimir Efimovich, deceased; and Yavich, Maria Semenovna, administrator, 4,055,216, Cl. 164-258.000.
 Yazawa, Kenichiro: See—
 Hasegawa, Eiichi; and Yazawa, Kenichiro, 4,055,430, Cl. 96-90.00R.
 Yokoyama, Takashi: See—
 Ashida, Kaneyoshi; Ohtani, Masaaki; Yokoyama, Takashi; and Ohkubo, Shoichi, 4,055,522, Cl. 260-2.5AW.
 Yoli, Alfred H.; and Husain, Iqbal, to Automation Industries, Inc. Cask handling method and apparatus. 4,055,508, Cl. 252-301.10W.
 Yonekawa, Masaji: See—
 Nakamura, Tutomu; Sasaki, Takehiko; Yonekawa, Masaji; and Maeda, Hidetoshi, 4,055,755, Cl. 364-705.000.
 Yonezawa Toys Co., Ltd.: See—
 Okamoto, Shozo, 4,055,021, Cl. 46-202.000.
 Yoshida, Harry Y. Pin with sleeve for making dental prosthesis. 4,054,995, Cl. 32-11.000.
 Yoshida, Hiroyuki; and Saga, Katumi, to Hodogaya Chemical Co., Ltd. Process for removing nitrogen oxides from gaseous mixtures. 4,055,624, Cl. 423-235.000.
 Yoshida, Kanji: See—
 Kamada, Kensuke; Minami, Shunsuke; and Yoshida, Kanji, 4,055,696, Cl. 428-398.000.
 Yoshida Kogyo K.K.: See—
 Okawa, Taro; and Takeda, Hideichi, 4,055,031, Cl. 52-172.000.
 Yoshida, Koji: See—
 Yano, Nobumitsu; Fukinbara, Itaru; Yoshida, Koji; and Korenaga, Tokiyoshi, 4,055,674, Cl. 426-430.000.
 Yoshimura, Hisashi; Yukimoto, Sadao; Matsumoto, Takashi; Konno, Isago; Kato, Nobuyuki; Ohtani, Tadao; and Kubo, Takao, to Matsushita Electric Industrial Company Limited. Inboard type magnetic system for electro-dynamic transducer. 4,055,732, Cl. 179-117.000.
 Yoshioka, Takao: See—
 Soma, Nobuo; Yoshioka, Takao; Kurumada, Tomoyuki; and Morimura, Syoji, 4,055,536, Cl. 260-45.80N.
 Young, William P., to Molten Metal Engineering Co. Method and apparatus for preparing agglomerates suitable for use in a blast furnace. 4,055,390, Cl. 432-14.000.
 Yukimoto, Sadao: See—
 Yoshimura, Hisashi; Yukimoto, Sadao; Matsumoto, Takashi; Konno, Isago; Kato, Nobuyuki; Ohtani, Tadao; and Kubo, Takao, 4,055,732, Cl. 179-117.000.
 Zajacek, John G.: See—
 McCoy, John J.; and Zajacek, John G., 4,055,630, Cl. 423-509.000.
 Zalewski, Norman G., to Taylor & Gaskin. Ferris wheel type parts washer. 4,055,246, Cl. 198-575.000.

Zelchan, Gunar Izidorovich: See—
 Voronkov, Mikhail Grigorievich; Platonova, Ada Timofeevna; Mansurova, Ljudmila Andreevna; Kuznetsov, Igor Georgievich; Zelchan, Gunar Izidorovich; and Dyakov, Valery Mikhailovich, 4,055,637, Cl. 424-184.000.
 Zeller, Burton S.: See—
 Holmes, Donald E.; Howard, Wayne R.; Fisher, John F.; and Zeller, Burton S., 4,055,228, Cl. 180-14.00B.
 Zeller, Robert Dale; and Sullivan, Daryl Dean, to Johns-Manville Corporation. Method of and assembly for measuring equivalent sphere illumination. 4,055,383, Cl. 356-229.000.
 Zellweger Uster AG: See—
 Loch, Ernst, 4,055,077, Cl. 73-73.000.
 Ziekman, Paul; and van Riet, Jan A. P., to SKF Industrial Trading and Development Company, B.V. Testing method for the separate deter-

mination of varying work surface flaws and arrangement for said method. 4,055,382, Cl. 356-210.000.
 Zimmer, Peter. Treating of travelling webs. 4,055,612, Cl. 264-40.700.
 Zimmermann, Ulrich: See—
 Coster, Hans; Pilwat, Gunter; and Zimmermann, Ulrich, 4,055,799, Cl. 324-71.00R.
 Zions, Bernard S.; and Zions, Victor. Gas pump counter display and method of formation thereof. 4,055,692, Cl. 428-78.000.
 Zions, Victor: See—
 Zions, Bernard S.; and Zions, Victor, 4,055,692, Cl. 428-78.000.
 Zivtins, George J.: See—
 Christensen, Ronald J.; and Zivtins, George J., 4,055,467, Cl. 195-2.000.
 Zwahlen, Gunther: See—
 Babler, Fridolin; Mollet, Hans; and Zwahlen, Gunther, 4,055,439, Cl. 106-288.00Q.
 Zwicker, Homer A. Clamp for holding ice skate while grinding blade. 4,055,026, Cl. 51-228.000.

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977	B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976	B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976	B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977	B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977	B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977	B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976	B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976	B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976	B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977	B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977	B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977	B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976	B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977	B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976	B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976	B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976	B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977	B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977	B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976	B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976	B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976	B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976	B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977	B 385,631	3,982,924	Jan. 27, 1976	Sep. 21, 1976
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977	B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976	B 386,673	3,993,717	Feb. 3, 1976	Nov. 16, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976	B 386,828	3,992,440	Feb. 3, 1976	Nov. 23, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976	B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976	B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977	B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976	B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977	B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976	B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977	B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976	B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977	B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976	B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976	B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976	B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976	B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976	B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976	B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977	B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977	B 395,975	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976	B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977	B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977	B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 330,719	4,000,774	Mar. 9, 1976	Jan. 4, 1977	B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 332,116	4,001,121	Mar. 16, 1976	Jan. 4, 1977	B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 332,442	3,996,299	Feb. 3, 1976	Dec. 7, 1976	B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 333,736	4,001,231	Mar. 30, 1976	Jan. 4, 1977	B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 333,838	3,989,867	Mar. 16, 1976	Nov. 2, 1976	B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 333,838	4,001,201	Mar. 16, 1976	Jan. 4, 1977	B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977	B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977	B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976	B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977	B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977	B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976	B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977	B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976	B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977	B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976	B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976	B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976	B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977	B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977	B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976	B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976	B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977	B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977	B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976	B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 358,427	3,989,896	Mar. 30, 1976	Nov. 2, 1976	B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977	B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976	B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977	B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977	B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976	B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977	B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976	B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976	B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976	B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977	B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977	B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976	B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977	B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977	B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976	B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976	B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977	B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 415,597	4,001,335	Mar. 16, 1976	Jan. 4, 1977	B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 415,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976	B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977	B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976	B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977	B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976	B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976	B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976	B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977	B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976	B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976	B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977	B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977	B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976	B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976	B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977	B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976	B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976	B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976	B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976	B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976	B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976	B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977	B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976	B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977	B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977	B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977	B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977	B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 426,639	3,972,539	Feb. 3, 1976	Nov. 16, 1976	B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977	B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 434,441	D 242,842	Mar. 16, 1976	Dec. 28, 1976	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976	B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977	B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976	B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977	B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976	B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976	B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977	B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976	B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976	B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976	B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976	B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976	B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976	B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977	B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977	B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976	B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976	B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976	B 498,208	4,001,480	Jan. 13, 1976	Jan. 4, 1977
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976	B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 488,836	4,013,121	Mar. 30, 1976	Nov. 22, 1977	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976	B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976	B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977	B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977	B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976	B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976	B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976	B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977	B 499,324	4,001,375	Jan. 16, 1976	Jan. 4, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976	B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976	B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976	B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976	B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976	B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976	B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976	B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976	B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976	B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976	B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976	B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976	B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977	B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976	B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976	B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977	B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976	B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976	B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976	B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976	B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977	B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976	B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976	B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977	B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976	B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976	B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977	B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976	B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976	B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977	B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976	B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977	B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977	B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976	B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977	B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976	B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976	B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977	B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976	B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977	B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976	B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976	B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976	B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976	B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976	B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976	B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976	B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976	B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976	B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976	B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976	B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976	B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976	B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977	B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976	B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976	B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976	B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976	B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976	B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976	B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977	B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977	B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977	B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977	B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977	B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 525,961	3,985,557	Jan. 13, 1976	Nov. 2, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 526,106	3,990,073	Jan. 27, 1976	Sep. 21, 1976	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 526,477	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 528,303	3,991,023	Mar. 16, 1976	Nov. 9, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 9, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977	B 540,888	4,005,528	Mar. 30, 1976	Feb. 15, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976	B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977	B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977	B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977	B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976	B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 533,259	3,999,556	Jan. 24, 1976	Dec. 28, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976	B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 546,922	3,987,741	Mar. 16, 1976	Oct. 26, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976	B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976	B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976	B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 552,489	3,994,864	Jan. 10, 1976	Nov. 30, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 567,158	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 567,207	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 567,305	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 567,437	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 556,057	3,985,439	Jan. 13, 1976	Oct. 12, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976	B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF OCTOBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

- Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, to Du Pont de Nemours, E. I., and Company. Method for producing a gradient elution. Re. 29,454, Cl. 222-1.000.
- Berman, George A.: See—
Drutchas, Gilbert H.; and Berman, George A., Re. 29,456, Cl. 417-53.000.
- Brodbeck, John J., to Chevron Research Company. Equilibration of lower alkyl substituted polyalkyl aromatic hydrocarbons with reduced disproportionation. Re. 29,459, Cl. 260-668.00A.
- Byrne, Sydnor H., Jr.: See—
Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, Re. 29,454, Cl. 222-1.000.
- Chevron Research Company: See—
Brodbeck, John J., Re. 29,459, Cl. 260-668.00A.
- Coleman Company, Inc.: See—
Hastings, Thomas C., Re. 29,457, Cl. 431-123.000.
- Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., to Pennzoil Company. Potassium phosphate manufacture. Re. 29,458, Cl. 71-34.000.
- Drutchas, Gilbert H.; and Berman, George A., to TRW Inc. Pumps with servo-type actuation for cheek plate unloading. Re. 29,456, Cl. 417-53.000.
- Du Pont de Nemours, E. I., and Company: See—
Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, Re. 29,454, Cl. 222-1.000.
- GTE Automatic Electric Laboratories Incorporated: See—
Mills, Jeffrey P., Re. 29,460, Cl. 364-724.000.
- Hastings, Thomas C., to Coleman Company, Inc.: See—
Means for burners. Re. 29,457, Cl. 431-123.000.
- Marsan Manufacturing Company, Inc.: See—
Weddle, Rosemary B., Re. 29,453, Cl. 128-283.000.
- Mills, Jeffrey P., to GTE Automatic Electric Laboratories Incorporated. PCM tone receiver using optimum statistical technique. Re. 29,460, Cl. 364-724.000.
- Mita, Yoshinari: See—
Moriwaki, Masahiro; Sakaguchi, Mitsuhiro; and Mita, Yoshinari, Re. 29,461, Cl. 340-173.0LM.
- Moriwaki, Masahiro; Sakaguchi, Mitsuhiro; and Mita, Yoshinari, to Nippon Electric Company, Limited. Hologram graphic data tablet apparatus using a vernier. Re. 29,461, Cl. 340-173.0LM.
- Nippon Electric Company, Limited: See—
Moriwaki, Masahiro; Sakaguchi, Mitsuhiro; and Mita, Yoshinari, Re. 29,461, Cl. 340-173.0LM.
- Pennzoil Company: See—
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., Re. 29,458, Cl. 71-34.000.
- Sakaguchi, Mitsuhiro: See—
Moriwaki, Masahiro; Sakaguchi, Mitsuhiro; and Mita, Yoshinari, Re. 29,461, Cl. 340-173.0LM.
- Sardisco, John B.: See—
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., Re. 29,458, Cl. 71-34.000.
- Slayton, Dale E.: See—
Slayton, Darrell E., Re. 29,455, Cl. 280-106.00T.
- Slayton, Darrell E., to Slayton, Dale E. Hay baler trailer. Re. 29,455, Cl. 280-106.00T.
- Stewart, James R., Jr.: See—
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., Re. 29,458, Cl. 71-34.000.
- Townsend, Charles E., Jr. Headwear construction. Re. 29,452, Cl. 2-177.000.
- TRW Inc.: See—
Drutchas, Gilbert H.; and Berman, George A., Re. 29,456, Cl. 417-53.000.
- Weddle, Rosemary B., to Marsan Manufacturing Company, Inc. Drainage bag for human body. Re. 29,453, Cl. 128-283.000.
- Wolf, John P., III: See—
Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, Re. 29,454, Cl. 222-1.000.

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- Genn, Fern F.: See—
Genn, Olan R., 4,132, Cl. 32.000.
- Genn, Olan R., to Genn, Olan R.; and Genn, Fern F. Walnut tree. 4,132, 10-25-77, Cl. 32.000.
- Kashima, Takaaki Peter. Chrysanthemum named Imperial Yellow. 4,137, 10-25-77, Cl. 78.000.
- Kepitis, Elga, by said Juris E. Schutz: See—
Schutz, Juris Edgar; and McIntosh, Murdoch Niall, 4,136, Cl. 54.000.
- Kepitis, Peteris: See—
Schutz, Juris Edgar; and McIntosh, Murdoch Niall, 4,136, Cl. 54.000.
- McIntosh, Murdoch Niall: See—
Schutz, Juris Edgar; and McIntosh, Murdoch Niall, 4,136, Cl. 54.000.
- Mock, Norman. Chrysanthemum. 4,133, 10-25-77, Cl. 74.000.
- Mock, Norman. Chrysanthemum. 4,134, 10-25-77, Cl. 74.000.
- Mock, Norman. Chrysanthemum. 4,135, 10-25-77, Cl. 74.000.
- Schutz, Juris E., by said Murdoch N. McIntosh: See—
Schutz, Juris Edgar; and McIntosh, Murdoch Niall, 4,136, Cl. 54.000.
- Schutz, Juris Edgar; and McIntosh, Murdoch Niall, to Schutz, Juris E., by said Murdoch N. McIntosh; Schutz, Solveiga M.; Kepitis, Peteris; and Kepitis, Elga, by said Juris E. Schutz, part interest to each. *Coleonema pulchrum* plant. 4,136, 10-25-77, Cl. 54.000.
- Schutz, Solveiga M.: See—
Schutz, Juris Edgar; and McIntosh, Murdoch Niall, 4,136, Cl. 54.000.

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- AB Bofors: See—
Dahlberg, Sten Johan; Korpi, Jouko Kalevi; and Larsson, Ulf Robert, 246,176, Cl. D15-32.000.
- Akers, Scott P. Aquarium cover. 246,194, 10-25-77, Cl. D30-12.000.
- Albright, Harold D., Jr. Building for dispensing ice cream. 246,192, 10-25-77, Cl. D25-9.000.
- AMF Incorporated: See—
Podall, Robert, 246,159, Cl. D10-40.000.
- Bacskay, Stephen A.; and Messeri, Sidney, to Outlook in Plastics Corporation, Inc.; and Tingue, Brown & Co., part interest to each. Cart. 246,165, 10-25-77, Cl. D12-29.000.
- Balmer, James G.; and Linder, Peter E., to Velo-Bind, Inc. Book binding machine. 246,204, 10-25-77, Cl. D64-11.00R.
- Bausch & Lomb Incorporated: See—
Jordan, Paul A., 246,188, Cl. D24-17.000.
- Beatrice Foods Co.: See—
Lindner, Henry, 246,161, Cl. D10-111.000.
- Lindner, Henry, 246,162, Cl. D10-111.000.
- Lindner, Henry, 246,163, Cl. D10-111.000.
- Benkoe, Erwin: See—
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friedlich, Richard D., 246,195, Cl. D34-4.00R.

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- Bradburne, Francis Edward Husband. Air freshener or the like. 246,115, 10-25-77, Cl. D23-150.000.
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 Koshler, Dale R., 246,164, Cl. D10-124.000.
 Butsch, Otto R., to Sycor, Inc. Closure and bezel for disk recorders and the like. 246,178, 10-25-77, Cl. D14-40.000.
 Campagnolo, Tullio. Wheel for motor-cycles. 246,172, 10-25-77, Cl. D12-105.000.
 Carlsson, Stig Ture; Scuka, Viktor; and Rasmusson, Bo Magnus, to Telefonaktiebolaget L M Ericsson. Tool for digging and laying of submarine cable. 246,167, 10-25-77, Cl. D12-65.000.
 Chan, Ming Kong. Portable cooking stove. 246,151, 10-25-77, Cl. D7-110.000.
 Chesebrough-Pond's Inc.: See—
 Russo, John A.; Ham, David E.; and Vitrac, Jean Pierre, 246,191, Cl. D24-33.000.
 Chesley, Ronald F.: See—
 Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 246,195, Cl. D34-4.00R.
 Codi Corporation: See—
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 Dahlberg, Sten Johan; Korpi, Jouko Kalevi; and Larsson, Ulf Robert, to AB Bofors. Adapter for corner shaped tooth for excavating, digging or bucket loading equipment. 246,176, 10-25-77, Cl. D15-32.000.
 Dalziel, Warren L., to Shugart Associates. Disk clamping element. 246,177, 10-25-77, Cl. D14-40.000.
 DeArment, Samuel W. Double syringe. 246,187, 10-25-77, Cl. D24-14.000.
 Dodd, Jackie L. Bicycle. 246,171, 10-25-77, Cl. D12-111.000.
 Durco, Andrew, Jr., to Mostek Corporation. Digital clock. 246,158, 10-25-77, Cl. D10-15.000.
 Evangelista, Bisked U. Citrus fruit juice extractor. 246,150, 10-25-77, Cl. D7-48.000.
 Everitt, Delmar K.: See—
 Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., 246,195, Cl. D34-4.00R.
 Faivre, Andre, to S E B. Electric ice-cream freezer. 246,179, 10-25-77, Cl. D15-82.000.
 Friedrich, Richard D.: See—
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 Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friedrich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Boy doll. 246,195, 10-25-77, Cl. D34-4.00R.
 Griffin, Timothy L., Jr. Speaker enclosures. 246,174, 10-25-77, Cl. D14-33.000.
 Ham, David E.: See—
 Russo, John A.; Ham, David E.; and Vitrac, Jean Pierre, 246,191, Cl. D24-33.000.
 Han, Robert K. S. Chest of drawers. 246,146, 10-25-77, Cl. D6-145.000.
 Harris, Edward H. Lighting panel. 246,203, 10-25-77, Cl. D48-23.00R.
 Hendricks, Lee. Hanging support for articles. 246,145, 10-25-77, Cl. D6-113.000.
 Heumann, Jules M., to Metropolitan Furniture Manufacturing Company. Bench or similar article. 246,142, 10-25-77, Cl. D6-58.000.
 Hodge, Joseph, to Pilling Co. Hepatic occlusion clamp. 246,190, 10-25-77, Cl. D24-27.000.
 Hoyt, Earl. Squeeze bottle or the like. 246,155, 10-25-77, Cl. D9-2.000.
 Insalaco, Charles J. Contoured grading rake. 246,153, 10-25-77, Cl. D8-13.000.
 Iwanami, Tetsuo, to Sanyei Corporation. Stylized boxing game apparatus, or similar article. 246,197, 10-25-77, Cl. D34-15.0AD.
 Jordan, Paul A., to Bausch & Lomb Incorporated. Ophthalmometer or similar article. 246,188, 10-25-77, Cl. D24-17.000.
 Keen, Robert Donald. Sprinkler standard. 246,183, 10-25-77, Cl. D23-7.000.
 Kocour, Max G.; and Zundel, Arthur P., to National Can Corporation. End closure for a container. 246,157, 10-25-77, Cl. D9-255.000.
 Koshler, Dale R., to Bulova Watch Company, Inc. Electronic watch. 246,164, 10-25-77, Cl. D10-124.000.
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 Dahlberg, Sten Johan; Korpi, Jouko Kalevi; and Larsson, Ulf Robert, 246,176, Cl. D15-32.000.
 Kudla, John, to Codi Corporation. Boat for carrying articles into and out of furnaces. 246,184, 10-25-77, Cl. D23-127.000.
 Kusel, Edwin F., to Wesley-Jessen Inc. Dispensing rack for contact lens vials. 246,148, 10-25-77, Cl. D6-188.000.
 Landrus, Donald S. Man powered airplane. 246,168, 10-25-77, Cl. D12-78.000.
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 Lattie, Robert A. Reflector. 246,160, 10-25-77, Cl. D10-111.000.
 Levin, Kenneth M. Control unit for electronic neural stimulator. 246,173, 10-25-77, Cl. D13-32.000.
 Levin, Monte L., to Scovill Manufacturing Company. Electric food cooker. 246,149, 10-25-77, Cl. D7-94.000.
 Lewis, Peter Howard. Combined wallet and calculator. 246,205, 10-25-77, Cl. D87-3.00A.
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 Luoma, Emil Thomas. Anchoring device for plants. 246,152, 10-25-77, Cl. D8-1.000.
 Mazur, Harry E. Fastener. 246,141, 10-25-77, Cl. D2-409.000.
 Meek, Robert P. Boat hull. 246,166, 10-25-77, Cl. D12-62.000.
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 Muller, Walter. Combined multiple cabinet and shelf storage unit. 246,147, 10-25-77, Cl. D6-164.000.
 Muscatello, Ralph A.; and Wright, Kent M., to Gillette Company, The. Combined bottle and cap therefor. 246,156, 10-25-77, Cl. D9-71.000.
 Nash, Stanley P., to Schweiger Industries, Inc. Seat. 246,143, 10-25-77, Cl. D6-63.000.
 Nash, Stanley P., to Schweiger Industries, Inc. Seat. 246,144, 10-25-77, Cl. D6-63.000.
 National Can Corporation: See—
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 Neary, Joseph F., to Troller Corporation. Diving sinker. 246,182, 10-25-77, Cl. D22-30.000.
 Ogawa, Iwakichi, to Takara Co., Ltd. Articulated toy figure. 246,199, 10-25-77, Cl. D34-15.0AD.
 Ogawa, Iwakichi, to Takara Co., Ltd. Articulated toy figure. 246,200, 10-25-77, Cl. D34-15.0AD.
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 Oppermann, Henry J. Animation lamp. 246,202, 10-25-77, Cl. D48-20.00R.
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 Podall, Robert, to AMF Incorporated. Lighting and appliance timer. 246,159, 10-25-77, Cl. D10-40.000.
 Powers, Michael E. Bicycle cowling. 246,170, 10-25-77, Cl. D12-111.000.
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 Reckwald, Sandra Lee. Building. 246,193, 10-25-77, Cl. D25-24.000.
 Rorabaugh, Dale A., to Surgical Mechanical Research, Inc. Ophthalmic support stand. 246,186, 10-25-77, Cl. D24-1.100.
 Rose, Douglas H. Coaster. 246,198, 10-25-77, Cl. D34-15.0AJ.
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 Smith, Harold E. Electroauricular therapy probe. 246,189, 10-25-77, Cl. D24-17.000.
 Spencer, Gary. Vending vehicle body for selling and dispensing frozen deserts or the like. 246,169, 10-25-77, Cl. D12-99.000.
 Stubelick, Gary Adam. Headphone apparatus. 246,175, 10-25-77, Cl. D14-36.000.
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 Sweeney, Thomas E. Fishing rod handle. 246,181, 10-25-77, Cl. D22-23.000.
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 Ogawa, Iwakichi, 246,201, Cl. D34-15.0AD.
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- Tsang, Chak-Pui. Combined letter opener and key holder. 246,154, 10-25-77, Cl. D8-104.000.
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 Vitrac, Jean Pierre: See—
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 Wesley-Jessen Inc.: See—
 Kusek, Edwin F., 246,148, Cl. D6-188.000.
 Wright, Kent M.: See—
 Muscatello, Ralph A.; and Wright, Kent M., 246,156, Cl. D9-71.000.
 Yamauchi, Loretta H. Cabinet bulletin board. 246,180, 10-25-77, Cl. D19-52.000.
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 Kocour, Max G.; and Zundel, Arthur P., 246,157, Cl. D9-255.000.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 25, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

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71	4,054,970	CLASS 51		12	4,055,071	110	2 H	4,055,169	192	4,055,459	
	CLASS 23	228	4,055,026	23	4,055,072	120	2 S	4,055,170	209	4,055,460	
230 EP	4,055,399	238 GG	4,055,027	40	4,055,074	378	32	4,055,171	290	4,055,461	
253 R	4,055,395	334	4,055,028	61.4	4,055,076	CLASS 102	87 R	4,055,172	382	4,055,462	
253 TP	4,055,394	395	4,055,029	73	4,055,077	14	92 BC	4,055,173	CLASS 164		
269	4,055,396	411	4,055,025	88.5 R	4,055,078	23	139	4,055,174	4	4,055,212	
264	4,055,397	CLASS 52		117.3	4,055,079	CLASS 104	142.5	4,055,175	45	4,055,213	
270.5 W	4,055,398	86	4,055,030	139	4,055,080	148 LM	213	4,055,176	241	4,055,214	
277 C	4,055,401	172	4,055,031	146	4,055,081	CLASS 106	218 M	4,055,177	252	4,055,215	
	CLASS 24	CLASS 53		194 E	4,055,083	10	260	4,055,178	258	4,055,216	
68 CD	4,054,971	14	4,055,032	194 R	4,055,082	50	275	4,055,179	CLASS 165		
201 HE	4,054,972	122	4,055,033	418	4,055,085	52	283	4,055,180	1	4,055,217	
205 R	4,054,973	124 C	4,055,034	421 R	4,055,087	64	287	4,055,181	89	4,055,218	
	CLASS 26	167	4,055,035	424	4,055,088	73.32	305.1	4,055,182	CLASS 172		
9	4,054,974	31	4,055,403	425.4 R	4,055,086	288 Q	334 C	4,055,183	47	4,055,221	
	CLASS 29	85	4,055,404	432 R	4,055,089	CLASS 108	349 B	4,055,184	413	4,055,222	
27 C	4,054,975	216	4,055,405	510	4,055,090	132	402	4,055,185	777	4,055,223	
90 R	4,054,976	CLASS 56		CLASS 74		CLASS 110	419 PG	4,055,186	CLASS 174		
157.1 R	4,054,977	13.6	4,055,036	394	4,055,091	8 R	422	4,055,187	66	4,055,224	
157.3 R	4,054,979	16.4	4,055,037	439	4,055,092	CLASS 111	9	4,055,188	68.5	4,055,225	
	4,054,981	CLASS 57		501 R	4,055,093	85	84 B	4,055,189	CLASS 175		
159.1	4,054,982	11	4,055,038	CLASS 75		CLASS 112	235 R	4,055,190	5	4,055,226	
227	4,054,983	34 AT	4,055,039	74	4,055,415	143	CLASS 132		24 R	4,055,463	
237	4,054,984	140 BY	4,055,040	124	4,055,416	158 A	39	4,055,191	87	4,055,464	
416	4,054,985	CLASS 60		142	4,055,417	158 E	115	4,055,192	CLASS 176		
434	4,054,986	226 R	4,055,041	CLASS 82		158 R	107	4,055,193	208	4,055,465	
452	4,054,987	265	4,055,042	1 C	4,055,094	CLASS 113	10	4,055,194	CLASS 177		
564.6	4,054,988	282	4,055,043	36 A	4,055,095	116 EE	89 CC	4,055,442	CLASS 178		
571	4,054,989	322	4,055,045	CLASS 83		120 Y	CLASS 137		18	4,055,726	
623.1	4,054,990	428	4,055,046	37	4,055,096	121 C	84	4,055,197	68	4,055,727	
	CLASS 30	444	4,055,047	169	4,055,097	CLASS 114	116.5	4,055,198	CLASS 179		
231	4,054,991	646	4,055,048	309	4,055,098	144 E	590	4,055,199	2 C	4,055,729	
276	4,054,992	651	4,055,049	403	4,055,099	219	624.11	4,055,200	15 AT	4,055,728	
	4,054,993	692	4,055,050	454	4,055,100	230	CLASS 139		84 VF	4,055,730	
296 R	4,054,994	CLASS 61		660	4,055,101	244	421	4,055,201	99	4,055,731	
	CLASS 32	CLASS 62		749	4,055,102	270			117	4,055,732	
11	4,054,995	45 B	4,055,051	CLASS 84							
14 A	4,054,997	103	4,055,052	1.01	4,055,103						
14 B	4,054,996	CLASS 63		CLASS 85							
33	4,054,998	3	4,055,053	1 SS	4,055,385						
	CLASS 33			CLASS 89							
181 AT	4,054,999			1 A	4,055,104						
241	4,055,000										
	CLASS 34										
1	4,055,001										

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175.3 R	4,055,733	6 G	4,055,257	491	4,055,319	346.7	4,055,577	CLASS 296	CLASS 339
14 B	4,055,228	8.5 C	4,055,261	501	4,055,320	347.2	4,055,578	23 G	6 R
32	4,055,229	17 A	4,055,258	CLASS 249		348.34	4,055,579	CLASS 299	CLASS 340
89.1	4,055,230	17 D	4,055,259	182	4,055,321	404.5	4,055,580	53	16 R
132	4,055,232	44 R	4,055,260	187 R	4,055,322	429.9	4,055,581	CLASS 305	80
		140	4,055,262	CLASS 250		439 R	4,055,582	CLASS 307	146.1 AQ
135	4,055,233	152	4,055,263	239	4,055,761	448.2 E	4,055,584	57	146.3 E
241	4,055,231	252	4,055,264	253	4,055,762	453 SP	4,055,585	10 R	146.3 F
2 R	4,055,234	254	4,055,266	270	4,055,763	465 C	4,055,587	229	147 LP
73.2	4,055,235	10.49 R	4,055,267	336	4,055,764	465.5 R	4,055,588	254	173 LM
73.4	4,055,237	121 P	4,055,740	370	4,055,765	507 R	4,055,591	296 R	Re.29.461
73.5	4,055,238	145	4,055,741	385	4,055,766	514 D	4,055,592	355	173 R
50	4,055,239	216	4,055,742	461 R	4,055,767	514 G	4,055,593	360	173.2
CLASS 190		239	4,055,743	492 R	4,055,768	520 B	4,055,594	321	4,055,838
CLASS 192		390	4,055,744	505	4,055,769	534 M	4,055,596	321	4,055,839
67 A	4,055,240	406	4,055,745	613 D	4,055,771	553 B	4,055,597	347 AD	4,055,840
105 CE	4,055,241	9 C	4,055,268	CLASS 251	4,055,772	562 S	4,055,598	347 DD	4,055,841
CLASS 194		10	4,055,269	306	4,055,323	586 P	4,055,599	420	4,055,842
55	4,055,242	23	4,055,270	309	4,055,324	593 R	4,055,600	CLASS 343	4,055,843
61	4,055,243	64	4,055,271	328	4,055,325	617 R	4,055,601	CLASS 350	4,055,844
CLASS 195		70	4,055,272	351	4,055,326	618 H	4,055,602	10	4,055,376
1.7	4,055,466	256	4,055,273	CLASS 252		668 A	4,055,603	105	4,055,377
2	4,055,467	269	4,055,274	8.55 C	4,055,502	851	4,055,604	CLASS 351	4,055,378
29	4,055,468	1	4,055,275	12	4,055,503	857 L	4,055,605	160	4,055,379
66 R	4,055,469	3	4,055,276	63.2	4,055,504	CLASS 261		171	4,055,380
127	4,055,470	42	4,055,277	102	4,055,505	36 A	4,055,609	CLASS 354	4,055,381
CLASS 198		54	4,055,278	132	4,055,506	114 R	4,055,610	21	4,055,846
345	4,055,244	70	4,055,279	162	4,055,507	CLASS 264		CLASS 355	
422	4,055,245	1	4,055,280	301.1 W	4,055,508	6	4,055,611	3 R	4,055,380
575	4,055,246	3	4,055,281	363.5	4,055,509	22	4,055,612	75	4,055,381
CLASS 200		42	4,055,282	426	4,055,510	40.7	4,055,613	CLASS 356	
5 A	4,055,734	44	4,055,283	435	4,055,511	46.4	4,055,614	210	4,055,382
16 A	4,055,735	54	4,055,284	441	4,055,512	59	4,055,615	229	4,055,383
51 R	4,055,737	70	4,055,285	462	4,055,513	105	4,055,616	CLASS 357	
296	4,055,738	421	4,055,286	470	4,055,514	139	4,055,617	CLASS 358	
315	4,055,739	45 S	4,055,287	542	4,055,515	141	4,055,618	CLASS 360	
CLASS 201		CLASS 224		47	4,055,327	258	4,055,619	77	4,055,849
20	4,055,471	5 R	4,055,283	79	4,055,328	313	4,055,620	CLASS 361	
CLASS 202		42.1 D	4,055,284	86 R	4,055,329	CLASS 266		305	4,055,850
234	4,055,473	42.42 R	4,055,286	131	4,055,330	44	4,055,331	CLASS 362	
CLASS 204		45 S	4,055,287	CLASS 260		48	4,055,332	159	4,055,759
32 R	4,055,472	1	4,055,288	2 A	4,055,516	130	4,055,333	352	4,055,760
70	4,055,474	92	4,055,289	2 EP	4,055,517	138	4,055,334	CLASS 363	
98	4,055,475	128	4,055,290	2.5 AF	4,055,521	245	4,055,335	CLASS 364	
195 T	4,055,476	CLASS 228		2.5 AK	4,055,519	283	4,055,336	200	4,055,851
302	4,055,477	108	4,055,291	2.5 AM	4,055,518	CLASS 267		424	4,055,750
CLASS 206		17 M	4,055,292	2.5 AW	4,055,522	101	4,055,337	466	4,055,748
5	4,055,248	31 FS	4,055,293	2.5 R	4,055,523	125	4,055,338	500	4,055,751
447	4,055,249	69	4,055,294	8	4,055,524	CLASS 271		551	4,055,752
457	4,055,250	80	4,055,295	17 N	4,055,525	173	4,055,339	705	4,055,753
CLASS 208		CLASS 235		23.7 A	4,055,527	236	4,055,340	715	4,055,757
11 LE	4,055,480	61.11 E	4,055,747	29.3	4,055,528	CLASS 273		724	Re.29.460
89	4,055,481	61.7 B	4,055,746	29.6 RW	4,055,529	86 C	4,055,341	725	4,055,756
111	4,055,482	92 PE	4,055,749	31.8 B	4,055,530	88	4,055,342	821	4,055,758
127	4,055,483	302.3	4,055,754	32.4	4,055,531	108	4,055,343	CLASS 401	
CLASS 209		CLASS 236		37 EP	4,055,532	110	4,055,344	CLASS 407	
3	4,055,485	1 C	4,055,296	45.7 PH	4,055,533	131 AC	4,055,345	CLASS 408	
11	4,055,486	34.5	4,055,297	45.7 R	4,055,534	131 BB	4,055,346	CLASS 417	
38	4,055,251	CLASS 237		45.7 S	4,055,535	135 D	4,055,347	53	Re.29.456
44	4,055,487	2 B	4,055,299	45.7 P	4,055,536	146	4,055,348	221	4,055,387
74 M	4,055,252	CLASS 239		45.9 C	4,055,539	179 A	4,055,349	CLASS 423	
173	4,055,488	15	4,055,300	47 CP	4,055,543	CLASS 274		79	4,055,621
223	4,055,489	101	4,055,301	47 EN	4,055,541	10 S	4,055,350	118	4,055,622
CLASS 210		102	4,055,302	47 P	4,055,545	15 R	4,055,351	235	4,055,623
17	4,055,490	104	4,055,303	47 UA	4,055,542	CLASS 277		262	4,055,624
19	4,055,491	128	4,055,304	47 XA	4,055,544	152	4,055,352	320	4,055,626
21	4,055,492	230	4,055,305	51 R	4,055,546	CLASS 279		359	4,055,627
31 C	4,055,493	524	4,055,306	67 FP	4,055,547	2 R	4,055,353	447.4	4,055,628
49	4,055,494	601	4,055,307	77.5 AA	4,055,550	CLASS 280		509	4,055,629
52	4,055,495	CLASS 241		77.5 AN	4,055,551	47.31	4,055,354	558	4,055,630
87	4,055,496	48	4,055,307	77.5 AT	4,055,552	106 T	Re.29.455	657	4,055,632
91	4,055,497	100	4,055,308	78 L	4,055,553	179 A	4,055,355	CLASS 424	
94	4,055,498	221	4,055,309	112.5 S	4,055,554	628	4,055,356	1	4,055,633
119	4,055,499	CLASS 242		117	4,055,555	641	4,055,357	47	4,055,634
412	4,055,500	7.08	4,055,310	152	4,055,556	CLASS 282		78	4,055,635
516	4,055,501	18 DD	4,055,311	166	4,055,558	27.5	4,055,358		
CLASS 211		43.1	4,055,312	176	4,055,559	CLASS 285			
189	4,055,253	56.4	4,055,313	186	4,055,560	CLASS 292			
CLASS 213		128	4,055,314	206	4,055,567	228	4,055,360		
61	4,055,254	CLASS 243		239 B	4,055,561	359	4,055,361		
CLASS 214		118 P	4,055,317	250 AH	4,055,564	CLASS 293			
2	4,055,255	CLASS 244		281 N	4,055,565	62	4,055,362		
6 DK	4,055,256	243	4,055,318	295 A	4,055,566	CLASS 294			
				302 H	4,055,568	19 R	4,055,363		
				305	4,055,569	63 B	4,055,364		
				308 R	4,055,571	78 R	4,055,365		
				327 B	4,055,572				
				345.5	4,055,573				
				346.6	4,055,576				

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177	4,055,636	304	4,055,657	127	4,055,672	379	4,055,689	4,055,707	CLASS 536
184	4,055,637	305	4,055,658	231	4,055,673	CLASS 428		CLASS 429	17
219	4,055,638	310	4,055,659	430	4,055,674	9	4,055,690	10	4,055,715
230	4,055,639	311	4,055,660	438	4,055,677	78	4,055,692	49	4,055,716
	4,055,640	312	4,055,661	470	4,055,678	91	4,055,693	104	4,055,717
242	4,055,641	319	4,055,662	532	4,055,679	95	4,055,694	143	4,055,718
246	4,055,642	330	4,055,663	534	4,055,680	113	4,055,695	CLASS 542	
249	4,055,643		4,055,664	548	4,055,681	195	4,055,696	CLASS 543	
250	4,055,645		4,055,665	607	4,055,682	262	4,055,697	CLASS 544	
	4,055,646	CLASS 425		635	4,055,683	311	4,055,698	CLASS 545	
251	4,055,647	4 R	4,055,388	656	4,055,684	366	4,055,699	CLASS 546	
260	4,055,648	466	4,055,389	CLASS 427		391	4,055,700	CLASS 547	
263	4,055,650	CLASS 426		2	4,055,682	398	4,055,701	CLASS 548	
267	4,055,651	31	4,055,666	8	4,055,683	410	4,055,702	CLASS 549	
273 R	4,055,652	62	4,055,667	18	4,055,684	411	4,055,703	CLASS 550	
275	4,055,653	79	4,055,668	124	4,055,685	633	4,055,704	23	4,055,588
283	4,055,654	93	4,055,669	142	4,055,686	652	4,055,705	121	4,055,589
294	4,055,655	119	4,055,670	195	4,055,687	208	4,055,706	179	4,055,590
300	4,055,656	123	4,055,671		4,055,688			207	4,055,721

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D2—	409	246,141	D8—	1	246,152		124	246,163	D14—	33	246,174		150	246,185	5 CC	246,196
D6—	58	246,142		13	246,153		29	246,164		36	246,175	D24—	1.1	246,186	15 AD	246,197
	63	246,143		104	246,154	D12—	29	246,165		40	246,177		14	246,187		246,199
		246,144	D9—	2	246,155		62	246,166		32	246,178		17	246,188		246,200
	113	246,145		71	246,156		65	246,167	D15—	82	246,176		27	246,189		246,198
	145	246,146		255	246,157		78	246,168		52	246,179		23	246,190	15 AJ	246,198
	164	246,147	D10—	15	246,158		99	246,169	D19—	82	246,180		37	246,191	D48—	20 R
	188	246,148		40	246,159		111	246,170	D22—	23	246,181	D25—	9	246,192	23 R	246,202
D7—	48	246,150		111	246,160		205	246,171		30	246,182		24	246,193	23 R	246,203
	94	246,149			246,161		205	246,172	D23—	7	246,183	D30—	12	246,194	D64—	11 R
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1 : 4,055,089	4,055,394	4,055,463	4,055,187	20 : 4,055,793	4,055,173
4,055,126	4,055,401	4,055,548	4,055,208	4,054,991	4,055,196
4,055,253	4,055,442	4,055,692	4,055,214	4,055,250	4,055,212
5 : 4,055,207	4,055,473	4,055,719	4,055,222	4,055,479	4,055,213
4,055,359	4,055,486	4,055,763	4,055,230	4,055,698	4,055,228
6 : Re.29,452	4,055,498	Re.29,454	4,055,254	21 : 4,055,260	4,055,232
Re.29,459	4,055,499	4,055,040	4,055,272	22 : 4,055,481	4,055,246
4,054,981	4,055,500	4,055,056	4,055,279	4,055,482	4,055,276
4,054,983	4,055,516	4,055,163	4,055,282	4,055,483	4,055,284
4,054,994	4,055,519	4,055,201	4,055,286	4,055,513	4,055,285
4,054,995	4,055,531	4,055,409	4,055,288	4,055,720	4,055,386
4,055,004	4,055,564	4,055,410	4,055,321	24 : 4,055,015	4,055,563
4,055,005	4,055,593	4,055,412	4,055,328	4,055,102	4,055,602
4,055,016	4,055,603	4,055,507	4,055,329	4,055,106	4,055,609
4,055,048	4,055,604	4,055,560	4,055,337	4,055,121	4,055,717
4,055,053	4,055,620	4,055,587	4,055,385	4,055,177	4,055,718
4,055,075	4,055,652	4,055,661	4,055,390	4,055,281	4,055,772
4,055,080	4,055,675	4,055,000	4,055,396	4,055,332	4,055,792
4,055,082	4,055,678	4,055,002	4,055,419	4,055,771	4,055,065
4,055,104	4,055,734	4,055,122	4,055,454	4,055,847	4,055,205
4,055,140	4,055,736	4,055,162	4,055,467	4,055,012	4,055,243
4,055,141	4,055,738	4,055,165	4,055,524	4,055,026	4,055,280
4,055,176	4,055,744	4,055,283	4,055,530	4,055,070	4,055,377
4,055,185	4,055,754	4,055,375	4,055,569	4,055,111	4,055,384
4,055,188	4,055,757	4,055,576	4,055,608	4,055,138	4,055,422
4,055,193	4,055,764	4,055,601	4,055,664	4,055,278	4,055,550
4,055,195	4,055,773	4,055,677	4,055,676	4,055,298	4,055,551
4,055,200	4,055,777	4,055,745	4,055,681	4,055,379	4,055,690
4,055,211	4,055,794	4,055,116	4,055,699	4,055,403	4,055,124
4,055,224	4,055,797	4,055,270	4,055,796	4,055,496	4,055,605
4,055,226	4,055,805	4,055,174	4,055,807	4,055,682	4,054,969
4,055,233	4,055,806	4,055,632	4,055,832	4,055,704	4,055,013
4,055,257	4,055,810	4,055,017	4,055,835	4,055,733	4,055,171
4,055,263	4,055,814	4,055,265	4,055,086	4,055,735	4,055,252
4,055,267	4,055,816	4,055,365	4,055,127	4,055,758	4,055,307
4,055,290	8 : 4,055,014	17 : Re.29,460	4,055,175	4,055,759	4,055,343
4,055,293	4,055,167	4,054,952	4,055,268	4,055,768	4,055,364
4,055,295	4,055,194	4,054,956	4,055,273	4,055,781	4,055,414
4,055,301	4,055,255	4,054,967	4,055,370	4,055,788	4,055,501
4,055,302	4,055,320	4,055,003	4,055,445	4,055,790	4,055,669
4,055,303	4,055,330	4,055,007	4,055,466	4,055,800	4,055,064
4,055,304	4,055,348	4,055,022	4,055,543	4,055,808	4,054,993
4,055,305	4,055,434	4,055,036	4,055,638	4,055,820	4,055,150
4,055,306	4,055,616	4,055,046	4,055,687	4,055,827	4,055,660
4,055,322	4,055,801	4,055,057	4,055,829	4,055,851	4,055,079
4,055,327	9 : 4,054,958	4,055,093	4,055,843	26 : Re.29,456	4,055,227
4,055,334	4,054,986	4,055,115	Re.29,455	4,055,023	4,055,725
4,055,341	4,055,085	4,055,134	4,054,984	4,055,028	4,055,730
4,055,345	4,055,097	4,055,146	4,055,105	4,055,083	4,054,957
4,055,347	4,055,159	4,055,180	4,055,160	4,055,088	4,055,001
4,055,354	4,055,259	4,055,181	4,055,223	4,055,096	4,055,008
4,055,360	4,055,296	4,055,182	4,055,242	4,055,100	4,055,051
4,055,376	4,055,314	4,055,184	4,055,368	4,055,158	4,055,087

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

PI 49

4,055,129	4,054,987	4,055,786	4,055,657	4,055,553	4,055,478
4,055,130	4,054,989	4,055,803	4,055,684	4,055,573	4,055,495
4,055,131	4,054,996	4,055,811	4,055,686	4,055,592	4,055,544
4,055,198	4,054,997	4,055,815	4,055,705	4,055,596	4,055,598
4,055,217	4,055,009	4,055,848	4,055,707	4,055,597	4,055,626
4,055,275	4,055,049	4,055,849	4,055,748	4,055,607	4,055,680
4,055,287	4,055,054	4,055,897	4,055,753	4,055,610	4,055,819
4,055,351	4,055,078	4,055,191	4,055,765	4,055,629	4,055,821
4,055,423	4,055,101	4,055,206	4,055,766	4,055,630	4,055,449
4,055,456	4,055,103	4,055,374	4,055,804	4,055,645	4,055,494
4,055,484	4,055,143	4,055,388	4,055,813	4,055,665	4,055,178
4,055,505	4,055,144	4,055,670	4,055,839	4,055,703	Re.29,453
4,055,506	4,055,145	4,055,841	4,055,845	4,055,712	4,055,072
4,055,511	4,055,168	38 : 4,055,262	40 : 4,055,399	4,055,723	4,055,108
4,055,514	4,055,186	39 : 4,054,999	4,055,502	4,055,724	4,055,135
4,055,514	4,055,189	4,055,038	4,055,509	4,055,760	4,055,169
4,055,525	4,055,219	4,055,041	4,055,567	4,055,762	4,055,462
4,055,529	4,055,294	4,055,197	4,055,582	4,055,826	4,055,533
4,055,532	4,055,319	4,055,713	4,055,588	4,055,828	4,055,666
4,055,554	4,055,333	4,055,248	4,055,746	4,055,846	4,055,709
4,055,578	4,055,339	4,055,251	4,055,147	4,055,850	4,055,749
4,055,606	4,055,340	4,055,291	4,055,204	4,055,850	4,054,960
4,055,643	4,055,344	4,055,363	4,055,234	4,055,850	4,055,110
4,055,644	4,055,361	4,055,400	4,055,297	4,055,850	4,055,183
4,055,649	4,055,418	4,055,406	4,055,488	4,055,850	4,055,203
4,055,659	4,055,420	4,055,413	4,055,498	4,055,850	4,055,317
4,055,663	4,055,424	4,055,416	4,055,498	4,055,850	4,055,369
4,055,671	4,055,429	4,055,441	4,055,511	4,055,850	4,055,737
4,055,672	4,055,447	4,055,457	4,055,511	4,055,850	4,055,830
4,055,691	4,055,452	4,055,472	4,055,511	4,055,850	4,055,830
4,055,693	4,055,469	4,055,476	4,055,511	4,055,850	4,055,830
4,055,702	4,055,480	4,055,477	4,055,511	4,055,850	4,055,830
4,055,731	4,055,508	4,055,497	4,055,511	4,055,850	4,055,830
4,055,750	4,055,521	4,055,515	4,055,511	4,055,850	4,055,830
4,055,774	4,055,562	4,055,528	4,055,511	4,055,850	4,055,830
4,055,791	4,055,581	4,055,534	4,055,511	4,055,850	4,055,830
4,055,802	4,055,588	4,055,537	4,055,511	4,055,850	4,055,830
4,055,812	4,055,591	4,055,538	4,055,511	4,055,850	4,055,830
4,055,836	4,055,631	4,055,540	4,055,511	4,055,850	4,055,830
35 : 4,055,247	4,055,633	4,055,541	4,055,511	4,055,850	4,055,830
4,055,789	4,055,701	4,055,561	4,055,511	4,055,850	4,055,830
36 : 4,054,959	4,055,714	4,055,641	4,055,511	4,055,850	4,055,830
4,054,963	4,055,729	4,055,655	4,055,511	4,055,850	4,055,830
4,054,975	4,055,742	4,055,656	4,055,511	4,055,850	4,055,830

DESIGN PATENTS

4 : 246,160	246,180	11 : 246,194	25 : 246,156	246,164	37 : 246,192
6 : 246,141	246,182	12 : 246,166	246,174	246,165	42 : 246,202
246,142	246,183	13 : 246,171	246,175	246,181	45 : 246,190
246,145	246,186	17 : 246,148	246,178	246,184	48 : 246,158
246,146	246,195	246,157	246,193	246,184	51 : 246,150
246,152	246,198	246,159	246,204	246,184	53 : 246,189
246,170	246,161	246,162	246,168	246,169	55 : 246,143
246,173	246,153	246,163	246,155	246,188	246,144
246,177	246,191				

PLANT PATENTS

6 : 4,132	4,133	4,134	4,135	4,137
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